INTERNATIONAL NURSERY REPORT No. 8

FOOD LEGUME NURSERIES

1983-84

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS

Box 5466 Aleppo, Syria

July 1986

PREFACE

A number of trials and nurseries were supplied by the Food Legume Improvement Program (FLIP) of ICARDA to cooperating scientists within and outside the ICARDA region for 1983/84 growing season. Many of these trials and nurseries were also grown at ICARDA sites in Syria and Lebanon. This report summarises the data returned by the cooperating scientists and those obtained at ICARDA sites from these trials and nurseries. The results received from cooperators till December, 1985 have been included.

The report has been prepared by Dr R.S. Malhotra, International Trials Scientist of the Food Legume Improvement Program. The Computor Center at ICARDA has provided invaluable assistance in computerization of field book enabling speedy analysis of data. The assistance of Mr Fawzi Merjaneh and Ms Suheila Arslan in the statistical analysis and the assistance of FLIP secretarial staff and particularly Ms Nawal Saroukhan in the preparation of the manuscript is sincerely acknowledged.

It is hoped that the results and discussion contained in this report will be of interest and use to the cooperating scientists. Any comments on the report and suggestions for improvement in future would be most welcomed.

Mohan C. Saxena
Leader,
Food Legume Improvement Program
ICARDA, P.O.Box 5466
Aleppo - Syria

CONTENTS

		Page
1.	**INTRODUCTION**	1
2.	**ICARDA INTERNATIONAL TRIALS AND NURSERIES FOR THE 1983/84 SEASON**	1
2.1.	DESCRIPTION	1
2.1.1.	Adaptation Trials (AT)	1
2.1.2.	International Yield Trials (IYT)	2
2.1.3.	International Screening Nurseries (ISN)	2
2.1.4.	International F_3 Trials/Nurseries (IF_3T/N)	3
2.1.5.	International Disease and Pest Nurseries (I-N)	3
2.1.6.	International Agronomy Trials	4
2.2.	DISTRIBUTION AND LIST OF COOPERATORS	4
2.3.	DESIGN, ANALYSIS AND MANAGEMENT	4
2.3.1.	Design and Analysis	4
2.3.2.	Management	18
3.	**CHICKPEA INTERNATIONAL TRIALS AND NURSERIES**	19
3.1.	Chickpea Adaptation Trial (CAT)	19
3.2.	Chickpea International Yield Trial-Spring (CIYT-Sp)	27
3.3.	Chickpea International Yield Trial-Winter-Mediterranean Region (CIYT-W-MR)	38
3.4.	Chickpea International Yield Trial-W-Sub-Tropical Region (CIYT-W-STR)	53
3.5.	Chickpea International Yield Trial-Large Seed (CIYT-L)	62
3.6.	Chickpea International Screening Nursery (CISN)	73
3.7.	Chickpea International F_3 Trial-Mediterranean (CIF_3T-MR)	81
3.8.	Chickpea International F_3 Trial-Sub-Tropical Region (CIF_3T-STR).	88
3.9.	Chickpea International Ascochyta Blight Nursery (CIABN)	93
4.	**FABA BEAN INTERNATIONAL TRIALS AND NURSERIES**	98
4.1.	Faba Bean International Yield Trial-Large Seed (FBIYT-L)	98
4.2.	Faba Bean International Yield Trial-Small Seed (FBIYT-S)	103
4.3.	Faba Bean International Screening Nursery-Large Seed (FBISN-L)	117
4.4.	Faba Bean International Screening Nursery-Small Seed (FBISN-S)	124
4.5.	Faba Bean International F_3 Nursery ($FBIF_3T$)	134

4.6. Faba Bean International F_3 Nursery-Early ($FBIF_3T$-E) 140
4.7. Faba Bean International Disease Screening Nurseries 148
4.7.1. Faba Bean International Chocolate Spot Nursery (FBICSN) 148
4.7.2. Faba Bean International Ascochyta Blight Nursery (FBIABN) 150
4.7.3. Faba Bean International Rust Nursery (FNIRN) 152
4.8. Faba Bean International Orobanche Nursery (FBION) 153

5. **LENTIL INTERNATIONAL TRIALS AND NURSERIES** 156

5.1. Lentil International Yield Trial-Large Seed (LIYT-L) 156
5.2. Lentil International Yield Trial-Small Seed (LIYT-S) 167
5.3. Lentil International Screening Nursery-Large Seed (LISN-L) 177
5.4. Lentil International Screening Nursery-Small Seed (LISN-S) 185
5.5. Lentil International Screening Nursery-Early (LISN-E) 193
5.6. Lentil International Screening Nursery-Tall-Erect (LISN-T-E) 194
5.7. Lentil International F_3 Trial (LIF_3T) 210
5.8. Lentil International F_3 Trial-Early (LIF_3T-E) 218
5.9. Lentil International Orobanche Nursery (LION) 226

6. **INTERNATIONAL AGRONOMY TRIALS** 228

6.1. Date of Planting and Plant-Population Trial 228
6.1.1. Chickpea Date of Planting and Plant-Population Trial (CDPPT) 228
6.1.2. Faba Bean Plant-Population Trial (FBPPT) 231
6.1.3. Lentil Plant-Population Trial (LPPT) 231

6.2. Fertility-cum-Inoculation Trial 234
6.2.1. Chickpea Fertility-cum-Inoculation Trial (CFIT) 235
6.2.2. Faba Bean Fertility-cum-Inoculation Trial (FBFIT) 235
6.2.3. Lentil Fertility-cum-Inoculation Trial (LFIT) 235

6.3. Weed Control Trial 239
6.3.1. Chickpea Weed Control Trial (CWCT) 239
6.3.2. Faba Bean Weed Control Trial (FBWCT) 241
6.3.3. Lentil Weed Control Trial (LWCT) 241

6.4. Chickpea Iron Efficiency Trial (CIET) 244

7. **ACKNOWLEDGEMENTS** 245

1. INTRODUCTION

The international cooperative testing program on food legume improvement is co-ordinated by the International Center for Agricultural Research in the Dry Areas (ICARDA). The main objective of the program is to provide a mechanism for the multi-location testing of genetic material of kabuli chickpeas, faba beans and lentils originating from national and international programs.

The testing aims at evaluating genotypic performance for both seed yield and reaction to biotypes of locally occurring pests and diseases. It is hoped that through such testing, firstly, it will prove possible to identify both superior genotypes which are adapted to specific environments, and genotypes which have a wide adaptation. Secondly, that the performance data from a number of widely differing environments will help the breeder to reduce the number of seasons required for evaluation prior to cultivar release. In addition the program will permit the dissemination of elite germplasm and segregating populations to interested scientists, who can exercise their own selection to develop superior cultivars well adapted to their conditions.

Through the distribution of agronomic trials it is hoped that agronomic research on these legumes will be encouraged and the information on optimum agronomic practices for different agro-ecological conditions would become available.

2. ICARDA INTERNATIONAL TRIALS AND NURSERIES FOR THE 1983/84 SEASON

2.1. DESCRIPTION

2.1.1. Adaptation Trials (AT)

The environmental conditions vary greatly both within and between the countries in which the three food legume species are grown. This diversity may hinder the improvement of the crop species by the inability to conduct sufficient breeder's trials in all the relevant countries. However, it may be possible to meaningfully group the different legume growing areas into a few agro-ecological zones. The identification of such zones is of major importance in breeding for wider adaptability, and would also allow ICARDA to serve the national programs better through the development and distribution of locally adapted materials.

Insufficient information is available on the relationship between key agro-ecological variables and legume crop performance to be able to confidently predict such zones. In the absence of this information, it was felt that the best way to characterise the different environments is through the study of a uniform set of diverse genotypes grown in the main legume production areas over several years. This idea was first discussed at the 1978 regional food legume workshop and the first adaptation trials were distributed for 1978/79 season.

The adaptation trials for lentils and faba beans were discontinued after conducting for 4 years, however, for chickpeas, 1983/84 season was the last season. Entries in the trial during 1983/84 season were same as in the previous season.

2.1.2. International Yield Trials (IYT)

In order to identify heavy yielding genotypes, with either specific or wide adaptation, it is essential to test genetic material emerging from ICARDA and other national breeding programs in a wide range of environments, encompassing the major production zones in the different countries.

The IYTs are replicated trials which test advanced materials that have previously shown above average performance. These trials permit an assessment of yield performance (G) across a range of environments (E) and provide an estimate of the relative size of G x E interactions in that growing season. They also allow national programs to identify genotypes best adapted to their local coditions, and provide ICARDA with information that will rationalise crossing programs for different countries.

As in the past there are separate large-seeded and small-seeded trials on lentils and faba beans. In lentils the large seeded yield trials comprise entries with a minimum seed size 4.5 g/100 seeds, whereas in faba beans the large seeded trials are composed of Vicia faba major types. A trial of large-seeded kabuli types is also available for those countries having a requirement of large seed size (greater than 40 g/100 seeds). The winter-planted chickpea yield trial of cold tolerant, ascochyta blight resistant types is available for the Mediterranean as well as Sub-Tropical Regions.

Breeders desiring to enter lines into an IYT are requested to send to ICARDA, by early October approximately 4 kg of chickpeas, 2 kg of lentils and/or 5 kg of faba beans. This will be increased by ICARDA and included in next years trials. Since ICARDA aims to supply only Ascochyta resistant material of chickpeas, please furnish seed of resistant lines only. ICARDA can pay the cost of shipping the seed to Aleppo to the cooperators.

2.1.3. International Screening Nurseries (ISN)

The ISNs form an adjunct to the IYTs by providing an initial evaluation of a large number or advanced lines (F_5/F_6) and elite germplasm, encompassing a wide range of genetic diversity, in non-replicated trials in the environments utilized for the IYTs. The results thus provide a basis on which genotypes can be advanced to the IYTs and provide national programs with the opportunity to practice selection in a greater range of material than provided in the IYTs.

As with the IYT's, the faba bean ISN and lentil ISN are divided into large and small seeded types. These nurseries are non-replicated and contain 50-100 entries.

There is also a screening nursery of early lentil lines available particularly for those countries of a more southern latitude in South Asia and Africa and a nursery of lentils with tall and erect growth habit which can be harvested with a cutter-bar.

Cooperators desiring to enter material into an ISN are requested to send approximately 1000 seeds for each entry of lentils and chickpeas and 1500 seeds per entry of faba beans for increase and inclusion in next year's nursery.

2.1.4. International F_3 Trials/Nurseries (IF_3T/N)

Genotypes tested in the IYTs and in the ISNs tend to be relatively advanced breeding material that is approaching homozygosity, so nullifying any chances for re-selection in superior performing genotypes. In contrast the F_3 bulk trials/nurseries comprise early generation segregating material, thus permitting breeders in the national programs the chance to practice their own selection in the populations best adapted to the local environment. In addition the trials/nurseries allow estimates to be made of cross performance and interactions across a range of environments, which will additionally assist in identifying parents to be used in hybridization programs for the different countries.

The F_3T/Ns for lentils and kabuli chickpeas are developed separately for different major environmental conditions.

2.1.5. International Disease and Pest Nurseries (I-N)

The development of cultivars resistant to pathogens and pests prevalent in the main legume growing areas is essential if stable seed yields are to be achieved. However, there is presently little information available on the incidence and severity of legume diseases and pests in the different areas. The International Disease and Pest Nurseries have been formulated to rectify this situation. The aim of these nurseries is to test a relatively large number of genotypes, in replicated or unreplicated design, in a range of locations covering a number of countries. The nursery results thus furnish information on the incidence and severity of the disease/pest in differing geographic areas, and provide a means for the identification of resistant genotypes. These together should greatly assist the plant breeder in developing genotype that combines a heavy seed yield with a stable parasite resistance.

Realizing the importance of different diseases and pests in the region, four nurseries in faba beans, two in chickpeas and one in lentils have been developed. The entries in these nurseries are initially selected on the basis of their resistance/tolerance at restricted experimental sites of ICARDA. The cooperators desirous to enter lines in disease and pest nurseries are requested to send to ICARDA, by early October approximately 1000 seeds for each entry of lentils and chickpeas and 1500 seeds per entry of faba beans for

increase and inclusion in the next years nursery.

2.1.6. International Agronomy Trials

In many countries the legume crops tend to be neglected in favour of other crops, resulting in poorer management and fewer agronomic inputs. To combat this trend it is essential to develop suitable agronomic management practices for legumes that, if adopted, would increase both yields, and a farmer's income, and hence improve economic well-being in a country. Also the use of such practices should permit the full benefit to be gained from the cultivation of the potentially heavy yielding cultivars that emerge from plant breeding programs.

Realising the need for developing information on suitable agronomic management of the food legumes in the region a program of international agronomic trials has been in operation. In this program the cooperators are provided with information on design and conduct of the trial. In addition, the necessary experimental material such as fertilizers, pesticides, and Rhizobium culture are supplied. No seed is, however, sent as these trials are to be conducted with the best locally-adapted genotypes. A trial for the chemical control of Orobanche in faba bean is also available.

2.2. DISTRIBUTION AND LIST OF COOPERATORS

In Table 2.2.1. is given a list of the trials and nurseries distributed from ICARDA to the different countries; in Table 2.2.2. a list of the cooperators, and in Table 2.2.3. details on some of the locations at which the trials were conducted. Weather conditions during the cropping season for some of the locations are given in Fig. 1. In total, 1033 sets of trials were distributed to the cooperators. Data were returned on 539 of the trials and nurseries, representing 52% of the number distributed.

2.3. DESIGN, ANALYSIS AND MANAGEMENT

2.3.1. Design and Analysis

The designs used for the individual trials and nurseries are given in the crop reports. For the International Screening Nurseries (ISNs) which included both test and check entries, an augmented design, as proposed by Federer (1956)[1] was used. This design permits some adjustment of seed yields for block differences, and the calculation of standard errors for the comparison of entry means.

Only the data on seed yield have been analysed statistically, and the term 'significant' has been used to denote a probability level (P) equal or less than 0.05. The co-efficients of variation (CV) given in the different tables were calculated using an error mean square (EMS) from the relevant analysis of variance. The EMS was also used to calculate the appropriate least significant difference (LSD), which was

Table 2.2.1. Distribution of international nurseries and trials to the cooperators in different countries during 1983-84.

COUNTRY	CAT	CIYT-SPR	CIYTW-MDR	CIYTW-STR	CIYT-L	CIS-N	CIF3T-STR	CIF3T-MDR	CIAB-N	CDPT	CFIT	CIET	CWCT	FBIYT-L	FBIYT-S	FBISN-L	FBISN-S	FBIF3N	FBIF3N-E	FBION	FBIAB-N	FBICSN	FBIRN	FBPT	FBFIT	FBWCT	LIYT-L	LIYT-S	LISN-L	LISN-S	LISN-E	LISN-TE	LIF3T	LIF3T-E	LION	LPPT	LFIT	LWCT
ALGERIA	1	4	4	-	2	1	-	2	2	1	2	2	3	1	-	1	1	1	1	-	-	-	-	1	2	2	2	1	3	1	-	2	2	-	2	1	2	3
ARGENTINA	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	1	-	-	-	2	1	1
AUSTRALIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BANGLADESH	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRAZIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	1	1	1	1	-	1	-	-	-	-	-	-
BULGARIA	-	-	1	-	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	1	-	-	-	-	-
BURMA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CANADA	-	1	-	-	1	1	-	1	-	-	-	-	-	-	2	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHILE	1	-	1	-	-	-	-	1	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	3	-	2	-	1	2	-	-	-	-	-	-
CHINA	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COSTA RICA	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
COLUMBIA	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CYPRUS	1	-	1	-	-	1	-	-	-	-	-	-	-	-	1	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZECHOSLOVAKIA	1	-	-	-	1	-	-	-	-	-	-	-	-	1	1	1	1	1	1	-	-	-	-	-	-	-	1	1	1	1	1	-	1	-	-	1	1	1
ECUADOR	1	-	-	1	-	1	-	1	-	-	-	-	-	1	-	1	-	1	1	-	-	-	-	-	-	-	1	-	1	-	1	1	-	1	-	-	-	-
EGYPT	2	-	1	1	-	1	1	-	1	-	2	-	2	2	3	2	3	2	3	3	-	1	1	-	-	2	2	2	1	1	1	1	2	2	-	-	-	2
ETHIOPIA	1	1	-	1	1	1	-	-	-	1	-	-	-	1	1	1	1	2	2	-	-	-	-	-	-	1	-	1	1	2	2	1	-	-	-	1	-	-
FRANCE	-	1	-	-	-	1	-	1	1	-	-	-	-	-	1	-	2	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GREECE	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GUATEMALA	2	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
HUNGARY	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
INDIA	2	3	1	4	2	3	1	1	7	-	-	-	-	-	3	1	2	-	-	-	-	-	-	-	-	-	2	4	1	3	5	3	-	3	-	2	-	-
IRAN	-	-	2	-	2	1	-	-	1	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-
IRAQ	1	2	-	-	1	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	2	2	-	-	-	1	-	-	-	-	-	-
ITALY	1	3	4	-	4	2	-	2	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	2	3	2	2	-	2	2	-	-	-	-	-
JORDAN	-	1	1	-	1	1	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	1	2	1	1	-	-	1	-
KENYA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEBANON	1	1	1	-	-	1	-	1	1	1	-	2	2	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	1	-	1
LIBYA	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MALAWI	2	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MALI	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAURITIUS	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MEXICO	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOROCCO	5	3	8	-	2	-	-	-	2	2	-	-	4	1	1	2	2	-	1	1	1	1	1	2	2	2	3	2	3	1	2	3	-	-	4	-	-	2
MUSCAT (OMAN)	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPAL	2	2	-	-	-	3	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	2	1	-	-	-	-	-	4
PAKISTAN	7	5	6	6	2	8	4	-	7	5	6	4	11	-	1	3	2	-	1	-	-	-	-	1	1	1	2	7	4	6	14	2	-	6	-	3	6	9
PERU	3	1	1	-	2	1	1	-	-	1	1	-	1	2	-	2	-	-	1	-	-	-	-	1	1	1	2	-	2	-	-	-	-	-	-	-	-	-
POLAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	3
PORTUGAL	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QATAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAUDI ARABIA	1	1	2	-	-	-	-	-	-	1	-	-	-	-	1	1	1	-	-	-	-	-	1	-	-	-	-	2	1	1	-	-	-	-	-	-	-	-
SOMALIA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
SPAIN	1	-	5	-	4	2	-	3	1	-	-	-	1	1	2	-	2	2	3	3	-	-	-	-	-	1	2	-	1	-	-	2	2	-	-	-	-	-
SRILANKA	1	1	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	1	-	-	-	-
SUDAN	2	1	-	2	1	1	2	-	-	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	1	-	2	-	2	2	-	-	1	-	-	3	1
SYRIA	-	5	7	-	5	-	-	-	2	-	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	3	3	-	3	-	-	-	-	1	1
TANZANIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
THAILAND	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TUNISIA	3	2	5	1	4	4	2	2	4	2	-	1	4	3	3	4	4	3	3	2	1	1	1	2	2	3	4	-	3	-	1	4	3	3	2	-	-	2
TURKEY	2	2	2	-	2	1	-	1	2	-	2	-	-	3	2	1	1	-	1	-	-	-	-	-	2	-	3	2	2	1	-	3	3	-	-	-	1	1
USA	-	2	3	1	4	3	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
UK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WEST GERMANY	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YEMEN A. R.	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
YEMEN P. D. R.	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
ZAMBIA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ICARDA LEBANON	1	1	1	-	1	1	-	1	1	-	-	-	-	1	1	1	1	1	1	-	-	-	-	-	-	-	1	1	1	1	-	1	1	-	-	-	-	-
ICARDA SYRIA	2	3	4	1	1	1	1	1	3	-	-	-	-	3	3	3	3	2	2	1	1	-	1	-	-	-	1	1	1	1	2	1	1	2	2	-	-	-
TOTAL	57	49	65	19	51	50	14	20	41	15	16	11	33	30	36	38	38	17	29	10	5	5	5	8	11	15	40	38	40	39	40	41	19	20	10	1	16	31

Table 2.2.2. List of cooperators for FLIP 1983/84 international nurseries.

ALGERIA

Dr L. Hachemi
IDGC
Rue Pasteur
B.P. 16
Al-Harrach
Algiers

ARGENTINA

Mrs Liliana N. Gray
Facultad de Ciencias Naturales
Univ. Nacional de Salta
Buenos Aires 177
4400 Salta

Ing. Agr. Juan Carlos Arostegui
Cooperativa de Tabacaleros de
Jujuy LTDA
P.O.Box 15,
4608 Perico Jujuy
Av. San Martin
S/N - CC 4608 Perico

AUSTRALIA

Dr G.H. Walton
Research Officer
Plant Research Division
Department of Agriculture
Jarrah Road, South Perth
Western Australia

BANGLADESH

Dr Md. Anwarul Quader Shaikh
Head of Plant Genetics Division
Institute of Nuclear Agriculture
P.O.Box 4
Mymensingh

BRAZIL

Mr Simiao A. Vieira
Research Officer
CNP Trigo-EMBRAPA
BR 285, Km 174 Caixa Postal 569
99100 Passo Fundo, RS

Dr Fonseca
EMBRAPA - CENARGEN CIIQ
Caixa Postal 10-2372
70.000 Brasilia - DF

BULGARIA

Mr M.I. Mihov
Institute for Wheat and Sunflower
Near General Toshevo - 9520

BURMA

Dr V. Santhanam
Team Leader
Crop Development Project
c/o UNDP P.O.Box 650
Rangoon

CANADA

Dr C. Bernier
The University of Manitoba
Winnipeg, R3T 2N2
Manitoba

Dr A.E. Slinkard
Crop Science Department
University of Saskatchewan
Saskatoon S7N 0W0

Dr J. McVitty
Department of Plant Science
University of Manitoba
Winnipeg, R3T 2N2

Dr G. Rowland
Crop Development Center
University of Saskatchewan
Saskatoon S7N 0W0

Mr Gary R. Ablett
Soybean and Field Bean Specialist
Farm Crops Section
Ministry of Agric. & Food
Ridgetown College of Agri.
Technology, Ridgetown
Ontario N0P 2C0

CHILE

Dr Raul Matte Vial
Director
Estacion Experimental
Sociedad Nacional de Agric.
Tenderini 187
Casilla 40 - D
Santiago 1

Dr A. Krarup H.
Faculty of Agriculture
University Austral
Casilla 567, Valdivia

Mr Mario Mera Krieger
Estacion Experimental
Carillanca (INIA)
Casilla 58-D

Mr Mario Paredes C.
Instituto de Investigaciones Agropecuarias
Estacion Experimental
Quilamapur (INIA)
Casilla 426, Chillan

CHINA

Mr Zheng Zhuo-jie
Germplasm Resource Institute
The Chinese Academy of Agri. Sci.
Beijing

Ms Lang Li Jiuan
Researcher of Faba Bean Breeding
Crop Research Institute
Zhejiang Academy of Agri. Science
Hangzhu

COLUMBIA

Mr Juan Jaramillo Vasquez
Coordinator Nacional Hortalizas
Instituto Columbiano
Agropecuario, Apartado Aereo 233
Palmira

Mr Edmundo Burbano Insuasty
Programa de Hortalizas
Instituto Columbiono Agropecuario ICA
Centro Regional de Investigacion
Obonuco Pasto Narino
Apdo Aereo 339

COSTA RICA

Ing. Agr. M. de los Angeles Alvarez Fernandez
Escuela de Ciencias Agrarias
Universidad Nacional
Apdo 86 Heredia

CYPRUS

Dr A. Hadjichristodoulou
Agric. Res. Office
Agricultural Research Institute
Ministry of Agric. & Natural Resources
Nicosia

CZECHOSLOVAKIA

Ing. Teodor Sinsky and/or
Ing. L. Pastucha
Vyskumny ustav rastlinnej vyroby
Bratislavska cesta 122
921 68 Piestany

ECUADOR

Ing. Cristobal Villasis H.
INIAP-Estacion Experimental Santa Catalina, Apartado 340 - Quinto

EGYPT

Dr A. Nassib
Director, ARC
Food Legume Research Section
Field Crops Research Institute
Giza

Dr Mazhar F. Abdulla
Cairo University
Faculty of Agriculture
Giza

Prof. Dr Amin Shoukry Hanna
Head of Agronomy Dept.
Faculty of Agriculture
Mansoura University
Mansoura

ETHIOPIA

Mr Geletu Bejiga
Pulse Section
Addis Ababa University
P.O.Box 32
Debre Zeit

Mr Asfaw Telaye
Institute of Agricultural Research
P.O.Box 2003
Addis Ababa

FRANCE

Dr Jacques Wery
Chaire de Phytotechnic
Ecole Nationale Superieure Agronomique
34060 Montpellier Cedex

Dr Francoise Rousselle
INRA, Station d'Amelionation des Plantes
BP 29-35650 Le Rheu

Mr Chapon
Ets. Tourneur Freres
64 Rue de General Leclerc
BP 1- F 77120 Coulommiers

GREECE

Dr E. Stylopoulous
Director, Institute for Fodder Crops
Larissa

GUATEMALA

Ing. Oscar Lionel Orozco B.
Coordinator Programa Hotalizap
Avenida Reforma 8-60
Zone 9, Edificio "Galerias Reforma"
La Nueva

HUNGARY

Dr L. Holly
Deputy Director
Research Centre for Agrobotany
I.P.P.Q.
H-2766 Tapioszele

INDIA

Dr V.P.Gupta
Associate Professor
Dept. of Plant Breeding
H.P. Agricultural University
Palampur Himachal Pradesh
176062 (H.P.)

Dr P.N. Bahl
Division of Genetics
I.A.R.I.
New Delhi - 110 012

Dr S. Chandra
Project Director (Pulses)
Pulse Project Directorate
Kanpur 208-024
Uttar Pradesh

Dr S.K.Sharma
Associate Professor of Genetics
Department of Basic Sci.
H.P. Agric. Univ.
Palampur 176062

Dr J.S.Sindhu
Division of Genetic & Plant Breeding
Chandra Skendra Azad (CSA)
University of Agric. & Technology
Kanpur 208 002, Uttar Pradesh

Dr B.B.Nagaich
Bundelkhand Farm
Development Center (Ltd)
1 Diwanpura RATH (Hamirpur) U.P.

Dr Y.L.Nene
Leader, Pulses Improvement Program
ICRISAT, Patancheru P.O.
Andhra Pradesh 502 324

Dr M.P.Pandey
Senior Pulses Breeder
Department of Plant Breeding
G.B.Pant University of Agri.
and Technology
Pantnagar, 263145 U.P.

Dr Balram Sharma
Senior Scientist
Division of Genetics
I.A.R.I.
New Delhi - 110 012

Dr R.D.Sharma
Associate Professor
Head Department of Mycology
Plant Pathology
Himchal Pradesh Krishi Vishva
Vidyalaya
Palampur - 176 062

Dr Gurdip Singh
Pulse Pathologist
Punjab Agricultural University
Department of Plant Breeding
Ludhiana 141004 Punjab

IRAN

Dr Behrooz Sadri
Food Legume Research Section
Seed & Plant Improvement Institute
Ministry of Agric. & Rural Development
Mard - Abad Ave.
Karaj

Mr Nosrat Zarepeyma
Seed & Plant Improvement Office
Dept. of Agric. & Rural Development
Eman Ave., Oroumieh

ITALY

Dr Fransesco Bonciarelli
Institute di Agron. Generalle
Coltivazioni Erbacee
Universita degli Studi di Perugia
Borgo XX Giugno, 74
06100 Perugia

Dr Alessandro Bozini
Regional Representative for Europe
AGP, FAO, Via delle Terme di Caracalla
Room F 412
00100 Rome

Dr Luigi Rossi
Centro di Studi
Nucleari della Cabaccia
S. Maria di Galeria
00060 Rome

Prof. L.M. Monti
Cattedra di Miglioramento Genetico
Facolta de Agraria
Instituto di Agronomia
Via dell'Universita
100-80055 Portici (Na)
Napoli

JORDAN

Dr Nasri Haddad
Faculty of Agriculture
University of Jordan
Amman

KENYA

Dr Abdul Shakoor
Dryland Farming Research &
Development Project
P.O.Box 340
Machakos

LEBANON

Dr A.Alameddin
Head, Plant Breeding Department
Agric. Research Institute
Tel Amara, Rayak

Dr Mahmoud Solh
College of Agriculture
A.U.B.
Beirut

LIBYA

Dr Abu Baker Maddur
UNDP, Agric. Res. Center
P.O.Box 2480
Tripoli

MALAWI

Mr C.S.M. Chanika
Food Legume Agronomist
Officer-in-Charge
Chitedze Agric. Res. Station
P.O.Box 158
Lilongwe

MALI

Dr John Scheuring
ICRISAT - Mali Representative
Cooperative Program in Mali
c/o Ambassade Americaine
BP 34 Bamako

Dr P.Serafini
ICRISAT - Mali
c/o American Embassy
B.P. 34 Bamako
Via Paris

MAURITIUS

Mr A.L. Owadally
Ministry of Agriculture
Natural Resources & the Environment
Division of Agronomy
Reduit

MEXICO

Ing. Roza Maria Gomez Garza
Mejorador de Garbanzo
INIA, CIAPAN
Apartado Postal 356
800 00 Culiacan
Sinalva

MOROCCO

Mr Sakr Bouazza
Station Centrale de Legumineuses
Alimentaires INRA
BP 415 Rabat

Mr Abdel-latif Ammeziane el Hassani
Pathologist
Laboratoire de Phytopathologie Phytiatrie
INRA
BP 415 Rabat

MUSCAT (SULTANATE OF OMAN)

Dr A. Mjeni
Head of Agric. Res. & Fisheries
Ministry of Agriculture
P.O.Box 467
Muscat

NEPAL

Mr R.P.Sah
Assistant Agronomist
Parwanipur Agric. Station
Birganj Narayani Zone

Mr Rajman P. Chaudhary
Agronomist and Leader
Grain Legume Program
Parwanipur Agriculture Station
P.O.Box 1336
Birganj, Narayani Zone

THE NETHERLANDS

Ir. G.P.W. van Bentum
Chief Plant Breeder
Gebroken Meeldijk
Nicklesson-Zwaan
BC. 74-Postbus 19
2990 AA Barendrecht

PAKISTAN

Mr B.A. Malik
Pulse Coordinator
PARC, Nacional Agricultural Research Centre
P.O. National Health Laboratories
Islamabad

Dr M. Tufail
Director Pulses
Ayub Agricultural Research Institute
Faisalabad

Mr M. Siddiq
Director General
Agricultural Research Institute
Tarnab, Peshawar
N.W.F.P.

Dr Syed Hassan Raza
Deputy Director
Land & Water Use Station
PARC AZRI Brewery Rd.
Quette, Baluchistan

PERU

Dr Cesar Apolitano
Coordinator Projecto Legumino Grano
Estacion Exp. Vesta Florida
CRIA de Norte
Apdo 116
Chiclayo

Dr Alfonso Cerrate Valenzuela
Grain Legume Leader
Universidad Nacional Agraria
La Molina, Apartado 456
Lima

POLAND

Dr Josef Bochniarz
I.U.N.G. (Institute of Soil Science and
Cultivation of Plants)
24-100 Pulawy

PORTUGAL

Mr Geoffrey Hallidie
Quinta Vale de Marmelo
7350 Elvas

QATAR

Dr Omar Shahata Khalil
Field Crops Expert
Ministry of Industry & Agriculture
Dept. of Agric. & Water Research
P.O.Box 1967
Doha

SAUDI ARABIA

Dr S. Abu Shakra
Technical Director
Saudi Arabian Agric. & Water
Research Center
P.O.Box 17285Riyadh

Dr M.O. Ghandorah
Dept. of Crop Production
College of Agriculture
King Saud University
P.O.Box 2460Riyadh

SOMALIA

Dr B.J. Kolp
Project Director
Bay Region Agric. Development Project
P.O.Box 2971
Magadisho

SPAIN

Dr Juan L. Fernandez
Ing. Agr. AGRAR S/A Monasterio S/N
Zaragoza 14

Dr Juan Fernandez Perez
Semillas Pacifico S.A.
Prada de San Roquez
Apartado 11, Arahal
Sevilla

Dr J. Cubero
Escuela Tecnica Superior de
Ingenieros Agronomos
Departmento de Genetica
Apartado 240
Cordoba

Dr Teresa Moreno (Mrs.)
Instituto Nacional de Investigaciones Agrarias
Finca "ALAMEDA DEL OBISPO"
Apartado 240
Cordoba

Mr Jose Riado Abad
Productora Andaluza de Semillas S.A.
Carretera N-IV Madrid-Cadiz Km. 573
Apartado Correos 42
Los Palacios
Sevilla

SRI LANKA

Dr I. Gunawardena
Deputy Director Research
1, Sarasavi Mawatha
Peradeniya

SUDAN

Dr Mustafa Hussein
Plant Pathologist & Coordinator
NVP - Sudan
Shambat Research Station, ARC
P.O.Box 30
Khartoum North

Dr Farouk A. Salih
Shambat Research Station
P.O.Box 30
Khartoum North

SYRIA

Mr Kasem El-Arab
Head, Field Crops Dept.
Agricultural and Scientific Research
Douma - Damascus

TANZANIA

Dr R.Woytek
Soil Erosion & Agroforestry Project
P.O.Box 72
Lushoto

THAILAND

Dr Vdom Pupipat
Coordinator
High Protein Crops Research
and Development Project
Kasetsart University
Bangkok 10900

Dr Chamras Ungkarpla
Director of Plan Implementation
Division,
Office of Agriculture Economics
Ministry of Agriculture Cooperatives
Raj Damnern Avenue
Bangkok

TUNISIA

Dr Mohamed Bouslama
Legume Breeder Ecole Superieure
D'Agriculture
Du Kef Boulifa

Mr Ali Haddad
Office des Cereales
Service Rotation
Direction Technique
30 Rue Alain Savary, Tunis

Dr Howard Gridley
ICARDA
BP 84
2049 Ariana

TURKEY

Dr Dogan Sakar
Coordinator National
Food Legume Project
Ministry of Agric. Foresty & Rural
Affairs
P.O.Box 226
Ankara

Dr C.D. Smit
FAO, P.O.Box 407
Ankara

Prof. Dr A. Ceylan
EGE University
Ziraat Facultesi
Tarla Bitkileri Yestirme Ve Islahi Bolumu
Bornova

Dr Mujgan Engin (Mrs)
Cukurova Universitesi
Ziraat Facultesi
Tarla Bitkeleri Bolumu
Adana

Dr Ali Gulumser
Faculty of Agriculture
Ondokuzmayis Universitesi
Samsun

Prof. Didar Eser
Department of Field Crops
Faculty of Agriculture
University of Ankara
Ankara

UK

Dr W.A. Stevens
Royal Hollway College
Hunters dale Callaw Hill
Virginia Water Surrey
Gu 25 4LN

Dr R. Summerfield
University of Reading
Plant Environment Laboratory
Shinfield Grange
Shinfield, Reading RG2 9AD
Berkshire

Dr Stuart Brown
Soil Science Department
University of Reading
London Rd Reading
AGISAQ

Dr D. Bond
Plant Breeding Institute
Maris Lane
Trumpington Road
Cambridge CB2 2LQ

USA

Mr Hamadi Ben Salah
Dept of Agronomy
Throckmorton Hall
Manhattan Kansas 66500
913-532-6101

Dr Fred Muehlbauer
Research Geneticist
Grass and Legume Breeding and Production
Johnson Hall
Rm 215, Washington State University
Pullman, W.A. 99164

Dr Floyed A. Weems
Wilbur - Ellis Company
Seed Division 12001
Empire Way Spokane
Washington WA 99206

Dr K. Foster
Department of Agronomy & Range Science
University of California
San Francisco
California 95616

W. GERMANY

Dr Roswitha Schonwitz
Institut fur Biochemic des
Pflanzen Hinder Surgplatz 55
4400 Muaster
West Salen

YEMEN ARAB REPUBLIC

Mr G.B. Bartels
Al Boun Project
P.O.Box 861
Sana'a

Dr Peter G. Bisset
Agronomist Dhamar Agricultural &
Forestry Research & Development Project
c/o British Embassy
P.O.Box 1287
Sana'a

YEMEN DEMOCRATIC REPUBLIC

Mr Iqbal M. Saleh Soodi
Agronomy Section
El-Kod Research Center
Greater Aden

ZAMBIA

Dr D.J. Allen
Leader, Grain Legume Research Team
Research Branch
Msekera Regional Research Station
P.O.Box 89
Chipala

ICARDA'S FOOD LEGUME SCIENTISTS COOPERATING IN THE INTERNATIONAL TESTING PROGRAM.

1. Dr. Douglas P. Beck (Joined January 1986)
   Microbiologist

2. Dr. S.P.S. Beniwal (Joined January 1986)
   Food Legume Pathologist/Breeder (Ethiopia)

3. Dr. Cesar Cardona (Left in November 1985)
   Legume Entomologist

4. Dr. William Erskine
   Lentil Breeder

5. Dr. Howard Gridley (Left in November 1985)
   Legume Breeder (Tunisia)

6. Dr. Salim Hanounik
   Faba Bean Pathologist

7. Dr. M.V. Reddy (Left in January 1985)
   Chickpea Pathologist (ICRISAT)

8. Dr. Larry D. Robertson
   Faba Bean Breeder

9. Dr. Mohan C. Saxena
   Program Leader & Agronomist

10. Dr. K.B. Singh
    Chickpea Breeder (ICRISAT)

11. Dr. R.S. Malhotra
    International Trials Scientist

12. Dr. M.V. Murinda (Left in December 1984)
    Post Doctoral Research Fellow

13. Dr. J. Sauerborn (Joined May 1985)
    Post Doctoral Research Fellow

14. Dr. Mohamed El-Sherbeeny
    Post Doctoral Research Fellow (Faba Bean Breeding)

15. Dr. Said N. Silim (Joined January 1985)
    Post Doctoral Research Fellow

Table 2.2.3. Latitude, longitude, altitude and rainfall for some of the international nursery locations for 1983/84 season.

COUNTRY	LOCATION	LATITUDE	LONGITUDE	ALTITUDE (m)	RAINFALL (mm)
ALGERIA	Khroub	36° 25', N	6° 67', E	640	402
ALGERIA	Setif	36° 09', N	5° 21', E	1000	390
ARGENTINA	Perico	24° 23', S	65° 05', W	900	147
ARGENTINA	Salta	24° 54', S	65° 29', W	1250	92
BANGLADESH	Mymensingh	24° 46', N	90° 24', E	20	14
BRAZIL	Santa Maria	29° 41', S	3° 34', W	95	1589
BULGARIA	Toshevo	43° 40', N	28° 02', E	236	574
CANADA	Manitoba	50° 00', N	97° 00', W	730	340
CANADA	Ridge Town	42° 25', N	81° 55', W	217	1077
CANADA	Saskatoon	52° 10', N	106° 41', W	500	105
CHILE	Casilla	38° 41', S	72° 25', E	200	783
CHILE	Chillan	21° 36', S	55° 71', W	217	956
CHILE	Granerous	34° 00', S	73° 00', E	479	308
CHILE	Valdivia	39° 45', S	73° 14', S	12	1709
CHINA	Yunnan	25° 07', N	102° 43', E	1917	167
CHINA	Zhejiang	30° 18', N	120° 10', E	4.6	906
COSTA RICA	Heredia	10° 16', N	84° 71', W	1200	2491
ECUADOR	Pichincha	00° 00',	78° 27', W	2350	-
EGYPT	Mansoura	30° 00', N	31° 00', E	5	31
EGYPT	Nubaria	29° 00', N	30° 00', E	18	-
EGYPT	Sakha	30° 45', N	31° 00', E	6	-
EGYPT	Sids	31° 00', N	23° 30', E	30	-
ETHIOPIA	Debre Zeit	8° 50', N	38° 58', E	1900	305
FRANCE	Coulommiers	48° 47', N	3° 8', E	150	565
FRANCE	Montauben	48° 75', N	1° 25', E	114	3303
FRANCE	Montpellier	43° 37', N	1° 33', E	49	454
GREECE	Larissa	39° 70', N	22° 05', E	70	539
WEST GERMANY	Stuttgart	49° 00', N	9° 00', E	420	737
INDIA	New Delhi	28° 00', N	77° 00', E	227	5
INDIA	Ludhiana	30° 56', N	75° 52', E	247	25
IRAN	Gorgan	35° 48', N	54° 28', E	155	434
IRAN	Karaj	48° 35', N	51° 00', E	1321	158
IRAN	Oroumieh	37° 59' N	45° 1 E	1325	220

Cont'd 2/...

Table 2.2.3. Cont'd 2.

COUNTRY	LOCATION	LATITUDE	LONGITUDE	ALTITUDE (m)	RAINFALL (mm)
IRAQ	Dohuk	33° 19', N	47° 18', E	480	298
IRAQ	Sulaimaniya	36° 5, N	46° 5, E	700	455
ITALY	Badiola	43° 01, N	0° 07, E	250	646
ITALY	Leonessa	42° 34, N	0° 29, E	925	486
ITALY	Salerno	40° 37, N	14° 25, E	35	677
JORDAN	Jubeiha	32° 01, N	35° 52, E	980	437
JORDAN	Marow	32° 33, N	35° 51, E	580	274
LEBANON	Terbol	33° 49, N	35° 59, E	890	597
LIBYA	El-Marg	32° 18, N	20° 11, E	310	395
MEXICO	Caliacan	24° 48, N	107° 24, W	40	676
MOROCCO	Douyet	34° 02, N	5° 00, W	416	382
MOROCCO	Marchouch	33° 33, N	6° 42, W	450	392
MOROCCO	Rabat	34° 00, N	6° 50, W	65	516
NEPAL	Birgunj	27° 02, N	84° 05, E	115	158
NEPAL	Jankpur	26° 49, N	85° 58, E	93	150
NEPAL	Khumaltar	27° 40, N	85° 20, E	1360	1180
PAKISTAN	Bahawalpur	29° 25, N	70° 40, E	170	24
PAKISTAN	Chakwal	33° 00, N	74° 00, E	300	71
PAKISTAN	Dokri	37° 50, E	68° 10, E	-	7
PAKISTAN	Faisalabad	31° 26, N	73° 60, E	605	60
PAKISTAN	Islamabad	33° 39, N	73° 50, E	683	509
PAKISTAN	Karak	32° 33, N	70° 71, E	-	462
PAKISTAN	Lahore	31° 19, N	74° 05, E	225	90
PAKISTAN	Quette	26° 32, N	40° 70, E	1667	88
PAKISTAN	Tarnab	32° 33, N	70° 07, E	-	407
PERU	Chombara	11° 57, S	76° 13, W	238	-
PERU	La Molina	10° 20, S	77° 10, W	3000	772
PERU	San Lorenzo	11° 45, S	75° 30, W	3400	697
POLAND	Pulawy	51° 25, N	21° 58, E	142	457
PORTUGAL	Elvas	38° 51, N	7° 10, W	240	608
QATAR	Rawdat Harma	25° 48, N	51° 18, E	50	52
SPAIN	Cordoba	37° 51, N	4° 51, W	110	682
SPAIN	Jaen	38° 6, N	0° 32, W	625	473
SPAIN	Sevilla	37° 28 N	5° 38 W	72	543

Cont'd 3/...

Table 2.2.3. Cont'd 3.

COUNTRY	LOCATION	LATITUDE	LONGITUDE	ALTITUDE (m)	RAINFALL (mm)
SUDAN	Hudeiba	17° 34', N	33° 56', E	351	-
SUDAN	Shambat	15° 40, N	32° 32, E	376	-
SYRIA	Heimo	37° 03, N	41° 09, E	451	-
SYRIA	Izra'a	32° 50, N	36° 15, E	575	-
SYRIA	Lattakia	35° 40, N	35° 40, E	7	-
SYRIA	Tel Hadya	36° 40, N	37° 20, E	392	-
TURKEY	Ankara	39° 55, N	32° 40, E	902	445
TURKEY	Corum	40° 11, N	34° 51, E	800	192
TURKEY	Izmir	38° 35, N	27° 04, E	10	796
TURKEY	Samsun	41° 18, N	36° 20, E	3.8	743
YEMEN A.R.	Sana'a	14° 42, N	44° 20, E	2315	114
YEMEN P.D.R.	Aden	12° 20 N	42° 53 E	11	212

used to test whether a genotype's performance differed significantly from that of the control/local check. The LSD is not appropriate for testing differences between any pair of genotypes in a trial.

2.3.2. **Management**

For all except the agronomic trials it was emphasised that the material should be planted at the farmer's normal planting date, and that the locally recommended practices should be used with respect to fertilizer, pesticides, herbicides and irrigation.

For each trial or nursery, observations were requested on plant stand (1-5; rating 1 = perfect), time to 50% flowering (days), plant height (cm) and yield (kg/ha). Other characters were optional e.g. plant width (cm), plant type (erect, semi-erect or prostrate), height of lowest pods (cm), disease damage rating (1-5; 1 = free from disease), insect damage rating (1-5; 1 = free from insect damage), lodging (1-5; 1 = no lodging), vigour rating a visual estimate of yield potential (1-5; 1 = very vigorous), shattering (1-5; 1 = no shattering), time to maturity (days), branching (1-5; 1 = very few branches) and virus (1-5; 1 = free of virus).

In addition, cooperators were requested to send information on the altitude, latitude, longitude, temperature, rainfall, number and dates of irrigations, dates of planting and harvest, herbicides, pesticides and fertilizers applied (indicating type, rate and date of application), names and titles of people conducting the nursery and any other relevant information which could be of value in interpreting the data.

(1) Federer, W.T. (1956). Augmented designs. Hawaiin Planters Record, 55, 191-208, 1956.

3. CHICKPEA INTERNATIONAL TRIALS AND NURSERIES

Thieteen Chickpea international trials and nurseries were available to the cooperators in the 1983/84 season. These included yield trials, screening nurseries, segregating populations, disease nursery and agronomic trials.

3.1. CHICKPEA ADAPTATION TRIAL (CAT)

Material

The Chickpea Adaptation Trial comprised of 16 entries, 9 kabuli and 7 desi types. Most of the entries are the land races and are widely grown in different countries of the region. These land races have been chosen with the idea that they may be diverse and may help in classification of the countries into agro-ecological zones.

Methods and Management

The material was suggested to be sown in a randomised complete block design with four replications. The recommended plot size was four rows, each 4 m long with inter- and intra row spacings of 30 cm and 10 cm, respectively.

Fifty seven sets of the trial were sent to different cooperators in 32 countries. The results were, however, received for 21 sets and were analysed. The agronomic data provided by the cooperators are presented in Table 3.1.1.

Results and Discussion

The means for time to flowering, time to maturity and plant height across locations are listed in Tables 3.1.2, 3.1.3, and 3.1.4, respectively. Time to flowering for entries over all the locations ranged from 63 to 86 days. The entry ICC 5810 from India was the earliest to flower (in 63 days). The other entries which took comparatively less time to flower were ICC 50003 and ICC 11529 from India. In general, the lines originating in the Mediterranean region were late in flowering.

The average time to maturity (Table 3.1.3) overall the locations ranged from 134 days for ICC 5810 (India) to 150 days for ILC 1934 (Iran) and ILC 1929 (Syria). The location mean data further revealed that Sulaimaniya (Iraq), Shendi (Sudan) and Terbol (Lebanon) took minimum time (less than 100 days) to mature and were early maturing locations. The locations namely, Perico (Argentina) and Chakwal (Pakistan), were very late maturing locations (taking more than 180 days) and were followed by La-Molina (Peru), Tarnab (Pakistan), Tel Hadya-winter (Syria), etc.

The data on plant height (Table 3.1.4) revealed that plant height was least at Sulaimaniya in Iraq and Tel Hadya spring in Syria (25 cm), and Setif in Algeria (26 cm). Some other locations with less plant height included, Valdivia (Chile), Terbol (Lebanon), Bahawalpur (Pakistan), Hudeiba (Sudan) and Tel Hadya winter (Syria). At other locations like Shandweel (Egypt), Birganj (Nepal), and La Molina

Table 3.1.1. Agronomic data for different locations in the CAT during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
ALGERIA	Setif	16.1.1984	-		46			
ARGENTINA	Perico	27.4.1984	190				3	Lorsban
CHILE	Valdivia	9.11.1984	150		100	50		Linuron
EGYPT	Mallawi		142					
EGYPT	Shandweel	24.11.1983	159		30	8	2	
IRAQ	Sulaimaniya	17.3.1984	90	40	80			
LEBANON	Terbol	2.4.1984	98		50		2	
MOROCCO	Karia	23.2.1984	-		3	13		Birlane
MOROCCO	Marchouch	21.2.1984	-					
MOROCCO	Sidi Kacem	7.3.1984	-		50	60		
NEPAL	Birgunj	1.11.1983	152	20	20	20		Metacid
PAKISTAN	Bahawalpur	8.11.1983	152	18	46		2	Thiodan
PAKISTAN	Chakwal	13.10.1983	185					
PAKISTAN	Tarnab	22.10.1983	184					
PERU	Chambara	19.5.1984	166				3	Tamaion Aldrex
PERU	La Molina	8.5.1984	189		80		5	Tamaion
SUDAN	Hudeiba	21.11.1983	-	43			8	
SUDAN	Shendi	22.11.1983	100	86			9	
SYRIA	Tel Hadya-winter	4.12.1983	170		50			Bravo 500
SYRIA	Tel Hadya-spring	28.2.1984	126		50			Bravo 500

Table 3.1.2. Time to flowering (days) of entries at different locations in the CAT during 1983/84.

ENTRY	ORIGIN	ARGENTINA	CHILE	EGYPT		IRAQ	LEBANON	NEPAL	PAKISTAN			PERU		SUDAN		SYRIA		MEAN
		Perico	Valdivia	Mallawi	Shandweel	Sulaimaniya	Terbol	Birgunj	Bahawalpur	Chakwal	Tarnab	Chambara	La-Molina	Hudeiba	Shendi	Tel Hadya-spring	Tel Hadya-winter	
ICC 5810	INDIA	78	50	65	59	63	50	63	79	138	45	42	45	38	35	56	100	63
ICC 4918	INDIA	98	48	70	74	62	53	70	81	143	105	76	79	70	43	68	111	78
ICC 11525	ICRISAT	100	48	69	72	63	50	69	86	145	106	78	84	59	47	67	111	78
ICC 11529	ICRISAT	87	53	68	68	61	50	64	79	139	63	70	77	47	45	67	111	72
ICC 50003	INDIA	79	53	69	66	58	50	62	79	138	63	68	71	50	45	64	108	70
ICC 4948	INDIA	103	53	69	80	63	54	71	86	138	117	77	84	81	57	75	115	83
ICC 10136	INDIA	104	50	68	82	63	54	71	96	144	119	83	93	80	55	75	117	85
ILC 1919	INDIA	98	50	69	75	57	50	71	78	139	106	76	79	89	49	65	108	79
ILC 3256	CYPRUS	104	53	69	82	63	51	71	86	143	121	93	99	82	63	68	112	85
ILC 519	EGYPT	103	50	68	76	61	50	66	86	138	97	80	83	75	50	67	112	79
ILC 482	TURKEY	104	50	69	72	57	50	71	86	142	104	84	84	87	51	66	108	80
ILC 1934	IRAN	104	53	70	90	62	54	77	89	140	138	77	91	88	58	70	113	86
ILC 1932	JORDAN	103	52	68	80	60	50	71	84	137	118	79	91	89	55	66	113	82
ILC 1922	MOROCCO	104	48	69	76	60	51	72	86	142	115	82	87	88	52	67	110	82
ILC 1929	SYRIA	104	50	69	77	62	50	72	87	147	109	84	88	93	53	64	112	83
ILC 1931	TURKEY	95	53	69	75	61	50	71	86	144	108	87	92	90	58	66	109	82
Location mean		98	51	69	75	61	51	69	85	141	102	77	83	75	51	67	111	

Table 3.1.3. Time to maturity (days) of entries at different locations in CAT during 1983/84.

ENTRY	ARGENTINA	CHILE	EGYPT		IRAQ	LEBANON	NEPAL	PAKISTAN			PERU		SUDAN	SYRIA	MEAN
	Perico	Valdivia	Mallawi	Shandweel	Sulaimaniya	Terbol	Birgunj	Bahawalpur	Chakwal	Tarnab	Chambara	La-Molina	Shendi	Tel Hadya-winter	
ICC 5810	182	150	138	149	88	92	151	130	183	116	122	132	84	165	134
ICC 4918	190	150	141	152	88	95	145	145	184	174	151	166	87	167	145
ICC 11525	191	146	138	155	87	94	147	153	184	172	155	173	92	167	147
ICC 11529	191	146	140	152	89	93	147	152	182	175	151	165	94	169	146
ICC 50003	184	146	139	152	88	92	147	152	182	174	148	164	89	166	145
ICC 4948	190	149	142	152	88	94	145	152	182	175	154	168	97	169	147
ICC 10136	190	146	143	151	88	95	148	152	184	174	156	174	96	173	148
ILC 1919	190	146	140	159	87	96	147	151	183	173	153	169	91	169	147
ILC 3256	190	150	135	158	89	98	149	138	184	180	166	182	99	170	149
ILC 519	190	146	141	151	89	98	151	148	182	180	161	181	96	169	149
ILC 482	190	146	140	150	87	98	148	141	183	176	163	182	100	169	148
ILC 1934	190	146	142	152	90	103	152	152	184	184	159	179	97	172	150
ILC 1932	190	146	141	159	89	97	146	133	183	179	160	182	99	169	148
ILC 1922	190	150	142	149	87	98	151	151	184	177	163	184	96	170	149
ILC 1929	190	146	143	154	90	97	149	143	185	176	164	186	102	171	150
ILC 1931	190	146	136	151	88	98	151	139	184	176	165	189	97	169	149
Location mean	189	147	140	153	88	96	148	146	183	172	156	173	95	169	

Table 3.1.4. Plant height (cm) of entries at different locations in the CAT during 1983/84.

ENTRY	ALGERIA	ARGENTINA	CHILE	EGYPT		IRAQ	LEBANON	NEPAL	PAKISTAN			PERU		SUDAN		SYRIA		MEAN
	Setif	Perico	Valdivia	Mallawi	Shandweel	Sulaimaniya	Terbol	Birgunj	Bahawalpur	Chakwal	Tarnab	Chambara	La-Molina	Hudeiba	Shendi	Tel Hadya-spring	Tel Hadya-winter	
ICC 5810	25	68	32	46	84	24	30	83	42	42	40	60	75	32	51	28	32	47
ICC 4918	25	53	24	44	78	25	33	53	30	46	36	52	56	36	45	25	32	41
ICC 11525	25	51	41	42	73	20	32	50	33	42	36	44	47	34	48	24	28	39
ICC 11529	25	55	21	42	76	24	32	65	36	46	37	50	50	32	51	25	35	41
ICC 50003	26	58	31	39	76	24	26	53	32	43	35	46	53	32	49	25	30	40
ICC 4948	25	53	33	42	80	21	27	59	36	44	33	48	55	35	52	24	31	41
ICC 10136	25	54	28	42	71	20	27	56	32	43	32	36	40	30	47	18	26	37
ILC 1919	25	59	32	41	71	26	34	56	32	50	39	55	62	30	54	22	32	42
ILC 3256	27	64	30	44	79	26	32	62	43	45	43	67	68	41	63	26	38	47
ILC 519	25	62	29	43	91	27	29	67	39	57	43	68	78	44	67	26	39	49
ILC 482	27	61	29	43	84	31	34	68	42	46	42	66	68	33	56	26	35	47
ILC 1934	27	63	27	47	93	31	37	67	42	38	48	71	74	40	67	27	39	49
ILC 1932	29	52	23	41	75	25	33	64	31	59	41	57	66	36	62	25	34	44
ILC 1922	28	63	24	50	91	30	28	67	40	52	46	67	70	35	59	27	41	48
ILC 1929	25	57	32	41	94	25	32	62	36	42	46	63	70	35	56	26	35	46
ILC 1931	25	61	24	41	80	26	34	63	39	51	42	60	66	38	58	26	37	45
Location mean	26	58	29	43	81	25	31	62	36	47	40	57	62	35	55	25	34	

Table 3.1.5. Seed yield (Y=kg/ha) and Rank (R) of entries at different locations in the CAT during 1983/84.

ENTRY	ALGERIA Setif		ARGENTINA Perico		CHILE Valdivia		EGYPT Hallawi		EGYPT Shandweel		IRAQ Sulaimaniya		LEBANON Terbol		MOROCCO Karia		MOROCCO Marchouch		MOROCCO Sidi-Kacem		NEPAL Birgunj	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
ICC 5810	0	7	2306	16	665	9	143	16	135	16	188	16	1063	16	781	11	193	16	339	16	371	16
ICC 4918	0	7	3600	1	705	7	1750	1	255	13	417	8	1825	4	625	14	732	1	714	4	1824	2
ICC 11525	0	7	3257	4	294	16	1190	8	406	8	354	11	1617	10	1063	4	450	4	518	13	1488	4
ICC 11529	0	7	3264	3	498	12	1351	6	589	6	333	13	1651	8	250	16	511	3	696	5	1137	7
ICC 50003	0	7	3188	7	763	2	1589	2	479	7	594	4	1683	6	1125	3	543	2	750	3	1316	5
ICC 4948	0	7	3236	5	584	11	940	14	708	4	333	13	1794	5	781	11	386	7	446	14	1711	3
ICC 10136	0	7	3347	2	772	1	1518	3	609	5	365	10	1587	12	875	9	286	11	375	15	1871	1
ILC 1919	240	6	3007	9	604	10	1440	4	286	10	698	2	1994	1	1188	2	357	8	607	10	1160	6
ILC 3256	0	7	3236	5	758	3	1369	5	141	15	427	6	1673	7	438	15	286	11	679	7	910	9
ILC 519	260	5	2639	14	715	6	1042	11	766	3	427	6	1632	9	875	9	243	15	696	5	813	13
ILC 482	656	1	2757	13	741	5	1012	12	266	12	750	1	1571	13	906	7	400	6	679	7	996	8
ILC 1934	333	4	2563	15	697	8	1190	8	271	11	375	9	1452	14	906	7	357	8	911	1	859	11
ILC 1932	0	7	2875	10	441	14	964	13	813	2	344	12	1593	11	750	13	339	10	661	9	816	12
ILC 1922	0	7	3132	8	389	15	833	15	839	1	644	3	1925	3	1219	1	271	14	821	2	887	10
ILC 1929	521	3	2840	11	754	4	1190	8	307	9	271	15	1948	2	1031	5	282	13	554	11	734	14
ILC 1931	646	2	2750	12	481	13	1310	7	240	14	458	5	1450	15	1031	5	404	5	554	11	684	15
Location mean	166		3000		616		1177		444		436		1654		865		377		625		1100	
C.V.%	201.1		14.7		25.7		25.0		44.4		27.9		12.1		53.8		48.0		31.2		40.8	
S.E.	166.9		221		79.3		147.1		98.6		60.9		100.1		232.8		90.6		97.4		224.1	
L.S.D. (5%)	475		629		226		419		281		174		285		NS		258		277		638	

Cont'd...

ENTRY	PAKISTAN Bahawalpur		PAKISTAN Chakwal		PAKISTAN Tarnab		PERU Chambara		PERU La-Molina		SUDAN Hudeiba		SUDAN Shendi		SYRIA Tel Hadya-winter		SYRIA Tel Hadya-spring		100-seed[1/] weight	100-seed[2/] weight	MEAN	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	(g)	(g)	Y	R
ICC 5810	115	16	1142	14	203	16	3583	15	3589	14	249	1	2249	5	1260	14	544	8	14.1	13.5	956	16
ICC 4918	899	6	2587	1	833	1	3600	6	3599	5	71	4	2085	6	2019	7	504	12	21.2	19.9	1432	1
ICC 11525	1479	3	2403	5	698	2	3589	14	3588	15	180	3	2866	1	1521	12	465	14	13.8	13.9	1371	4
ICC 11529	625	10	2201	7	677	3	3601	4	3601	3	57	5	2809	2	1968	8	788	3	20.1	19.9	1330	6
ICC 50003	646	9	1819	10	484	11	3593	12	3595	12	209	2	2733	3	2026	6	831	1	17.3	17.1	1398	3
ICC 4948	1500	2	2431	4	443	13	3601	4	3629	2	52	6	2601	4	1046	16	337	16	13.00	14.4	1328	8
ICC 10136	1333	5	2514	2	651	4	3607	1	3596	10	22	7	2006	7	1135	15	438	15	13.4	13.6	1345	5
ILC 1919	1438	4	2240	6	526	10	3594	11	3707	1	3	13	1819	8	2333	1	831	1	20.4	18.6	1404	2
ILC 3256	708	8	1326	12	552	7	3595	10	3599	5	1	14	546	14	2262	2	508	10	28.3	22.9	1151	13
ILC 519	333	13	1688	11	328	15	3598	9	3597	8	18	8	1480	9	1854	10	430	13	19.1	20.4	1175	11
ILC 482	781	7	2080	8	589	6	3600	6	3600	4	0	16	302	16	2143	5	508	10	24.9	25.6	1217	9
ILC 1934	333	13	1153	13	469	12	3172	16	3598	7	8	10	541	15	1267	13	533	9	27.6	26.6	1049	15
ILC 1932	255	15	906	16	411	14	3590	13	3597	8	9	9	922	13	1820	11	729	5	20.3	21.8	1092	14
ILC 1922	1594	1	2462	3	542	8	3600	6	3596	10	5	12	1401	10	1870	9	574	7	26.2	21.1	1330	6
ILC 1929	406	12	1094	15	542	8	3602	3	3369	16	1	14	930	12	2229	3	651	6	32.8	29.8	1163	12
ILC 1931	510	11	1934	9	630	5	3603	2	3593	13	8	10	946	11	2205	4	744	4	26.7	27.6	1209	10
Location mean	810		1874		536		3571		3591		56		1640		1809		593					
C.V.%	47.6		17.4		33.7		6.8		3.7		102.2		31.0		26.4		36.1					
S.E.	192.8		163.4		90.3		120.5		65.7		28.5		254.1		239.1		106.9					
L.S.D. (5%)	549		465		257		NS		NS		81		724		681		304					

1/ 100-seed weight for Syria-Tel Hadya-winter.

2/ 100-seed weight for Syria-Tel Hadya-spring.

Table 3.1.6. Correlations (df=14) among different locations for time to flowering in the CAT during 1983/84.

COUNTRY	LOCATION	CHILE	EGYPT		IRAQ	LEBANON	NEPAL	PAKISTAN			PERU		SUDAN		SYRIA	
		Valdivia	Mallawi	Shandweel	Sulaimaniya	Terbol	Birgunj	Bahawalpur	Chakwal	Tarnab	Chambara	La-Molina	Hudeiba	Shendi	Tel Hadya-spring	Tel Hadya-winter
ARGENTINA	Perico	-0.20	0.53*	0.82**	0.11	0.36	0.82**	0.69**	0.39	0.91**	0.80**	0.82**	0.84**	0.72**	0.62*	0.70**
CHILE	Valdivia		0.03	0.21	0.01	0.08	-0.04	-0.06	-0.39	-0.02	0.06	0.17	0.01	0.44	0.16	0.16
EGYPT	Mallawi			0.59*	-0.19	0.33	0.60*	0.21	0.37	0.66**	0.71**	0.68**	0.56*	0.52*	0.54*	0.53*
EGYPT	Shandweel				0.21	0.61*	0.85**	0.68**	0.20	0.93**	0.70**	0.84**	0.77**	0.85**	0.72**	0.79**
IRAQ	Sulaimaniya					0.46	0.09	0.41	0.30	0.13	-0.06	0.06	-0.18	0.12	0.26	0.29
LEBANON	Terbol						0.49	0.53*	0.05	0.51*	0.14	0.28	0.22	0.33	0.75**	0.58*
NEPAL	Birgunj							0.59*	0.40	0.93**	0.63**	0.71**	0.86**	0.72**	0.50*	0.51*
PAKISTAN	Bahawalpur								0.49	0.68**	0.56*	0.65**	0.52*	0.64**	0.65**	0.68**
PAKISTAN	Chakwal									0.37	0.52*	0.43	0.32	0.26	0.15	0.23
PAKISTAN	Tarnab										0.78**	0.86**	0.86**	0.82**	0.67**	0.71**
PERU	Chambara											0.96**	0.78**	0.83**	0.60*	0.69**
PERU	La Molina												0.77**	0.90**	0.69**	0.80**
SUDAN	Hudeiba													0.78**	0.43	0.50*
SUDAN	Shendi														0.63**	0.68**
SYRIA	Tel Hadya-spring															0.90**

* $P \leq 0.05$; ** $P \leq 0.01$

Table 3.1.7. Correlations (df=14) among different locations for seed yield in the CAT during 1983/84.

COUNTRY	LOCATION	ARGENTINA	CHILE	EGYPT		IRAQ	LEBANON	MOROCCO			NEPAL	PAKISTAN			PERU		SUDAN		SYRIA	
		Perico	Valdivia	Mallawi	Shandweel	Sulaimaniya	Terbol	Karia	Marchouch	Sidi-Kacem	Birgunj	Bahawalpur	Chakwal	Tarnab	Chambara	La-Molina	Hudeiba	Shendi	Tel Hadya-winter	Tel Hadya-spring
ALGERIA	Setif	-0.51*	0.21	0.01	-0.37	0.30	-0.03	0.32	-0.13	0.11	-0.41	-0.30	-0.20	0.03	-0.16	-0.31	-0.44	-0.64**	0.41	0.16
ARGENTINA	Perico		-0.11	0.69**	0.21	0.13	0.59*	-0.22	0.62*	0.05	0.83**	0.64**	0.68**	0.75**	0.36	0.15	-0.05	0.44	0.09	-0.09
CHILE	Valdivia			0.22	-0.37	0.03	-0.05	-0.15	-0.06	-0.01	0.05	-0.34	-0.24	-0.16	-0.13	-0.20	-0.08	-0.27	0.07	-0.13
EGYPT	Mallawi				-0.08	0.29	0.52*	-0.07	0.65**	0.31	0.61*	0.25	0.39	0.75**	0.02	0.07	-0.28	0.08	0.39	0.25
EGYPT	Shandweel					0.03	0.30	0.07	-0.12	0.11	0.21	0.27	0.22	-0.14	0.20	0.10	-0.19	0.23	-0.27	-0.06
IRAQ	Sulaimaniya						0.42	0.45	0.17	0.46	0.09	0.39	0.39	0.21	0.11	0.42	-0.30	-0.25	0.52*	0.27
LEBANON	Terbol							0.23	0.25	0.30	0.41	0.57*	0.40	0.43	0.26	-0.09	-0.47	0.03	0.44	0.15
MOROCCO	Karia								-0.21	0.01	-0.07	0.32	0.11	-0.14	-0.04	-0.04	0.05	-0.07	0.05	0.14
MOROCCO	Marchouch									0.30	0.58*	0.15	0.47	0.70**	0.05	0.16	0.18	0.37	0.22	0.18
MOROCCO	Sidi-Kacem										-0.14	-0.14	-0.10	0.16	-0.49	0.08	-0.34	-0.36	0.39	0.27
NEPAL	Birgunj											0.67*	0.75**	0.61*	0.17	0.27	0.04	0.52*	-0.28	-0.33
PAKISTAN	Bahawalpur												0.82**	0.45	0.27	0.37	-0.09	0.37	-0.15	-0.28
PAKISTAN	Chakwal													0.62*	0.36	0.41	-0.01	0.51*	-0.08	-0.22
PAKISTAN	Tarnab														0.15	-0.02	-0.23	0.11	0.29	0.01
PERU	Chambara															-0.04	0.12	0.32	0.34	0.10
PERU	La Molina																0.04	0.23	-0.13	0.02
SUDAN	Hudeiba																	0.68**	-0.33	0.02
SUDAN	Shendi																		-0.36	0.02
SYRIA	Tel Hadya-winter																			0.62**

* $P \leq 0.05$; ** $P \leq 0.01$

(Peru), the plant heights were more. Further, it is evident that in general, the plant height was less in Indian types as compared to Mediterranean types.

The location means for seed yield (Table 3.1.5) revealed that the highest yield was recorded at La-Molina in Peru (3591 kg/ha) and the other high yielding locations included Chambara in Peru (3571 kg/ha) and Perico in Argentina (3000 kg/ha). However, Hudeiba in Sudan (56 kg/ha), Setif in Algeria (166 kg/ha), Marchouch in Morocco (377 kg/ha), and Shandweel in Egypt (444 kg/ha) were the poor yielding locations.

It is also evident that overall mean yield of desi lines (1308 kg/ha), in general, is higher than the kabuli lines (1199 kg/ha). The perusal of Table 3.1.5 revealed that ICC 50003 and ICC 4918 appeared more frequently among the five heaviest yielders and were followed by ICC 11525, ICC 11529, ICC 4948 and ICC 10136 etc. and were more adaptable than others. The correlations between days to flowering for different locations (Table 3.1.6) revealed that Sulaimaniya (Iraq), Valdivia (Chile) and Chakwal (Pakistan) are not associated with any other location. In general, all other locations showed positive correlations among themselves for time to flowering.

The correlations between seed yields (Table 3.1.7) revealed that Setif (Algeria) was negatively associated with Perico (Argentina) and Shendi (Sudan). The correlation between Perico (Argentina) and a large number of locations, including, Mallawi (Egypt), Terbol (Lebanon), Marchouch (Morocco), Birganj (Nepal), Bahawalpur, Tarnab and Chakwal in Pakistan, were positive and significant. Similarly Mallawi (Egypt) had positive and significant association with a few locations. In general, the correlations among other locations were not significant.

3.2. CHICKPEA INTERNATIONAL YIELD TRIAL - SPRING (CIYT-SP)

Material

The Chickpea International Yield Trial (CIYT-Sp) comprised 23 test entries and one local check to be supplied by the cooperator. Twenty one entries from these were the advanced breeding lines developed at ICARDA. All these lines were tested for their superior performance at least once either in local, regional or international trials. Cooperators were free to use these entries in their breeding programs or for release as cultivars.

Methods and Management

The trial design was a randomised complete block with four replications. The suggested plot size was 4 rows, each 4 m long with an inter- and intra row spacing of 30- and 10 cm respectively. Forty nine sets of trials were distributed to cooperators in 23 countries.

Results were returned from 31 sets covering 16 countries. The agronomic practices employed at different locations are shown in Table 3.2.1.

Results and Discussion

The location means for time to flowering, time to maturity and plant height are listed in Tables 3.2.2, 3.2.3, and 3.2.4, respectively. Flowering was earliest at Ridge Town in Canada (48 days) and was followed by Kharoub in Algeria (51 days), Terbol in Lebanon (54 days), Dohuk in Iraq (61 days) and Shambat in Sudan (61 days). Capalbio in Italy (155 days), Islamabad in Pakistan (134 days) and Tel Hadya-winter in Syria (131 days) were the locations where the entries took maximum time to flower. The entry means across locations ranged from 84 days for ILC 482 to 92 days for ILC 3279.

The entry means for time to maturity ranged from 135 days for FLIP 81-68W and ILC 482 to 139 days for ILC 3279. Dohuk in Iraq (97 days), Terbol in Lebanon (100 days), Shambat in Sudan (100 days) and Samsun in Turkey (100 days) were the early maturing locations. Islamabad in Pakistan (197 day), Tel Hadya-winter in Syria (181 days), and El Marg in Libya (162 days) were the late maturing locations.

The data on plant height revealed that the entries were tallest at Birganj in Nepal (71 cm) and were followed by Dokri in Pakistan (69 cm), Capalbio in Italy (66 cm) and Chillan in Chile (62 cm). The entries were shortest at Ridge Town in Canada (22 cm), Setif in Algeria (26 cm), Tel Hadya spring in Syria (28 cm), Ankara in Turkey (28 cm) and Dohuk in Iraq (29 cm). Time to flowering, time to maturity and plant height were positively associated among themselves (Table 3.2.5). However, seed yield exhibited negative association with time to flowering and plant maturity.

The seed yield and the rank of different entries at each location and the 100-seed weight at Tel Hadya are given in Table 3.2.6. The ANOVA of yield data revealed that the differences among the entries were significant at 23 locations out of the 30 analysed. The coefficient of variation for the design varied from 5.2 per cent at Capalbio (Italy) to 120.4 per cent at Debre Zeit (Ethiopia). The LSD for different locations revealed that 8, 15, 10, 23, 1, and 11 entries at Sulaimaniya (Iraq), Islamabad (Pakistan), Al-Ghab (Syria), Tel Hadya-winter (Syria), Ankara and Samsun (Turkey), respectively, out-yielded the local check by a significant margin. The entry mean ranged from 105 kg/ha at Shambat (Sudan) to 3608 kg/ha at Capalbio (Italy). The highest yield was recorded for ILC 482 (1180 kg/ha) which was followed by FLIP 82-20C (1139 kg/ha) and FLIP 82-9C (1093 kg/ha). The lowest yield was obtained from ILC 3279 (817 kg/ha). Among the five highest yielding lines at each location (Table 3.2.7) the local check appeared most frequently (in 16 out of 31 locations) and was followed by ILC 482 (15 times), FLIP 82-20C (14 times), FLIP 82-9C (13 times), FLIP 81-3 (11 times) and FLIP 82-87C (10 times). These entries

Table 3.2.1. Agronomic data for different locations in the CIYT-Sp during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
ALGERIA	Khroub	20.11.1983	-	50	100			Treflan
ALGERIA	Setif	10.1.1984	-		46			Treflan
CANADA	Ridge Town	9.6.1984	-	45	48	48		Trifluralin
CHILE	Chillan	20.8.1984	156		90			Linuron
ETHIOPIA	Debre Zeit	4.9.1984	151					
IRAQ	Dohuk	10.3.1984	100	40	100			
IRAQ	Sulaimaniya	17.3.1984	109	40	80			
ITALY	Capalbio	6.12.1983		40	100			Tribunil
JORDAN	Marow	26.2.1984	139	20	25			
LEBANON	Terbol	1.4.1984	102		50		2	Kerb + Bladex
LIBYA	El-Marg	24.11.1983	162	18	46			
MOROCCO	El-Koudia	2.2.1984	139					
MOROCCO	Karia	22.2.1984	144	30	50	60		Birlane, Dithane
MOROCCO	Marchouch	20.2.1984		200	26			
NEPAL	Birgunj	1.11.1983		20	20	20		Metacid
PAKISTAN	Bahawalpur	8.11.1983	151	18	46		2	Thiodan
PAKISTAN	Chakwal	13.10.1983	154	35	90			
PAKISTAN	Dokri	8.11.1983	159	20	50			Thiodan-heliothis
SUDAN	Shambat	12.12.1983	105	43			7	
SYRIA	Jinderis	5.3.1984	111	-	50			
SYRIA	Tel Hadya-spring	28.2.1984	152	-	50			
SYRIA	Tel Hadya-winter	26.11.1983	182	-	50			
TURKEY	Ankara	27.2.1984	134	20	50			Basudine
TURKEY	Samsun	7.4.1984	104	25	50			

Table 3.2.2. Time to flowering (days) of entries at different locations in CIYT-Sp during 1983/84.

ENTRY NAME	ORIGIN	ALGERIA	CANADA	CHILE	ETHIOPIA	IRAQ		ITALY	JORDAN	LEBANON	LIBYA	MOROCCO	
		Khroub	Ridge Town	Chillan	Debre Zeit	Dohuk	Sulaimaniya	Capalbio	Marow	Terbol	El-Marg	El-Koudia	Karia
FLIP 81-3	ICARDA	51	46	85	84	59	79	152	80	52	110	87	92
FLIP 81-24	ICARDA	51	47	88	79	61	82	153	80	52	103	88	96
FLIP 81-25	ICARDA	48	46	88	82	61	80	152	80	52	111	87	90
FLIP 81-68W	ICARDA	49	49	88	70	61	76	155	80	54	110	87	90
FLIP 81-69	ICARDA	51	49	90	85	62	81	158	81	54	112	64	92
FLIP 81-70	ICARDA	52	48	92	80	62	80	158	82	54	111	69	88
FLIP 81-71	ICARDA	52	48	91	83	63	78	158	80	58	110	68	88
FLIP 81-75	ICARDA	51	49	88	74	62	80	157	80	53	114	64	88
FLIP 82-1C	ICARDA	51	45	88	78	61	79	155	80	52	101	88	88
FLIP 82-2C	ICARDA	52	47	91	74	61	80	156	80	54	112	64	88
FLIP 82-4C	ICARDA	48	48	90	81	62	81	156	80	54	101	67	88
FLIP 82-9C	ICARDA	50	46	90	84	61	80	154	79	53	102	87	88
FLIP 82-16C	ICARDA	51	51	98	85	61	79	159	81	59	114	64	92
FLIP 82-20C	ICARDA	51	46	88	82	62	82	153	82	52	111	64	93
FLIP 82-22C	ICARDA	51	49	88	81	61	80	157	80	52	104	59	92
FLIP 82-25C	ICARDA	49	50	90	72	63	82	154	80	58	103	88	96
FLIP 82-26C	ICARDA	48	48	91	73	61	79	155	79	57	102	64	92
FLIP 82-39C	ICARDA	49	48	90	80	61	80	158	80	54	112	61	88
FLIP 82-75C	ICARDA	52	51	92	90	61	75	158	80	60	118	64	88
FLIP 82-77C	ICARDA	48	48	88	77	62	79	158	80	52	110	84	88
FLIP 82-87C	ICARDA	51	48	88	78	62	77	153	82	52	111	64	88
ILC 482	TURKEY	49	44	84	76	61	79	152	81	50	93	83	88
ILC 3279	USSR	57	51	98	93	53	78	158	82	64	119	68	88
Local check	-	50	46	88	47	60	80	152	81	52	110	68	88
Location mean		51	48	90	79	61	79	155	80	54	108	73	90

ENTRY NAME	ORIGIN	PAKISTAN				SUDAN	SYRIA			TURKEY	MEAN
		Bahawalpur	Chakwal	Dokri	Islamabad	Shambat	Jinderis	Tel Hadya-winter	Tel Hadya-spring	Ankara	
FLIP 81-3	ICARDA	101	114	95	131	62	66	128	66	89	87
FLIP 81-24	ICARDA	89	112	93	132	60	67	128	67	89	87
FLIP 81-25	ICARDA	86	114	99	134	67	65	130	66	90	87
FLIP 81-68W	ICARDA	89	113	93	134	67	69	130	67	90	87
FLIP 81-69	ICARDA	105	118	101	134	62	71	133	70	90	89
FLIP 81-70	ICARDA	104	118	94	135	65	70	132	69	91	88
FLIP 81-71	ICARDA	97	112	94	134	60	70	132	72	91	88
FLIP 81-75	ICARDA	103	118	94	133	51	69	133	70	90	87
FLIP 82-1C	ICARDA	86	110	92	132	60	68	130	67	90	86
FLIP 82-2C	ICARDA	89	118	96	137	62	70	132	68	90	87
FLIP 82-4C	ICARDA	100	112	98	133	62	70	132	69	90	87
FLIP 82-9C	ICARDA	91	114	100	132	61	69	130	68	90	87
FLIP 82-16C	ICARDA	114	119	102	140	51	69	133	71	90	90
FLIP 82-20C	ICARDA	92	111	96	132	63	69	129	68	89	86
FLIP 82-22C	ICARDA	105	115	100	135	60	70	132	67	89	87
FLIP 82-25C	ICARDA	81	113	95	136	60	70	131	67	90	87
FLIP 82-26C	ICARDA	86	113	94	134	61	69	131	68	90	86
FLIP 82-39C	ICARDA	105	118	96	133	64	69	132	70	90	88
FLIP 82-75C	ICARDA	111	119	102	139	65	71	133	72	90	90
FLIP 82-77C	ICARDA	86	115	88	135	59	69	131	67	90	86
FLIP 82-87C	ICARDA	97	110	95	133	64	69	130	68	90	86
ILC 482	TURKEY	84	110	98	129	61	63	127	65	90	84
ILC 3279	USSR	111	118	105	141	67	77	135	76	88	92
Local check	-	87	110	93	132	49	63	-	64	88	-
Location mean		96	114	96	134	61	69	131	68	90	

Table 3.2.3. Time to maturity (days) of the entries at different locations in CIYT-Sp during 1983/84.

ENTRY	CHILE	ETHIOPIA	IRAQ		JORDAN	LEBANON	LIBYA	MOROCCO		PAKISTAN				SUDAN	SYRIA	TURKEY		MEAN
NAME	Chillan	Debre Zeit	Dohuk	Sulaimaniya	Marow	Terbol	El-Marg	El-Koudia	Karia	Bahawalpur	Chakwal	Dokri	Islamabad	Shambat	Tel Hadya-winter	Ankara	Samsun	
FLIP 81-3	148	146	97	108	134	96	162	134	144	137	152	148	196	102	178	130	94	136
FLIP 81-24	149	141	100	109	139	99	162	134	144	128	150	150	198	97	179	132	98	136
FLIP 81-25	149	144	98	109	137	98	162	134	144	139	152	150	198	98	182	132	96	137
FLIP 81-68W	149	134	97	105	136	100	162	134	144	133	151	149	199	100	181	132	96	135
FLIP 81-69	149	137	98	109	136	100	162	134	144	131	154	151	195	101	181	132	99	136
FLIP 81-70	150	147	97	108	138	102	162	134	144	131	154	150	198	104	181	133	101	137
FLIP 81-71	150	145	99	105	138	102	162	134	144	136	151	149	198	105	181	132	99	137
FLIP 81-75	149	136	98	108	136	97	162	134	144	132	154	150	196	98	182	132	99	136
FLIP 82-1C	149	146	96	107	139	101	162	134	144	128	150	150	196	104	181	132	99	136
FLIP 82-2C	150	140	97	109	136	102	162	134	144	133	154	149	198	104	181	133	101	137
FLIP 82-4C	150	151	97	109	136	100	162	134	144	138	151	151	196	102	181	133	102	137
FLIP 82-9C	149	147	97	108	136	98	162	134	144	139	151	150	198	101	181	131	100	137
FLIP 82-16C	156	148	97	108	139	102	162	134	144	131	155	145	199	102	182	133	104	138
FLIP 82-20C	149	139	98	110	137	98	162	134	144	137	150	148	195	102	180	132	101	136
FLIP 82-22C	148	150	99	108	136	99	162	134	144	131	153	153	200	102	181	131	101	137
FLIP 82-25C	149	131	99	110	137	104	162	134	144	151	152	153	201	103	180	133	103	138
FLIP 82-26C	150	132	96	103	138	102	162	134	144	131	151	150	200	96	181	133	104	136
FLIP 82-39C	150	137	97	108	136	98	162	134	144	138	154	150	197	101	181	131	101	136
FLIP 82-75C	150	149	97	104	136	105	162	134	144	137	155	150	197	101	182	132	102	137
FLIP 82-77C	148	139	99	106	139	100	162	134	144	137	153	146	199	95	182	132	100	136
FLIP 82-87C	148	146	97	105	139	99	162	134	144	136	150	147	198	102	180	131	100	136
ILC 482	144	133	98	107	137	97	162	134	144	138	150	148	196	97	181	130	98	135
ILC 3279	156	151	98	107	136	108	162	139	144	129	154	159	199	105	183	134	104	139
Local check	148	112	97	109	138	101	162	134	144	151	150	151	193	91	-	131	102	-
Location mean	149	141	97	107	137	100	162	134	144	135	152	150	197	100	181	132	100	

Table 3.2.4. Plant height (cm) of entries at different locations in the CIYT-Sp during 1983/84.

ENTRY NAME	ALGERIA (1)		CANADA	CHILE	ETHIOPIA	IRAQ		ITALY	JORDAN	LEBANON	LIBYA	NEPAL	PAKISTAN				SYRIA		TURKEY		MEAN
	Khroub	Setif	Ridge Town	Chillan	Debre Zeit	Dohuk	Sulaimaniya	Capalbio	Marow	Terbol	El Marg	Birgunj	Bahawalpur	Chakwal	Dokri	Jinderis	Tel Hadya-winter	Tel Hadya-spring	Ankara	Samsun	
FLIP 81-3	38	26	20	64	41	25	33	61	31	38	51	69	37	62	64	29	46	28	25	33	41
FLIP 81-24	31	26	22	61	43	32	33	61	35	34	52	69	38	56	65	31	48	27	29	35	41
FLIP 81-25	33	26	23	62	41	32	32	59	30	34	45	68	38	56	66	31	41	28	27	35	40
FLIP 81-68W	37	27	21	65	44	27	33	74	36	40	55	72	38	61	63	31	46	26	27	40	43
FLIP 81-69	34	26	21	61	42	29	37	61	36	40	58	79	50	48	98	35	56	28	34	39	46
FLIP 81-70	40	26	23	63	45	29	35	69	36	39	55	73	39	60	73	32	47	29	30	39	44
FLIP 81-71	37	26	23	62	46	31	38	68	37	40	56	68	40	48	66	34	48	28	30	40	43
FLIP 81-75	30	26	23	61	40	26	32	64	31	35	54	71	37	64	73	31	49	26	26	38	42
FLIP 82-1C	31	25	22	62	40	28	30	66	27	34	51	66	39	56	66	30	43	28	26	35	40
FLIP 82-2C	32	26	25	67	42	29	36	64	34	39	56	71	47	59	68	33	50	29	28	40	44
FLIP 82-4C	33	27	22	63	43	29	39	70	34	37	53	76	46	56	68	33	48	28	28	40	44
FLIP 82-9C	32	25	25	56	34	28	33	58	29	35	52	65	38	57	68	29	43	25	24	37	40
FLIP 82-16C	38	26	18	64	43	30	35	74	34	38	56	68	37	51	63	30	47	27	25	39	42
FLIP 82-20C	30	26	22	61	42	30	39	63	33	38	54	67	46	50	67	34	51	30	28	39	43
FLIP 82-22C	36	27	20	64	45	29	33	60	34	39	54	68	44	54	58	32	51	29	27	39	42
FLIP 82-25C	32	27	23	66	45	33	38	71	37	44	56	76	47	61	74	32	48	30	35	43	46
FLIP 82-26C	37	26	23	71	38	26	38	73	39	42	55	72	49	60	67	33	47	29	32	44	45
FLIP 82-39C	34	26	24	51	45	28	29	60	27	33	51	61	42	56	65	29	42	27	25	35	40
FLIP 82-75C	35	26	19	60	42	31	36	68	32	35	53	71	41	58	73	32	48	26	25	38	43
FLIP 82-77C	29	28	25	70	41	30	42	65	35	39	57	88	41	64	85	35	54	26	31	43	46
FLIP 82-87C	33	25	22	59	43	29	32	69	31	35	53	64	42	56	53	34	48	27	26	38	41
ILC 482	35	28	25	61	40	28	32	61	32	32	52	73	39	51	56	30	40	26	25	34	40
ILC 3279	35	26	25	71	50	36	48	80	42	48	72	90	62	68	105	43	69	31	41	47	54
Local check	33	27	22	59	47	30	28	61	36	33	50	56	40	55	49	27	-	27	31	39	-
Location mean	34	26	22	62	42	29	35	66	34	37	54	71	42	57	69	32	48	28	28	39	

(1) One replicate only.

Table 3.2.5. Correlation (df=21) among three agronomic characters and seed yield of entries in the CIYT-Sp during 1983/84.

Characters	Time to maturity	Plant height	Seed yeild
Time to flowering	0.71**	0.56**	-0.60**
Time to maturity		0.54**	-0.31
Plant height			-0.65**

* ≤ P 0.05; ** ≤ P 0.01

Table 3.2.6. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in the CIYT-spring during 1984.

ENTRY	ALGERIA				CANADA		CHILE		ETHIOPIA		IRAQ				ITALY		JORDAN		LEBANON		LIBYA		MOROCCO						NEPAL	
NAME	Khroub(1)		Setif		Ridge Town		Chillan		Debre Zeit		Dohuk		Sulaimaniya		Capalbio		Marow		Terbol		El-Marg		El-Koudia		Karia		Marchouch		Birgunj	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
FLIP 81-3	36	1	979	6	479	13	1703	7	433	3	296	6	458	4	3906	6	219	23	1904	2	815	18	2028	4	1469	20	157	22	461	13
FLIP 81-24	21	19	1057	3	470	15	1230	17	284	6	168	21	271	22	3500	15	418	13	1690	7	1125	7	2434	2	1719	15	243	9	605	4
FLIP 81-25	24	11	896	16	453	16	1824	1	296	5	205	14	417	14	3526	14	294	20	1571	16	1459	1	1981	6	2031	2	239	11	750	3
FLIP 81-68W	21	19	969	7	236	24	1805	2	138	19	252	8	458	4	2917	24	535	5	1692	6	1052	11	1578	17	1438	22	182	16	320	20
FLIP 81-69	24	11	844	20	567	8	1129	21	171	13	168	21	417	14	3406	17	286	21	1588	12	761	21	1388	22	1813	10	318	6	461	13
FLIP 81-70	24	11	906	15	413	19	1775	4	153	17	221	10	458	4	4125	4	478	9	1483	21	974	13	1743	10	1719	15	121	24	410	18
FLIP 81-71	25	10	1125	1	607	6	1510	10	207	9	302	5	458	4	3802	10	421	12	1531	18	1190	6	1644	14	1844	8	182	16	547	8
FLIP 81-75	29	4	938	11	448	17	1303	15	588	2	182	18	396	18	3844	7	347	16	1439	23	678	22	1953	7	1438	22	225	13	469	12
FLIP 82-1C	27	6	880	19	565	9	883	23	170	14	175	20	438	9	3833	8	278	22	1672	9	1093	9	1292	23	2250	1	189	15	313	21
FLIP 82-2C	29	4	938	11	481	12	1713	6	310	4	199	15	438	9	3401	18	308	19	1590	11	942	14	1535	18	1906	4	182	16	213	22
FLIP 82-4C	27	6	896	16	483	11	1783	3	122	20	265	7	427	12	3974	5	532	6	1829	4	865	16	1946	8	1906	4	254	8	414	17
FLIP 82-9C	31	2	943	10	629	4	1322	14	202	10	358	3	438	9	3552	13	458	11	1588	12	1207	3	1686	13	1875	6	325	4	582	5
FLIP 82-16C	18	21	844	20	293	22	1439	12	224	8	113	24	406	16	3417	16	539	4	1579	14	897	15	1446	19	1438	22	168	20	172	23
FLIP 82-20C	23	16	1052	4	547	10	1717	5	157	16	176	19	479	3	3833	8	386	14	1706	5	1110	8	2208	3	1750	14	239	11	457	15
FLIP 82-22C	26	9	932	13	479	13	1291	16	174	12	198	16	458	4	3573	11	628	1	1556	17	839	17	1836	9	1563	19	171	19	438	16
FLIP 82-25C	31	2	958	8	634	3	1176	19	176	11	363	2	521	2	3016	23	564	3	1490	20	1080	10	1722	12	1469	20	243	9	566	6
FLIP 82-26C	22	18	802	23	273	23	1451	11	97	24	239	9	406	16	3307	19	575	2	1579	14	1013	12	1408	20	1781	13	168	20	500	11
FLIP 82-39C	24	11	927	14	610	5	1646	8	119	22	214	13	302	19	3245	20	204	24	1460	22	778	20	1728	11	1844	8	129	23	539	9
FLIP 82-75C	24	11	885	18	332	21	1145	20	140	18	193	17	271	22	4161	3	321	18	1391	24	649	23	1583	16	1688	18	214	14	508	10
FLIP 82-77C	27	6	828	22	582	7	953	22	120	21	160	23	302	19	3120	21	360	15	1526	19	810	19	1593	15	1969	3	275	7	371	19
FLIP 82-87C	14	23	1016	5	425	18	1395	13	158	15	221	10	427	12	3573	11	339	17	1833	3	1197	5	2013	5	1813	10	421	2	566	6
ILC 482	23	16	1083	2	717	1	1568	9	272	7	315	4	677	1	4188	2	506	8	1917	1	1228	2	2573	1	1875	6	386	3	957	2
ILC 3279	4	24	740	24	403	20	652	24	111	23	221	10	281	21	3099	22	517	7	1610	10	405	24	1403	21	1719	15	321	5	152	24
Local check	16	22	953	9	660	2	1182	18	1126	1	445	1	240	23	4276	1	478	9	1679	8	1204	4	831	24	1813	10	446	1	2164	1
Location mean	24		933		491		1400		248		236		410		3608		416		1621		974		1731		1755		242		539	
C.V.%	-		19.4		37.6		37.1		120.4		33.7		34.2		5.2		34.3		12.7		19.1		30.4		23.8		53.2		39.4	
L.S.D. at 5%	-		NS		260		NS		421		112		198		265		201		290		262		NS		NS		181		299	
S.E.	-		90.5		92.2		259.6		149.3		39.7		70.0		94.1		71.4		103.0		92.7		303.4		208.9		64.2		106.1	
No. of entries significantly exceeding	-		-		0		-		0		0		8		0		0		0		0		-		-		0		0	

(1) Based on one replication only.

Cont'd. 2...

Table 3.2.6. Cont'd. 2.

ENTRY NAME	PAKISTAN								SUDAN		SYRIA														TUNISIA				TURKEY				100-seed(2) weight (g)	MEAN	
	Bahawalpur		Chakwal		Dokri		Islamabad		Shambat		Al-Ghab		Gelline		Homs		Izra'a		Jinderis		Tel Hadya-spring		Tel Hadya-winter		Beja		El-Kef		Ankara		Samsun				
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R		Y	R
FLIP 81-3	512	5	2667	7	391	13	2583	12	94	8	1482	5	765	16	1119	2	552	9	1092	14	296	1	2108	2	1250	14	706	3	1518	15	1674	17	19.3	1068	6
FLIP 81-24	321	14	2396	8	556	4	3369	2	81	11	1357	10	740	19	912	10	539	11	1049	19	205	8	1696	8	1850	1	488	19	1402	21	1563	20	22.6	1069	5
FLIP 81-25	357	11	2245	9	267	23	2464	14	86	10	1274	15	720	21	911	11	516	13	1089	15	236	6	1744	6	1338	11	606	12	1327	23	1410	23	23.6	1027	10
FLIP 81-68W	226	16	2068	16	380	14	1875	19	81	11	1095	18	888	9	1110	3	526	12	1138	9	100	23	1399	11	1244	15	650	8	1414	20	1549	21	29.5	931	21
FLIP 81-69	123	22	1932	20	655	2	1680	23	35	22	1601	3	589	24	738	21	484	18	1006	21	141	19	1170	22	1156	18	431	21	1276	24	1590	19	26.5	893	22
FLIP 81-70	170	20	3224	1	272	22	2423	15	70	14	1196	17	860	10	861	15	359	23	1077	17	150	17	1476	10	1406	9	513	16	1456	19	1819	14	26.3	029	9
FLIP 81-71	214	18	2677	6	508	5	3110	4	73	13	1500	4	833	12	986	6	589	6	1136	10	157	14	1537	9	1523	4	663	7	1475	17	1701	16	28.4	1085	4
FLIP 81-75	59	23	2115	14	346	17	2508	13	31	23	1226	16	782	14	695	24	380	22	1170	7	117	21	1177	21	1481	6	419	24	1519	14	1864	13	29.0	966	17
FLIP 82-1C	452	6	2128	13	403	12	2595	10	135	4	952	21	624	23	1120	1	505	14	1052	18	240	5	1386	12	1050	24	488	19	1496	16	2007	9	25.2	977	14
FLIP 82-2C	186	19	1943	19	307	19	1748	22	38	20	792	22	776	15	708	23	552	9	933	22	141	19	1190	20	1525	4	688	6	1542	12	1944	11	26.1	934	20
FLIP 82-4C	381	9	1964	18	357	16	2664	8	39	19	1280	14	943	3	738	21	625	4	1136	10	156	15	1379	13	1150	20	694	5	1607	7	2288	5	22.9	1058	7
FLIP 82-9C	143	21	3042	3	501	6	3205	3	60	16	1333	12	977	1	1092	4	396	21	1120	12	208	7	1763	5	1138	21	706	3	1685	4	1993	10	24.9	1093	3
FLIP 82-16C	43	24	1813	21	84	24	3513	1	42	18	1839	1	955	2	962	8	490	17	1439	1	154	16	1215	18	1338	11	650	8	1577	9	2201	6	26.6	1003	12
FLIP 82-20C	536	3	2818	5	622	3	3009	5	68	15	1393	8	892	8	1064	5	500	15	1350	2	202	10	2107	3	1156	18	556	15	1745	3	2431	4	22.4	1139	2
FLIP 82-22C	366	10	2104	15	491	7	2773	6	45	17	1446	6	837	11	824	19	469	19	1167	8	203	9	2023	4	1394	10	500	18	1538	13	2604	1	25.0	1031	8
FLIP 82-25C	524	4	2172	10	486	8	1829	21	98	7	1339	11	895	7	838	17	615	5	1011	20	202	10	1369	14	1225	16	781	1	1463	18	2507	3	29.4	1000	13
FLIP 82-26C	452	6	1302	23	298	20	2617	9	107	6	1042	19	920	4	911	11	438	20	921	23	145	18	1326	15	1531	3	631	10	1596	8	2563	2	29.2	970	16
FLIP 82-39C	224	17	2047	17	338	18	2700	7	91	9	1607	2	765	16	846	16	563	8	1079	16	277	3	1206	19	1063	23	431	21	1371	22	2118	7	29.2	976	15
FLIP 82-75C	345	12	1714	22	482	9	2589	11	36	21	1006	20	912	5	773	20	641	2	1185	6	117	21	1289	17	1119	22	594	13	1677	5	2042	8	24.0	958	18
FLIP 82-77C	333	13	2151	11	373	15	2095	16	195	3	1369	9	815	13	896	14	500	15	1094	13	163	13	1318	16	1275	13	513	16	1556	11	1771	15	24.2	937	19
FLIP 82-87C	430	8	2151	11	454	11	1871	20	115	5	1310	13	757	18	969	7	630	3	1230	4	278	2	2145	1	1169	17	594	13	1644	6	1604	18	23.4	1021	11
ILC 482	631	2	2885	4	290	21	2015	18	200	2	1405	7	908	6	827	18	583	7	1189	5	190	12	1742	7	1481	6	619	11	1999	1	1885	12	24.9	1180	1
ILC 3279	250	15	1141	24	460	10	2065	17	-	-	738	24	649	22	955	9	307	24	761	24	57	24	1077	23	1450	8	425	23	1574	10	1215	24	25.4	817	23
Local check	1119	1	3135	2	683	1	1288	24	701	1	762	23	732	20	905	13	979	1	1318	3	272	4	0	24	1819	2	756	2	1807	2	1431	22	29.2	-	
Location mean	350		2243		417		2441		105		1264		814		907		531		1114		184		1452		1339		588		1553		1907		25.7		
C.V.%	56.4		26.5		49.4		24.6		93.4		32.8		22.6		33.6		30.4		17.5		46.1		25.6		37.6		20.0		5.5		18.2		8.3		
L.S.D. at 5%	278		840		290		847		138		585		NS		NS		227		275		119		524		NS		166		121		489		3.0		
S.E.	98.7		297.7		102.9		300.2		49.0		207.6		91.8		152.2		80.7		97.6		42.3		185.7		252.0		58.8		42.9		173.3		1.1		
No. of entries significantly exceeding	0		0		0		15		0		10		-		-		0		0		0		23		-		0		1		11		-		

(2) 100-seed weight is based on Tel Hadya (Syria) location only.

Table 3.2.7. The five heaviest seed yielding entries at the individual locations in the CIYT-Sp during 1983/84.

RANK	ALGERIA		CANADA	CHILE	ETHIOPIA	IRAQ		ITALY	JORDAN	LEBANON	LIBYA
	Khroub	Setif	Ridge Town	Chillan	Debre Zeit	Dohuk	Sulaimaniya	Capalbio	Marow	Terbol	El-Marg
1	FLIP 81-3	FLIP 81-71	ILC 482	FLIP 81-25	Local check	Local check	ILC 482	Local check	FLIP 82-22C	ILC 482	FLIP 81-25
2	FLIP 82-25C	ILC 482	Local check	FLIP 81-68W	FLIP 81-75	FLIP 82-25C	FLIP 82-25C	ILC 482	FLIP 82-26C	FLIP 81-3	ILC 482
3	FLIP 82-9C	FLIP 81-24	FLIP 82-25C	FLIP 82-4C	FLIP 81-3	FLIP 82-9C	FLIP 82-20C	FLIP 82-75C	FLIP 82-25C	FLIP 82-87C	FLIP 82-9C
4	FLIP 82-2C	FLIP 82-20C	FLIP 82-9C	FLIP 81-70	FLIP 82-2C	ILC 482	FLIP 81-3	FLIP 81-70	FLIP 82-16C	FLIP 82-4C	Local check
5	FLIP 81-75	FLIP 82-87C	FLIP 82-39C	FLIP 82-20C	FLIP 81-25	FLIP 81-71	FLIP 81-68W FLIP 81-70 FLIP 81-71 FLIP 82-22C	FLIP 82-4C	FLIP 81-68W	FLIP 82-20C	FLIP 82-87C

Cont'd. ...

RANK	MOROCCO			NEPAL	PAKISTAN				SUDAN	SYRIA	
	El-Koudia	Karia	Marchouch	Birgunj	Bahawalpur	Chakwal	Dokri	Islamabad	Shambat	Al-Ghab	Gelline
1	ILC 482	FLIP 82-1C	Local check	Local check	Local check	FLIP 81-70	Local check	FLIP 82-16C	Local check	FLIP 82-16C	FLIP 82-9C
2	FLIP 81-24	FLIP 81-25	FLIP 82-87C	ILC 482	ILC 482	Local check	FLIP 81-69	FLIP 81-24	ILC 482	FLIP 82-39C	FLIP 82-16C
3	FLIP 82-20C	FLIP 82-77C	ILC 482	FLIP 81-25	FLIP 82-20C	FLIP 82-9C	FLIP 82-20C	FLIP 82-9C	FLIP 82-77C	FLIP 81-69	FLIP 82-4C
4	FLIP 81-3	FLIP 82-2C	FLIP 82-9C	FLIP 81-24	FLIP 82-25C	ILC 482	FLIP 81-24	FLIP 81-71	FLIP 82-1C	FLIP 81-71	FLIP 82-26C
5	FLIP 82-87C	FLIP 82-4C	ILC 3279	FLIP 82-9C	FLIP 81-3	FLIP 82-20C	FLIP 81-71	FLIP 82-20C	FLIP 82-87C	FLIP 81-3	FLIP 82-75C

Cont'd. ...

RANK	SYRIA					TUNISIA		TURKEY	
	Homs	Izra'a	Jinderis	Tel Hadya-spring	Tel Hadya-winter	Beja	El-Kef	Ankara	Samsun
1	FLIP 82-1C	Local check	FLIP 82-16C	FLIP 81-3	FLIP 82-87C	FLIP 81-24	FLIP 82-25C	ILC 482	FLIP 82-22C
2	FLIP 81-3	FLIP 82-75C	FLIP 82-20C	FLIP 82-87C	FLIP 81-3	Local check	Local check	Local check	FLIP 82-26C
3	FLIP 81-68W	FLIP 82-87C	Local check	FLIP 82-39C	FLIP 82-20C	FLIP 82-26C	FLIP 81-3	FLIP 82-20C	FLIP 82-25C
4	FLIP 82-9C	FLIP 82-4C	FLIP 82-87C	Local check	FLIP 82-22C	FLIP 82-2C	FLIP 82-9C	FLIP 82-9C	FLIP 82-20C
5	FLIP 82-20C	FLIP 82-25C	ILC 482	FLIP 82-1C	FLIP 82-9C	FLIP 81-71	FLIP 82-4C	FLIP 82-75C	FLIP 82-4C

(1) The brackets indicate entries having the same rank.

Table 3.2.8. Correlation (df=20) among different locations for the seed yield of entries in the CIYT-Spring during 1983/84.

COUNTRY	LOCATION	ALGERIA Setif	CANADA Ridge Town	CHILE Chillan	ETHIOPIA Debre Zeit	IRAQ Dohuk	IRAQ Sulaimaniya	ITALY Capalbio	JORDAN Marow	LEBANON Terbol	LIBYA El-Marg	MOROCCO El-Koudia	MOROCCO Karia	MOROCCO Marchouch	NEPAL Birgunj
ALGERIA	Khroub	-0.06	0.41	-0.06	0.40	0.45*	0.12	0.10	-0.19	-0.07	-0.24	-0.07	-0.04	-0.24	-0.05
ALGERIA	Setif		0.39	0.27	0.24	0.40	0.39	0.27	0.01	0.40	0.45*	0.68**	-0.10	0.25	0.46*
CANADA	Ridge Town			-0.22	0.05	0.41	0.34	0.14	-0.22	0.12	0.21	0.30	0.42	0.38	0.47*
CHILE	Chillan				0.09	0.21	0.31	0.13	0.06	0.30	0.25	0.32	-0.16	-0.25	0.08
ETHIOPIA	Debre Zeit					-0.01	0.11	0.25	-0.30	0.08	-0.09	0.36	-0.32	-0.01	0.11
IRAQ	Dohuk						0.54**	0.04	0.26	0.24	0.36	0.20	-0.07	0.21	0.48*
IRAQ	Sulaimaniya							0.23	0.38	0.49*	0.44*	0.29	-0.05	0.27	0.33
ITALY	Capalbio								-0.13	0.24	-0.05	0.38	0.17	0.08	0.28
JORDAN	Marow									0.03	0.16	0.04	-0.36	-0.01	-0.01
LEBANON	Terbol										0.34	0.52*	0.11	0.44*	0.24
LIBYA	El-Marg											0.33	0.38	0.34	0.49*
MOROCCO	El-Koudia												-0.10	0.40	0.66**
MOROCCO	Karia													0.25	0.18
MOROCCO	Marchouch														0.52*

Table 3.2.8. Cont'd

COUNTRY	LOCATION	PAKISTAN Bahawalpur	PAKISTAN Chakwal	PAKISTAN Dokri	PAKISTAN Islamabad	SUDAN Shambat	SYRIA Al-Ghab	SYRIA Gelline	SYRIA Homs	SYRIA Izra'a	SYRIA Jinderis	SYRIA Tel Hadya-spring	SYRIA Tel Hadya-winter	TUNISIA Beja	TUNISIA El-Kef	TURKEY Ankara	TURKEY Samsun
ALGERIA	Khroub	0.07	0.24	0.12	-0.05	-0.07	-0.15	-0.02	-0.02	-0.14	-0.40	0.10	-0.04	-0.12	0.25	-0.07	0.13
ALGERIA	Setif	0.29	0.60**	0.36	0.13	0.13	0.14	0.06	0.23	0.34	0.24	0.24	0.54**	0.31	0.17	0.29	-0.23
CANADA	Ridge Town	0.27	0.51*	0.36	-0.09	0.39	0.26	-0.20	-0.06	0.14	-0.14	0.40	0.15	-0.14	-0.05	0.19	0.01
CHILE	Chillan	0.01	0.26	-0.35	0.01	-0.22	0.01	0.29	0.05	0.03	0.12	0.03	0.22	0.10	0.33	0.03	-0.10
ETHIOPIA	Debre Zeit	-0.18	0.18	-0.15	0.05	-0.18	0.01	-0.23	-0.14	-0.22	0.03	0.05	0.07	0.39	-0.07	-0.02	-0.32
IRAQ	Dohuk	0.34	0.41	0.14	-0.15	0.19	-0.05	0.39	0.19	0.21	-0.26	0.18	0.24	-0.08	0.66**	0.26	0.09
IRAQ	Sulaimaniya	0.40	0.43*	-0.10	-0.29	0.27	0.04	0.21	0.12	0.01	0.11	0.06	0.32	0.01	0.41	0.46*	0.14
ITALY	Capalbio	0.20	0.42	-0.01	0.25	-0.08	-0.09	0.07	-0.11	0.01	0.27	0.04	0.27	0.02	-0.09	0.48*	-0.03
JORDAN	Marow	0.07	-0.03	-0.14	0.15	-0.03	0.06	0.68**	-0.04	-0.15	0.16	-0.41	0.03	0.30	0.36	0.29	0.52*
LEBANON	Terbol	0.55**	0.25	0.01	-0.10	0.36	0.08	-0.02	0.36	0.33	0.16	0.40	0.57**	-0.01	0.30	0.41	-0.18
LIBYA	El-Marg	0.33	0.40	-0.01	0.07	0.35	-0.07	0.03	0.46*	0.08	0.01	0.32	0.46*	0.19	0.35	0.13	-0.24
MOROCCO	El-Koudia	0.46*	0.50*	0.13	0.12	0.24	0.20	0.11	-0.04	0.20	0.27	0.33	0.61**	0.36	-0.01	0.41	0.16
MOROCCO	Karia	0.20	0.06	0.06	-0.07	0.38	-0.30	-0.36	0.04	0.09	-0.31	0.24	-0.03	-0.18	-0.17	0.05	-0.17
MOROCCO	Marchouch	0.27	0.16	0.31	-0.32	0.35	0.10	-0.04	0.07	0.26	0.15	0.14	0.31	-0.11	0.07	0.44*	-0.26
NEPAL	Birgunj	0.47*	0.36	0.18	-0.06	0.41	0.14	0.02	-0.07	0.20	-0.07	0.32	0.39	0.17	0.02	0.31	-0.19
PAKISTAN	Bahawalpur		0.10	0.18	-0.19	0.59**	-0.16	0.06	0.23	0.47*	-0.06	0.45*	0.54**	-0.10	0.27	0.46*	0.26
PAKISTAN	Chakwal			0.18	0.17	0.19	0.19	0.11	0.35	-0.23	0.19	0.27	0.51*	0.06	0.07	0.24	0.26
PAKISTAN	Dokri				-0.05	-0.15	0.03	-0.27	0.08	0.15	-0.13	0.09	0.32	-0.14	-0.17	-0.10	-0.02
PAKISTAN	Islamabad					-0.27	0.36	0.31	0.33	-0.22	0.43*	0.12	0.18	0.20	-0.04	0.08	0.23
SUDAN	Shambat						-0.01	-0.06	0.29	0.16	-0.10	0.33	0.19	0.01	-0.001	0.35	-0.15
SYRIA	Al-Ghab							0.04	0.09	0.01	0.50*	0.29	0.17	-0.07	-0.12	-0.08	0.01
SYRIA	Gelline								0.05	0.01	0.38	-0.32	0.04	0.03	0.57**	0.58**	0.51*
SYRIA	Homs									-0.08	0.24	0.41	0.49*	-0.23	0.25	0.05	-0.15
SYRIA	Izra'a										0.06	0.23	0.10	-0.19	0.39	0.15	-0.05
SYRIA	Jinderis											0.02	0.32	-0.21	-0.01	0.42	0.10
SYRIA	Tel Hadya-spring												0.61**	-0.26	0.01	-0.02	-0.06
SYRIA	Tel Hadya-winter													0.01	0.16	0.33	-0.05
TUNISIA	Beja														-0.03	-0.02	-0.15
TUNISIA	El-Kef															0.30	0.17
TURKEY	Ankara																0.34

* $P \leq 0.05$; ** $P \leq 0.01$

seem to be comparatively more stable than others.

The correlations between seed yields among different locations (Table 3.2.8) revealed that Setif in Algeria, Terbol in Lebanon, El-Marg in Libya, El-Kaudia in Morocco, Bahawalpur and Chakwal in Pakistan, Homs and Tel Hadya-spring in Syria, were positively associated with Tel Hadya-winter in Syria. The Tel Hadya-spring in Syria, however, did not show any correaltion with other locations except Bahawalpur in Pakistan.

3.3. CHICKPEA INTERNATIONAL YIELD TRIAL-WINTER-MEDITERRANEAN REGION (CIYT-W-MR)

Material

The material for the Chickpea International Yield Trial-Winter comprised of 23 test entries, and one local check to be supplied by the cooperator. The test entries were resistant to ascochyta blight and were selected from the local and regional yield trials based on their superior yield performance. Out of these 23 test entries, 21 were developed through hybridization at ICARDA. The cooperators were free to use these entries in their breeding programs or for release as commercial cultivars.

Methods and Management

The trial design was a randomized complete block with four replications. The suggested plot size was four rows 4 m long with an inter- and intra row spacing of 30- and 10 cm respectively.

Sixty five sets of trials were distributed to cooperators in 23 countries. Results were returned from 45 sets covering 19 countries. The crop at Breda (Syria) failed due to severe drought. The agronomic practices employed at different locations are shown in Table 3.3.1.

Results and Discussion

Mean for time to flowering, time to maturity and plant height for different entries at each of the reported locations are compiled in Tables 3.3.2, 3.3.3 and 3.3.4 respectively. Time to flowering ranged from 119 days for ILC 482 to 131 days for FLIP 82-93C. The entries flowered earliest at Karaj in Iran in 29 days and were followed by Tel Hadya-spring in Syria (70 days), Culiacan in Mexico (71 days) and La Molina in Peru (80 days). The entries in Oroumieh in Iran took maximum time to flower (185 days) and other late flowering locations included Annoceur in Morocco, Ankara in Turkey, El-Kef in Tunisia and Larissa in Greece. The locations which flowered earlier were also earlier in maturity. There were little differences in time to maturity (ranging from 178 days for FLIP 82-43C to 184 days for FLIP 82-93C). The plant height data revealed that the entry FLIP 82-93C was tallest (61 cm) and was followed by FLIP 82-64C (60 cm), FLIP 82-73C (59 cm), FLIP 82-72C

Table 3.3.1. Agronomic data for different locations in the CIYT-W-MR during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicides/ Herbicides
ALGERIA	Setif	10.1.1984	167		46			Treflan
BULGARIA	Toshevo	3.1.1984	201	30	60			Benlate,Calixin M, Actellic
CHILE	Chillan	6.6.1984	209		90			Linuron
EGYPT	Shandweel	24.11.1983	154	18	71		2	
GREECE	Larissa	1.12.1983	215		285			Phosdrin
IRAN	Karaj	4.11.1983	117	30	70		4	Treflan,Metasystox
IRAN	Oroumieh	25.10.1983	258	18	46		4	Metasystox,Basudin, Zeneb
ITALY	Capalbio	6.12.1984	241	40	100			Tribunil
JORDAN	Marow	23.11.1983	196	20	25			
LEBANON	Terbol	20.11.1983	190		50			Kerb, Bladex
MEXICO	Culiacan	30.11.1983	141	40	40		2	
MOROCCO	Annoceur	25.11.1983	238	30	50	60		
MOROCCO	Douyet	23.11.1983	210	30	50	60		
MOROCCO	Karia	13.11.1983	216	30	50	60		
MOROCCO	Sidi Kacem	27.11.1983	227	30	50	60		
MOROCCO	Sidi Laidi	28.11.1983	161	30	50	60		
MOROCCO	Zemamra	3.11.1983	169	30	50	60		
PAKISTAN	Chakwal	13.10.1983	187	35	90			
PAKISTAN	Faisalabad	7.11.1983	187	20	50			
PAKISTAN	Islamabad		197					
PAKISTAN	Tarnab	22.10.1983	180	20	50			
PERU	La Molina	9.5.1984	168		80			Aldrex
PORTUGAL	Elvas	3.12.1983	214	21	54			Tribunil,Dithane
SPAIN	Cordoba	11.1.1984	208					
SPAIN	Jaen	5.12.1983	243					
SPAIN	Sevilla	13.12.1983	227					
SYRIA	Breda	14.11.1983						
SYRIA	Jinderis	19.11.1983	191					
SYRIA	Tel Hadya-winter	26.11.1983	183		50			
SYRIA	Tel Hadya-spring	28.2.1984	129					
TUNISIA	El-Kef	9.11.1983	207	15	45			
TUNISIA	Mateur	17.11.1983	215		150			
TUNISIA	Menzel Temime	30.11.1983	203		150			
TURKEY	Ankara	2.12.1983	218	20	60			
TURKEY	Samsun	7.3.1984	132	25	50			
YEMEN D.R.	El-Kod	28.11.1983	120	1	119			

Table 3.3.2. Time to flowering (days) of entries at different locations in CIYT-W-MR during 1983/84.

ENTRY NAME	ORIGIN	BULGARIA	CHILE	EGYPT	GREECE	IRAN		ITALY	JORDAN	LEBANON	MEXICO	MOROCCO				
		Toshevo	Chillan	Shandweel	Larissa	Karaj	Oroumieh	Capalbio	Marow	Terbol	Culiacan	Annoceur	Douyet	Karia	Sidi-Laidi	Zemamra
FLIP 81-26	ICARDA	143	147	88	160	27	184	151	139	123	75	173	99	105	123	99
FLIP 81-29	ICARDA	146	145	94	160	28	185	153	144	145	78	173	103	105	123	109
FLIP 81-34W	ICARDA	147	146	90	161	28	182	153	142	131	76	173	103	114	123	112
FLIP 81-40W	ICARDA	146	143	94	159	31	185	152	140	133	77	173	103	120	123	112
FLIP 81-41W	ICARDA	145	143	92	159	29	182	152	141	132	75	173	134	120	123	121
FLIP 81-56W	ICARDA	145	143	91	161	29	184	153	141	130	72	173	101	114	123	121
FLIP 81-57W	ICARDA	145	147	87	161	33	185	155	141	145	76	173	126	120	123	121
FLIP 81-59W	ICARDA	146	143	92	160	28	184	154	143	138	72	182	134	105	123	121
FLIP 81-269	ICARDA	147	149	92	161	28	185	154	145	141	68	173	99	105	123	109
FLIP 81-293	ICARDA	147	143	89	160	29	185	154	141	125	65	173	128	114	123	112
FLIP 82-5C	ICARDA	146	147	91	162	31	187	155	143	145	76	173	134	120	123	112
FLIP 82-13C	ICARDA	148	148	95	162	31	184	156	152	145	78	175	134	105	127	121
FLIP 82-40C	ICARDA	146	146	92	161	29	184	155	141	137	70	179	134	105	123	109
FLIP 82-43C	ICARDA	146	143	91	159	29	187	153	139	125	71	173	139	105	123	112
FLIP 82-64C	ICARDA	148	147	96	164	28	187	154	149	146	78	177	103	120	127	112
FLIP 82-65C	ICARDA	148	149	95	162	29	185	155	144	146	74	173	139	114	123	121
FLIP 82-72C	ICARDA	146	147	95	163	30	187	156	145	146	76	173	126	120	123	112
FLIP 82-73C	ICARDA	146	143	93	161	29	187	154	141	144	74	173	126	114	123	109
FLIP 82-79C	ICARDA	145	147	93	163	31	187	156	143	146	77	177	137	120	123	112
FLIP 82-91C	ICARDA	146	144	91	165	32	187	155	146	146	76	173	139	114	127	121
FLIP 82-93C	ICARDA	147	147	95	166	33	184	157	146	146	77	173	139	101	123	121
ILC 482	TURKEY	144	130	76	159	25	182	149	138	119	61	173	96	102	88	89
ILC 1929	SYRIA	144	142	77	160	26	182	151	-	138	61	173	96	102	88	107
Local check	-	148	145	75	160	28	184	151	142	132	30	173	120	102	88	102
																Cont'd.
Location mean		146	145	90	161	29	185	154	143	138	71	174	121	111	119	112

ENTRY NAME	ORIGIN	PAKISTAN				PERU	PORTUGAL	SYRIA				TUNISIA	TURKEY	YEMEN D.R.	MEAN
		Chakwal	Faisalabad	Islamabad	Tarnab	La-Molina	Elvas	Breda	Jinderis	Tel-Hadya-winter	Tel-Hadya-spring	El-Kef	Ankara	El-Kod	
FLIP 81-26	ICARDA	142	107	129	124	83	122	134	135	130	68	162	168	56	121
FLIP 81-29	ICARDA	143	119	134	133	89	127	135	137	131	68	165	171	79	126
FLIP 81-34W	ICARDA	151	117	132	129	84	132	135	137	130	68	172	171	56	125
FLIP 81-40W	ICARDA	151	117	132	137	81	132	134	135	132	70	165	170	79	126
FLIP 81-41W	ICARDA	145	119	134	140	80	130	135	136	132	70	172	170	79	127
FLIP 81-56W	ICARDA	151	110	131	132	80	135	135	137	132	71	172	171	79	126
FLIP 81-57W	ICARDA	148	114	133	141	79	136	136	137	133	71	172	176	79	128
FLIP 81-59W	ICARDA	151	115	132	121	76	137	132	136	133	70	165	171	79	127
FLIP 81-269	ICARDA	146	117	132	136	88	132	135	136	130	69	165	176	36	124
FLIP 81-293	ICARDA	145	119	129	135	79	129	134	133	130	71	165	171	56	124
FLIP 82-5C	ICARDA	149	112	133	135	75	133	135	137	133	70	165	171	36	126
FLIP 82-13C	ICARDA	151	124	135	139	89	139	136	138	133	73	175	176	51	129
FLIP 82-40C	ICARDA	150	116	131	136	83	137	134	135	131	71	169	176	51	126
FLIP 82-43C	ICARDA	142	118	131	133	73	128	133	134	130	70	169	170	36	124
FLIP 82-64C	ICARDA	146	117	133	137	85	135	135	137	132	72	171	176	39	127
FLIP 82-65C	ICARDA	150	120	132	138	84	136	135	137	133	72	170	171	51	128
FLIP 82-72C	ICARDA	151	114	132	133	79	135	136	138	133	72	172	176	79	128
FLIP 82-73C	ICARDA	144	110	133	134	77	132	134	136	131	72	165	171	51	125
FLIP 82-79C	ICARDA	151	118	134	140	89	133	136	138	133	71	175	171	56	129
FLIP 82-91C	ICARDA	139	117	133	141	85	134	136	138	135	71	167	176	56	128
FLIP 82-93C	ICARDA	151	120	135	139	83	135	136	138	133	72	173	176	-	131
ILC 482	TURKEY	152	99	128	111	70	122	135	126	129	67	162	168	-	119
ILC 1929	SYRIA	149	110	130	109	70	128	134	133	-	66	164	176	-	121
Local check	-	138	108	131	106	66	127	138	140	137	77	157	168	-	-
Location mean		147	115	132	131	80	132	135	136	126	70	168	172	59	

Table 3.3.3. Time to maturity (days) of entries at different locations in CIYT-W-MR during 1983/84.

ENTRY	BULGARIA	CHILE	EGYPT	IRAN		JORDAN	LEBANON	MEXICO	MOROCCO				
NAME	Toshevo	Chillan	Shandweel	Karaj	Oroumieh	Marow	Terbol	Culiacan	Annoceur	Douyet	Karia	Sidi-Laidi	Zemamra
FLIP 81-26	194	208	150	112	254	193	184	137	233	191	201	157	164
FLIP 81-29	195	202	145	117	254	193	185	139	230	191	201	157	159
FLIP 81-34W	201	208	146	112	258	194	184	139	233	191	205	157	159
FLIP 81-40W	194	200	151	117	256	194	187	140	230	200	208	157	169
FLIP 81-41W	198	200	152	115	256	195	186	141	233	200	208	157	169
FLIP 81-56W	194	200	151	112	258	192	185	136	228	191	205	157	169
FLIP 81-57W	196	208	150	112	254	194	185	137	236	200	208	157	182
FLIP 81-59W	194	200	150	115	254	195	184	137	233	200	216	157	159
FLIP 81-269	199	209	148	115	258	196	187	135	238	191	216	157	159
FLIP 81-293	200	202	149	112	255	192	185	136	233	200	205	157	159
FLIP 82-5C	200	208	150	117	258	194	187	139	236	200	208	157	169
FLIP 82-13C	199	209	154	117	258	195	187	141	236	200	216	161	159
FLIP 82-40C	201	208	150	117	256	194	187	137	238	200	216	157	159
FLIP 82-43C	195	200	150	117	256	192	185	136	230	210	216	157	169
FLIP 82-64C	201	208	151	112	258	196	190	137	238	191	208	161	159
FLIP 82-65C	199	209	149	117	251	197	190	141	236	210	205	157	169
FLIP 82-72C	198	209	150	117	250	195	189	138	238	200	208	157	169
FLIP 82-73C	201	200	150	117	256	195	190	136	233	200	205	157	169
FLIP 82-79C	199	208	150	115	251	193	186	140	236	210	208	157	169
FLIP 82-91C	201	203	149	115	254	195	187	140	233	210	205	161	182
FLIP 82-93C	200	208	149	117	254	194	185	138	233	210	208	157	159
ILC 482	193	198	146	115	254	193	184	137	228	210	201	153	169
ILC 1929	193	200	148	115	256	-	187	138	233	215	201	153	159
Local check	201	204	149	112	252	196	187	136	228	210	201	153	164
Location mean	198	204	149	115	255	194	186	138	233	201	207	157	166

Cont'd. 2.

ENTRY	PAKISTAN			PERU	SYRIA		TUNISIA	TURKEY		YEMEN D.R.	MEAN
NAME	Chakwal	Islamabad	Tarnab	La-Molina	Jinderis	Tel-Hadya-winter	El-Kef	Ankara	Samsun	El-Kod	
FLIP 81-26	181	195	177	167	188	178	207	213	120	120	179
FLIP 81-29	181	196	178	169	189	179	201	212	121	120	179
FLIP 81-34W	186	196	181	167	187	178	204	213	120	92	179
FLIP 81-40W	185	195	180	162	189	182	201	211	121	120	180
FLIP 81-41W	182	195	183	166	190	181	207	213	120	120	181
FLIP 81-56W	186	194	177	163	188	180	207	213	120	120	179
FLIP 81-57W	184	194	180	167	191	182	207	213	121	120	182
FLIP 81-59W	186	195	175	163	191	182	201	212	121	120	180
FLIP 81-269	182	195	176	157	189	182	201	217	125	64	178
FLIP 81-293	183	193	175	155	188	180	201	212	124	120	179
FLIP 82-5C	185	194	180	162	192	182	201	218	125	52	179
FLIP 82-13C	187	196	179	165	189	182	207	217	129	79	181
FLIP 82-40C	185	194	177	162	190	182	207	213	129	120	182
FLIP 82-43C	181	194	176	154	189	180	207	213	128	64	178
FLIP 82-64C	183	195	180	166	189	181	207	219	131	67	179
FLIP 82-65C	184	197	181	163	191	183	207	219	132	92	182
FLIP 82-72C	186	197	178	168	190	183	207	218	126	92	181
FLIP 82-73C	181	195	178	159	190	182	207	218	125	79	179
FLIP 82-79C	187	194	180	167	191	181	207	217	124	120	182
FLIP 82-91C	179	194	181	166	192	183	207	218	125	120	183
FLIP 82-93C	186	194	179	164	191	183	207	217	125	-	184
ILC 482	186	195	173	154	189	182	201	213	122	-	182
ILC 1929	184	197	175	156	190	-	207	-	122	-	180
Local check	180	192	166	166	192	184	207	213	122	-	-
Location mean	184	195	178	163	190	174	205	206	124	100	

Table 3.3.4. Plant height of entries at different locations in CIYT-W-MR during 1983/84.

ENTRY NAME	ALGERIA Setif	BULGARIA Toshevo	CHILE Cnillan	EGYPT Shandweel	GREECE Larissa	IRAN Karaj	IRAN Oroumieh	ITALY Capalbio	JORDAN Marow	LEBANON Terbol	MEXICO Culiacan	PAKISTAN Chakwal	PAKISTAN Tarnab
FLIP 81-26	27	33	56	84	64	34	41	75	45	60	99	53	53
FLIP 81-29	29	31	66	84	74	26	38	69	53	72	107	60	58
FLIP 81-34W	26	39	63	83	68	37	46	66	51	66	103	59	56
FLIP 81-40W	27	32	53	83	68	26	45	59	47	62	89	62	49
FLIP 81-41W	26	34	53	88	66	31	43	68	48	59	96	53	42
FLIP 81-56W	27	35	60	70	66	28	45	66	49	52	92	46	48
FLIP 81-57W	27	27	53	78	66	29	33	71	43	53	94	57	43
FLIP 81-59W	26	32	57	71	68	25	40	61	43	62	102	54	49
FLIP 81-269	26	40	70	83	78	32	48	75	61	66	102	51	51
FLIP 81-293	28	35	62	86	66	33	45	71	54	64	100	58	45
FLIP 81-5C	28	37	59	93	70	36	43	66	50	64	109	61	59
FLIP 82-13C	26	32	60	74	65	29	33	66	46	57	99	58	54
FLIP 82-40C	26	38	62	85	69	47	45	74	58	70	98	56	50
FLIP 82-43C	26	33	61	86	68	33	43	70	50	66	100	50	48
FLIP 82-64C	25	58	69	100	81	45	54	81	66	73	100	64	54
FLIP 82-65C	26	53	63	96	76	47	47	81	60	72	107	57	52
FLIP 82-72C	26	43	64	96	78	37	33	80	59	67	101	62	70
FLIP 82-73C	26	47	65	99	79	48	51	81	46	79	105	59	58
FLIP 82-79C	26	41	61	94	74	43	46	76	56	74	113	53	58
FLIP 82-91C	27	55	67	94	73	47	46	75	55	71	109	59	50
FLIP 82-93C	27	48	66	101	73	47	63	83	55	71	109	52	62
ILC 482	26	29	58	71	64	30	37	69	45	60	86	55	47
ILC 1929	26	32	60	71	59	20	31	63	-	53	102	45	45
Local check	26	43	67	94	64	28	37	66	47	57	72	51	37
Location mean	27	38	61	86	70	35	43	71	52	64	100	56	51

Cont'd. 2.

ENTRY NAME	PERU La Molina	PORTUGAL Elvas	SPAIN Cordoba	SPAIN Sevilla	SYRIA Breda	SYRIA Jinderis	SYRIA Tel-Hadya-winter	SYRIA Tel-Hadya-spring	TUNISIA El-Kef	TURKEY Ankara	TURKEY Samsun	YEMEN D.R. El-Kod	MEAN
FLIP 81-26	66	65	58	48	23	52	39	27	43	29	40	17	49
FLIP 81-29	70	69	43	58	24	52	41	29	47	30	45	23	52
FLIP 81-34W	65	68	66	54	24	55	41	29	47	33	45	22	52
FLIP 81-40W	65	65	54	50	24	56	41	29	45	31	40	24	49
FLIP 81-41W	58	68	54	53	22	51	39	29	40	29	38	26	49
FLIP 81-56W	56	68	51	60	23	53	38	26	41	28	37	21	47
FLIP 81-57W	55	72	60	55	24	55	37	27	44	27	37	23	48
FLIP 81-59W	61	68	49	58	23	48	35	27	33	28	40	23	47
FLIP 81-269	61	77	75	54	25	63	42	28	49	31	48	27	55
FLIP 81-293	64	70	74	54	24	61	47	29	49	33	45	23	53
FLIP 82-5C	77	64	68	54	24	61	46	30	43	31	47	28	54
FLIP 82-13C	58	67	53	56	23	56	39	27	44	27	44	21	49
FLIP 82-40C	63	70	67	55	25	63	46	30	47	31	45	16	53
FLIP 82-43C	67	65	58	55	22	50	44	29	38	28	44	24	50
FLIP 82-64C	72	80	75	56	26	70	48	30	51	36	53	21	60
FLIP 82-65C	72	79	84	55	24	61	51	29	49	38	52	16	58
FLIP 82-72C	75	76	73	56	25	68	47	31	53	35	47	19	57
FLIP 82-73C	78	75	81	55	26	69	52	31	54	39	52	18	59
FLIP 82-79C	74	72	84	51	25	64	53	30	53	36	49	18	57
FLIP 82-91C	68	76	80	59	26	74	51	31	50	39	50	24	58
FLIP 82-93C	72	76	83	55	28	75	48	33	49	35	48	-	61
ILC 482	56	55	53	58	23	47	37	26	43	29	44	-	48
ILC 1929	60	50	-	60	23	45	-	27	31	22	42	-	46
Local check	65	60	-	55	30	78	56	34	49	30	37	-	-
Location mean	66	69	66	55	24	59	42	29	45	31	44	22	

Table 3.3.5. 100-seed weight (g) of entries at different locations in CIYT-W-MR during 1983/84.

ENTRY NAME	BULGARIA	CHILE	EGYPT	GREECE	IRAN		ITALY	LEBANON	MEXICO	PAKISTAN	PERU	SYRIA			TUNISIA	TURKEY		MEAN
	Toshevo	Chillan	Shandweel	Larissa	Karaj	Oroumieh	Capalbio	Terbol	Culiacan	Tarnab	La-Molina	Jinderis	Tel Hadya-winter	Tel Hadya-spring	El-Kef	Ankara	Samsun	
FLIP 81-26	22.8	21.0	20.9	23.6	23.8	29.3	28.3	25.9	25.3	20.1	28.8	16.2	21.4	21.1	24.2	24.1	28.5	23.8
FLIP 81-29	36.7	31.9	34.0	32.5	35.4	39.5	38.2	33.9	36.3	31.3	48.5	26.2	28.0	27.5	34.5	36.2	40.3	34.8
FLIP 81-34W	27.6	21.2	22.3	27.3	25.1	28.3	28.7	25.4	27.8	21.5	39.1	18.1	20.3	22.7	27.8	25.4	30.0	25.8
FLIP 81-40W	33.2	29.0	27.0	29.8	31.1	32.5	31.1	32.3	34.0	27.0	40.9	23.0	29.3	29.3	34.0	34.2	38.4	31.5
FLIP 81-41W	27.5	23.6	26.5	24.9	26.5	29.5	30.6	25.2	27.5	22.8	42.0	20.8	24.5	23.3	28.3	26.2	29.4	27.0
FLIP 81-56W	30.3	23.4	27.7	28.6	26.6	31.3	30.4	27.1	31.0	25.0	39.3	20.2	23.5	23.4	29.0	30.8	33.0	28.3
FLIP 81-57W	33.5	26.2	28.6	29.1	33.1	35.3	33.0	29.7	32.5	27.3	38.3	23.3	28.8	27.2	30.0	31.9	24.7	30.2
FLIP 81-59W	27.2	25.2	25.8	26.4	29.5	28.8	28.7	29.8	30.8	22.8	34.1	20.7	27.2	25.1	29.2	26.3	32.5	27.7
FLIP 81-269	33.4	29.0	34.3	31.3	30.5	34.8	35.6	34.5	43.0	29.0	46.1	24.0	28.6	27.6	34.3	35.3	37.1	33.4
FLIP 81-293	32.9	24.7	27.5	29.0	30.8	37.0	33.7	30.9	33.8	26.3	36.3	23.1	28.4	27.6	26.5	30.0	33.5	30.1
FLIP 82-5C	32.1	27.0	30.0	30.6	29.5	30.0	28.9	30.0	35.3	28.4	41.1	23.2	26.7	25.9	30.5	31.3	34.9	30.3
FLIP 82-13C	32.4	27.4	26.0	30.6	28.3	31.8	32.5	32.2	34.3	25.0	37.3	24.1	28.0	27.1	31.7	30.0	33.7	30.1
FLIP 82-40C	35.8	26.6	28.8	30.1	32.8	38.3	33.0	31.6	38.0	27.5	42.0	23.3	27.8	29.1	28.9	31.1	33.8	31.7
FLIP 82-43C	36.2	30.7	32.3	32.3	32.4	38.0	33.7	34.1	37.8	30.6	42.9	21.9	25.8	27.7	34.8	34.0	38.8	33.2
FLIP 82-64C	43.4	36.0	37.6	39.3	35.8	42.8	41.7	42.1	45.3	35.0	53.6	30.1	32.3	30.5	39.0	38.8	42.0	39.1
FLIP 82-65C	41.2	31.5	33.1	37.3	35.3	41.3	39.2	39.2	47.0	36.8	46.4	29.7	33.4	30.7	36.2	38.8	45.6	37.8
FLIP 82-72C	37.5	33.8	33.0	35.4	36.1	37.0	39.2	37.5	41.3	31.9	49.8	26.9	31.5	31.9	34.7	38.0	41.4	36.3
FLIP 82-73C	39.5	32.9	35.6	35.0	33.8	36.5	38.5	36.9	43.3	34.5	45.0	28.4	33.3	32.0	31.5	36.9	42.8	36.3
FLIP 82-79C	31.9	26.8	30.5	31.3	30.4	32.8	31.5	30.4	35.5	27.1	39.1	23.5	26.8	25.3	30.5	28.4	33.0	30.3
FLIP 82-91C	33.4	25.6	28.6	33.4	29.1	33.3	34.3	30.6	36.8	27.1	38.3	26.5	28.6	27.8	30.2	32.7	41.1	31.6
FLIP 82-93C	31.6	26.3	29.7	31.4	29.9	28.0	34.6	30.0	34.0	26.3	40.1	25.5	27.4	28.3	30.3	32.2	33.0	30.5
ILC 482	31.5	25.9	28.0	29.1	31.6	35.5	31.3	30.4	34.8	25.8	34.8	20.4	28.9	26.3	29.4	30.0	37.3	30.1
ILC 1929	33.8	37.5	34.4	35.1	33.3	34.3	38.4	34.8	41.0	31.6	49.4	29.2	0.0	29.6	34.5	0.0	42.5	31.7
Local check	29.2	47.4	25.5	39.3	29.4	30.3	37.8	42.6	61.3	20.1	65.7	23.0	26.8	26.6	41.8	32.9	45.7	-
Location mean	33.1	28.8	29.5	31.4	30.8	34.0	33.9	32.4	37.0	27.5	42.5	23.8	26.6	27.2	31.7	30.6	36.4	

Table 3.3.6. Correlation (df=21) among three agronomic characters and seed yield of entries in the CIYT-W-MR during 1983/84.

Characters	Time to maturity	Plant height	Seed yield
Time to flowering	0.47*	0.49*	-0.19
Time to maturity		0.26	0.12
Plant height			-0.03

* $\leq$0.05; **$\leq$0.01

Table 3.3.7. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in the CIYT-W-MR during 1983/84.

ENTRY NAME	ALGERIA Setif		BULGARIA Toshevo		CHILE Chillan		EGYPT Shandweel		GREECE Larissa		IRAN Karaj		IRAN Oroumieh		ITALY Capalbio		JORDAN Marow		LEBANON Terbol		MEXICO Culiacan		MOROCCO Annoceur		MOROCCO Douyet		MOROCCO Karia		MOROCCO Sidi Kacem	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
FLIP 81-26	1104	11	5915	2	406	24	391	24	2600	10	1375	14	1514	22	4214	17	633	9	2270	11	4162	18	957	11	964	9	2094	17	786	21
FLIP 81-29	1448	1	2278	18	654	12	557	20	2200	21	1464	9	1757	19	3651	24	550	12	2417	4	5161	8	1061	4	857	18	2219	16	554	24
FLIP 81-34W	1083	13	2026	23	584	17	708	13	2244	19	1591	7	2071	12	3911	19	667	7	2210	13	3644	21	1046	5	1179	2	2656	2	714	22
FLIP 81-40W	1292	3	2276	18	629	13	547	21	2119	23	1411	10	1850	16	4302	16	365	18	2023	20	3478	23	860	14	929	13	2594	3	911	13
FLIP 81-41W	1156	6	2542	8	625	14	688	14	2669	7	1196	19	1971	14	3802	22	338	19	2427	3	3391	24	636	19	857	18	2406	11	804	20
FLIP 81-56W	1115	10	2589	7	779	5	406	23	2606	8	1686	5	2192	7	4802	6	763	3	2044	18	4788	10	1000	9	1000	7	2750	1	1054	4
FLIP 81-57W	1240	4	5958	1	717	8	583	18	2313	18	1391	13	2350	2	4995	2	550	12	2435	2	3845	19	779	17	964	9	2500	8	893	14
FLIP 81-59W	813	24	2286	17	547	21	474	22	2575	11	1243	17	2257	5	4016	18	316	21	2179	14	5272	6	579	21	1036	5	2406	11	964	9
FLIP 81-269	875	23	2323	16	809	4	771	10	3325	1	1121	22	1869	15	4922	4	333	20	2282	10	5530	2	928	12	786	22	2500	8	946	10
FLIP 81-293	1125	9	2448	12	779	5	948	4	2775	4	1500	8	2364	1	4833	5	682	5	2379	7	5401	3	1389	2	1214	1	2531	6	929	11
FLIP 82-5C	1083	13	2375	15	770	7	938	5	2088	24	1279	15	1979	13	4573	11	675	6	1857	23	3613	22	836	15	964	9	2094	17	1000	7
FLIP 82-13C	917	20	2500	10	576	20	604	16	2606	8	969	24	1650	21	4641	8	517	16	2024	19	4681	12	821	16	1071	4	2531	6	821	18
FLIP 82-40C	938	19	2714	6	711	9	802	9	3063	2	1979	1	2257	5	4609	10	468	17	2410	5	5277	5	1214	3	893	15	1906	23	1018	5
FLIP 82-43C	969	18	2380	14	621	15	1057	1	2563	13	1404	11	2279	4	4771	7	688	4	2356	8	5019	9	1393	1	1036	5	1938	22	1089	3
FLIP 82-64C	1021	16	2146	21	578	19	734	12	2125	22	1139	21	1500	24	3693	23	632	10	1780	24	4539	14	1021	7	893	15	2563	4	929	11
FLIP 82-65C	917	20	2047	22	531	22	922	6	2431	16	1393	12	2164	8	3901	20	539	14	2405	6	4377	15	554	22	893	15	2000	20	857	17
FLIP 82-72C	1021	16	2271	20	830	3	849	8	2538	14	1036	23	1843	17	4505	12	664	8	2054	16	4574	13	496	23	1107	3	2438	10	875	16
FLIP 82-73C	1042	15	3042	3	680	11	1031	3	2694	6	1736	2	2086	11	4432	15	278	22	2214	12	4762	11	1036	6	786	22	1969	21	982	8
FLIP 82-79C	1094	12	2510	9	475	23	1057	1	2456	15	1154	20	2107	10	4620	9	885	1	1899	22	4274	16	1014	8	964	9	1875	24	1107	1
FLIP 82-91C	1156	6	2464	11	596	16	865	7	2575	11	1211	18	1657	20	4505	12	578	11	2161	15	4252	17	896	13	1000	7	2344	13	1018	5
FLIP 82-93C	1198	5	2979	4	686	10	599	17	2713	5	1719	4	1843	17	4484	14	529	15	2446	1	3646	20	779	17	857	18	2563	4	893	14
ILC 482	1417	2	2969	5	844	2	667	15	2981	3	1725	3	2314	3	5568	1	774	2	2339	9	5196	7	993	10	929	13	2250	15	1107	1
ILC 1929	906	22	1990	24	1035	1	578	19	2231	20	1264	16	2121	9	3896	21	-	-	1994	21	5285	4	346	24	750	24	2063	19	661	23
Local check	1146	8	2411	13	580	18	755	11	2381	17	1676	6	1507	23	4927	3	140	23	2054	16	6189	1	607	20	821	21	2313	14	821	18
Location mean	1086		2726		668		730		2536		1403		1979		4441		546		2194		4598		885		948		2313		906	
C.V.%	15.4		73.9		34.4		21.8		11.1		30.8		18.6		5.7		65.4		14.5		11.5		27.4		21.5		23.7		22.5	
L.S.D. at 5%	236		NS		NS		224		400		NS		520		357		NS		NS		747		342		NS		NS		287	
S.E.	83.7		1008.6		114.8		79.6		141.7		215.6		184.4		126.7		171.2		158.9		264.9		121.1		101.8		273.7		101.7	
No. of entries significantly exceeding the local check.	2		-		-		3		3		-		12		1		-		-		0		11		-		-		0	

Cont'd. 2....

Table 3.3.7. Cont'd 2.

ENTRY NAME	MOROCCO				PAKISTAN								PERU		PORTUGAL		SPAIN						SYRIA							
	Sidi Laidi		Zemamra		Chakwal		Faisalabad		Islamabad		Tarnab		La Molina		Elvas		Cordoba		Jaen		Sevilla		Al-Ghab		Gelline		Hama		Heimo	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
FLIP 81-26	117	7	540	4	1483	15	1101	12	1637	15	578	11	1701	2	-	-	4571	6	1608	14	3085	15	2589	7	1101	18	2006	3	571	5
FLIP 81-29	98	11	473	7	2066	6	882	19	1597	16	682	1	701	21	-	-	2077	22	1205	21	2333	21	2125	20	1437	4	2238	2	586	4
FLIP 81-34W	103	9	430	9	1396	19	615	23	1315	19	417	19	1572	3	-	-	4506	9	1987	8	2788	18	2506	9	1264	14	1714	9	487	16
FLIP 81-40W	98	11	493	5	1646	11	637	22	2560	2	479	14	1889	1	-	-	3542	17	1771	11	4080	2	2304	15	1077	19	1780	7	614	2
FLIP 81-41W	67	22	151	24	1257	22	673	21	1772	11	297	24	855	16	-	-	4470	10	1585	15	3688	8	2911	3	1204	15	1613	17	601	3
FLIP 81-56W	78	19	371	12	1729	9	1168	9	1215	20	667	4	1443	4	-	-	3810	16	2303	2	3770	5	2429	10	1520	2	1702	12	517	14
FLIP 81-57W	73	20	311	16	1441	17	1153	10	4306	1	385	21	1242	6	-	-	5577	1	1922	9	3703	7	2536	8	1304	13	1655	15	473	17
FLIP 81-59W	80	18	336	15	1611	12	945	16	1744	12	682	1	1159	7	2031	16	3476	18	1538	17	2008	22	2351	11	1310	12	1619	16	490	15
FLIP 81-269	123	5	656	1	2382	4	1503	5	1446	17	672	3	877	15	1042	17	4396	11	1563	16	3523	10	2339	12	1545	1	1298	22	560	8
FLIP 81-293	131	4	485	6	2542	3	1989	1	2493	3	604	9	794	18	2292	13	5530	2	2261	3	4125	1	2708	5	1500	3	1869	4	570	7
FLIP 82-5C	97	14	248	20	1472	16	1242	8	1814	10	474	15	1127	10	2943	10	2982	20	1495	18	3578	9	2321	13	982	22	1542	18	244	23
FLIP 82-13C	96	15	222	21	1031	24	496	24	1695	13	453	17	669	22	3255	8	3951	15	1703	12	2865	17	2315	14	1333	10	1714	9	423	21
FLIP 82-40C	118	6	433	8	2021	7	1638	2	2474	4	641	6	712	20	2083	15	4357	12	2432	1	4043	3	2298	16	1423	5	1714	9	571	5
FLIP 82-43C	161	1	429	10	2333	5	1244	7	1440	18	510	13	1101	12	2526	12	5024	3	1068	22	3758	6	2155	18	1405	8	1679	13	526	12
FLIP 82-64C	86	16	354	14	1528	14	798	20	987	24	438	18	953	14	2109	14	2512	21	1613	13	2695	20	1887	23	871	24	1482	19	530	11
FLIP 82-65C	70	21	302	17	1667	10	997	13	1197	21	401	20	667	23	3177	9	4554	7	1482	19	3308	12	3012	2	1321	11	1125	23	523	13
FLIP 82-72C	52	24	277	18	1420	18	992	14	1677	14	615	8	1119	11	2896	11	3357	19	1866	10	2753	19	2726	4	1020	21	1399	20	445	19
FLIP 82-73C	98	11	370	13	1976	8	1448	6	1140	22	620	7	990	13	3672	4	4137	14	2247	4	2923	16	2613	6	1381	9	1744	8	202	24
FLIP 82-79C	151	2	256	19	1333	21	979	15	2155	7	333	23	575	24	3490	5	4690	5	2013	7	3508	11	2292	17	1179	16	1667	14	336	22
FLIP 82-91C	66	23	218	22	1542	13	884	17	2348	6	370	22	747	19	3359	7	4536	8	1464	20	3113	14	1929	21	1027	20	1821	5	432	20
FLIP 82-93C	83	17	181	23	1344	20	1153	10	1869	9	583	10	1133	8	3802	3	4849	4	2146	5	3285	13	1929	21	1413	6	1393	21	471	18
ILC 482	107	8	551	2	2767	1	1583	3	2466	5	646	5	1131	9	4245	1	4280	13	2042	6	3820	4	3470	1	1407	7	2452	1	718	1
ILC 1929	102	10	545	3	1135	23	884	17	1073	23	516	12	811	17	3385	6	390	23	326	23	1714	23	2149	19	1145	17	970	24	533	10
Local check	135	3	424	11	2635	2	1517	4	2008	8	469	16	1395	5	4218	2	0	24	157	24	261	24	1214	24	957	23	1818	6	551	9
Location mean	99		377		1740		1105		1851		522		1057		2972		3816		1658		3113		2379		1255		1667		498	
C.V.%	36.5		38.1		20.8		31.1		27.6		28.5		48.4		-		27.0		21.1		14.4		31.3		34.4		17.3		29.1	
L.S.D. at 5%	51		203		510		484		721		210		721		-		1542		493		630		NS		NS		407		205	
S.E.	18.1		71.9		181.0		171.7		255.7		74.5		255.6		-		514.9		174.8		223.5		371.8		215.8		144.3		72.6	
No. of entries significantly exceeding the local check.	0		1		0		0		1		2		0		-		22		22		23		-		-		2		0	

Cont'd 3...

Table 3.3.7. Cont'd 3.

ENTRY NAME	SYRIA												TUNISIA										TURKEY				YEMEN D.R.(2)		100-seed weight	Ascochyta Blight(4) Rating, 1-9 scale		MEAN	
	Homs		Izra'a		Jableh		Jinderis		Tel Hadya-winter		Tel Hadya-spring (1)		Beja		El-Kef-1		El-Kef-2		Mateur		Menzel Temime		Ankara		Samsun		El-Kod		(g)	Veg.	Pod		
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R				Y	R
FLIP 81-26	2464	7	1118	18	5420	6	2321	3	1313	2	242	6	729	24	1675	9	1188	14	1323	18	792	23	1365	11	1600	13	66	15	21.4	3.0	3.5	1749	10
FLIP 81-29	2458	8	1104	19	2979	23	2200	7	868	19	250	5	2292	12	1738	7	1420	5	1719	7	1604	9	1440	4	1764	7	25	18	28.0	5.0	5.5	1594	20
FLIP 81-34W	1714	24	1201	16	4510	15	2013	15	1319	1	295	3	3396	3	1525	16	1326	8	1563	10	1323	17	1325	16	1410	18	83	13	20.3	3.0	2.5	1670	16
FLIP 81-40W	2214	15	1313	8	4931	11	2146	8	1239	4	144	19	2146	14	1381	23	1459	4	2135	3	1406	14	1427	5	1639	12	158	12	29.3	4.5	3.8	1718	12
FLIP 81-41W	2417	10	1285	11	5865	3	1833	18	1125	10	109	20	1750	19	1381	23	1014	19	1260	20	1385	16	1451	3	1454	17	50	17	24.5	3.3	3.0	1641	18
FLIP 81-56W	2381	12	1132	17	5361	8	2135	11	1065	13	225	7	917	23	1744	5	1483	3	2042	4	1406	14	1046	22	1583	14	16	20	23.5	5.0	5.3	1776	7
FLIP 81-57W	2929	2	1326	6	5052	10	2249	5	1168	7	213	9	2146	14	1950	2	1378	7	1729	6	1271	19	1365	11	1708	8	66	15	28.5	5.5	4.0	1951	3
FLIP 81-59W	1976	20	1410	4	3924	19	1471	23	561	22	169	13	1021	21	1606	13	886	22	1594	9	1552	11	942	23	1708	8	191	11	27.2	5.8	4.7	1562	21
FLIP 81-269	1798	23	1222	15	4417	17	2138	9	438	23	352	1	3000	6	1663	10	1165	15	1448	14	1656	8	1338	14	1840	4	292	7	28.6	6.8	8.0	1760	9
FLIP 81-293	2518	5	1271	12	6455	2	2318	4	893	17	168	14	2625	8	1975	1	1405	6	2188	2	1448	12	1385	8	2014	2	17	19	28.4	3.5	4.8	2040	2
FLIP 82-5C	1929	21	1549	2	5448	5	1992	16	1085	12	158	16	1000	22	1638	11	1308	9	1833	5	1219	20	1329	15	2167	1	292	7	26.7	4.3	4.0	1662	17
FLIP 82-13C	2006	19	1229	14	5295	9	2406	2	974	15	170	12	1854	17	1406	22	1123	16	1208	21	1948	2	1301	17	1833	5	425	5	28.0	4.5	4.2	1678	15
FLIP 82-40C	2446	9	1660	1	5639	4	1887	17	710	21	145	18	2521	10	1413	21	1200	12	1698	8	1875	3	1389	7	1882	3	633	2	27.8	5.7	6.0	1911	4
FLIP 82-43C	2726	3	1298	10	6531	1	2106	13	1235	5	189	11	3667	1	1500	17	1299	10	1542	12	1688	6	1371	9	1681	11	292	7	25.8	3.3	4.5	1904	5
FLIP 82-64C	2298	13	1021	20	4767	12	2246	6	1048	14	160	15	3042	4	1444	18	1240	11	938	24	1573	10	1271	19	1333	19	325	6	23.3	4.3	3.5	1551	22
FLIP 82-65C	2470	6	1000	22	3406	22	1833	18	712	20	104	21	1833	18	1431	19	1485	2	1104	22	1854	4	1358	13	1535	16	192	10	33.4	5.5	4.8	1627	19
FLIP 82-72C	2286	14	1014	21	4712	13	2104	14	920	16	94	22	2479	11	1538	15	924	21	1271	19	1844	5	1405	6	1583	14	608	3	31.5	6.0	5.3	1684	13
FLIP 82-73C	2071	17	1319	7	3660	21	2112	12	1158	8	93	23	3021	5	1619	12	945	20	1333	16	2271	1	1258	20	1708	8	542	4	33.3	4.3	4.8	1799	6
FLIP 82-79C	2012	18	1264	13	4535	14	1719	20	1281	3	150	17	1896	16	1431	19	1115	17	1333	16	1688	6	1296	18	1257	21	908	1	26.8	3.3	3.5	1725	11
FLIP 82-91C	1917	22	1354	5	4083	18	1661	21	1210	6	196	10	2750	7	1694	8	1113	18	1563	10	1292	18	1369	10	1097	22	83	13	28.6	3.3	7.0	1682	14
FLIP 82-93C	2196	16	1313	8	3816	20	2137	10	1118	11	224	8	2271	13	1606	13	1196	13	1458	13	1083	21	1481	2	1278	20	-	-	27.4	3.5	3.0	1774	8
ILC 482	3054	1	1424	3	4479	16	2820	1	1127	9	319	2	2583	9	1944	3	1543	1	2208	1	1417	13	1488	1	1778	6	-	-	28.9	5.0	5.8	2134	1
ILC 1929	2417	10	785	24	1008	24	340	24	0	24	254	4	1083	20	1888	4	833	23	1375	15	1000	22	0	24	1024	23	-	-	-	9.0	-	1283	23
Local check	2524	4	861	23	5410	7	1576	22	893	17	92	24	3521	2	1744	5	688	24	1000	23	552	24	1244	21	854	24	-	-	26.8	2.8	2.5	-	-
Location mean	2301		1228		4654		1990		977		188		2231		1622		1197		1536		1464		1277		1572								
C.V.%	23.6		20.7		26.2		18.9		26.2		45.7		79.40		13.00		20.8		19.6		23.9		4.2		20.4								
L.S.D. at 5%	NS		359		1720		531		361		121		NS		297		352		425		493		76		452								
S.E.	271.0		127.3		609.7		188.5		128.0		43.0		1022.6		105.4		124.7		150.9		174.9		26.8		160.3								
No. of entries significantly exceeding the local check.	-		15		0		12		3		8		-		0		18		14		21		16		19								

(1) Syria, Tel Hadya-spring is not included in the average over locations.
(2) Based on one replication only.
(3) & (4) Based on Tel Hadya, Syria only.

Table 3.3.8. The five heaviest seed yielding entries at the individual locations in CIYT-W-MR during 1983/84.

RANK	ALGERIA	BULGARIA	CHILE	EGYPT	GREECE	IRAN		ITALY	JORDAN	LEBANON	MEXICO
	Setif	Toshevo	Chillan	Shandweel	Larissa	Karaj	Oroumieh	Capalbio	Marow	Terbol	Culiacan
1	FLIP 81-29	FLIP 81-57W	ILC 1929	FLIP 82-43C[1]	FLIP 81-269	FLIP 82-40C	FLIP 81-293	ILC 482	FLIP 82-79C	FLIP 82-93C	Local check
2	ILC 482	FLIP 81-26	ILC 482	FLIP 82-79C	FLIP 82-40C	FLIP 82-73C	FLIP 81-57W	FLIP 81-57W	ILC 482	FLIP 81-57W	FLIP 81-269
3	FLIP 81-40W	FLIP 82-73C	FLIP 82-72C	FLIP 82-73C	ILC 482	ILC 482	ILC 482	Local check	FLIP 81-56W	FLIP 81-41W	FLIP 81-293
4	FLIP 81-57W	FLIP 82-93C	FLIP 81-269	FLIP 81-293	FLIP 81-293	FLIP 82-93C	FLIP 82-43C	FLIP 81-269	FLIP 82-43C	FLIP 81-29	ILC 1929
5	FLIP 82-93C	ILC 482	FLIP 81-56W FLIP 81-293	FLIP 82-5C	FLIP 82-93C	FLIP 81-56W	FLIP 81-59W FLIP 82-40C	FLIP 81-293	FLIP 81-293	FLIP 82-40C	FLIP 82-40C

Cont'd. ...

RANK	MOROCCO						PAKISTAN				PERU
	Annoceur	Douyet	Karia	Sidi Kacem	Sidi Laidi	Zemamra	Chakwal	Faisalabad	Islamabad	Tarnab	La Molina
1	FLIP 82-43C	FLIP 81-293	FLIP 81-56W	FLIP 82-79C	FLIP 82-43C	FLIP 81-269	ILC 482	FLIP 81-293	FLIP 81-57W	FLIP 81-29	FLIP 81-40W
2	FLIP 81-293	FLIP 81-34W	FLIP 81-34W	ILC 482	FLIP 82-79C	ILC 482	Local check	FLIP 82-40C	FLIP 81-40W	FLIP 81-59W	FLIP 81-26
3	FLIP 82-40C	FLIP 82-72C	FLIP 81-40W	FLIP 82-43C	Local check	ILC 1929	FLIP 81-293	ILC 482	FLIP 81-293	FLIP 81-269	FLIP 81-34W
4	FLIP 81-29	FLIP 82-13C	FLIP 82-64C	FLIP 81-56W	FLIP 81-293	FLIP 81-26	FLIP 81-269	Local check	FLIP 82-40C	FLIP 81-56W	FLIP 81-56W
5	FLIP 81-34W	FLIP 81-59W FLIP 82-43C	FLIP 82-93C	FLIP 82-40C FLIP 82-91C	FLIP 81-269	FLIP 81-40W	FLIP 82-43C	FLIP 81-269	ILC 482	ILC 482	Local check

Cont'd ...

RANK	PORTUGAL	SPAIN			SYRIA						
	Elvas	Cordoba	Jaen	Sevilla	Al-Ghab	Gelline	Hama	Heimo	Homs	Izra'a	Jableh
1	ILC 482	FLIP 81-57W	FLIP 82-40C	FLIP 81-293	ILC 482	FLIP 81-269	ILC 482	ILC 482	ILC 482	FLIP 82-40C	FLIP 82-43C
2	Local check	FLIP 81-293	FLIP 81-56W	FLIP 81-40W	FLIP 82-65C	FLIP 81-56W	FLIP 81-29	FLIP 81-40W	FLIP 81-57W	FLIP 82-5C	FLIP 81-293
3	FLIP 82-93C	FLIP 82-43C	FLIP 81-293	FLIP 82-40C	FLIP 81-41W	FLIP 81-293	FLIP 81-26	FLIP 81-41W	FLIP 82-43C	ILC 482	FLIP 81-41W
4	FLIP 82-73C	FLIP 82-93C	FLIP 82-73C	ILC 482	FLIP 82-72C	FLIP 81-29	FLIP 81-293	FLIP 81-29	Local check	FLIP 81-59W	FLIP 82-40C
5	FLIP 82-79C	FLIP 82-79C	FLIP 82-93C	FLIP 81-56W	FLIP 81-293	FLIP 82-40C	FLIP 82-91C	FLIP 81-26 FLIP 82-40C	FLIP 81-293	FLIP 82-91C	FLIP 82-5C

Cont'd .

RANK	SYRIA			TUNISIA					TURKEY		YEMEN D.R.
	Jinderis	Tel Hadya-winter	Tel Hadya-spring	Beja	El-Kef-1	El-Kef-2	Mateur	Menzel-Temime	Ankara	Samsun	El-Kod
1	ILC 482	FLIP 81-34W	FLIP 81-269	FLIP 82-43C	FLIP 81-293	ILC 482	ILC 482	FLIP 82-73C	ILC 482	FLIP 82-5C	FLIP 82-79C
2	FLIP 82-13C	FLIP 81-26	ILC 482	Local check	FLIP 81-57W	FLIP 82-65C	FLIP 81-293	FLIP 82-13C	FLIP 82-93C	FLIP 81-293	FLIP 82-40C
3	FLIP 81-26	FLIP 82-79C	FLIP 81-34W	FLIP 81-34W	ILC 482	FLIP 81-56W	FLIP 81-40W	FLIP 82-40C	FLIP 81-41W	FLIP 82-40C	FLIP 82-72C
4	FLIP 81-293	FLIP 81-40W	ILC 1929	FLIP 82-64C	ILC 1929	FLIP 81-40W	FLIP 81-56W	FLIP 82-65C	FLIP 81-29	FLIP 81-269	FLIP 82-73C
5	FLIP 81-57W	FLIP 82-43C	FLIP 81-29	FLIP 82-73C	FLIP 81-56W	FLIP 81-29	FLIP 82-5C	FLIP 82-72C	FLIP 81-40W	FLIP 82-13C	FLIP 82-13C

1) The brackets indicate entries having the same rank.

Table 3.3.9. Correlation (df=20) among different locations for the seed yield of entries in the CIYT-W-MR during 1983-84.

COUNTRY	LOCATION	BULGARIA TOSHEVO	CHILE CHILLAN	EGYPT SHANDWEEL	GREECE LARISSA	IRAN KARAJ	ITALY OROUMIEH	ITALY CAPALBIO	JORDAN MAROW	LEBANON TERBOL	MEXICO CULIACAN	MOROCCO ANNOCEUR
ALGERIA	SETIF	0.22	0.21	-0.25	-0.27	0.30	-0.04	0.11	0.26	0.20	-0.27	0.14
BULGARIA	TOSHEVO		-0.17	-0.37	0.03	0.12	-0.02	0.25	0.03	0.29	-0.20	-0.03
CHILE	CHILLAN			0.10	0.36	0.26	0.37	0.58	0.03	0.13	0.29	0.08
EGYPT	SHANDWEEL				0.07	-0.07	0.26	0.15	0.17	-0.09	0.12	0.29
GREECE	LARISSA					0.24	0.25	0.53	-0.21	0.45	0.57	0.17
IRAN	KARAJ						0.48	0.21	0.01	0.47	0.12	0.44
IRAN	ORUMIEH							0.45	0.11	0.39	0.27	0.22
ITALY	CAPALBIO								0.31	0.09	0.31	0.27
JORDAN	MAROW									0.28	-0.01	0.32
LEBANON	TERBOL										0.17	0.10
MEXICO	CULIACAN											0.40

Table 3.3.9. cont'd.

COUNTRY	LOCATION	MOROCCO DOUYET	MOROCCO KARIA	MOROCCO S.KACEM	MOROCCO S.LAIDI	PAKISTAN ZEMAMRA	PAKISTAN CHAKWAL	PAKISTAN FAISALABAD	PAKISTAN ISLAMABAD	PAKISTAN TARNAB	PERU LA MOLINA	PORTUGAL ELVAS
ALGERIA	SETIF	-0.12	0.14	-0.22	-0.08	0.11	0.17	-0.01	0.40	0.02	0.22	0.63
BULGARIA	TOSHEVO	-0.09	-0.08	-0.08	-0.01	0.11	-0.12	0.15	0.53	-0.04	0.35	0.45
CHILE	CHILLAN	-0.01	0.28	0.24	-0.14	0.20	0.50	0.55	0.21	0.46	-0.02	0.03
EGYPT	SHANDWEEL	0.04	-0.56	0.40	0.37	-0.15	0.23	0.33	-0.10	-0.28	-0.53	0.03
GREECE	LARISSA	-0.21	-0.10	0.34	0.24	0.33	0.50	0.60	0.01	0.45	-0.29	-0.26
IRAN	KARAJ	-0.17	-0.16	0.14	0.16	0.28	0.43	0.51	0.11	0.41	0.20	0.24
IRAN	ORUMIEH	0.21	-0.19	0.43	0.24	0.11	0.46	0.54	0.36	0.14	-0.06	0.03
ITALY	CAPALBIO	0.12	-0.03	0.65	0.31	0.25	0.47	0.61	0.48	0.25	0.01	0.16
JORDAN	MAROW	0.48	-0.09	0.26	0.30	-0.02	0.05	0.11	0.05	-0.14	-0.01	0.18
LEBANON	TERBOL	-0.16	-0.13	-0.27	0.03	0.19	0.39	0.36	0.28	0.20	-0.12	-0.01
MEXICO	CULIACAN	0.02	-0.18	0.22	0.35	0.53	0.71	0.57	-0.16	0.69	-0.41	-0.47
MOROCCO	ANNOCEUR	0.16	-0.21	0.23	0.78	0.49	0.59	0.50	0.01	0.21	-0.06	-0.22
MOROCCO	DOUYET		0.30	-0.02	0.08	-0.06	-0.09	0.06	0.12	-0.09	0.18	-0.10
MOROCCO	KARIA			-0.27	-0.44	-0.01	-0.20	-0.29	0.06	0.05	0.39	-0.25
MOROCCO	SIDI KACEM				0.30	-0.02	0.30	0.46	0.15	0.03	-0.08	0.01
MOROCCO	SIDI LAIDI					0.50	0.48	0.40	-0.03	0.12	-0.08	-0.19
MOROCCO	ZEMAMRA						0.73	0.45	-0.03	0.57	0.31	-0.40
PAKISTAN	CHAKWAL							0.76	0.04	0.58	-0.10	-0.24
PAKISTAN	FAISALABAD								0.21	0.54	-0.18	-0.20
PAKISTAN	ISLAMABAD									-0.19	0.06	0.13
PAKISTAN	TARNAB										0.13	-0.31
PERU	LA MOLINA											0.03

cont'd..2/...

Table 3.3.9. cont'd 2.

		SPAIN			SYRIA							
COUNTRY	LOCATION	CORDOBA	JAEN	SEVILLA	ALGHAB	GELLINE	HAMA	HEIMO	HOMS	IZRAA	JABLEH	JINDERIS
ALGERIA	SETIF	-0.10	0.07	0.21	0.16	-0.02	0.68	0.31	0.44	0.01	-0.15	0.47
BULGARIA	TOSHEVO	0.40	0.12	0.13	0.14	-0.02	0.23	0.04	0.44	0.04	0.15	0.30
CHILE	CHILLAN	-0.03	0.34	0.37	0.26	0.34	0.05	0.10	0.23	0.24	0.14	0.40
EGYPT	SHANDWEEL	0.23	-0.03	0.22	0.02	-0.07	-0.27	-0.47	-0.12	0.14	0.11	-0.22
GREECE	LARISSA	0.43	0.34	0.29	0.28	0.61	0.02	0.27	0.09	0.27	0.12	0.14
IRAN	KARAJ	0.21	0.58	0.35	0.17	0.50	0.33	0.17	0.34	0.40	-0.04	0.19
IRAN	ORUMIEH	0.48	0.37	0.44	0.46	0.56	0.06	0.06	0.40	0.42	0.22	-0.07
ITALY	CAPALBIO	0.48	0.39	0.58	0.29	0.38	0.24	0.03	0.34	0.42	0.33	0.46
JORDAN	MAROW	0.09	0.11	0.19	0.07	-0.13	0.25	0.01	0.26	-0.18	0.25	0.27
LEBANON	TERBOL	0.51	0.04	0.20	0.32	0.64	0.16	0.45	0.48	0.13	-0.05	0.10
MEXICO	CULIACAN	-0.07	0.04	-0.10	0.08	0.56	0.22	0.23	0.17	0.02	-0.02	0.17
MOROCCO	ANNOCEUR	0.21	0.17	0.38	-0.21	0.35	0.44	0.12	0.19	0.23	0.43	0.31
MOROCCO	DOUYET	0.22	0.10	-0.03	0.07	-0.09	0.11	0.01	-0.05	-0.08	0.43	0.02
MOROCCO	KARIA	-0.08	0.17	-0.08	-0.12	0.02	-0.09	0.28	-0.16	-0.28	0.04	0.22
MOROCCO	SIDI KACEM	0.30	0.28	0.48	0.04	0.03	-0.07	-0.18	0.11	0.46	0.31	-0.08
MOROCCO	SIDI LAIDI	0.29	-0.01	0.35	-0.11	0.32	0.26	0.05	0.06	0.25	0.39	0.17
MOROCCO	ZEMAMRA	-0.01	0.02	0.18	0.20	0.37	0.39	0.50	0.19	-0.03	0.06	0.45
PAKISTAN	CHAKWAL	0.13	0.07	0.35	0.31	0.55	0.41	0.42	0.43	0.20	0.10	0.40
PAKISTAN	FAISALABAD	0.38	0.43	0.48	0.27	0.51	0.15	0.07	0.36	0.38	0.24	0.27
PAKISTAN	ISLAMABAD	0.45	0.24	0.44	0.11	0.03	0.26	0.15	0.43	0.46	0.21	0.13
PAKISTAN	TARNAB	-0.26	0.22	-0.14	0.05	0.52	0.26	0.21	0.11	0.08	-0.15	0.29
PERU	LA MOLINA	-0.02	0.09	0.09	0.06	-0.19	0.15	0.18	0.04	-0.05	0.16	0.23
PORTUGAL	ELVAS(1)	-0.03	0.06	-0.07	0.28	-0.14	0.28	-0.22	0.28	-0.06	-0.34	0.02
SPAIN	CORDOBA		0.32	0.54	0.26	0.37	-0.09	0.06	0.25	0.20	0.37	0.02
SPAIN	JAEN			0.36	0.23	0.29	0.07	-0.08	0.05	0.26	0.11	0.19
SPAIN	SEVILLA				0.26	0.23	0.05	0.25	0.40	0.38	0.61	0.25
SYRIA	AL GHAB					0.21	0.23	0.30	0.46	-0.04	0.07	0.34
SYRIA	GELLINE						0.15	0.25	0.23	0.14	-0.01	0.20
SYRIA	HAMA							0.35	0.40	0.23	0.05	0.48
SYRIA	HEIMO								0.53	-0.13	0.16	0.36
SYRIA	HOMS									-0.01	0.27	0.52
SYRIA	IZRA'A										0.25	-0.15
SYRIA	JABLEH											0.19

cont'd..3/...

Table 3.3.9. cont'd 3.

COUNTRY	LOCATION	TEL-HADIA WINTER	TEL-HADIA SPRING	TUNISIA BEJA	TUNISIA EL-KEF1	TUNISIA EL-KEF2	TUNISIA MATEUR	TUNISIA M.TEMIME	TURKEY ANKARA	TURKEY SAMSUN	YEMEN D.R.(2) EL KOD
ALGERIA	SETIF	0.49	0.28	0.02	0.45	0.52	0.51	-0.41	0.53	-0.09	-0.39
BULGARIA	TOSHEVO	0.32	0.17	-0.31	0.43	0.04	0.02	-0.46	0.11	0.04	-0.20
CHILE	CHILLAN	-0.29	0.20	0.22	0.48	0.21	0.53	0.13	0.18	0.48	-0.03
EGYPT	SHANDWEEL	0.03	-0.38	0.52	-0.16	-0.15	-0.19	0.50	0.22	0.03	0.54
GREECE	LARISSA	-0.46	0.31	0.16	0.20	-0.20	0.08	0.20	0.07	0.18	0.20
IRAN	KARAJ	0.10	0.16	0.13	0.27	0.39	0.49	-0.04	0.11	0.14	-0.10
IRAN	ORUMIEH	-0.15	-0.03	0.08	0.34	0.26	0.51	0.20	-0.17	0.35	0.03
ITALY	CAPALBIO	0.04	0.33	0.10	0.53	0.23	-0.53	-0.01	0.12	0.34	0.23
JORDAN	MAROW	0.43	0.19	-0.03	0.25	0.42	0.19	-0.27	0.09	-0.13	0.14
LEBANON	TERBOL	-0.20	0.22	0.18	0.32	0.17	0.16	-0.08	0.39	0.10	-0.39
MEXICO	CULIACAN	-0.63	0.23	0.22	0.31	-0.01	0.15	0.47	-0.27	0.40	0.17
MOROCCO	ANNOCEUR	0.21	0.27	0.46	0.24	0.35	0.37	0.04	0.12	0.22	0.01
MOROCCO	DOUYET	0.19	-0.02	0.02	0.17	0.06	0.25	-0.15	-0.18	0.08	-0.15
MOROCCO	KARIA	-0.03	0.30	-0.01	0.20	0.13	0.20	-0.32	-0.16	-0.13	-0.52
MOROCCO	SIDI KACEM	0.06	-0.10	0.06	0.08	-0.03	0.24	0.14	-0.24	0.01	0.45
MOROCCO	SIDI LAIDI	0.12	0.27	0.28	0.01	0.18	0.19	0.07	0.10	0.26	0.30
MOROCCO	ZEMAMRA	-0.23	0.59	0.24	0.35	0.40	0.41	-0.04	0.06	0.40	-0.20
PAKISTAN	CHAKWAL	-0.30	0.39	0.41	0.51	0.40	0.53	0.17	0.16	0.45	-0.13
PAKISTAN	FAISALABAD	-0.29	0.16	0.16	0.59	0.18	0.45	0.08	0.09	0.50	0.10
PAKISTAN	ISLAMABAD	0.15	0.06	-0.05	0.44	0.21	0.47	-0.28	0.29	0.14	-0.09
PAKISTAN	TARNAB	-0.50	0.32	-0.05	0.39	0.02	0.37	0.13	-0.22	0.47	-0.02
PERU	LA MOLINA	0.42	0.24	-0.20	0.09	0.22	0.35	-0.53	-0.10	0.01	-0.39
PORTUGAL	ELVAS	0.39	-0.11	-0.18	0.18	0.07	0.07	-0.14	-0.02	-0.35	0.64
SPAIN	CORDOBA	0.20	0.10	0.18	0.25	0.06	0.11	-0.16	0.20	-0.10	-0.05
SPAIN	JAEN	0.07	-0.06	-0.01	0.20	0.04	0.31	0.10	-0.06	0.04	0.28
SPAIN	SEVILLA	0.18	0.01	0.06	0.14	0.49	0.52	-0.15	0.39	0.24	-0.01
SYRIA	AL GHAB	-0.04	-0.01	-0.13	0.27	0.21	0.21	0.09	0.18	0.28	-0.11
SYRIA	GELLINE	-0.40	0.39	0.14	0.36	0.25	0.36	0.24	-0.07	0.34	-0.14
SYRIA	HAMA	0.35	0.37	-0.01	0.48	0.31	0.55	-0.22	0.20	0.17	-0.29
SYRIA	HEIMO	-0.18	0.42	0.08	0.15	0.46	0.31	-0.30	0.30	0.01	-0.50
SYRIA	HOMS	0.13	0.02	0.02	0.42	0.48	0.31	-0.11	0.34	0.19	-0.24
SYRIA	IZRAA	-0.02	0.02	-0.03	0.10	-0.07	0.47	-0.05	0.03	0.37	0.18
SYRIA	JABLEH	0.22	-0.11	-0.02	0.01	0.09	0.24	-0.19	0.07	0.34	-0.06
SYRIA	JINDERIS	0.21	0.42	0.18	0.45	0.50	0.30	-0.11	0.42	0.35	-0.18
SYRIA	TH-WINTER		-0.04	0.06	-0.01	0.15	0.07	-0.39	0.27	-0.41	-0.06
SYRIA	TH-SPRING			0.16	0.49	0.39	0.33	-0.44	0.09	0.06	-0.40
TUNISIA	BEJA				-0.03	0.03	-0.09	0.38	0.39	-0.16	0.17
TUNISIA	EL-KEF1					0.36	0.59	-0.35	0.03	0.31	0.48
TUNISIA	EL-KEF2						0.57	-0.29	0.28	0.21	0.48
TUNISIA	MATEUR							-0.29	0.05	0.45	-0.39
TUNISIA	MENZEL TEMIME								-0.16	0.18	0.62
TURKEY	ANKARA									-0.03	-0.01
TURKEY	SAMSUN										-0.05

(1) df=14 for Portugal, Elvas.
(2) df=18 for Yemen, El-Kod.

The underlind figures indicate significant ($p<0.05$) correlation values.

Table 3.3.10. The mean yield (Y=kg/ha) and rank (R) of the common entries in the CIYT-W during 1982/83 and 1983/84.

ENTRY	1982/83		1983/84		MEAN	
	Y	R	Y	R	Y	R
FLIP 81-26	1582	5	1749	4	1666	5
FLIP 81-34	1554	6	1670	5	1612	6
FLIP 81-41	1756	1	1641	6	1699	4
FLIP 81-56	1752	2	1776	3	1764	3
FLIP 81-57	1687	4	1951	2	1819	2
FLIP 81-59	1541	7	1562	7	1552	7
ILC 482	1743	3	2134	1	1939	1

(58 cm), and FLIP 82-91C (58 cm) etc. Among the locations, the entries were tallest at Culiacan in Mexico (100 cm), and Shandweel in Egypt (86 cm), and shortest at El-Kod in Yemen (22 cm), Breda in Syria (24 cm), Setif in Algeria (27 cm), Tel Hadya-spring in Syria (29 cm), Ankara in Turkey (31 cm), Karaj in Iran (35 cm) and Toshevo in Bulgaria (38 cm).

The 100-seed weight of entries is given in Table 3.3.5. It is apparent that there were wide differences in 100-seed weight at different locations. The smallest seed size was recorded at Jinderis in Syria (23.8 g/100 seeds) and the largest at La-Molina in Peru (42.5 g/100 seeds). Among the entries FLIP 82-64C was with largest seed size (39.1 g) and was followed by FLIP 82-65C (37.89), FLIP 82-72C (36.39) and FLIP 82-73C etc.

The correlations among different agronomic characters (Table 3.3.6) revealed that plant height and time to maturity had positive and significant association with time to flowering. All other character associations were not significant.

The mean yields at different locations (Table 3.3.7) revealed that highest yields were obtained at Jableh in Syria (4654 kg/ha), Culiacan in Mexico (4598 kg/ha) and Capalbio in Italy (4441 kg/ha). One of the entries namely FLIP 82-43C at Jableh gave as high as 6531 kg/ha. On average over locations, the five best entries included ILC 482 (2134 kg/ha), FLIP 81-293 (2040 kg/ha), FLIP 81-57W (1951 kg/ha), FLIP 82-40C (1911 kg/ha), and FLIP 82-43C (1904 kg/ha). The ANOVA for seed yield further revealed that the local check was excelled by a significant margin ($P \leq 0.05$) by some entries at 22 locations: Setif (Algeria); Shandweel (Egypt); Larissa (Greece); Oroumieh (Iran); Capalbio (Italy); Islamabad and Tarnab (Pakistan); Annoceur and Zemamra (Morocco); Cordoba, Jaen and Sevilla (Spain); Hama, Izra'a, Jinderis, and Tel Hadya (Syria); El-Kef, Mateur, Menzel Temime (Tunisia); and Ankara and Samsun (Turkey).

The five best entries in each of the locations are given in Table 3.3.8. Among these ILC 482 occured most frequently among the five heaviest yielders and was followed by FLIP 82-293 and FLIP 82-40C etc. These lines are relatively more adaptable than others. The correlations between seed yields of different locations are given in Table 3.3.9. The seed yields at Tel Hadya-winter in Syria, in general, were not associated with other locations.

On the basis of average over two years for the common entries, ILC 482 ranked number 1 and was followed by FLIP 81-57, and FLIP 81-56 etc. (Table 3.3.10).

3.4. CHICKPEA INTERNATIONAL YIELD TRIAL-WINTER-SUB TROPICAL REGION (CIYT-W-STR)

Material

The material for the Chickpea International Yield Trial-Winter

sub tropical comprised of 23 test entries, and one local check to be supplied by the cooperator. The test entries were tolerant/resistant to ascochyta blight and were selected from the local and regional yield trials based on their superior yield performance. Out of 23 entries, 21 were developed at ICARDA through hybridization program. The cooperators were free to use these entries in their breeding programs or for release as commercial cultivars.

Methods and Management

The trial design was a randomised complete block with four replications. The suggested plot size was four rows each 4 m long with an inter- and intra row spacing of 30- and 10 cm respectively. Ninteen sets of trials were distributed to cooperators in 10 countries. Indian cooperators could not get the materials cleared because of some local quarantine regulations. The results were received for 9 trials out of which eight were worth analysing and are reported. The agronomic practices employed at different locations are given in Table 3.4.1.

Results and Discussion

The data on time to flowering, time to maturity and plant height are given in Tables 3.4.2, 3.4.3 and 3.4.4, respectively. At Mallawi in Egypt the entries flowered at the earliest in 71 days. At Islamabad and Quetta in Pakistan and Tel Hadya in Syria the mean time taken to flower was more than 130 days. The range in time to flowering for different entries was, however, from 101 for ILC 482 to 116 days for ILC 3279. Mean time to maturity was earliest at Mallawi in Egypt (140 days) and Debre Zeit in Ethiopia (144 days) whereas it was 235 days at Quetta in Pakistan. Averaged over locations, ILC 482 and FLIP 81-335 were earliest to mature. The plant height was least at Quetta in Pakistan (21 cm) and maximum at Mallawi in Egypt and Tel Hadya in Syria (47 cm). Averaged over the locations the plant height ranged from 36 cm for ILC 482 to 43 cm for FLIP 82-69C.

The correlations between agronomic characters are given in Table 3.4.5. Time to flowering and time to maturity were positively and significantly associated with each other but were negatively associated with seed yield. The plant height had significant and positive association with time to flowering.

The seed yield and rank of entries at different locations and 100-seed weight at Tel Hadya are given in Table 3.4.6. The ANOVA revealed that the differences among entries were significant for all the locations except at Quetta in Pakistan and Beja in Tunisia. Among the locations showing significant results, 14, 23 and 3 entries exceeded the respective local checks at Mallawi in Egypt, Tel Hadya in Syria and El-Kef in Tunisia, respectively. Among the location means, the highest yields were obtained at Islamabad in Pakistan (2347 kg/ha). On the basis of average yield over locations FLIP 82-28C (1155 kg/ha) ranked number 1, and was followed by FLIP 82-3C (1081 kg/ha), FLIP

Table 3.4.1. Agronomic data for different locations in the CIYT-W-STR during 1983/84.

Country	Location	Planting date	Crop duration (days)	Fertilizer (kg/ha)			Irrigation	Insecticide/ Fungicide/ Herbicides
				N	P_2O_5	K_2O		
ECUADOR	Pichincha	1.12.1983	-					
EGYPT	Mallawi	6.12.1983	142	15	30		3	Igran
ETHIOPIA	Debre Zeit	7.9.1984	149					
PAKISTAN	Faisalabad	7.11.1983	188	20	50			
PAKISTAN	Islamabad	-	199					
PAKISTAN	Quette	22.10.1983	237	20	50		4	
SUDAN	Hudeiba	23.11.1983	-				7	
SYRIA	Tel Hadya	26.11.1983	183		50			

3.4.2. Time to flowering (days) of entries at different locations in the CIYT-W-STR during 1983/84.

ENTRY NAME	ORIGIN	ECUADOR	EGYPT	ETHIOPIA	PAKISTAN			SYRIA	MEAN
		Pichincha	Mallawi	Debre Zeit	Faisalabad	Islamabad	Quette	Tel Hadya	
FLIP 81-10	ICARDA	90	73	85	112	130	135	131	108
FLIP 81-74	ICARDA	95	71	81	110	134	136	133	109
FLIP 81-312	ICARDA	94	70	85	108	132	138	129	108
FLIP 81-335	ICARDA	81	70	73	101	130	137	129	103
FLIP 82-3C	ICARDA	94	72	81	113	131	134	132	108
FLIP 82-8C	ICARDA	93	73	72	114	132	136	132	107
FLIP 82-10C	ICARDA	95	72	91	118	140	138	133	112
FLIP 82-17C	ICARDA	92	72	90	114	134	133	131	109
FLIP 82-28C	ICARDA	90	71	84	111	131	134	130	107
FLIP 82-36C	ICARDA	86	70	82	108	130	138	131	106
FLIP 82-38C	ICARDA	87	71	81	108	132	138	131	107
FLIP 82-52C	ICARDA	85	70	80	107	132	138	130	106
FLIP 82-53C	ICARDA	94	71	81	109	134	137	130	108
FLIP 82-56C	ICARDA	93	72	88	110	130	137	131	109
FLIP 82-59C	ICARDA	94	71	85	113	133	136	133	109
FLIP 82-61C	ICARDA	-	71	81	120	135	138	133	113
FLIP 82-63C	ICARDA	96	73	82	117	137	135	131	110
FLIP 82-66C	ICARDA	93	69	79	113	133	137	130	108
FLIP 82-68C	ICARDA	92	73	90	109	137	138	132	110
FLIP 82-69C	ICARDA	-	72	94	114	132	139	132	114
FLIP 82-71C	ICARDA	94	70	77	108	131	133	132	106
ILC 482	TURKEY	73	68	79	95	129	135	128	101
ILC 3279	USSR	-	69	94	120	140	137	134	116
Local check	-	-	68	47	100	132	133	-	-
Location mean		91	71	82	110	133	136	131	

Table 3.4.3. Time to maturity (days) of entries at different locations in the CIYT-W-STR during 1983/84.

ENTRY	EGYPT	ETHIOPIA	PAKISTAN		SYRIA	MEAN
NAME	Mallawi	Debre Zeit	Islamabad	Quette	Tel Hadya	
FLIP 81-10	139	147	196	233	181	179
FLIP 81-74	142	148	196	232	183	180
FLIP 81-312	139	145	199	235	179	179
FLIP 81-335	138	133	198	238	178	177
FLIP 82-3C	140	144	195	237	182	180
FLIP 82-8C	140	136	197	237	183	179
FLIP 82-10C	141	149	196	236	182	181
FLIP 82-17C	140	148	197	236	181	180
FLIP 82-28C	138	146	197	234	179	179
FLIP 82-36C	141	146	197	235	181	180
FLIP 82-38C	136	144	196	235	180	178
FLIP 82-52C	137	148	197	236	181	180
FLIP 82-53C	141	146	198	233	180	180
FLIP 82-56C	141	148	197	235	182	181
FLIP 82-59C	140	147	196	235	182	180
FLIP 82-61C	140	145	199	238	182	181
FLIP 82-63C	136	146	198	237	179	179
FLIP 82-66C	141	147	198	235	182	181
FLIP 82-68C	141	149	197	236	183	181
FLIP 82-69C	138	147	196	236	183	180
FLIP 82-71C	140	146	199	235	182	180
ILC 482	141	136	194	232	182	177
ILC 3279	141	149	197	235	183	181
Local check	143	107	196	235	-	-
Location mean	140	144	197	235	181	

Table 3.4.4. Plant height (cm) of entries at different locations in the CIYT-W-STR during 1983/84.

ENTRY NAME	EGYPT Mallawi	ETHIOPIA Debre Zeit	PAKISTAN Quette	SYRIA Tel Hadya	MEAN
FLIP 81-10	45	39	20	44	37
FLIP 81-74	44	41	21	47	38
FLIP 81-312	49	39	21	40	37
FLIP 81-335	49	41	22	43	39
FLIP 82-3C	46	42	21	47	39
FLIP 82-8C	51	39	20	56	42
FLIP 82-10C	43	34	21	52	38
FLIP 82-17C	53	41	21	46	40
FLIP 82-28C	44	38	23	42	37
FLIP 82-36C	50	40	21	47	40
FLIP 82-38C	45	39	24	42	38
FLIP 82-52C	47	38	21	45	38
FLIP 82-53C	48	37	22	42	37
FLIP 82-56C	51	45	23	49	42
FLIP 82-59C	47	39	21	48	39
FLIP 82-61C	44	42	21	44	38
FLIP 82-63C	43	43	20	49	39
FLIP 82-66C	49	36	21	51	39
FLIP 82-68C	45	41	21	46	38
FLIP 82-69C	46	44	22	58	43
FLIP 82-71C	44	37	23	48	38
ILC 482	47	38	21	38	36
ILC 3279	46	34	21	64	41
Local check	47	30	20	-	-
Location mean	47	39	21	47	

Table 3.4.5. Correlation (df=21) among three agronomic characters and seed yield of entries in the CIYT-W-STR during 1983/84.

Characters	Time to maturity	Plant height	Seed yield
Time to flowering	0.71**	0.44*	-0.48*
Time to maturity		0.32	-0.49*
Plant height			-0.23

*≦0.05; **≦0.01

Table 3.4.6. Seed yield (Y = kg/ha) and rank (R) of entries at different locations in CIYT-W-STR during 1983/84.

ENTRY NAME	EGYPT Mallawi		ETHIOPIA Debre Zeit		PAKISTAN Faisalabad		PAKISTAN Islamabad		PAKISTAN Quette		SYRIA Tel Hadya		TUNISIA Beja		TUNISIA El-Kef		100-seed[1/] weight	Ascochyta blight[2/] score (1-9 rating)		MEAN	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	(g)	Veg	Pod	Y	R
FLIP 81-10	869	10	103	24	1627	2	3212	2	387	18	1435	14	1467	1	986	14	20.3	4.8	5.3	1077	3
FLIP 81-74	917	8	142	20	920	15	1499	24	655	2	1158	19	558	18	965	17	26.5	5.0	5.8	782	21
FLIP 81-312	637	19	378	4	1284	4	2477	9	446	14	1790	6	1117	8	1076	12	21.6	3.3	3.8	1011	5
FLIP 81-335	685	17	324	6	975	10	2472	10	399	17	2099	2	367	23	944	19	26.7	3.0	4.0	987	8
FLIP 82-3C	1821	1	267	9	994	8	2251	14	327	23	1717	9	842	13	1271	3	28.9	4.0	4.8	1081	2
FLIP 82-8C	1500	2	475	3	931	12	2366	12	476	11	1169	18	983	11	1000	13	33.8	5.3	5.3	990	7
FLIP 82-10C	804	13	113	23	1224	5	2570	6	310	24	1492	13	717	15	965	17	24.4	3.3	4.3	935	13
FLIP 82-17C	1286	3	115	22	689	23	2884	4	595	3	1429	15	475	19	1083	11	24.9	4.3	4.5	1010	6
FLIP 82-28C	792	15	305	7	835	20	3709	1	357	20	2146	1	692	16	1092	10	21.6	3.5	4.3	1155	1
FLIP 82-36C	780	16	498	2	976	9	2435	11	565	6	1299	17	408	20	1167	6	21.7	5.0	5.5	965	9
FLIP 82-38C	1012	5	147	18	1071	7	2076	16	595	3	1568	11	358	24	833	22	26.6	4.0	5.3	913	14
FLIP 82-52C	952	7	184	13	928	14	1969	18	685	1	1765	7	375	22	1201	4	27.1	3.3	4.3	961	10
FLIP 82-53C	536	20	181	15	930	13	1738	23	476	11	2030	3	383	21	896	20	26.0	3.0	4.0	848	17
FLIP 82-56C	655	18	167	16	878	17	2532	7	506	7	1557	12	692	16	979	15	28.2	4.5	5.5	909	15
FLIP 82-59C	994	6	195	12	920	15	2141	15	476	11	1738	8	1225	5	1139	7	28.4	4.0	3.8	950	12
FLIP 82-61C	399	23	143	19	859	19	1871	20	446	14	1407	16	1092	9	1132	8	30.2	4.5	5.0	782	21
FLIP 82-63C	821	12	361	5	632	24	2579	5	506	7	1989	4	1150	7	1313	2	24.8	3.0	3.5	1025	4
FLIP 82-66C	887	9	132	21	697	22	2006	17	506	7	1130	21	1408	4	1340	1	31.9	5.0	5.0	837	19
FLIP 82-68C	1179	4	182	14	952	11	1969	18	357	20	910	23	1467	1	1201	4	32.2	6.3	7.0	844	18
FLIP 82-69C	798	14	154	17	1074	6	1803	21	595	3	1039	22	1008	10	1111	9	36.5	5.0	5.3	822	20
FLIP 82-71C	342	24	233	11	877	18	2503	8	387	18	1837	5	1442	3	972	16	29.5	3.3	4.0	894	16
ILC 482	536	20	251	10	1876	1	2303	13	357	20	1571	10	758	14	793	24	28.5	4.8	5.3	961	10
ILC 3279	869	10	281	8	758	21	1789	22	506	7	1157	20	858	12	806	23	27.7	3.3	3.3	771	23
Local check	506	22	941	1	1465	3	3181	3	417	16	0	24	1200	6	875	21	-	9	-	923	-
Location mean	857		261		1016		2347		472		1476		877		1048						
C.V.%	23.8		84.9		35.1		20.7		37.7		19.1		57.5		20.6						
L.S.D. 5%	288		313		502		683		NS		398		NS		354						
S.E.	102.1		110.9		178.0		242.3		89.1		141.3		290.9		124.5						
No. of entries significantly exceeding the local check	14		0		0		0		-		23		-		3						

1/ Based on Tel Hadya only; 2/ 1=free, 9=killed, veg=vegitative stage, Pod=pod stage.

Table 3.4.7. The five heaviest seed yielding entries at the individual locations in the CIYT-W-STR during 1983/84.

RANK	EGYPT	ETHIOPIA	PAKISTAN			SYRIA	TUNISIA	
	Mallawi	Debre Zeit	Faisalabad	Islamabad	Quette	Tel Hadya	Beja	El-Kef
1	FLIP 82-3C	Local check	ILC 482	FLIP 82-28C	FLIP 82-52C	FLIP 82-28C	FLIP 81-10	FLIP 82-66C
2	FLIP 82-8C	FLIP 82-36C	FLIP 81-10	FLIP 81-10	FLIP 81-74	FLIP 81-335	FLIP 82-68C	FLIP 82-63C
3	FLIP 82-17C	FLIP 82-8C	Local check	Local check	FLIP 82-69C (1)	FLIP 82-53C	FLIP 82-71C	FLIP 82-3C
4	FLIP 82-68C	FLIP 81-312	FLIP 81-312	FLIP 82-17C	FLIP 82-38C	FLIP 82-63C	FLIP 82-66C	FLIP 82-52C
5	FLIP 82-38C	FLIP 82-63C	FLIP 82-10C	FLIP 82-63C	FLIP 82-17C	FLIP 82-71C	FLIP 82-59C	FLIP 82-68C

(1) The brackets indicate entries having the same rank.

Table 3.4.8. Correlation (df=21) among different locations for the seed yield of entries in the CIYT-W-STR during 1983/84.

COUNTRY	LOCATION	ETHIOPIA	PAKISTAN			SYRIA	TUNISIA	
		Debre Zeit	Faisalabad	Islamabad	Quette	Tel Hadya	Beja	El-Kef
EGYPT	Mallawi	0.11	-0.17	0.01	0.04	-0.28	-0.04	0.33
ETHIOPIA	Debre Zeit		-0.07	0.19	-0.09	0.19	-0.10	0.09
PAKISTAN	Faisalabad			0.15	-0.37	-0.02	0.06	-0.44*
PAKISTAN	Islamabad				-0.43*	0.44*	0.07	0.05
PAKISTAN	Quette					-0.25	-0.40	0.07
SYRIA	Tel Hadya						-0.29	-0.05
TUNISIA	Beja							0.36

*$P \leq 0.05$; **$P \leq 0.01$

81-10 (1077 kg/ha), FLIP 82-63C (1025 kg/ha), and FLIP 81-312 (1011 kg/ha) etc. The range in 100-seed weight in the trial was 20.3 to 36.5 g.

The five best entries in all the locations are given in Table 3.4.7. Among these FLIP 82-63C occured most frequently among the top five at different locations and was followed by FLIP 81-10, FLIP 82-17C and FLIP 82-68C. These lines seem to be more adaptable as compared to others.

The correlations among different locations for seed yield (Table 3.4.8) showed that Tel Hadya-Syria had a significant and positive association with Islamabad-Pakistan. Two other combinations having significant but negative associations included Islamabad and Quette in Pakistan, and El-Kef in Tunisia and Faisalabad in Pakistan.

3.5. CHICKPEA INTERNATIONAL YIELD TRIAL-LARGE SEED (CIYT-L)

Material

The Chickpea International Yield Trial-Large Seed comprised of 19 test entries and one check entry to be supplied by the cooperator. The test entries originated from five countries and were selected on the basis of their superior performance either in regional or local trials. Cooperators were free to use these entries in their breeding programs or for release as commercial cultivars.

Methods and Management

The trial design was a randomised complete block with four replications. The suggested plot size was 4 rows, each 4 meter long with inter- and intra row spacings of 30- and 10 cm respectively.

Fifty-one sets were sent to cooperators in 25 countries. The results were, however, received for 29 trials from 17 countries, out of which 28 were worth analysis and are reported. The agronomic information received from the cooperators is given in Table 3.5.1.

Results and Discussion

The data on time to flowering, time to maturity and plant height are given in Tables 3.5.2, 3.5.3, and 3.5.4, respectively. At Karaj in Iran the entries flowered at the earliest in 28 days. The locations, including, Graneros in Chile, Islamabad in Pakistan and Capalbio in Italy, the entries took maximum days to flower (135 to 158 days) and these were late. The range in time to flowering, time to maturity and plant height for different entries was 80 to 83 days, 126 to 128 days, and 40 to 48 cm, respectively. The plant height at Sulaimaniya (Iraq) was least (26 cm) and at Culiacan (Mexico) was maximum (84 cm).

The correlations between different agronomic characters revealed that time to flowering, time to maturity and plant height were

Table 3.5.1. Agronomic data for different locations in the CIYT-L during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
BULGARIA	Toshevo	21.4.1984	104	30	60			
CHILE	Chillan	18.8.1984	147		90			Linuron
CHILE	Granerous	14.5.1984	196				2	
EGYPT	Mallawi	6.12.1983	141	30	15		3	Igran
GREECE	Larissa	14.3.1984	116		285			Phosdzin
IRAN	Karaj	4.11.1983	121	30	70		4	Metasystox,Benomil , Treflan
IRAN	Oroumieh	10.4.1984	103	18	46		4	Metasystox, Basudin, Zeneb
IRAQ	Sulaimaniya	23.3.1984	95	40	80			Dithane
ITALY	Badiola	26.3.1984	128		100			Benlate, Calixin M, Actellic
ITALY	Capalbio	30.4.1984	95	40	100			Tribunil
JORDAN	Marow	26.2.1984	122	20	25			
LEBANON	Terbol	1.4.1984	108		50			Kerb, Bladex
MEXICO	Culiacan	5.12.1983	138	40	40		2	Bellotero
MOROCCO	Karia	23.2.1984	124	30	50	60		
MOROCCO	Marchouch	21.02.1984	169		200			
PERU	La Molina	9.5.1984	183		80		6	Tamaron, Aldrex
SYRIA	Jinderis	4.3.1984	113					
SYRIA	TH-Spring	28.2.1984	127		50			
TURKEY	Ankara	28.2.1984	140	20	60			Basudine
TURKEY	Samsun	7.4.1984	91	25	50			

Table 3.5.2. Time to flowering (days) of entries at different locations in CIYT-L during 1983/84.

ENTRY	ORIGIN	BULGARIA	CHILE		EGYPT	GREECE	IRAN		IRAQ	ITALY		JORDAN	LEBANON	MEXICO	MOROCCO	PAKISTAN	PERU	SYRIA		TURKEY	MEAN
NAME		Toshevo	Chillan	Granerous	Mallawi	Larissa	Karaj	Oroumieh	Sulaimaniya	Badiola	Capalbio	Marow	Terbol	Culiacan	Karia	Islamabad	La Molina	Jinderis	Tel Hadya	Ankara	
ILC 35	SYRIA	51	94	138	70	69	27	65	64	77	157	75	52	69	91	132	82	64	64	87	80
ILC 76	SPAIN	51	94	137	72	70	29	65	64	81	158	73	55	72	95	135	79	68	68	88	82
ILC 83	SPAIN	51	92	135	69	71	28	65	64	80	158	75	55	68	91	135	76	67	65	88	81
ILC 112	SPAIN	51	94	139	72	71	29	65	64	82	159	75	56	72	91	137	88	70	67	89	83
ILC 116	SPAIN	51	92	134	69	69	28	66	64	80	158	75	54	70	91	134	78	65	65	89	81
ILC 132	SPAIN	51	92	136	72	70	28	66	63	79	158	74	55	71	91	134	76	67	68	87	81
ILC 134	SPAIN	52	92	135	71	70	29	66	62	80	158	75	55	68	91	135	75	67	67	87	81
ILC 135	SPAIN	51	92	136	71	69	29	62	63	81	158	74	54	72	91	136	76	67	67	87	81
ILC 136	SPAIN	51	92	135	70	69	27	65	64	80	158	75	54	70	95	136	76	65	65	89	81
ILC 165	TUNISIA	51	88	133	71	71	28	66	63	78	157	75	53	69	95	134	78	65	65	87	80
ILC 171	TUNISIA	51	93	140	71	71	29	65	64	82	160	75	54	73	95	137	84	70	69	89	83
ILC 254	TURKEY	51	92	139	72	71	29	62	65	81	160	75	57	74	95	140	86	71	69	89	83
ILC 451	TURKEY	50	92	136	71	70	27	66	64	81	157	75	51	72	95	132	80	69	67	87	81
ILC 464	TURKEY	51	94	137	69	69	28	65	64	80	158	75	56	74	95	134	88	70	67	87	83
ILC 496	TURKEY	51	92	137	71	71	29	63	64	81	159	74	56	74	91	137	93	71	68	88	83
ILC 613	TUNISIA	51	92	137	72	71	27	66	64	81	158	74	52	73	95	135	82	67	66	87	82
ILC 620	MOROCCO	51	94	136	70	71	28	65	65	81	161	74	55	74	95	137	88	69	68	87	83
ILC 629	TUNISIA	51	92	142	70	71	30	66	64	82	161	73	53	74	95	137	93	68	67	87	83
ILC 2587	TURKEY	51	92	136	69	69	26	66	65	80	156	75	52	69	95	130	76	67	65	87	80
Local check	-	51	92	137	69	69	29	62	64	80	159	74	51	32	95	133	70	64	64	87	
Location mean		51	92	137	70	70	28	65	64	80	158	74	54	69	93	135	81	67	66	88	

Table 3.5.3. Time to maturity (days) of entries at different locations in CIYT-L during 1983/84.

ENTRY	BULGARIA	CHILE		EGYPT	IRAN		IRAQ	ITALY	JORDAN	LEBANON	MEXICO	MOROCCO	PERU	TURKEY		MEAN
NAME	Toshevo	Chillan	Granerous	Mallawi	Karaj	Oroumieh	Sulaimaniya	Badiola	Marow	Terbol	Culiacan	Karia	La Molina	Ankara	Samsun	
ILC 35	100	147	195	141	121	101	90	125	121	100	133	122	170	138	88	126
ILC 76	104	147	195	140	121	103	92	125	120	105	136	124	178	134	89	128
ILC 83	102	147	196	137	121	101	95	124	119	103	134	122	180	134	88	127
ILC 112	103	147	195	140	121	101	92	126	121	107	138	122	178	135	90	128
ILC 116	102	147	195	140	121	101	90	124	120	104	134	122	173	135	89	126
ILC 132	104	147	195	136	121	103	93	125	120	106	136	122	171	135	89	127
ILC 134	102	147	194	139	121	103	91	125	120	105	135	122	175	135	88	127
ILC 135	104	147	195	139	121	103	92	124	121	104	136	122	178	135	89	127
ILC 136	103	147	196	136	121	101	95	124	121	107	137	124	166	137	91	127
ILC 165	102	140	195	140	121	101	94	125	120	105	137	124	176	137	89	127
ILC 171	103	147	195	137	121	103	94	128	121	104	136	124	176	138	89	128
ILC 254	102	147	195	140	121	103	94	124	121	103	137	124	183	138	88	128
ILC 451	99	147	195	140	121	100	95	126	121	98	132	124	172	139	87	126
ILC 464	104	147	194	139	121	103	91	128	122	108	137	124	177	139	90	128
ILC 496	104	147	195	141	121	103	94	128	122	108	138	122	171	139	90	128
ILC 613	103	147	195	141	121	101	94	124	122	105	137	124	172	138	92	128
ILC 620	103	147	195	138	121	101	91	124	120	106	138	124	177	139	92	128
ILC 629	104	147	195	140	121	101	91	124	120	104	137	124	174	140	91	128
ILC 2587	99	147	195	139	121	103	94	124	120	102	133	124	168	140	91	127
Local check	101	147	195	140	121	103	-	124	121	100	130	124	175	131	90	-
Location mean	102	147	195	139	121	102	93	125	120	104	135	123	174	137	89	

Table 3.5.4. Plant height (cm) of entries at different locations in CIYT-L during 1983/84.

ENTRY	BULGARIA	CHILE		EGYPT	IRAN		IRAQ	ITALY		JORDAN	LEBANON	MEXICO	PERU	SYRIA	TURKEY		SYRIA	
NAME	Toshevo	Chillan	Granerous	Mallawi	Karaj	Oroumieh	Sulaimaniya	Badiola	Capalbio	Marow	Terbol	Culiacan	La Molina	Tel Hadya	Ankara	Samsun	Jinderis	MEAN
ILC 35	28	50	39	47	24	33	25	64	61	27	35	72	57	27	23	31	31	40
ILC 76	33	53	64	41	36	41	32	63	75	31	39	84	66	29	31	33	33	46
ILC 83	39	53	54	41	36	38	21	63	64	31	37	81	66	30	32	32	33	44
ILC 112	35	62	63	50	38	42	33	67	70	36	44	88	62	30	33	34	35	48
ILC 116	35	55	65	47	35	40	24	66	80	32	37	82	64	29	31	33	32	46
ILC 132	35	52	66	44	32	42	31	63	76	32	42	87	63	29	32	33	33	47
ILC 134	37	54	54	45	30	49	26	63	68	32	39	82	64	30	31	34	31	45
ILC 135	36	62	70	44	39	40	32	66	75	31	40	84	61	29	33	33	32	47
ILC 136	36	56	59	48	37	42	29	62	73	34	43	92	66	30	31	36	35	48
ILC 165	32	49	45	47	29	38	20	64	77	30	36	79	57	28	29	32	31	43
ILC 171	35	56	44	44	34	43	22	68	89	34	37	91	68	31	32	38	34	47
ILC 254	39	64	60	44	34	42	26	63	83	33	42	91	68	31	32	37	33	48
ILC 451	31	56	53	41	31	36	21	66	65	30	32	75	56	29	27	32	32	42
ILC 464	30	56	50	44	36	40	23	66	77	34	41	83	60	30	28	34	33	45
ILC 496	39	57	51	47	35	41	32	64	77	33	39	82	58	28	33	36	34	46
ILC 613	42	55	51	42	33	39	25	65	73	33	36	90	58	23	30	34	33	45
ILC 620	34	59	70	46	31	41	31	62	79	33	36	98	65	32	34	35	34	48
ILC 629	37	54	53	46	31	41	27	64	79	35	40	92	64	30	31	35	33	47
ILC 2587	30	59	48	41	25	36	17	64	71	29	36	82	61	27	28	33	30	42
Local check	40	61	59	41	29	36	-	64	69	33	32	72	65	26	29	29	31	-
Location mean	35	56	56	44	33	40	26	64	74	32	38	84	62	29	30	34	33	

Table 3.5.5. Correlation (df=1) among three agronomic characters and seed yield of entries in the CIYT-L during 1983/84.

Characters	Time to maturity	Plant height	Seed yield
Time to flowering	0.83**	0.67**	-0.31
Time to maturity		0.61**	-0.52*
Plant height			0.15

* $P \leq 0.05$; ** $P \leq 0.01$

Table 3.5.6. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in CIYT-L during1983/84.

ENTRY NAME	BULGARIA		CHILE				EGYPT		GREECE		IRAN				IRAQ		ITALY				JORDAN		LEBANON	
	Toshevo		Chillan		Granerous		Mallawi		Larissa		Karaj		Oroumieh		Sulaimaniya		Badiola		Capalbio		Marow		Terbol	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
ILC 35	2475	20	420	20	578	17	1405	7	2694	4	1725	11	1421	16	287	18	3129	8	4021	3	300	10	1730	8
ILC 76	2577	18	898	7	1344	7	1083	15	2369	17	1979	5	1707	6	354	7	2774	15	3042	13	238	16	1371	20
ILC 83	2776	12	635	16	1000	11	869	18	2544	10	1829	8	1550	11	313	15	2655	17	3109	12	353	5	1914	3
ILC 112	3205	2	969	5	813	13	1351	10	2844	2	1175	20	1750	4	521	1	3045	9	1526	20	346	6	1413	18
ILC 116	2835	9	1072	3	2094	2	1464	5	2506	14	2082	2	1564	10	385	4	2790	14	3729	5	288	13	1625	14
ILC 132	3001	4	668	11	1531	5	1000	16	2544	10	2064	3	1314	18	354	7	2858	13	3271	8	404	1	1767	7
ILC 134	2639	16	846	9	1578	4	1417	6	2650	6	1993	4	1800	2	427	2	2646	18	3182	11	276	14	1660	11
ILC 135	2749	13	875	8	2125	1	1607	3	2200	20	1657	13	1543	13	375	5	2546	19	3245	9	225	18	1671	10
ILC 136	2738	14	771	10	1094	8	1190	14	2438	16	1959	6	1286	19	323	14	3180	3	4062	2	354	4	1890	4
ILC 165	2597	17	443	19	672	15	1369	8	2619	8	1493	16	1914	1	354	7	3196	2	3432	7	313	8	1653	13
ILC 171	2644	15	645	14	481	19	1565	4	2475	15	1636	14	1607	7	344	12	3144	5	2469	16	393	2	1584	15
ILC 254	3149	3	1143	2	1969	3	1220	13	2231	19	1396	18	1507	14	344	12	2757	16	3193	10	149	20	1692	9
ILC 451	2929	7	1037	4	1047	10	1321	11	2850	1	1725	11	1600	8	292	17	2902	11	3599	6	293	12	1542	16
ILC 464	2802	10	646	13	953	12	881	17	2544	10	2218	1	1579	9	354	7	3135	7	2365	18	301	9	1856	5
ILC 496	2793	11	609	17	781	14	1369	8	2325	18	1889	7	1500	15	354	7	2900	12	2990	14	294	11	1657	12
ILC 613	2966	5	645	14	484	18	1631	2	2556	9	1525	15	1400	17	375	5	2904	10	2448	17	192	19	1802	6
ILC 620	2922	8	580	18	672	15	1286	12	2775	3	1825	9	1550	11	302	16	3158	4	2719	15	235	17	1532	17
ILC 629	3748	1	660	12	1078	9	1732	1	2525	13	1800	10	1721	5	427	2	3215	1	2240	19	368	3	1378	19
ILC 2587	2513	19	920	6	438	20	815	19	2681	5	1474	17	1257	20	219	20	2539	20	3807	4	266	15	1980	1
Local check	2948	6	1424	1	1500	6	470	20	2650	6	1314	19	1764	3	273	19	3142	6	4589	1	329	7	1947	2
Location mean	2850		795		1112		1252		2551		1738		1567		349		2931		3152		296		1683	
C.V.%	15.2		29.6		83.8		16.7		13.7		25.2		21.1		27.3		9.5		9.4		46.8		19.4	
L.S.D. at 5%	614		333		NS		296		NS		NS		NS		134		394		421		NS		NS	
S.E.	216.8		117.7		465.8		104.5		174.9		219.2		165.2		47.6		139.2		148.8		69.2		163.2	
No. of entries significantly exceeding the local check	1		0		-		19		-		-		-		3		0		0		-		-	

Cont'd. 2/...

Table 3.5.6. Cont'd. ...2/.

ENTRY NAME	MEXICO		MOROCCO				PAKISTAN		PERU		SYRIA													
	Culiacan		Karia		Marchouch		Islamabad		La Molina		Al-Ghab		Gelline		Hama		Heimo		Izra'a		Jinderis		Tel Hadya	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
ILC 35	2417	2	2000	14	400	18	73	14	1054	11	1351	5	1021	6	1321	7	41	13	505	9	1327	1	137	8
ILC 76	2116	17	2643	2	457	15	304	1	1065	10	1417	3	987	9	1155	18	25	19	417	17	1064	12	124	10
ILC 83	2074	19	1929	16	321	20	151	5	1229	8	1327	6	850	18	1357	4	97	1	500	10	1156	6	116	14
ILC 112	2324	5	1857	18	632	3	37	18	460	18	1042	13	1086	3	1196	16	21	20	464	12	1174	3	92	18
ILC 116	2007	20	2357	7	514	11	86	11	1554	6	1530	2	745	20	1214	14	35	16	521	7	1150	7	122	11
ILC 132	2236	11	2000	14	575	9	111	9	1634	3	982	14	968	12	1137	20	76	3	453	14	1088	9	114	15
ILC 134	2252	10	1929	16	639	2	77	12	1698	2	1065	12	887	16	1304	10	38	14	542	5	917	18	89	19
ILC 135	2144	15	2500	3	457	15	104	10	1610	5	744	20	1021	6	1167	17	52	7	401	18	900	20	118	13
ILC 136	2262	9	2500	3	618	4	26	20	1905	1	1107	11	1024	5	1333	5	76	3	641	3	1085	10	99	16
ILC 165	2229	9	2357	7	604	5	77	12	1141	9	958	16	1124	2	1321	7	50	10	390	19	992	15	97	17
ILC 171	2342	4	3500	1	468	14	29	19	562	15	1726	1	971	11	1256	11	35	16	365	20	917	18	158	5
ILC 254	2125	16	2286	10	539	10	137	7	1618	4	863	17	1012	8	1155	18	67	5	453	14	981	16	183	4
ILC 451	2278	7	2071	13	493	13	50	15	510	16	1327	6	896	15	1250	12	52	7	563	4	1161	5	188	3
ILC 464	2174	13	2429	5	589	6	169	3	493	17	976	15	982	10	1226	13	61	6	531	6	1069	11	121	12
ILC 496	2275	8	2429	5	579	8	46	16	401	20	815	19	962	13	1333	5	37	15	438	16	1052	13	68	20
ILC 613	2354	3	2357	7	439	17	147	6	411	19	1304	9	851	17	1208	15	51	9	651	2	1095	8	125	9
ILC 620	2109	18	2286	10	589	6	46	16	850	13	1161	10	1036	4	1310	9	50	10	460	13	962	17	145	7
ILC 629	2322	6	2143	12	689	1	160	4	599	14	1399	4	901	14	1476	2	31	18	521	7	1177	2	148	6
ILC 2587	2164	14	1500	20	350	19	136	8	1419	7	1310	8	823	19	1423	3	50	10	490	11	1038	14	215	2
Local check	2694	1	1857	18	504	12	178	2	951	12	857	18	1214	1	1548	1	96	2	714	1	1167	4	227	1
Location mean	2245		2246		523		107		1058		1163		968		1285		52		501		1074		134	
C.V.%	9.7		29.3		43.9		71.9		23.9		39.4		20.8		13.1		71.8		29.1		13.8		59.9	
L.S.D. at 5%	309		NS		NS		109		359		NS		NS		NS		NS		NS		210		NS	
S.E.	109.1		329.4		115.0		38.5		126.8		228.9		100.5		83.8		18.7		72.8		74.0		40.2	
No. of entries significantly exceeding the local check	0		-		-		1		7		-		-		-		-		-		-		-	

Cont'd. 3/...

Table 3.5.6. Cont'd. 3/...

ENTRY NAME	TUNISIA				TURKEY				100-seed[1/] weight (g)	MEAN	
	Beja		El-Kef		Ankara		Samsun				
	Y	R	Y	R	Y	R	Y	R		Y	R
ILC 35	1450	7	813	5	250	18	1079	13	31.5	1265	11
ILC 76	817	19	756	15	1226	5	1297	8	34.4	1272	9
ILC 83	1375	10	769	14	1055	7	1007	17	36.5	1245	13
ILC 112	1542	5	800	8	1042	8	979	18	39.3	1204	18
ILC 116	1108	15	781	10	1399	2	1031	15	33.9	1378	1
ILC 132	1117	14	719	16	1248	4	864	19	36.7	1289	7
ILC 134	1492	6	788	9	1183	6	1088	12	36.8	1325	3
ILC 135	783	20	775	13	1289	3	1031	15	38.6	1283	8
ILC 136	1717	3	781	10	526	14	1035	14	42.4	1358	2
ILC 165	1692	4	781	10	437	16	1135	11	37.6	1266	10
ILC 171	958	17	719	16	405	17	1431	2	36.7	1244	14
ILC 254	1442	8	813	5	718	11	1315	6	39.4	1302	4
ILC 451	1417	9	925	1	239	19	1589	1	32.2	1291	5
ILC 464	1733	2	675	20	762	10	1367	4	34.00	1250	12
ILC 496	875	18	706	19	965	9	1158	10	36.2	1200	19
ILC 613	1225	12	813	5	681	12	1315	6	34.3	1213	16
ILC 620	1142	13	769	18	571	13	1368	3	37.5	1229	15
ILC 629	1100	16	831	2	438	15	1322	5	36.8	1291	5
ILC 2587	1825	1	825	3	205	20	1235	9	33.5	1211	17
Local check	1317	11	825	3	1631	1	492	20	30.9	-	
Location mean	1306		783		813		1157				
C.V.%	39.2		19.4		9.4		22.1				
L.S.D. at 5%	NS		NS		108		361				
S.E.	295.4		76.1		38.1		127.7				
No. of entries significantly exceeding the local check	-		-		0		19				

1/ Based on Tel Hadya location.

Table 3.5.7. The five heaviest seed yielding entries at the individual locations in CIYT-L during 1983/84.

RANK	BULGARIA	CHILE		EGYPT	GREECE	IRAN		IRAQ	ITALY		JORDAN	LEBANON	MEXICO	MOROCCO	
	Toshevo	Chillan	Granerous	Mallawi	Larissa	Karaj	Oroumieh	Sulaimaniya	Badiola	Capalbio	Marow	Terbol	Culiacan	Karia	Marchouch
1	ILC 629	Local check	ILC 135	ILC 629	ILC 451	ILC 464	ILC 165	ILC 112	ILC 629	Local check	ILC 132	ILC 2587	Local check	ILC 171	ILC 629
2	ILC 112	ILC 254	ILC 116	ILC 613	ILC 112	ILC 116	ILC 134	ILC 134 (1)	ILC 165	ILC 136	ILC 171	Local check	ILC 35	ILC 76	ILC 134
3	ILC 254	ILC 116	ILC 254	ILC 135	ILC 620	ILC 132	Local check	ILC 629	ILC 136	ILC 35	ILC 629	ILC 83	ILC 613	ILC 135	ILC 112
4	ILC 132	ILC 451	ILC 134	ILC 171	ILC 35	ILC 134	ILC 112	ILC 116	ILC 620	ILC 2587	ILC 136	ILC 136	ILC 136	ILC 136	ILC 136
5	ILC 613	ILC 112	ILC 132	ILC 116	ILC 2587	ILC 76	ILC 629	ILC 135 ILC 613	ILC 171	ILC 116	ILC 83	ILC 464	ILC 112	ILC 464 ILC 496	ILC 165

Cont'd. ...

RANK	PAKISTAN	PERU	SYRIA							TUNISIA		TURKEY	
	Islamabad	La Molina	Al-Ghab	Gelline	Hama	Heimo	Izra'a	Jinderis	Tel Hadya	Beja	El-Kef	Ankara	Samsun
1	ILC 76	ILC 136	ILC 171	Local check	Local check	ILC 83	Local check	ILC 35	Local check	ILC 2587	ILC 451	Local check	ILC 451
2	Local check	ILC 134	ILC 116	ILC 165	ILC 629	Local check	ILC 613	ILC 629	ILC 2587	ILC 464	ILC 629	ILC 116	ILC 171
3	ILC 464	ILC 132	ILC 76	ILC 112	ILC 2587	ILC 132	ILC 136	ILC 112	ILC 451	ILC 136	ILC 2587	ILC 135	ILC 620
4	ILC 629	ILC 254	ILC 629	ILC 620	ILC 83	ILC 136	ILC 451	Local check	ILC 254	ILC 165	Local check	ILC 132	ILC 464
5	ILC 83	ILC 135	ILC 35	ILC 136	ILC 496 ILC 136	ILC 254	ILC 134	ILC 451	ILC 171	ILC 112	ILC 613 ILC 254 ILC 35	ILC 76	ILC 629

(1) The brackets indicate entries having the same rank.

Table 3.5.8. Correlation (df=17) among different locations for the seed yield of entries in the CIYT-L during 1983/84.

COUNTRY	LOCATION	CHILE		EGYPT	GREECE	IRAN		IRAQ	ITALY		JORDAN	LEBANON	MEXICO	MOROCCO		PAKISTAN
		Chillan	Granerous	Mallawi	Larissa	Karaj	Oroumieh	Sulaimaniya	Badiola	Capalbio	Marow	Terbol	Culiacan	Karia	Marchouch	Islamabad
BULGARIA	Toshevo	0.19	0.17	0.34	0.01	-0.15	0.15	0.52*	0.26	-0.56*	0.11	-0.44	0.12	-0.13	0.52*	0.04
CHILE	Chillan		0.60**	-0.07	-0.14	-0.16	-0.02	0.16	-0.54*	0.06	-0.36	-0.17	-0.42	-0.15	-0.02	0.12
CHILE	Granerous			0.08	-0.53*	0.29	0.08	0.28	-0.49*	0.22	-0.25	-0.13	-0.55*	0.01	0.16	0.19
EGYPT	Mallawi				-0.10	0.24	0.34	0.47*	0.27	-0.24	0.08	-0.53*	0.44	0.37	0.31	-0.32
GREECE	Larissa					-0.18	0.15	-0.02	0.29	-0.12	0.28	-0.10	0.30	-0.48*	0.06	-0.33
IRAN	Karaj						-0.11	-0.13	0.03	0.25	0.24	0.13	-0.30	0.16	0.15	0.21
IRAN	Oroumieh							0.57	0.20	-0.42	0.05	-0.66**	-0.01	0.16	0.42	0.07
IRAQ	Sulaimaniya								0.15	-0.67**	0.15	-0.55*	0.18	0.07	0.61**	-0.05
ITALY	Badiola									-0.28	0.41	-0.28	0.50*	0.35	0.52*	-0.33
ITALY	Capalbio										-0.10	0.46*	-0.21	-0.18	-0.35	-0.10
JORDAN	Marow											-0.01	0.32	0.07	0.22	-0.31
LEBANON	Terbol												-0.13	-0.25	-0.44	-0.06
MEXICO	Culiacan													0.07	0.19	-0.35
MOROCCO	Karia														0.07	-0.06
MOROCCO	Marchouch															-0.28

cont'd...

COUNTRY	LOCATION	PERU	SYRIA							TUNISIA		TURKEY	
		La Molina	Al-Ghab	Gelline	Hama	Heimo	Izra'a	Jinderis	Tel-Hadya	Beja	El-Kef	Ankara	Samsun
BULGARIA	Toshevo	-0.28	-0.07	-0.04	0.08	-0.08	0.17	0.20	0.06	-0.15	0.23	0.03	0.12
CHILE	Chillan	0.29	-0.01	-0.32	-0.39	-0.12	0.09	-0.12	0.35	-0.01	0.39	0.30	0.09
CHILE	Granerous	0.61**	-0.31	-0.15	-0.49*	0.11	-0.08	-0.22	-0.11	-0.31	-0.01	0.69**	-0.32
EGYPT	Mallawi	-0.25	0.13	0.05	0.02	-0.54*	0.01	-0.06	-0.16	-0.45	0.25	-0.04	0.13
GREECE	Larissa	-0.33	0.29	-0.04	0.28	-0.16	0.26	0.39	0.16	0.48*	0.41	-0.40	0.13
IRAN	Karaj	0.20	0.08	-0.30	-0.01	0.20	0.21	0.03	-0.29	-0.20	-0.46*	0.35	-0.08
IRAN	Oroumieh	-0.27	-0.01	0.28	0.01	-0.47*	-0.37	-0.18	-0.31	-0.08	0.03	0.16	0.15
IRAQ	Sulaimaniya	-0.19	-0.18	0.18	-0.27	-0.45	-0.04	-0.01	-0.57*	-0.20	-0.12	0.52*	-0.29
ITALY	Badiola	-0.46*	0.16	0.49*	0.23	-0.17	0.07	0.26	-0.17	0.16	-0.13	-0.49*	0.23
ITALY	Capalbio	0.66**	0.02	-0.19	0.13	0.35	0.16	0.10	0.19	0.20	0.25	-0.15	-0.19
JORDAN	Marow	-0.09	0.28	0.04	0.31	0.08	-0.08	0.29	-0.26	0.07	-0.25	-0.06	-0.30
LEBANON	Terbol	0.38	-0.18	-0.26	0.15	0.73**	0.36	-0.02	0.09	0.51*	-0.18	-0.14	-0.26
MEXICO	Culiacan	-0.45	0.10	0.28	0.20	-0.30	0.19	0.29	-0.10	0.10	0.18	-0.49*	0.11
MOROCCO	Karia	-0.20	0.24	0.23	-0.29	-0.18	-0.32	-0.41	-0.13	-0.50*	-0.44	0.02	0.33
MOROCCO	Marchouch	-0.07	-0.37	0.38	0.03	-0.27	0.05	-0.16	-0.42	0.06	-0.14	0.10	-0.04
PAKISTAN	Islamabad	0.03	0.12	-0.21	-0.17	0.01	-0.04	0.06	-0.16	-0.18	-0.10	0.26	0.13
PERU	La Molina		-0.22	-0.07	-0.11	0.42	0.02	-0.25	-0.01	0.16	0.01	0.32	-0.56*
SYRIA	Al-Ghab			-0.50	0.24	-0.26	0.12	0.32	0.39	-0.12	0.22	-0.28	0.34
SYRIA	Gelline				-0.20	-0.06	-0.43	-0.18	-0.29	0.08	-0.22	-0.14	-0.08
SYRIA	Hama					-0.01	0.19	0.20	0.13	0.31	0.22	-0.55*	0.10
SYRIA	Heimo						0.25	-0.02	0.07	0.31	-0.10	-0.01	-0.22
SYRIA	Izra'a							0.41	0.01	0.41	0.38	-0.17	0.06
SYRIA	Jinderis								0.01	0.19	0.33	-0.18	-0.15
SYRIA	Tel Hadya									0.17	0.52*	-0.57*	0.59*
TUNISIA	Beja										0.24	-0.46*	-0.03
TUNISIA	El-Kef											-0.43	0.29
TURKEY													-0.57*

* Significant at P≤0.05.

significantly and positively associated with each other (Table 3.5.5). Seed yield was only associated with time to maturity but negatively.

The seed yield and rank of entries for different locations and 100-seed weight for only Tel Hadya (Syria) are given in Table 3.5.6. The ANOVA revealed that the differences among entries were significant for 12 locations. Out of these only at 6 locations namely, Toshevo (Bulgaria), Mallawi (Egypt), Sulaimaniya (Iraq), Islamabad (Pakistan), La Molina (Peru), and Samsun (Turkey), a number of lines were significantly superior to the local checks. On the basis of overall performance of entries average over locations, ILC 116 (1378 kg/ha), ILC 136 (1358 kg/ha), ILC 134 (1325 kg/ha), ILC 254 (1302 kg/ha), and ILC 451 (1291 kg/ha) were the top yielders. The five heaviest seed yielding entries at each of the locations are given in Table 3.5.7. It is apparant from this table that ILC 629 occured most frequently among the top five heavy yielders and was followed by ILC 136 and ILC 112 etc. These entries seem to be relatively more adaptable than others.

The correlations between different locations for seed yield of entries (Table 3.5.8) revealed that Tel Hadya (Syria) is positively associated with El-Kef in Tunisia and Samsun in Turkey and nagatively with Sulaimaniya in Iraq and Ankara in Turkey.

3.6. CHICKPEA INTERNATIONAL SCREENING NURSERY (CISN)

Material

The Chickpea International Screening Nursery comprised of 60 test entries which originated from the materials developed through hybridization at ICARDA. The nursery also included three checks namely ILC 482, ILC 3279 and one local check to be supplied by the cooperator. All these entries were almost homozygous and had shown superior performance in ICARDA's local or regional trials. Cooperators were free to use any of these materials for their use in breeding programs.

Methods and Management

The entries were planted in single row non-replicated plots of 4 m length. The three checks were repeatedly grown in a block of 15 entries. The spacings between and within rows were 30- and 10 cm respectively.

Fifty sets of nursery were distributed to cooperators in 29 countries and the results were received from 24 locations in 17 countries. However, only 19 sets were worth analysis and are presented. The agronomic details received from the cooperators are given in Table 3.6.1.

Results and Discussion

The data on time to flowering, time to maturity and plant

Table 3.6.1. Agronomic data for different locations in the CISN during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
CANADA	Saskatoon	22.5.1984	109					Treflan, Metrelizin
COSTA RICA	Haradia	31.5.1984	-	15	45	15		Benlate, Bactospeine, Lannate
ECUADOR	Pichincha	1.12.1983	-					
ETHIOPIA	Debre Zeit	8.9.1984	151					
EGYPT	Shandweel	24.11.1983	163	18	71		2	
IRAN	Karaj	4.11.1983	121	30	70		4	Treflan, Metasystox
ITALY	Capalbio	6.12.1983	241	40	100			Tribunil
JORDAN	Marow	22.2.1984	-	20	25			
LEBANON	Terbol	2.4.1984	100		50		2	Kerb, Bladex
LIBYA	El-Marg	4.12.1983	169	18	46			
MEXICO	Culiacan	6.12.1983	133	40	40		3	
NEPAL	Birgunj	1.11.1983	150	20	20	20		Metacid
PAKISTAN	Bahawalpur	12.11.1983	147	18	46			Thiodan
PAKISTAN	Chakwal	12.10.1983	187	35	90			
PAKISTAN	Dokri	8.11.1983	157	20	50			Thiodan
PAKISTAN	Islamabad	24.10.1983	200				1	
PAKISTAN	Lahore	21.10.1983	176					
PAKISTAN	Tarnab	24.10.1983	182	20	50			
SUDAN	Hudeiba	27.11.1983	-				6	
SYRIA	Tel Hadya	28.2.1984	127		50			
TURKEY	Ankara	28.2.1984	136	20	60			Basudine

Table 3.6.2. Time to flowering (days) of entries at different locations in the CISN during 1983/84.

ENTRY NAME	ORIGIN	CANADA	COSTA RICA	EGYPT	ETHIOPIA	IRAN	ITALY	JORDAN	LEBANON	LIBYA	MEXICO	NEPAL	PAKISTAN						SYRIA	TURKEY	MEAN
		Saskatoon	Haradia	Shandweel	Debre Zeit	Karaj	Capalbio	Marow	Terbol	El Marg	Culiacan	Birgunj	Bahawalpur	Chakwal	Dokri	Islamabad	Lahore	Tarnab	Tel Hadya	Ankara	
FLIP 82-96	ICARDA	49	103	100	86	43	155	87	55	110	71	80	108	160	99	142	122	136	75	88	98
FLIP 82-97	ICARDA	49	102	-	93	29	152	84	60	109	74	80	113	160	102	142	122	134	74	88	98
FLIP 82-98	ICARDA	50	69	94	86	43	152	87	58	112	74	74	102	163	98	142	122	134	71	88	96
FLIP 82-100	ICARDA	49	60	100	78	42	154	91	58	116	71	80	113	159	102	142	122	135	76	88	97
FLIP 82-101	ICARDA	48	103	-	70	43	156	91	55	118	74	83	108	164	92	135	127	134	71	88	98
FLIP 82-104	ICARDA	48	60	100	80	33	152	86	55	112	71	75	99	157	93	139	114	130	67	88	93
FLIP 82-112	ICARDA	51	69	105	80	33	155	90	58	117	74	95	113	163	83	142	125	133	76	88	97
FLIP 82-113	ICARDA	52	97	105	93	31	154	84	60	116	74	95	113	155	99	142	116	138	72	86	99
FLIP 82-115	ICARDA	49	102	95	78	33	154	87	50	112	70	93	99	158	93	139	107	133	68	86	95
FLIP 82-117	ICARDA	50	71	100	100	49	155	87	55	116	73	86	113	161	102	149	122	137	71	88	99
FLIP 82-118	ICARDA	52	103	-	84	43	156	88	67	110	76	75	113	159	99	147	127	134	75	88	100
FLIP 82-119	ICARDA	49	68	97	93	43	151	90	60	111	68	67	92	160	92	139	114	120	69	86	93
FLIP 82-121	ICARDA	-	64	93	68	29	155	87	52	118	71	95	99	154	92	142	120	133	70	88	96
FLIP 82-126	ICARDA	46	101	108	75	43	157	91	60	116	79	98	99	145	93	135	125	136	75	86	98
FLIP 82-127	ICARDA	48	89	95	84	33	156	91	58	119	64	108	108	152	92	139	116	130	72	86	97
FLIP 82-128	ICARDA	48	93	92	79	29	156	91	60	110	70	74	99	154	92	139	114	133	69	86	94
FLIP 82-130	ICARDA	-	107	97	78	-	153	89	58	109	78	105	108	150	102	135	124	135	71	88	105
FLIP 82-133	ICARDA	-	102	-	86	-	156	87	58	119	75	96	113	160	103	135	127	139	75	87	107
FLIP 82-138	ICARDA	49	71	-	84	31	155	89	60	118	74	77	113	162	98	149	116	141	74	86	97
FLIP 82-144	ICARDA	-	102	-	86	-	151	87	52	109	73	95	106	155	98	135	116	131	71	87	103
FLIP 82-150	ICARDA	45	102	107	82	33	154	87	55	112	73	95	99	151	98	132	122	137	71	87	97
FLIP 82-152	ICARDA	45	107	106	83	27	154	89	55	110	75	98	99	162	102	135	122	135	71	87	98
FLIP 82-154	ICARDA	48	97	-	70	42	157	91	55	116	72	80	99	165	103	157	122	137	69	86	98
FLIP 82-160	ICARDA	-	60	92	70	-	150	87	50	103	66	97	78	162	92	137	107	100	67	86	94
FLIP 82-161	ICARDA	-	96	95	78	43	154	91	52	110	74	84	106	154	98	161	114	137	68	88	100
FLIP 82-164	ICARDA	-	71	95	76	43	151	87	50	112	71	93	92	152	92	137	107	118	67	86	94
FLIP 82-167	ICARDA	-	102	106	85	43	154	87	58	116	76	95	106	153	102	135	123	141	76	88	102
FLIP 82-169	ICARDA	-	71	97	71	43	155	87	60	110	70	80	99	154	92	142	112	119	72	88	96
FLIP 82-175	ICARDA	-	102	-	76	49	152	87	50	112	72	75	96	153	92	139	108	119	68	86	96
FLIP 82-180	ICARDA	-	104	100	100	43	157	87	67	118	75	104	113	154	112	135	130	146	77	87	106
FLIP 82-181	ICARDA	-	102	-	86	-	155	89	65	116	76	98	106	148	103	135	126	139	77	87	107
FLIP 82-182	ICARDA	-	69	100	81	45	154	91	60	112	68	87	99	154	92	139	114	132	69	88	97
FLIP 82-186	ICARDA	-	71	97	81	44	152	87	55	109	72	95	106	150	95	157	122	136	69	88	99
FLIP 82-188	ICARDA	-	71	100	86	33	154	88	55	113	73	95	108	160	103	139	116	133	68	88	99
FLIP 82-189	ICARDA	-	102	95	72	43	154	86	60	110	72	81	96	152	92	142	120	134	75	88	99
FLIP 82-193	ICARDA	-	107	-	83	33	155	87	58	112	76	80	108	158	102	135	116	134	75	88	100
FLIP 82-194	ICARDA	-	107	-	99	43	154	87	65	117	78	76	108	159	102	135	122	132	74	88	103
FLIP 82-195	ICARDA	-	98	97	82	45	155	87	60	118	78	97	106	152	102	135	114	136	74	88	101
FLIP 82-196	ICARDA	-	94	97	80	42	153	88	55	110	73	97	106	154	99	135	114	140	69	88	100
FLIP 82-197	ICARDA	-	107	98	76	43	153	86	55	112	76	104	116	154	99	135	122	140	69	86	102
FLIP 82-199	ICARDA	-	98	100	93	45	156	89	65	120	78	95	119	152	102	135	127	133	77	88	104
FLIP 82-203	ICARDA	-	107	-	79	43	155	86	58	110	74	76	108	154	99	135	122	135	73	86	100
FLIP 82-205	ICARDA	-	69	95	76	43	154	87	55	115	71	95	96	151	92	135	116	119	68	88	96
FLIP 82-208	ICARDA	-	67	95	80	43	154	90	60	119	70	77	99	150	93	135	114	118	75	88	96
FLIP 82-219	ICARDA	-	70	95	86	37	154	87	55	110	74	76	113	151	92	135	116	121	69	88	96
FLIP 82-225	ICARDA	-	91	95	83	42	154	86	58	119	74	95	99	153	102	135	127	140	69	86	100
FLIP 82-228	ICARDA	-	67	95	80	43	154	88	55	118	69	76	106	150	92	135	114	118	75	88	96
FLIP 82-232	ICARDA	-	107	95	76	49	156	87	58	117	75	104	106	154	98	135	116	133	76	88	102
FLIP 82-234	ICARDA	-	70	95	78	43	154	89	55	111	72	75	99	165	98	135	107	118	69	86	96
FLIP 82-236	ICARDA	-	81	97	86	-	154	91	55	118	73	95	108	149	93	135	122	134	72	88	103
FLIP 82-239	ICARDA	-	65	100	81	33	153	87	52	110	74	80	108	164	102	135	122	133	70	86	98
FLIP 82-241	ICARDA	-	86	-	88	44	156	91	67	119	74	76	108	159	99	135	127	137	74	86	101
FLIP 82-245	ICARDA	-	86	100	104	43	154	89	60	119	76	95	113	158	102	135	130	135	75	86	103
FLIP 82-246	ICARDA	-	91	-	80	43	152	91	60	113	72	77	96	161	93	135	122	121	68	88	98
FLIP 82-251	ICARDA	-	86	98	81	43	156	89	55	118	76	97	113	164	92	135	127	132	71	86	101
FLIP 82-254	ICARDA	-	86	105	84	49	157	91	65	120	76	104	113	159	99	135	127	140	77	86	104
FLIP 82-255	ICARDA	-	91	105	86	43	157	89	60	120	75	98	108	159	102	135	122	138	75	86	103
FLIP 82-258	ICARDA	-	76	97	80	49	154	91	55	110	73	78	99	154	93	139	114	133	71	88	97
FLIP 82-259	ICARDA	-	71	100	84	49	155	91	55	110	76	77	99	163	93	135	114	133	72	88	98
FLIP 82-261	ICARDA	-	81	95	80	49	155	91	58	116	74	95	106	154	98	139	116	132	71	88	100
ILC 482	Turkey	47	67	98	78	35	150	85	50	103	67	82	82	151	89	135	108	104	66	86	89
ILC 3279	USSR	51	89	102	101	45	156	90	66	119	76	97	114	160	103	141	127	141	76	87	102
Local check	-	49	66	80	45	41	153	87	50	112	35	79	96	154	95	139	107	112	65	87	-
Location mean		49	86	98	82	41	154	88	57	114	73	88	105	156	97	139	119	131	72	87	

Table 3.6.3. Time to maturity (days) of entries at different locations in the CISN during 1983/84.

ENTRY NAME	ETHIOPIA	IRAN	LEBANON	LIBYA	MEXICO	NEPAL	PAKISTAN					TURKEY	MEAN
	Debre Zeit	Karaj	Terbol	El-Marg	Culiacan	Birgunj	Bahawalpur	Chakwal	Dokri	Islamabad	Tarnab	Ankara	
FLIP 82-96	148	117	98	165	131	146	145	187	151	198	177	134	150
FLIP 82-97	151	117	98	165	130	148	133	187	148	198	179	134	149
FLIP 82-98	148	117	96	165	131	146	142	187	154	198	176	133	149
FLIP 82-100	151	117	96	165	132	144	133	187	149	198	178	133	149
FLIP 82-101	148	117	98	165	131	146	133	187	153	198	178	136	149
FLIP 82-104	154	117	98	165	135	144	134	187	151	198	177	136	150
FLIP 82-112	151	117	96	165	130	146	133	187	155	198	176	134	149
FLIP 82-113	148	121	98	165	131	148	145	187	152	198	178	134	150
FLIP 82-115	96	121	96	165	131	147	142	187	148	198	178	136	145
FLIP 82-117	151	117	96	165	130	147	133	187	153	198	179	134	149
FLIP 82-118	151	117	109	165	133	146	133	187	150	198	178	136	150
FLIP 82-119	149	126	106	165	130	143	133	187	146	198	178	136	150
FLIP 82-121	148	121	96	165	129	144	142	186	145	198	179	133	149
FLIP 82-126	148	117	100	165	131	148	130	183	157	200	182	134	150
FLIP 82-127	140	117	96	165	129	150	142	183	149	198	174	133	148
FLIP 82-128	148	117	96	165	130	143	133	183	148	198	174	133	147
FLIP 82-130	151	-	100	165	133	150	142	186	147	198	178	132	153
FLIP 82-133	140	-	98	165	133	148	147	186	148	198	182	133	153
FLIP 82-138	148	121	98	165	131	145	128	184	151	198	182	136	149
FLIP 82-144	151	-	96	165	134	148	145	186	149	198	178	134	153
FLIP 82-150	96	121	96	165	134	147	133	183	154	198	176	134	145
FLIP 82-152	151	121	98	165	133	147	136	184	153	198	178	134	150
FLIP 82-154	154	117	96	165	130	145	134	184	151	198	182	136	149
FLIP 82-160	140	-	94	165	131	150	142	184	145	198	171	133	150
FLIP 82-161	131	121	98	165	130	148	149	186	151	198	176	134	149
FLIP 82-164	154	126	94	165	130	144	149	184	148	198	176	133	150
FLIP 82-167	151	126	98	165	132	148	142	186	150	200	182	132	151
FLIP 82-169	140	121	106	165	131	146	142	184	149	200	178	135	150
FLIP 82-175	148	126	94	165	130	144	145	184	150	200	178	132	150
FLIP 82-180	154	121	109	165	135	147	149	184	156	200	182	135	153
FLIP 82-181	154	-	103	165	135	148	149	184	157	200	182	135	156
FLIP 82-182	151	121	103	165	130	144	149	184	150	198	178	136	151
FLIP 82-186	140	126	98	165	133	148	149	184	149	198	179	135	150
FLIP 82-188	154	117	98	165	130	148	151	186	151	198	177	134	151
FLIP 82-189	148	121	96	165	129	151	142	184	149	200	178	132	150
FLIP 82-193	154	117	100	165	133	147	151	184	151	200	176	134	151
FLIP 82-194	151	117	106	165	133	147	145	184	156	200	176	-	152
FLIP 82-195	154	121	98	165	131	151	133	184	154	196	178	130	150
FLIP 82-196	148	117	100	165	136	150	147	184	156	200	178	133	151
FLIP 82-197	148	121	96	165	135	147	145	184	153	200	178	129	150
FLIP 82-199	154	121	103	165	133	150	142	184	156	196	178	135	151
FLIP 82-203	148	121	100	165	130	145	147	184	154	200	178	131	150
FLIP 82-205	149	121	96	165	130	151	133	184	153	200	175	131	149
FLIP 82-208	151	121	100	165	128	151	142	186	151	198	174	132	150
FLIP 82-219	149	117	96	165	130	149	133	184	155	196	174	131	148
FLIP 82-225	148	117	98	165	130	147	145	184	155	200	179	132	150
FLIP 82-228	150	121	100	165	129	151	136	186	152	198	174	132	150
FLIP 82-232	151	117	98	165	131	145	142	184	157	196	174	131	149
FLIP 82-234	148	117	94	165	129	147	142	184	158	200	173	131	149
FLIP 82-236	151	-	98	165	126	147	133	186	150	200	177	132	151
FLIP 82-239	151	117	96	165	131	151	142	186	154	200	176	132	150
FLIP 82-241	151	126	106	165	131	150	145	184	156	200	176	135	152
FLIP 82-245	150	126	100	165	132	151	145	184	153	200	178	133	151
FLIP 82-246	151	126	100	165	131	149	133	184	149	200	179	132	150
FLIP 82-251	151	117	98	165	131	151	128	184	158	200	175	130	149
FLIP 82-254	154	117	103	165	133	150	128	184	157	198	182	135	151
FLIP 82-255	150	121	100	165	131	150	133	184	155	200	178	133	150
FLIP 82-258	151	126	100	165	130	149	133	184	151	200	177	132	150
FLIP 82-259	151	117	103	165	131	151	142	184	155	200	179	132	151
FLIP 82-261	150	121	100	165	129	149	133	184	151	200	176	131	149
ILC 482	148	124	94	165	129	146	136	184	150	199	171	130	148
ILC 3279	151	120	108	165	133	148	142	186	155	199	181	135	152
Local check	116	120	95	165	130	138	146	185	152	-	161	131	-
Location mean	147	120	99	165	131	147	140	185	152	199	177	133	

Table 3.6.4. Plant height (cm) of entries at different locations in the CISN during 1983/84.

ENTRY NAME	CANADA	COSTA RICA	EGYPT	ETHIOPIA	IRAN	ITALY	JORDAN	LEBANON	MEXICO	NEPAL	PAKISTAN				SYRIA	TURKEY	MEAN
	Saskatoon	Haradia	Shandweel	Debre Zeit	Karaj	Capalbio	Marow	Terbol	Culiacan	Birgunj	Bahawalpur	Chakwal	Dokri	Islamabad	Tel Hadya	Ankara	
FLIP 82-96	44	58	65	44	37	80	33	44	111	81	53	73	78	94	33	30	60
FLIP 82-97	40	43	65	33	26	60	30	44	100	71	40	79	52	81	31	23	51
FLIP 82-98	42	56	95	31	35	80	31	34	77	61	58	75	54	73	29	24	53
FLIP 82-100	39	46	90	50	26	65	43	40	95	79	47	77	80	87	32	26	58
FLIP 82-101	45	47	65	45	27	73	40	37	90	84	60	82	63	91	32	32	57
FLIP 82-104	41	47	80	35	30	70	29	45	109	73	42	70	54	73	30	30	54
FLIP 82-112	42	49	75	32	26	70	39	40	95	62	40	79	70	81	30	25	53
FLIP 82-113	33	48	55	32	30	45	24	37	95	63	42	74	59	76	29	24	48
FLIP 82-115	37	60	65	34	39	75	32	40	100	80	50	79	69	102	30	27	57
FLIP 82-117	47	65	80	36	31	75	34	40	103	92	50	80	60	81	33	28	58
FLIP 82-118	42	51	65	48	25	70	37	57	97	92	47	83	70	85	34	30	58
FLIP 82-119	43	59	90	-	26	75	43	45	90	74	47	80	66	88	31	28	59
FLIP 82-121	-	65	85	52	36	70	44	46	85	88	63	82	92	80	35	35	63
FLIP 82-126	45	72	85	42	37	65	25	50	90	96	60	82	76	92	31	35	61
FLIP 82-127	39	65	90	40	38	63	35	50	77	74	56	75	95	86	32	32	59
FLIP 82-128	40	-	90	40	42	70	36	48	100	75	50	72	90	91	30	35	61
FLIP 82-130	-	72	50	37	-	70	41	45	85	76	55	77	73	84	32	32	59
FLIP 82-133	-	69	75	43	-	70	34	35	80	81	66	72	72	93	33	31	61
FLIP 82-138	41	59	60	43	37	50	35	43	95	74	50	82	71	80	31	29	55
FLIP 82-144	-	67	55	44	-	75	33	50	75	73	43	77	64	81	29	30	57
FLIP 82-150	41	66	80	47	27	50	43	43	100	69	50	72	92	78	30	29	57
FLIP 82-152	47	74	70	43	26	76	31	52	125	67	55	62	70	82	34	29	59
FLIP 82-154	48	71	80	38	41	65	40	40	104	81	50	72	62	94	34	35	60
FLIP 82-160	-	53	80	34	-	65	29	35	74	61	58	63	61	77	28	28	53
FLIP 82-161	-	70	75	41	32	75	30	46	75	61	60	58	65	83	30	28	55
FLIP 82-164	-	44	75	37	11	70	30	40	95	73	60	72	81	78	29	30	55
FLIP 82-167	-	70	65	38	24	70	35	41	89	75	55	64	61	87	29	30	56
FLIP 82-169	-	69	70	44	32	70	39	42	95	76	67	73	88	88	29	35	61
FLIP 82-175	-	78	40	41	26	75	39	35	90	68	68	74	67	81	28	31	56
FLIP 82-180	-	62	80	48	25	80	42	50	85	71	72	72	70	81	34	34	60
FLIP 82-181	-	74	65	40	-	70	29	40	100	71	60	82	67	81	30	32	60
FLIP 82-182	-	65	60	42	21	80	29	54	106	86	70	62	68	93	29	33	60
FLIP 82-186	-	66	80	42	17	70	34	40	85	75	50	74	64	74	31	30	55
FLIP 82-188	-	74	75	46	27	75	47	45	105	80	71	82	67	83	33	33	63
FLIP 82-189	-	77	100	54	30	75	37	44	110	88	64	82	93	84	33	37	67
FLIP 82-193	-	72	55	42	25	75	30	47	80	64	66	78	60	71	26	28	55
FLIP 82-194	-	81	75	40	32	75	40	37	85	67	50	80	78	70	30	31	58
FLIP 82-195	-	65	65	42	28	70	37	39	80	62	42	62	78	66	31	28	53
FLIP 82-196	-	82	90	42	36	80	38	44	96	70	60	81	82	79	30	33	63
FLIP 82-197	-	53	80	38	25	75	35	37	85	58	63	73	78	60	29	27	54
FLIP 82-199	-	83	85	41	27	80	38	44	100	74	44	43	87	74	30	34	59
FLIP 82-203	-	55	65	41	29	80	36	40	75	65	53	72	67	75	28	31	54
FLIP 82-205	-	70	45	40	27	65	35	38	105	64	48	71	60	61	30	28	52
FLIP 82-208	-	86	85	49	30	80	35	49	100	73	64	72	68	69	32	36	62
FLIP 82-219	-	81	65	35	19	68	30	34	97	73	50	50	88	70	29	31	55
FLIP 82-225	-	68	85	45	33	75	39	32	91	72	55	81	71	68	28	32	58
FLIP 82-228	-	78	65	50	36	75	50	45	87	62	67	81	74	67	35	33	60
FLIP 82-232	-	67	85	45	25	75	24	45	95	76	51	80	78	72	28	29	58
FLIP 82-234	-	72	55	45	17	75	27	40	88	63	53	55	73	70	30	26	53
FLIP 82-236	-	77	55	45	-	78	34	54	85	62	45	65	54	73	34	29	56
FLIP 82-239	-	77	50	43	31	75	36	45	91	80	53	70	81	67	32	32	58
FLIP 82-241	-	86	75	51	25	80	37	56	91	87	57	79	88	81	34	34	64
FLIP 82-245	-	74	65	48	17	70	37	44	104	56	40	63	79	75	30	30	55
FLIP 82-246	-	70	45	41	24	70	29	42	95	63	42	75	74	80	31	33	54
FLIP 82-251	-	84	70	48	34	75	33	48	92	75	46	71	72	83	31	30	59
FLIP 82-254	-	78	75	54	35	80	31	42	103	85	54	63	80	88	30	39	62
FLIP 82-255	-	81	75	45	30	80	49	50	105	81	55	81	70	90	33	36	64
FLIP 82-258	-	77	80	38	18	65	35	47	78	67	46	61	62	74	30	28	54
FLIP 82-259	-	76	75	68	23	80	36	45	100	69	55	62	85	88	31	29	61
FLIP 82-261	-	70	65	33	20	65	27	42	70	61	47	51	68	60	28	25	49
ILC 482	35	59	45	35	21	64	38	37	85	65	45	81	54	89	28	27	51
ILC 3279	51	74	89	53	37	77	43	53	111	89	71	63	101	95	33	39	67
Local check	43	45	84	24	26	65	38	35	63	51	44	61	58	49	28	28	
Location mean	42	67	72	42	28	72	35	43	92	73	54	72	72	79	31	31	

Table 3.6.5. Adjusted seed yield (Y=kg/ha) and rank (R) of entries at different locations in the CISN during 1983/84.

ENTRY NAME	CANADA		ETHIOPIA		IRAN		ITALY		JORDAN		LEBANON		LIBYA		MEXICO		NEPAL		PAKISTAN			
	Saskatoon		Debre Zeit		Karaj		Capalbio		Marow		Terbol		El-Marg		Culiacan		Birgunj		Bahawalpur		Chakwal	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
FLIP 82-96	763	21	44	44	1374	17	1610	22	399	42	1336	43	287	56	2720	45	663	14	197	14	398	51
FLIP 82-97	719	25	94	35	2654	2	1714	11	0	60	1400	37	996	17	2443	50	635	17	169	19	537	44
FLIP 82-98	713	26	38	45	1683	10	1276	51	371	45	1273	49	746	30	2331	53	746	11	166	20	398	51
FLIP 82-100	926	5	94	35	563	40	1381	42	152	55	1400	37	704	32	3762	10	1024	3	127	34	259	61
FLIP 82-101	1088	1	104	33	1243	21	1610	22	352	49	2035	5	412	51	3554	16	413	30	148	25	315	59
FLIP 82-104	884	6	99	34	792	34	1631	17	0	60	2098	4	1079	13	2804	41	774	10	343	4	537	44
FLIP 82-112	676	32	33	47	2083	6	985	61	66	59	1654	16	396	52	2026	61	135	53	132	31	1648	2
FLIP 82-113	641	37	66	40	1889	9	2110	1	0	60	1844	9	1012	16	3554	16	0	58	154	23	1093	9
FLIP 82-115	663	36	66	40	1637	12	1714	11	0	60	1463	32	446	46	2956	33	330	35	211	12	398	51
FLIP 82-117	728	24	33	47	814	33	151	63	228	53	1654	16	421	50	2943	35	801	7	133	30	398	51
FLIP 82-118	790	14	38	45	820	31	1485	35	628	26	1336	43	471	44	2137	56	246	43	127	34	676	31
FLIP 82-119	788	15	33	47	409	45	1776	5	266	51	1273	49	1212	6	3165	28	302	39	216	11	537	44
FLIP 82-121	1012	2	116	28	1923	8	1763	6	841	11	1971	7	336	55	2845	39	404	31	142	28	306	60
FLIP 82-126	676	32	127	24	574	39	1638	15	536	35	1336	43	611	39	3540	19	293	41	15	54	444	50
FLIP 82-127	510	52	155	20	2192	4	1513	31	841	11	1082	60	428	48	3887	7	1043	2	136	29	1417	4
FLIP 82-128	593	43	283	8	2163	5	1721	10	355	47	1462	32	878	23	3234	26	987	4	232	10	1000	12
FLIP 82-130	712	27	188	17	0	55	1138	56	555	32	1336	43	586	40	2568	48	320	36	35	52	1139	8
FLIP 82-133	287	63	121	27	0	55	1367	43	403	41	1463	32	269	58	2873	38	376	32	0	58	861	22
FLIP 82-138	768	19	199	12	1237	22	1554	26	517	37	1400	37	253	60	3123	29	0	58	0	58	1417	4
FLIP 82-144	470	59	344	3	0	55	1679	13	422	40	2162	2	861	24	2734	43	626	18	47	50	1278	7
FLIP 82-150	699	29	360	2	1214	24	1471	36	736	17	1527	25	186	62	3679	13	487	24	0	58	861	22
FLIP 82-152	631	38	299	4	2060	7	1679	13	260	52	1780	11	503	43	2040	59	487	24	57	49	583	42
FLIP 82-154	853	9	199	12	1174	25	1617	19	317	50	1082	60	203	61	2929	36	0	58	62	46	583	42
FLIP 82-160	485	57	227	11	0	55	1346	45	126	58	1145	58	961	21	2234	55	654	15	211	12	722	30
FLIP 82-161	469	60	127	24	733	36	1283	49	549	33	1927	8	984	18	3401	22	422	28	58	47	352	55
FLIP 82-164	404	61	10	51	407	46	1283	49	539	34	1209	53	1276	3	2956	33	589	19	502	2	352	55
FLIP 82-167	554	49	0	52	3367	1	1617	19	587	30	1400	37	801	26	2456	49	506	22	27	53	1046	11
FLIP 82-169	683	31	33	47	938	28	1575	25	615	27	1273	49	643	38	2734	43	478	27	123	36	630	36
FLIP 82-175	833	11	0	52	344	47	1221	54	796	15	1654	16	1126	10	2123	57	839	6	101	39	907	14
FLIP 82-180	623	40	0	52	344	47	1075	58	1034	4	1495	31	851	25	2401	51	533	21	246	8	74	63
FLIP 82-181	710	28	0	52	818	32	1513	31	1015	5	1781	10	1193	7	1484	63	644	16	243	9	491	48
FLIP 82-182	585	45	0	52	630	38	1429	38	520	36	1400	37	468	45	2623	47	783	8	174	18	352	55
FLIP 82-186	365	62	0	52	418	43	1367	43	1082	2	1590	24	1101	11	1665	62	422	28	266	7	630	36
FLIP 82-188	598	42	0	52	1258	20	1242	52	968	8	1654	16	1026	15	3401	22	367	33	128	33	352	55
FLIP 82-189	767	20	0	52	470	42	1513	31	777	16	1717	12	701	33	3748	11	783	8	271	6	630	36
FLIP 82-193	854	8	0	52	1595	13	1533	29	701	22	1527	25	968	20	3040	31	311	38	120	37	630	36
FLIP 82-194	784	16	71	38	1658	11	1617	19	380	43	1262	52	775	29	2063	58	570	20	0	58	630	36
FLIP 82-195	744	22	110	30	1407	16	1533	29	142	56	1516	28	1175	9	2785	42	0	58	0	58	907	14
FLIP 82-196	509	53	294	5	967	26	1242	52	228	53	1643	21	1075	14	2813	40	154	52	80	42	907	14
FLIP 82-197	507	54	0	52	841	30	1471	36	714	18	1643	21	1483	1	3091	30	43	56	327	5	491	48
FLIP 82-199	584	46	0	52	161	51	1200	55	380	43	1199	56	783	27	2646	46	237	46	0	58	769	27
FLIP 82-203	497	55	0	52	790	35	1867	3	571	31	1516	28	1091	12	3869	8	348	34	147	26	907	14
FLIP 82-205	603	41	49	43	1287	18	1763	6	133	57	2151	3	675	35	4119	4	181	50	15	54	907	14
FLIP 82-208	497	55	88	37	893	29	1554	26	494	38	1453	35	658	36	3896	6	0	58	45	51	907	14
FLIP 82-219	574	47	71	38	1573	14	1825	4	923	9	1516	28	975	19	3285	24	487	24	15	54	213	62
FLIP 82-225	809	13	127	24	2458	3	1304	47	1180	1	818	63	783	27	4605	1	320	36	69	45	907	14
FLIP 82-228	586	44	55	42	1281	19	1763	6	828	14	1643	21	658	36	3563	15	0	58	77	44	630	36
FLIP 82-232	474	58	260	9	418	43	1638	15	980	7	1707	15	1266	4	3202	27	681	13	14	57	769	27
FLIP 82-234	558	48	286	6	146	52	1415	39	441	39	1650	20	1176	8	2970	32	913	5	193	15	815	24
FLIP 82-236	733	23	286	6	0	55	1394	41	631	25	1015	62	284	57	4387	2	246	43	157	22	676	31
FLIP 82-239	674	35	192	14	957	27	1103	57	355	47	1713	13	568	41	4123	3	219	48	185	17	1509	3
FLIP 82-241	697	30	192	14	0	55	999	60	593	29	1205	54	343	54	2387	52	246	43	132	31	537	44
FLIP 82-245	835	10	109	31	0	55	1019	59	707	19	1396	42	884	22	3498	20	191	49	105	38	954	13
FLIP 82-246	870	7	164	19	0	55	1290	48	364	46	1142	59	701	33	3248	25	135	53	154	23	676	31
FLIP 82-251	828	12	192	14	677	37	1311	46	603	28	1332	47	534	42	3470	21	163	51	79	43	1093	9
FLIP 82-254	772	17	186	18	209	50	1415	39	707	19	1205	54	51	63	3804	9	24	57	82	41	815	24
FLIP 82-255	676	32	147	22	0	55	1499	34	917	10	1332	47	434	47	4026	5	52	55	91	40	1787	1
FLIP 82-258	551	50	109	31	72	54	1582	24	707	19	1713	13	734	31	3554	16	302	39	158	21	815	24
FLIP 82-259	956	4	142	23	289	49	811	62	841	11	1523	27	384	53	3609	14	274	42	146	27	676	31
FLIP 82-261	516	51	236	10	146	52	1874	2	641	24	2919	1	426	49	3706	12	496	23	189	16	731	29
ILC 482	629	39	150	21	1230	23	1754	9	1042	3	2032	6	1243	5	2914	37	733	12	394	3	889	21
ILC 3279	771	18	111	29	515	41	1550	28	655	23	1181	57	263	59	2031	60	228	47	58	47	667	35
Local check	977	3	548	1	1481	15	1629	18	996	6	1431	36	1355	2	2314	54	3167	1	597	1	1306	6
Location mean	678		122		941		1460		551		1524		733		3049		458		140		748	
C.V.%	34.9		199.1		81.5		12.4		43.3		15.0		42.1		15.7		76.8		164.4		37.4	
L.S.D. at 5% for:																						
Checks	354		383		1125		268		378		335		471		676		672		410		426	
Checks vs. test entries	708		766		2250		537		756		669		943		1353		1344		820		853	
Test entries in the same block	792		856		2515		600		845		748		1054		1512		1502		916		954	
Test entries in different blocks	914		989		2904		693		976		864		1217		1746		1734		1058		1101	
S.E. for:																						
Checks	154		166		488		116		164		145		204		293		291		178		185	
Checks vs. test entries	307		332		976		233		328		290		409		587		583		356		370	
Test entries in the same block	343		371		1091		260		367		324		457		656		651		397		414	
Test entries in different blocks	396		429		1259		301		423		375		528		757		752		459		477	
Entries exceeding local check by a significant margin.	0		0		0		0		0		3		0		13		0		0		0	

Cont'd. 2...

Table 3.6.5. Cont'd. 2.

ENTRY NAME	PAKISTAN						SYRIA		TUNISIA						TURKEY		100-seed(1) weight	MEAN	
	Dokri		Islamabad		Tarnab		Tel Hadya		Beja		El-Kef		Menzel Temime		Ankara				
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	(g)	Y	R
FLIP 82-96	0	60	464	51	298	45	89	46	1290	35	1718	10	100	59	1410	29	31.6	798	53
FLIP 82-97	0	60	1376	3	298	45	0	61	1573	15	1579	19	800	12	742	61	24.2	933	32
FLIP 82-98	2868	6	633	38	604	5	381	5	1173	48	1779	7	175	52	1029	57	25.8	967	19
FLIP 82-100	0	60	1308	4	354	32	19	58	1423	24	1868	3	725	20	933	58	26.2	896	40
FLIP 82-101	268	55	1026	10	381	27	140	39	1323	28	1379	38	600	27	1473	23	29.8	940	28
FLIP 82-104	151	57	851	20	437	17	76	48	2173	1	1418	31	800	12	1410	29	23.7	966	20
FLIP 82-112	151	57	683	35	493	8	241	23	1323	28	1218	49	75	61	1422	27	28.3	813	51
FLIP 82-113	134	59	1708	1	270	49	133	41	1540	17	1279	46	500	32	775	60	24.0	984	18
FLIP 82-115	2301	13	620	41	437	17	57	49	1140	50	1868	3	100	59	787	59	22.8	905	38
FLIP 82-117	451	54	670	37	437	17	165	34	2073	3	1568	20	400	41	1270	40	25.3	807	52
FLIP 82-118	0	60	989	12	243	56	0	61	1740	11	1129	52	325	45	1219	44	-	758	58
FLIP 82-119	1651	22	326	57	465	12	298	16	2023	4	1668	12	75	61	1143	49	25.2	928	34
FLIP 82-121	2007	15	718	30	391	24	32	53	773	60	1118	54	725	20	1490	20	25.6	995	16
FLIP 82-126	923	39	912	17	113	63	6	59	873	58	818	60	850	8	1712	10	-	842	46
FLIP 82-127	2798	8	887	18	669	2	152	36	1723	12	1768	8	700	23	1738	7	28.8	1244	1
FLIP 82-128	2948	4	705	32	419	22	32	53	1823	6	1318	42	1250	1	1268	41	30.8	1193	2
FLIP 82-130	632	48	49	63	446	15	114	43	1190	43	1618	16	775	16	1738	7	24.6	797	54
FLIP 82-133	1623	23	924	16	169	62	248	21	1390	25	1667	14	425	38	1299	37	28.4	830	49
FLIP 82-138	715	44	1455	2	335	36	133	41	1190	43	1968	1	950	2	1109	53	27.0	964	23
FLIP 82-144	1523	26	961	14	613	4	413	3	1223	40	1418	31	875	7	1636	12	21.9	1015	12
FLIP 82-150	1940	16	1030	9	335	36	286	18	1673	13	668	61	650	25	1395	31	26.6	1010	13
FLIP 82-152	1340	30	818	23	224	58	495	2	1573	15	1168	50	750	18	1109	53	21.7	940	28
FLIP 82-154	1240	31	849	21	363	31	114	43	773	60	1518	22	550	30	1141	50	28.2	819	50
FLIP 82-160	1190	34	318	59	446	15	140	39	1623	14	368	62	600	27	1141	50	23.1	734	61
FLIP 82-161	1921	17	628	39	335	36	303	14	823	59	1129	52	850	8	2034	1	24.8	965	21
FLIP 82-164	2396	11	403	54	391	24	347	9	1290	35	1468	25	850	8	700	62	24.5	914	35
FLIP 82-167	3262	3	966	13	335	36	220	28	1190	43	1668	12	475	33	1831	4	27.4	1174	4
FLIP 82-169	4512	1	953	15	280	47	207	30	990	56	1329	40	450	36	1875	3	28.2	1070	8
FLIP 82-175	2946	5	328	56	252	55	290	17	1173	48	1468	25	900	6	1653	11	27.2	998	15
FLIP 82-180	1821	19	460	52	307	43	163	35	1290	35	1818	5	750	18	1412	28	-	879	43
FLIP 82-181	2521	9	1022	10	307	43	220	28	1890	5	1318	42	925	5	1259	43	25.6	1019	10
FLIP 82-182	2396	11	1053	8	280	47	201	31	1140	50	1468	25	150	57	1431	26	24.4	899	39
FLIP 82-186	2479	10	728	29	391	24	239	24	1790	7	1168	50	550	30	1475	22	21.6	933	33
FLIP 82-188	1579	24	691	34	585	6	322	12	1073	52	1418	31	950	2	1716	9	26.6	1017	11
FLIP 82-189	4396	2	560	46	335	36	195	32	-	-	868	59	400	41	1831	4	23.6	1109	7
FLIP 82-193	1496	28	803	25	474	11	239	24	1523	19	968	55	800	12	1132	52	23.8	985	17
FLIP 82-194	826	42	541	47	456	13	25	56	1323	28	-	-	325	45	0	63	28.0	739	60
FLIP 82-195	1234	32	535	49	344	34	146	37	1790	7	1918	2	675	24	1039	56	27.6	947	26
FLIP 82-196	684	46	497	50	261	53	38	50	1490	23	1568	20	425	38	1338	34	20.0	853	45
FLIP 82-197	626	49	785	26	317	41	89	46	1790	7	1268	47	800	12	1579	13	25.6	940	30
FLIP 82-199	893	40	810	24	261	53	6	59	1323	28	1468	25	300	47	1312	36	-	754	59
FLIP 82-203	643	47	610	43	456	13	0	61	-	-	879	58	475	33	1465	24	-	896	41
FLIP 82-205	2126	14	591	44	372	29	311	13	2090	2	1418	31	-	-	1579	13	29.3	1132	6
FLIP 82-208	576	52	622	40	344	34	146	37	1773	10	1618	16	300	47	1357	33	35.2	906	37
FLIP 82-219	1784	20	778	28	483	9	38	50	1323	28	1318	42	950	2	1515	18	25.2	1034	9
FLIP 82-225	1676	21	1135	7	372	29	32	53	1523	19	1468	25	825	11	1515	18	25.6	1154	5
FLIP 82-228	834	41	616	42	317	41	279	20	1040	54	1379	39	475	33	1769	6	31.4	936	31
FLIP 82-232	1084	37	1203	6	511	7	25	56	1223	40	968	55	775	16	1960	2	20.8	1008	14
FLIP 82-234	1421	29	1243	5	437	17	345	10	1023	55	1429	30	425	38	1456	25	23.0	965	22
FLIP 82-236	1154	35	537	48	187	61	224	27	1523	21	1418	31	175	53	1202	45	29.4	854	44
FLIP 82-239	1512	27	374	55	409	23	402	4	1190	43	918	57	575	29	1297	38	25.7	962	24
FLIP 82-241	796	43	712	31	381	27	358	7	1073	52	1318	42	175	53	1481	21	28.9	717	62
FLIP 82-245	1146	36	705	32	270	49	110	45	1540	17	1718	11	400	41	1393	32	-	894	42
FLIP 82-246	587	50	324	58	270	49	243	22	1323	28	1618	16	275	49	1266	42	27.6	771	57
FLIP 82-251	1229	33	780	27	437	17	301	15	1323	28	1329	40	450	36	1094	55	36.4	907	36
FLIP 82-254	579	51	868	19	215	60	231	26	1190	43	1818	6	200	51	1551	15	27.6	838	47
FLIP 82-255	1062	38	680	36	243	56	345	10	1290	35	1418	31	350	44	1551	15	30.0	942	27
FLIP 82-258	171	56	587	45	354	32	364	6	1273	39	1518	22	175	53	1177	48	32.5	838	47
FLIP 82-259	704	45	68	62	270	49	180	33	923	57	1518	22	175	53	1189	46	28.8	773	56
FLIP 82-261	487	53	212	60	770	1	358	7	1340	27	1729	9	150	58	1189	46	31.2	953	25
ILC 482	2867	7	431	53	667	3	284	19	1380	26	1650	15	615	26	1533	17	25.6	1181	3
ILC 3279	1577	25	849	21	222	59	33	52	1220	42	1240	48	230	50	1286	39	-	773	55
Local check	1868	18	80	61	478	10	508	1	1520	22	1413	37	725	20	1314	35	32.7	-	
Location mean	1408		731		375		193		1387		1408		536		1352				
C.V.%	63.9		25.4		25.3		86.9		20.4		18.2				17.3				
L.S.D. at 5% for:																			
Checks	1402		255		143		259		403		369				343				
Checks vs. test entries	2805		509		286		519		807		739				686				
Test entries in the same block	3136		569		320		580		902		826				766				
Test entries in different blocks	3621		658		370		670		1042		954				885				
S.E. for:																			
Checks	608		110		62		113		175		160				149				
Checks vs. test entries	1216		221		124		225		350		320				297				
Test entries in the same block	1360		247		139		252		391		358				332				
Test entries in different blocks	1570		285		160		291		452		414				384				
Entries exceeding local check by a significant margin.	0		44		1		0		0		0				1				

(1) 100 seed weight for Syria - Tel Hadya.

Table 3.6.6. The five heaviest seed yielding entries at the individual locations in CISN during 1983/84.

RANK	CANADA	ETHIOPIA	IRAN	ITALY	JORDAN	LEBANON	LIBYA	MEXICO	NEPAL
	Saskatoon	Debre Zeit	Karaj	Capalbio	Marow	Terbol	El-Marg	Culiacan	Birgunj
1	FLIP 82-101	Local check	FLIP 82-167	FLIP 82-113	FLIP 82-225	FLIP 82-261	FLIP 82-197	FLIP 82-225	Local check
2	FLIP 82-121	FLIP 82-150	FLIP 82-97	FLIP 82-261	FLIP 82-186	FLIP 82-144	Local check	FLIP 82-236	FLIP 82-127
3	Local check	FLIP 82-144	FLIP 82-225	FLIP 82-203	ILC 482	FLIP 82-205	FLIP 82-164	FLIP 82-239	FLIP 82-100
4	FLIP 82-259	FLIP 82-152	FLIP 82-127	FLIP 82-219	FLIP 82-180	FLIP 82-104	FLIP 82-232	FLIP 82-205	FLIP 82-128
5	FLIP 82-100	FLIP 82-196	FLIP 82-128	FLIP 82-119	FLIP 82-181	FLIP 82-101	ILC 482	FLIP 82-255	FLIP 82-234

Cont'd. ...

RANK	PAKISTAN					SYRIA	TUNISIA			TURKEY
	Bahawalpur	Chakwal	Dokri	Islamabad	Tarnab	Tel Hadya	Beja	El-Kef	Menzel Temime	Ankara
1	Local check	FLIP 82-255	Flip 82-169	FLIP 82-113	FLIP 82-261	Local check	FLIP 82-104	FLIP 82-138	FLIP 82-128	FLIP 82-161
2	FLIP 82-164	FLIP 82-112	FLIP 82-189	FLIP 82-138	FLIP 82-127	FLIP 82-152	FLIP 82-205	FLIP 82-195	FLIP 82-188	FLIP 82-232
3	ILC 482	FLIP 82-239	FLIP 82-167	FLIP 82-97	ILC 482	FLIP 82-144	FLIP 82-117	FLIP 82-100	FLIP 82-219	FLIP 82-169
4	FLIP 82-104	FLIP 82-127 (1)	FLIP 82-128	FLIP 82-100	FLIP 82-144	FLIP 82-239	FLIP 82-119	FLIP 82-115	FLIP 82-138	FLIP 82-167
5	FLIP 82-197	FLIP 82-138	FLIP 82-175	FLIP 82-234	FLIP 82-98	FLIP 82-98	FLIP 82-181	FLIP 82-180	FLIP 82-181	FLIP 82-189

(1) The brackets indicate entries having the same rank.

height are given in Tables 3.6.2, 3.6.3, and 3.6.4 respectively. Flowering was earliest at Karaj in Iran (41 days) and was closely followed by Saskatoon in Canada (49 days) and Terbol in Lebanon (57 days). The flowering was, however, very late at Chakwal in Pakistan (156 days) and Capalbio in Italy (154 days). Among the entries, ILC 482 flowered earliest in 89 days and was closely followed by FLIP 82-104 and FLIP 82-119 flowering in 93 days. The mean time to flowering and time to maturity for different entries ranged from 89 to 107 days and 145 to 156 days, respectively. The plant height was least at Karaj in Iran (28 cm), Tel Hadya in Syria (31 cm) and Ankara in Turkey (31 cm). Whereas at Mexico, maximum plant height was noted (92 cm). Among the entries averaged over locations, ILC 3279 and FLIP 82-189 were tallest with 67 cm height, and FLIP 82-113 was the shortest with 48 cm.

The adjusted seed yields of entries are presented in Table 3.6.5. Highest yield of 3049 kg/ha was recorded at Culiacan in Mexico and the other high yielding locations included Terbol in Lebanon, Capalbio in Italy, Dokri in Pakistan, El-Kef and Beja in Tunisia. At some of the locations namely, Debre Zeit in Ethiopia, Bahawalpur in Pakistan, Tel Hadya in Syria, Karaj in Iran and Birgunj in Nepal, the CVs were very high. The ANOVA of the experimental design revealed that at locations namely Terbol (Lebanon), Culiacan (Mexico), Islamabad and Tarnab (Pakistan), and Ankara (Turkey), 3, 13, 44, 1 and 1 entries, respectively, exceeded the local check in yield by a significant margin. The 100-seed weight of the entries varied from 20:0 to 36.4 g. The five heaviest seed yielding entries at different locations are given in Table 3.6.6.

3.7. CHICKPEA INTERNATIONAL F_3 TRIAL MEDITERRANEAN REGION (CIF_3T-MR)

Material

The material for the Chickpea International F_3 Trial - MR comprised of 21 F_3 populations which were derived from different crosses, and three checks. Two of the checks, namely ILC 482 and ILC 3279 was supplied by ICARDA and the third was to be added by the cooperator. The material was assumed to provide a wide range of variation within which the cooperators were free to practice their own selection.

Methods and Management

The trial design was a randomised complete block with three replications. The suggested plot size was 4 rows, 4 meter long with an inter- and intra row spacings of 30 - and 10 cm respectively. Twenty sets of trials were distributed to cooperators in 14 countries. The results were, however, received back for 9 trials and 8 were worth

Table 3.7.1. Agronomic data for different locations in the CIF_3T-MR during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha)			Irrigation	Insecticide/ Fungicide/ Herbicide
				N	P_2O_5	K_2O		
BULGARIA	Toshevo	19.4.1984	106	30	60			Aphalon-Benlate Calixin M-Actellic
CANADA	Saskatoon	22.5.1984	115					Treflan
CHILE	Chillan	16.8.1984	154		90			Linvron
ECUADOR	Pichincha	1.12.1983	-					
ITALY	Capalbio	6.12.1983	239	40	100			Tribunil
SYRIA	Tel Hadya	25.11.1983	184		50			
TURKEY	Ankara	28.2.1984	134	20	60			Basudine

Table 3.7.2. Time to flowering (days) of entries at different locations in CIF_3T-MR during 1983/84.

CROSS NO. X82TH	PEDIGREE	BULGARIA Toshevo	CANADA Saskatoon	CHILE Chillan	ECUADOR Pichincha	ITALY Capalbio	SYRIA Tel Hadya	TURKEY Ankara	MEAN
67	ILC 2593 X ILC 191	54	53	94	94	154	134	92	96
68	ILC 3394 X ILC 3279	54	49	91	95	153	134	88	95
70	ILC 3395 X ILC 3279	53	47	88	85	153	133	88	92
76	ILC 2956 X ILC 295	53	50	93	94	153	134	88	95
80	ILC 3346 X ILC 295	53	48	91	91	152	132	88	94
82	ILC 196 X ILC 482	52	47	91	83	152	132	88	92
87	ILC 3279 X ILC 249	54	48	93	93	153	133	92	95
88	ILC 3279 X ILC 1407	51	47	91	71	152	131	88	90
102	ILC 215WH X ILC 3279JH	53	46	91	95	154	134	92	95
105	ILC 3279WH X ILC 3394	53	48	91	90	153	134	92	94
110	ILC 200 X ILC 484	53	46	91	76	151	130	88	91
111	ILC 200 X ILC 482	53	48	93	81	152	131	88	92
121	ILC 182 X ILC 484	53	46	91	90	152	131	88	93
125	ILC 3346 X ILC 480	53	49	93	93	155	134	92	96
127	ILC 482 X ILC 196	53	48	91	79	153	132	88	92
128	ILC 482 X ILC 3279	53	48	91	85	153	132	88	93
134	(ILC 92 X ILC 194) X ILC 72	53	47	93	95	154	133	92	95
136	(ILC 92 X ILC 484) X ILC 3279	52	47	91	84	151	131	88	92
164	(ILC 1920 X ILC 482) X ILC 2956	54	47	94	95	153	132	92	95
168	(ILC 482 X ILC 202) X ILC 482	52	46	88	76	150	130	88	90
169	(ILC 3279 X ILC 484) X ILC 3279	53	48	93	94	152	132	92	95
ILC 482		53	46	91	77	150	129	88	91
ILC 3279		57	53	95	-	157	136	92	98
Local check		54	50	91	-	151	-	86	-
Location mean		53	48	92	87	153	127	89	

Table 3.7.3. Time to maturity (days) of entries at different locations in CIF_3T-MR during 1983/84.

ENTRY	BULGARIA	CHILE	SYRIA	TURKEY	MEAN
	Toshevo	Chillan	Tel Hadya	Ankara	
X82TH 67	104	150	184	134	143
X82TH 68	103	150	183	133	142
X82TH 70	103	148	184	134	142
X82TH 76	102	150	183	133	142
X82TH 80	103	150	183	133	142
X82TH 82	102	150	183	131	142
X82TH 87	103	150	183	130	142
X82TH 88	102	150	181	128	140
X82TH 102	103	150	183	132	142
X82TH 105	103	150	183	132	142
X82TH 110	100	150	180	129	140
X82TH 111	101	150	182	128	140
X82TH 121	101	150	182	130	141
X82TH 125	103	150	184	132	142
X82TH 127	103	150	183	130	142
X82TH 128	102	150	183	131	142
X82TH 134	103	150	184	133	143
X82TH 136	103	150	182	131	142
X82TH 164	102	152	183	132	142
X82TH 168	100	148	183	128	140
X82TH 169	103	150	183	130	142
ILC 482	98	150	182	126	139
ILC 3279	106	154	184	134	145
Local check	103	150	-	124	-
Location mean	102	150	175	131	

Table 3.7.4. Plant height (cm) of entries at different locations in CIF_3T-MR during 1983/84.

ENTRY	BULGARIA	CANADA	CHILE	ITALY	SYRIA	TURKEY	MEAN
	Toshevo	Saskatoon	Chillan	Capalbio	Tel Hadya	Ankara	
X82TH 67	41	42	65	70	53	39	52
X82TH 68	40	50	75	75	52	34	54
X82TH 70	46	44	63	73	57	41	54
X82TH 76	49	42	70	77	53	39	55
X82TH 80	42	39	65	80	56	40	54
X82TH 82	34	38	62	77	53	39	51
X82TH 87	43	41	64	70	60	38	53
X82TH 88	35	43	65	77	58	39	53
X82TH 102	41	49	66	73	58	40	55
X82TH 105	43	38	68	72	55	38	52
X82TH 110	33	34	65	55	49	36	45
X82TH 111	34	37	60	62	51	35	47
X82TH 121	38	37	60	63	51	35	47
X82TH 125	39	39	67	72	55	38	52
X82TH 127	44	36	65	75	54	37	52
X82TH 128	35	40	65	75	56	38	52
X82TH 134	42	40	66	73	57	40	53
X82TH 136	36	34	66	63	54	40	49
X82TH 164	43	44	69	67	58	37	53
X82TH 168	43	37	60	65	50	35	48
X82TH 169	39	45	69	70	56	39	53
ILC 482	26	34	55	53	41	29	40
ILC 3279	51	48	73	83	70	41	61
Local check	43	42	53	67	-	34	-
Location mean	40	41	65	70	52	38	

Table 3.7.5. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in CIF_3T-MR during 1983/84.

CROSS NO. X82TH	PEDIGREE	BULGARIA Toshevo		CANADA Saskatoon		CHILE Chillan		ITALY Capalbio		SYRIA Tel Hadya		TURKEY Ankara		TUNISIA Beja		TUNISIA El-Kef		100-seed[1/] weight (g)	MEAN	
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R		Y	R
67	ILC 2593 X ILC 191	3160	16	6119	13	1216	8	3924	15	989	23	1498	8	1208	6	1325	21	31.3	2430	13
68	ILC 3394 X ILC 3279	3181	14	4164	24	1279	6	3931	14	1424	21	1462	10	1258	3	1550	11	31.1	2281	21
70	ILC 3395 X ILC 3279	3521	3	6025	15	956	19	4243	4	1310	22	1598	6	825	13	1542	14	31.6	2503	17
76	ILC 2956 X ILC 295	3118	18	7008	2	1404	1	4160	7	1506	17	1600	5	817	14	1208	22	31.3	2603	6
80	ILC 3346 X ILC 295	3458	5	5622	20	1112	12	3903	16	1495	19	1638	4	1025	7	1750	1	28.5	2500	18
82	ILC 196 X ILC 482	3063	20	6081	14	1112	12	4167	6	1719	13	1533	7	1292	2	1650	3	27.8	2577	7
87	ILC 3279 X ILC 249	3382	8	5450	22	1297	4	3938	13	1887	6	1479	9	883	11	1567	8	29.1	2485	19
88	ILC 3279 X ILC 1407	3181	14	6747	4	927	21	4417	2	1876	7	1381	17	658	20	1650	3	22.4	2605	5
102	ILC 215WH X ILC 3279 JH	3396	6	6619	6	997	18	4000	11	1498	18	1383	16	767	16	1600	6	29.4	2533	9
105	ILC 3279WH X ILC 3394	3146	17	5856	18	1341	2	3715	19	1446	20	1449	11	975	8	1475	18	30.4	2425	14
110	ILC 200 X ILC 484	2938	24	5942	17	1146	10	3403	23	1913	5	1200	22	750	17	1525	15	20.2	2352	20
111	ILC 200 X ILC 482	3000	21	5494	21	1070	17	4056	9	2030	3	1390	15	800	15	1517	17	23.0	2420	15
121	ILC 182 X ILC 484	3319	10	5969	16	1094	14	3646	20	2130	2	1313	21	942	9	1550	11	24.7	2495	11
125	ILC 3346 X ILC 480	3201	13	6486	10	1292	5	3799	18	1586	14	1438	13	575	22	1592	7	29.2	2496	10
127	ILC 482 X ILC 196	2951	23	6525	9	1206	9	3986	12	1868	8	1348	19	667	19	1383	20	27.6	2492	12
128	ILC 482 X ILC 3279	3368	9	6142	12	1078	16	4104	8	1994	4	1443	12	525	23	1450	19	29.3	2513	16
134	(ILC 92 X ILC 194) X ILC 72	3243	12	6572	7	1146	10	4028	10	1581	15	1359	18	892	10	1558	10	25.9	2547	8
136	(ILC 92 X ILC 484) X ILC 3279	3708	1	5792	19	1258	7	3639	21	1740	12	1656	3	1500	1	1567	8	28.8	2608	4
164	(ILC 1920 X ILC 482) X ILC 2956	3389	7	6175	11	1086	15	4215	5	2197	1	1671	2	742	18	1550	11	29.0	2628	3
168	(ILC 482 X ILC 202) X ILC 482	3597	2	6686	5	940	20	4507	1	1824	9	1730	1	850	12	1692	2	29.2	2728	1
169	(ILC 3279 X ILC 484) X ILC 3279	3465	4	6969	3	1318	3	4326	3	1814	10	1413	14	1217	5	967	24	30.7	2686	2
ILC 482		3278	11	4379	23	654	24	3500	22	1797	11	1038	24	1243	4	1525	15	30.4	2177	23
ILC 3279		3111	19	6569	8	865	22	3285	24	1557	16	1319	20	508	24	1025	23	30.5	2280	22
Local check		2972	22	7222	1	786	23	3806	17	0	24	1052	23	625	21	1642	5	-	-	-
Location mean		3256		6109		1107		3946		1633		1433		897		1494				
C.V.%		11.7		19.3		22.3		8.6		17.9		6.2		64.1		17.0				
L.S.D. at 5%		NS		NS		NS		557		480		145		NS		NS				
S.E.		220.8		679.0		142.7		195.7		168.6		50.8		332.1		146.8				
No. of entries significantly exceeding the local check		-		-		-		2		23		22		-		-				

1/ Based on Tel Hadya - Syria only.

Table 3.7.6. The five heaviest seed yielding entries at the individual locations in CIF_3T-MR during 1983/84.

RANK	BULGARIA	CANADA	CHILE	ITALY	SYRIA	TUNISIA		TURKEY
	Toshevo	Saskatoon	Chillan	Capalbio	Tel Hadya	Beja	El-Kef	Ankara
1	X82TH 136	Local check	X82TH 76	X82TH 168	X82TH 164	X82TH 136	X82TH 80	X82TH 168
2	X82TH 168	X82TH 76	X82TH 105	X82TH 88	X82TH 121	X82TH 82	X82TH 168	X82TH 164
3	X82TH 70	X82TH 169	X82TH 169	X82TH 169	X82TH 111	X82TH 68	X82TH 82 (1)	X82TH 136
4	X82TH 169	X82TH 88	X82TH 87	X82TH 70	X82TH 128	ILC 482	X82TH 88	X82TH 80
5	X82TH 80	X82TH 168	X82TH 125	X82TH 164	X82TH 110	X82TH 169	Local check	X82TH 76

(1) The bracket indicate entries having the same rank.

analysis. The agronomic details supplied by the cooperators are given in Table 3.7.1.

Results and Discussion

The data on time to flowering, time to maturity and plant height are given in Tables 3.7.2, 3.7.3 and 3.7.4, respectively. The cross means averaged over locations for time to flowering, time to maturity and plant height ranged from 90 to 96 days, 140 to 143 days, and 47 to 55 cm, respectively.

The mean seed yield of the F_3 crosses and checks at each location is given in Table 3.7.5. Saskatoon (Canada), Capalbio (Italy), and Toshevo (Bulgaria) were the high yielding locations with location mean of 6109, 3946 and 3256 kg/ha, respectively. At Saskatoon (Canada) as high as 7.2 tons/ha seed yield was recorded for the local check which was closely followed by X82TH 76, X82TH 169 and X82TH 88. In general, a large number of F_3 populations exceeded the checks. On the basis of average over locations, X82TH 168, X82TH 169, X82TH 164, X82TH 136 and X82TH 88 were the top yielders. The five best entries at each location are given in Table 3.7.6.

3.8. CHICKPEA INTERNATIONAL F_3 TRIAL SUB-TROPICAL REGION (CIF_3T-STR)

Material

The material for the Chickpea International F_3 Trial Sub-tropical region comprised of 21 F_3 populations derived from different crosses and three checks. Two of the checks, ILC 482 and ILC 3279 were supplied by ICARDA and the third was to be added by the cooperator. The material was assumed to provide a wide range of variation within which the cooperators were free to practice their own selection.

Methods and Management

The trial design was a randomised complete block with three replications. The suggested plot size was 4 rows, each 4 m long with inter- and intra row spacings of 30 - and 10 cm, respectively.

Fourteen sets of trials were distributed to the cooperators in 9 countries. The results were, however, received for 7 and are reported. The agronomic details provided by cooperators are given in Table 3.8.1.

Results and Discussion

The data on time to flowering, time to maturity and plant height are given in Table 3.8.2. The cross means averaged over locations for time to flowering, time to maturity and plant height ranged from 106 days for X82TH 65 to 120 days for X82TH 91; 163 days for X82TH 13, X82TH 100 and X82TH 156 to 167 days for X82TH 91, and

Table 3.8.1. Agronomic data for different locations in the CIF_3T-W-STR during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha)			Irrigation
				N	P_2O_5	K_2O	
EGYPT	Giza	5.11.1983	-	36	72		5
LEBANON	Terbol	20.11.1983	190		50		
PAKISTAN	Islamabad	24.10.1983	190				
SUDAN	Shambat	12.12.1983	105	43			7
SYRIA	Tel Hadya	25.11.1983	185		50		

Table 3.8.2. Time to flowering (days), time to maturity (days) and plant height (cm) of entries at different locations in CIF_3T-STR during 1983/84.

ENTRY NAME		Time to flowering					Time to maturity					Plant height				
CROSS NO.	PEDIGREE	LEBANON	PAKISTAN	SUDAN	SYRIA	MEAN	LEBANON	PAKISTAN	SUDAN	SYRIA	MEAN	EGYPT	LEBANON	PAKISTAN	SYRIA	MEAN
X82TH		Terbol	Islamabad	Shambat	Tel Hadya		Terbol	Islamabad	Shambat	Tel Hadya		Giza	Terbol	Islamabad	Tel Hadya	
X82TH 2	ILC 191 X ILC 295	135	126	58	132	113	185	186	104	183	165	95	64	66	48	68
X82TH 13	ILC 2380 X ILC 249	123	129	58	131	110	184	186	100	180	163	86	68	65	47	67
X82TH 61	ILC 95 X ILC 191	145	136	57	135	118	187	186	103	185	165	98	68	66	53	71
X82TH 65	ILC 1250 X ILC 191	123	123	47	132	106	189	186	98	184	164	93	72	66	50	70
X82TH 77	ILC 3346 X ILC 464	144	135	48	135	116	190	186	103	184	166	99	78	75	55	77
X82TH 78	ILC 3346 X ILC 249	131	132	61	133	114	186	186	102	183	164	95	76	73	51	74
X82TH 81	ILC 196 X ILC 484	128	129	55	131	111	186	186	102	181	164	104	72	69	48	73
X82TH 86	ILC 3279 X ILC 464	144	135	63	135	119	190	186	101	184	165	98	78	81	51	77
X82TH 91	ILC 202 X ILC 464	142	135	68	134	120	190	190	105	184	167	95	73	71	57	74
X82TH 92	ILC 202 X ILC 249	128	130	57	132	112	186	186	104	182	165	87	77	63	55	71
X82TH 98	ILC 202WH X ILC 3394	146	133	60	133	118	187	186	104	184	165	106	72	71	50	75
X82TH 99	ILC 202WH X ILC 3395	124	127	47	132	108	190	186	97	184	164	102	73	61	48	71
X82TH 100	ILC 202WH X ILC 3396	144	125	48	131	112	186	186	97	184	163	100	75	69	52	74
X82TH 137	(ILC 97 X ILC 194) X ILC 2956	144	133	63	135	119	189	190	103	184	167	88	81	64	60	73
X82TH 146	(ILC 445 X ILC 482) X ILC 202	130	131	61	132	114	190	186	105	183	166	86	78	70	52	72
X82TH 149	(ILC 272 X ILC 482) X ILC 2956	135	129	61	133	115	187	186	101	184	165	92	69	80	95	74
X82TH 152	(ILC 202 X ILC 256) X ILC 482	126	126	61	131	111	186	186	102	182	164	92	66	67	50	69
X82TH 156	(ILC 3279 X ILC 484) X ILC 194	124	124	58	131	109	184	186	102	181	163	90	70	73	44	69
X82TH 158	(ILC 480 X ILC 72) X ILC 482	128	127	54	131	110	185	186	105	183	165	83	70	74	49	69
X82TH 160	(ILC 610 X ILC 72) X ILC 165	131	132	60	134	114	189	186	103	184	166	100	73	70	48	73
X82TH 165	(ILC 1920 X ILC 3279) X ILC 484	124	130	58	130	111	186	190	104	182	166	84	67	62	43	64
ILC 482		121	121	60	130	108	183	186	98	182	162	77	61	60	39	59
ILC 3279		148	135	62	137	121	187	186	104	184	165	110	84	73	68	84
Local check		126	125	48	-	-	187	186	92	-	-	88	57	57	-	-
Location mean		133	129	57	127		187	187	102	176		94	72	69	49	

Table 3.8.3. Seed yield (Y=kg/ha) and rank (R) of entries in CIF_3T-STR during 1983/84.

ENTRY NAME		EGYPT		LEBANON		PAKISTAN		SUDAN		SYRIA		TUNISIA				100-seed[1/] weight	MEAN	
CROSS NO. X82TH	PEDIGREE	Giza		Terbol		Islamabad		Shambat		Tel Hadya		Beja		El-Kef				
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	(g)	Y	R
X82TH 2	ILC 191 X ILC 295	1354	4	2333	8	3825	2	87	9	1243	19	1025	9	1183	14	26.6	1579	5
X82TH 13	ILC 2380 X ILC 249	1456	3	2317	11	3159	14	57	15	1935	2	425	21	1158	17	21.6	1501	11
X82TH 61	ILC 95 X ILC 191	1177	10	2167	16	3397	9	37	21	1286	16	708	14	1292	12	30.3	1438	14
X82TH 65	ILC 1250 X ILC 191	1120	13	2087	19	3317	11	153	5	1052	22	700	15	1133	19	29.3	1366	18
X82TH 77	ILC 3346 X ILC 464	1802	1	2325	10	4254	1	36	22	1324	14	1775	1	1525	3	34.6	1863	1
X82TH 78	ILC 3346 X ILC 249	1009	18	2516	2	3698	4	57	15	1759	7	1083	7	1200	13	29.5	1617	4
X82TH 81	ILC 196 X ILC 484	1469	2	2119	18	3254	12	184	3	1621	9	1558	3	1158	17	27.0	1623	3
X82TH 86	ILC 3279 X ILC 464	849	22	2429	5	3587	7	0	23	1521	12	908	10	1300	11	35.9	1513	10
X82TH 91	ILC 202 X ILC 464	865	21	2246	14	3460	8	47	18	1259	18	1200	4	1317	10	33.1	1485	12
X82TH 92	ILC 202 X ILC 249	1293	5	2476	4	2317	22	69	13	1902	4	358	23	1400	6	28.7	1402	16
X82TH 98	ILC 202WH X ILC 3394	1196	9	1952	22	2175	24	69	13	1098	20	1175	6	1000	22	29.3	1238	23
X82TH 99	ILC 202WH X ILC 3395	1233	8	2190	15	2778	18	208	2	884	23	283	24	1442	4	33.7	1288	21
X82TH 100	ILC 202WH X ILC 3396	787	23	2278	13	2786	17	135	7	1317	15	600	18	1075	20	35.8	1283	22
X82TH 137	(ILC 97 X ILC 194) X ILC 2956	1087	15	1905	23	2635	19	43	20	1554	11	692	16	1175	15	28.5	1299	20
X82TH 146	(ILC 445 X ILC 482) X ILC 202	1039	17	2063	20	2810	16	47	18	1510	13	683	17	1367	7	30.9	1360	19
X82TH 149	(ILC 272 X ILC 482) X ILC 2956	915	19	2508	3	3683	5	49	17	1854	5	583	19	1358	8	32.3	1564	7
X82TH 152	(ILC 202 X ILC 256)XILC 482	885	20	2333	8	3667	6	73	12	1976	1	450	20	1575	2	28.9	1566	6
X82TH 156	(ILC 3279 X ILC 484) X ILC 194	1175	11	2341	7	2286	23	139	6	1754	8	1033	8	1608	1	21.9	1477	13
X82TH 158	(ILC 480 X ILC 72) X ILC 482	1045	16	2159	17	2635	19	83	10	1914	3	783	12	1442	4	28.4	1437	15
X82TH 160	(ILC 610 X ILC 72) X ILC 165	1139	12	2429	5	3825	2	74	11	1081	21	783	12	1333	9	30.9	1523	9
X82TH 165	(ILC 1920 X ILC 3279) X ILC 484	1251	7	2310	12	3349	10	159	4	1589	10	908	10	1167	16	28.5	1533	8
ILC 482		1110	14	2651	1	3254	12	97	8	1263	17	425	21	950	24	29.3	1393	17
ILC 3279		1256	6	2000	21	2556	21	-		1786	6	1183	5	967	23	29.8	1625	2
Local check		681	24	1857	24	3095	15	667	1	0	24	1667	2	1050	21	-	-	
Location mean		1133		2250		3158		112		1437		874		1257				
C.V.%		40.5		13.6		7.3		46.7		18.1		69.1		21.0				
L.S.D. at 5%		NS		NS		377		82		427		NS		435				
S.E.		264.8		176.4		132.3		28.9		150.0		348.8		152.8				
No. of entries significantly exceeding the local check		-		-		7		0		23		-		3				

1/ Based on Tel Hadya - Syria only.

Table 3.8.4. The five heaviest seed yielding entries at the individual locations in CIF_3T-W-STR during 1983/84.

RANK	EGYPT	LEBANON	PAKISTAN	SUDAN	SYRIA	TUNISIA	
	Giza	Terbol	Islamabad	Shambat	Tel Hadya	Beja	El-Kef
1	X82TH 77	ILC 482	X82TH 77	Local check	X82TH 152	X82TH 77	X82TH 156
2	X82TH 81	X82TH 78	X82TH 2]	X82TH 99	X82TH 13	Local check	X82TH 152
3	X82TH 13	X82TH 149	X82TH 160]	X82TH 81	X82TH 158	X82TH 81	X82TH 77
4	X82TH 2	X82TH 92	X82TH 78	X82TH 165	X82TH 92	X82TH 91	X82TH 99]
5	X82TH 92	X82TH 86] (1)	X82TH 149	X82TH 65	X82TH 149	ILC 3279	X82TH 158]
		X82TH 160]					

(1) The brackets indicate entries having the same rank.

X82TH 137; and 67 cm for X82TH 13 to 77 cm for X82TH 77, and X82TH 86, respectively.

The mean seed yield of the F_3 crosses and checks at each location is given in Table 3.8.3. Islamabad in Pakistan was the highest yielding location (3158 kg/ha) and was followed by Terbol in Lebanon (2250 kg/ha). The seed yields in Sudan were the lowest (112 kg/ha). Out of 7 locations, only at Islamabad (Pakistan), Tel Hadya (Syria) and El-Kef (Tunisia) 7, 23 and 3 entries exceeded the local check by a significant margin. On the basis of overall locations, X82TH 77 was the highest yielding population (1863 kg/ha). The five best entries at each location are given in Table 3.8.4.

3.9. CHICKPEA INTERNATIONAL ASCOCHYTA BLIGHT NURSERY (CIABN)

Material

The Chickpea International Ascochyta Blight Nursery included 71 entries both from kabuli and desi types. This year 38 new lines, out of which 21 have been developed at ICARDA through hybridization, combining resistance in kabuli background and better in quality were added.

The susceptible check was the Syrian Local land race (ILC 1929).

Methods and Management

The suggested experimental design was randomised complete block design with two replications. The suggested plot size was one row 4 m long accomodating 40 plants. The susceptible check was repeatedly sown after every two test entries/rows to serve as an indicator cum spreader row. The cooperators in the Mediterranean region were advised to sow the nursery in the winter season instead of the usual spring season to get high disease pressure. Otherwise the nurseries were managed as per the local agronomic practices. In the absence of natural infestation, the cooperators were advised to do the artificial inoculation of the nursery with the blight disease either by scattering the diseased debris collected from the previous season or by supplementing the natural infection by spraying the spore suspension prepared from the freshly infected plants in the fields. A 1-9 scale was recommended for scoring the disease severity at least at two times, first in the vegetative stage and the second at the podding stage. The scale recommended is 1= highly resistant; 3= resistant; 5= tolerant; 7= susceptible; and 9= highly susceptible.

Forty one sets of blight nursery were distributed to cooperators in 18 countries and the results were received for 20 sets from 14 countries. The disease ratings from Giza (Egypt) and El-Kef (Tunisia) were not reported, and from Ludhiana (India), a large number of entries could not be tested due to some unavoidable reasons.

Results and Discussion

The performance of the entries in each location is presented in Table 3.9.1 and discussed as under:

Bangladesh: The nursery was sown at Mymensingh. Ten entries namely ILC 202, -2956, -3274, -3279, -3346, -3868, FLIP 82-222C, ICC 5566, ICC 6336, and NEC 138-2 showed resistant reaction.

Bulgaria, Iran, and Italy: The nursery was sown at Toshevo in Bulgaria, Oroumieh in Iran and Capalbio in Italy. There was least ascochyta blight infestation and almost all the entries were found resistant at these locations.

France: The nursery was sown at Montpellier. Thirty five entries were rated resistant with rating of 1 to 4. Three entries namely ILC 2956, FLIP 82-91C and ICC 2160 were with 1 rating and were highly resistant.

India: The nursery was screened at Ludhiana both in field and cloth chambers. Some of the lines either did not germinate or were killed by other fungal diseases thus the data on ascochyta blight for those lines could not be recorded. Among the remaining lines, except FLIP 81-59, FLIP 82-1C, FLIP 82-2C, FLIP 82-3C, FLIP 82-59C, FLIP 82-68C, FLIP 82-99C, FLIP 82-100C, FLIP 82-129C, FLIP 82-178C, FLIP 82-191C, FLIP 82-246C, ICC 4256 and ICC 6989, all other lines showed resistant reaction both under field and cloth chamber conditions.

Jordan: The nursery was sown at Marow, out of the 71 lines, 44 lines were resistant and seven were with rating of 1.

Lebanon: The nursery was sown at Terbol. Except four entries namely ILC 195, FLIP 81-59, FLIP 82-59C and ILC 1929, all other entries were resistant.

Morocco: The nursery was sown at Douyet and Marchouch. At Douyet, 41 entries and at Marchouch 55 entries were resistant.

Pakistan: The nursery was sown at Islamabad, Lahore and Tarnab. At Lahore, there was no disease development and all the entries were rated 1. At Islamabad, 21 entries and at Tarnab 14 entries were rated as resistant. Only six entries namely, ILC 72, -200, -3279, ICC 641, -7028 and NEC 138-2 were, however, resistant across both the locations.

Syria: The nursery was sown at Jinderis, Lattakia and Tel Hadya. At Jinderis, except seven entries, namely ILC 215, ILC 482, FLIP 81-59, FLIP 82-59C, FLIP 82-222C, ICC 5124, and ILC 1929 all other entries were rated as resistant. At Lattakia, except twelve entries, namely ILC 195, -215, -482, -3274, FLIP 81-41, FLIP 81-59, FLIP 81-71, FLIP

Table 3.9.1. Reaction of chickpea entries to ascochyta blight in CIABN, during 1983/84.

ENTRY	ORIGIN	BANGLADESH	BULGARIA	FRANCE	INDIA		IRAN	ITALY	JORDAN	LEBANON	MOROCCO		PAKISTAN			SYRIA			TURKEY	TUNISIA
		Mymensingh	Toshevo	Montpellier	Ludhiana FS[1]	Ludhiana CCS[2]	Oroumieh	Capalbio	Marow	Terbol	Douyet	Marchouch	Islamabad	Lahore	Tarnab	Jinderis	Lattakia	Tel Hadya	Ankara	Beja
ILC 72	SPAIN	6	1	3	-	-	2	1	6	1	2	2	3	1	4	3	3	4	1	2
ILC 182	USSR	6	1	3	2	1	2	1	4	3	3	4	5	1	5	3	3	4	2	2
ILC 187	USSR	5	1	3	-	1	2	1	5	3	3	3	5	1	4	3	3	5	2	4
ILC 195	USSR	6	1	3	-	-	2	1	6	5	5	2	5	1	5	4	6	3	1	2
ILC 196	USSR	7	1	5	-	1	2	2	4	3	4	3	4	1	5	4	-	5	1	2
ILC 200	USSR	7	1	5	-	-	2	1	4	1	4	2	4	1	4	3	3	3	1	2
ILC 201	USSR	7	1	3	1	1	2	1	5	1	3	2	5	1	4	3	3	5	1	2
ILC 202	USSR	3	1	4	-	-	2	2	4	1	2	2	5	1	5	3	3	4	1	2
ILC 215	USSR	9	1	9	-	-	2	1	8	1	5	6	9	1	8	7	8	8	3	4
ILC 482	TURKEY	7	1	7	-	-	2	1	2	3	6	6	8	1	7	5	6	7	5	2
ILC 2380	USSR	7	1	3	3	3	2	1	7	1	5	2	5	1	5	3	4	3	1	2
ILC 2506	USSR	9	1	5	-	2	2	1	2	3	5	2	4	1	5	3	3	4	1	2
ILC 2956	USSR	3	1	1	-	-	2	1	2	1	4	2	4	1	5	3	3	5	1	2
ILC 3274	UNKNOWN	3	1	5	2	1	2	1	3	3	3	2	5	1	5	4	5	4	1	3
ILC 3279	USSR	4	1	5	3	3	2	1	3	1	2	2	4	1	4	3	3	4	1	2
ILC 3346	USSR	4	1	7	1	2	2	1	4	3	5	2	5	1	5	3	3	3	2	2
ILC 3856	MOROCCO	5	1	5	3	3	2	1	5	3	3	3	4	1	5	3	3	4	1	4
ILC 3864	BULGARIA	8	1	3	-	1	2	1	6	3	5	4	4	1	5	3	2	3	1	3
ILC 3866	BULGARIA	6	1	5	-	2	2	1	3	3	5	3	5	1	5	4	3	5	1	4
ILC 3868	BULGARIA	3	1	5	-	-	3	1	3	3	4	2	6	1	5	3	3	4	2	4
ILC 3870	BULGARIA	6	1	4	-	-	2	1	4	1	3	3	4	1	5	3	4	4	1	4
ILC 4421	USSR	6	1	4	-	-	2	1	4	3	4	3	6	1	4	3	3	3	1	4
FLIP 81-41	ICARDA	9	1	4	2	1	2	2	5	1	2	2	6	1	5	3	9	5	2	2
FLIP 81-59	ICARDA	7	1	8	5	7	2	1	8	7	5	6	9	1	8	9	8	8	4	6
FLIP 81-70	ICARDA	7	1	4	3	1	2	1	3	3	3	4	7	1	5	3	3	6	1	3
FLIP 81-71	ICARDA	7	1	3	1	1	2	1	5	3	3	3	7	1	4	4	5	7	1	3
FLIP 81-75	ICARDA	8	1	5	3	3	2	1	6	1	4	2	6	1	5	3	3	7	1	4
FLIP 81-293	ICARDA	7	1	3	2	2	2	1	3	3	3	4	6	1	5	4	3	4	1	3
FLIP 82-1C	ICARDA	6	1	4	5	1	2	3	4	3	3	3	7	1	5	4	3	5	1	4
FLIP 82-2C	ICARDA	7	1	3	3	5	2	1	6	1	3	4	7	1	6	4	3	7	3	3
FLIP 82-3C	ICARDA	8	1	5	5	1	2	1	7	3	5	4	6	1	6	4	3	5	2	4
FLIP 82-26C	ICARDA	6	1	5	-	-	2	1	5	3	4	5	8	1	5	4	5	6	2	4
FLIP 82-40C	ICARDA	5	1	5	2	1	2	1	3	3	5	4	6	1	5	4	3	4	1	5
FLIP 82-59C	ICARDA	7	1	6	4	6	2	1	8	7	5	6	9	1	6	7	3	7	4	7
FLIP 82-61C	ICARDA	7	1	4	3	1	2	1	3	1	3	4	8	1	6	3	8	7	1	2
FLIP 82-64C	ICARDA	5	1	5	4	1	2	1	3	3	2	2	7	1	6	4	4	5	3	4
FLIP 82-65C	ICARDA	9	1	4	4	3	2	2	7	3	2	4	7	1	7	3	3	6	1	3
FLIP 82-68C	ICARDA	7	1	3	4	5	2	1	6	3	5	3	8	1	5	3	3	7	2	3
FLIP 82-74C	ICARDA	9	1	3	3	3	2	1	5	1	3	2	6	1	5	3	3	5	1	4
FLIP 82-91C	ICARDA	9	1	1	1	2	2	1	4	1	6	2	6	1	5	3	3	5	1	4

Cont'd. 2/...

Table 3.9.1. Cont'd. .../2.

NAME	ORIGIN	BANGLADESH	BULGARIA	FRANCE	INDIA		IRAN	ITALY	JORDAN	LEBANON	MOROCCO		PAKISTAN			SYRIA			TURKEY	TUNISIA
		Mymensingh	Toshevo	Montpellier	Ludhiana FS	Ludhiana CCS	Oroumieh	Capalbio	Marow	Terbol	Douyet	Marchouch	Islamabad	Lahore	Tarnab	Jinderis	Lattakia	Tel Hadya	Ankara	Beja
FLIP 82-99C	ICARDA	7	1	7	6	3	2	1	4	1	4	4	7	1	6	4	3	7	2	4
FLIP 82-100C	ICARDA	5	1	5	3	5	2	1	7	3	6	2	6	1	5	4	3	6	1	4
FLIP 82-129C	ICARDA	8	1	5	4	6	2	2	3	3	5	5	8	1	4	4	3	6	1	2
FLIP 82-178C	ICARDA	6	1	5	4	5	2	1	7	3	5	6	7	1	5	3	3	5	1	5
FLIP 82-191C	ICARDA	5	1	3	5	2	2	1	3	1	5	3	6	1	4	3	3	3	1	4
FLIP 82-222C	ICARDA	3	1	5	4	3	2	1	6	1	6	2	8	1	6	5	9	6	1	4
FLIP 82-239C	ICARDA	6	1	5	3	1	2	1	1	3	6	5	5	1	4	4	3	4	2	4
FLIP 82-246C	ICARDA	5	1	4	5	7	2	1	5	3	2	5	6	1	5	4	3	5	4	4
FLIP 82-259C	ICARDA	7	1	5	3	1	3	1	8	3	4	2	5	1	5	3	3	5	1	2
ICC 641	INDIA	8	1	2	1	1	2	1	2	1	6	2	4	1	4	3	3	4	1	2
ICC 2160	ICRISAT	9	1	1	4	1	2	1	1	1	6	5	4	1	5	3	3	3	1	2
ICC 3932	IRAN	7	1	2	3	3	2	1	2	1	4	3	4	1	5	3	3	3	1	2
ICC 4256	IRAN	8	1	5	6	0	2	1	3	1	7	6	4	1	5	4	4	3	2	2
ICC 5035	INDIA	9	1	5	2	2	2	1	3	1	4	3	5	1	5	3	3	4	1	2
ICC 5124	-	6	1	5	4	1	2	1	5	1	6	5	6	1	5	5	3	4	2	3
ICC 5127	UNKNOWN	6	1	5	4	4	2	1	2	1	7	3	6	1	5	3	3	5	1	2
ICC 5566	MEXICO	4	1	4	4	1	2	1	3	3	4	3	7	1	5	3	4	4	1	2
ICC 6304	USSR	6	1	5	3	4	3	1	4	1	3	2	6	1	4	3	3	4	1	4
ICC 6306	USSR	7	1	5	3	3	2	1	2	1	3	2	7	1	5	3	4	4	1	2
ICC 6336	INDIA	4	1	7	3	3	2	1	4	1	3	6	6	1	5	3	3	4	2	3
ICC 6373	IRAN	9	1	3	-	3	2	1	1	1	3	3	4	1	5	3	3	3	1	2
ICC 6945	IRAN	8	1	4	4	4	2	1	1	1	5	5	4	1	5	4	3	3	2	2
ICC 6981	IRAN	9	1	3	-	3	2	1	1	1	5	2	4	1	5	3	5	3	1	-
ICC 6988	IRAN	9	1	3	-	-	2	1	2	1	4	5	4	1	5	3	4	3	1	2
ICC 6989	IRAN	8	1	5	5	-	2	1	1	1	6	3	4	1	5	3	4	3	2	2
ICC 7028	IRAN	7	1	3	2	2	2	1	1	1	6	4	4	1	4	3	3	3	1	2
NEC 138-2	USSR	3	1	7	3	2	2	1	3	3	4	2	4	1	4	4	3	5	3	6
Pch 15	MOROCCO	6	1	4	4	3	2	2	2	3	3	2	5	1	7	4	4	4	2	5
Pch 70	MOROCCO	7	1	5	2	3	2	1	5	3	4	2	5	1	6	4	4	4	2	2
Pch 124	MOROCCO	6	1	4	-	1	2	2	4	3	3	4	4	1	5	4	3	4	1	2
ILC 1929	SYRIA	8	1	9	-	-	2	3	9	9			9	1	9	9	8	9	5	7

FS=Field Screening[1], CCS=Cloth Chamber Screening[2].

82-26C, FLIP 82-61C, FLIP 82-222C, ICC 6981, and ILC 1929 all other lines were resistant. At Tel Hadya only 38 entries turned to be resistant with rating of 1-4.

On the basis of disease ratings over locations entries namely ILC 72, -182, -200, -202, -2380, -2506, -3279, -3346, -3856, -3864, -3868, -3870, -4421, FLIP 81-293, FLIP 82-40C, FLIP 82-191C, FLIP 82-239C, ICC 641, -2160, -3932, ICC 4256, -5035, -5566, -6304, -6306, -6336, -6373, -6945, -6988, -6989, -7028, Pch 15, Pch 70 and Pch 124 were rated as resistant.

Turkey: The nursery was sown at Ankara. The disease infection was very low and most of the entries at this location rated from 1-5 including the susceptible check. Among the ones showing 4 or 5 ratings, were ILC 482, FLIP 81-59, FLIP 82-59C and FLIP 82-246C.

Tunisia: The nursery was sown at Beja and El-Kef. No disease data was received from El-Kef. At Beja, except FLIP 81-59, FLIP 82-40C, FLIP 82-59C, FLIP 82-128 C, NEC 138-2 and Pch 15, all other entries were resistant.

On the basis of overall locations in different countries, out of 70 test lines only 6 lines namely, ILC 187, ILC 202, ILC 2956, ILC 3274, ILC 3279 and ILC 3856 were rated as resistant to tolerant with ratings upto 5.

4. FABA BEAN INTERNATIONAL TRIALS AND NURSERIES

Introduction

Thirteen sets of trials and nurseries were available to cooperators. These included Yield Trials, Screening Nurseries, F_3 Trials, Disease and Pest Nurseries and Agronomy Trials. The cooperators were free to use these materials in their breeding programs or for release as cultivars. The results reported by the cooperators are presented in the following pages.

4.1. FABA BEAN INTERNATIONAL YIELD TRIAL - LARGE SEED (FBIYT-L)

Material

The Faba Bean International Yield Trial - Large Seed (FBIYT-L) comprised of 23 test entries and one local check to be supplied by the cooperator. All these lines were tested for their superior performance at least once either in regional trials or international screening nurseries.

Methods and Management

The trial design was a randomised complete block with 4 replications. The suggested plot size was 4 rows, each 4 m long, with inter row spacing of 0.50 m accomodating 120 seeds per plot. Thirty sets of the trial were distributed in 21 countries. The results were returned from 19 locations from 13 countries. The details received from the cooperators for different locations are given in Table 4.1.1. The trials at Sids in Egypt was severely effected by the residual effect of the herbicide used for the previous crop and that at San Lorenzo (Peru) by Fusarium sp.

Results and Discussion

The data on time to flowering (Table 4.1.2) revealed that at Debre Zeit in Ethiopia (51 days), and Mansoura in Egypt (53 days) the entries took comparative less time to flower and at Cordoba in Spain (123 days), and Yunnan in China (118 days) took comparatively more time. One average over locations, the entry 78S 49694 (ILB 605) was the earliest to flower in 83 days. In time to maturity (Table 4.1.3) there was a little difference among the entries averaged over all locations (174-176 days). The data on plant height (Table 4.1.4) showed that at Yunnan (China) the entries expressed minimum height (29 cm) whereas at Terbol (Lebanon) the entries were tallest (145 cm). Among the entries the mean plant height over locations was minimum for Reina-Blanca (73 cm) and maximum for FLIP 83-8FB (87 cm). The correlations between different agronomic characters (Table 4.1.5) revealed that time to maturity is significantly and positively correlated with plant height. All other correlations were not significant.

Table 4.1.1. Agronomic data for different Locations in the FBIYT-L during 1983/84

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K20	Irrigation	Insecticide/ Fungicide/ Herbicide
ARGENTINA	Perico	26.4.1984	198				5	
CHILE	Granerous	14.5.1984	205				2	
CHINA	Zhejiang	28.10.1983	217	26	58	22		
CHINA	Yunnan	20.10.1983	189	36	67		2	Propineb cygon
EGYPT	Mansoura	16.11.1983	153	20	32			
EGYPT	Sakha		180					
EGYPT	Sids	18.11.1983	163	37	75		5	Igran
ETHIOPIA	Debrezeit	30.6.1984	130					
IRAN	Gorgan	15.1.1984	144					Diazinon
LEBANON	Terbol	8.11.1983	209		50		1	Kerb, Tribunil, Metasystox
PERU	San Lorenzo	22.10.1983	284				3	Afalon, Tamaion
SPAIN	Cordoba	12.12.1983	150					Glyphosate
SYRIA	Lattakia	15.11.1983	210					
SYRIA	TH-Irrigated	6.11.1983	189					
SYRIA	TH-Rainfed	18.11.1983	168					
TUNISIA	Beja							
TUNISIA	El-Kef							
TURKEY	Ankara	5.3.1984	128	20	50			Basudine
W.GERMANY	Stuttgart	27.3.1984	164		116	199		Tribunil, Thiodan

Table 4.1.2. Time to flowering (days) of the entries at different locations in FBIYT-L during 1983/84.

ENTRY NAME ILB/ CROSS NO.	PEDIGREE	ARGENTINA Perico	CHILE Granerous	CHINA Yunnan	ETHIOPIA Debre Zeit	EGYPT Mansoura	EGYPT Sakha	EGYPT Sids	IRAN Gorgan	LEBANON Terbol	SPAIN Cordoba	SYRIA Tel Hadya Irrigated	SYRIA Tel Hadya Rainfed	TURKEY Ankara	W.GERMANY Stuttgart	MEAN
1814	Syrian Local Large	65	110	117	54	53	55	74	87	111	123	107	101	74	76	86
1269	New Mammoth	60	110	121	53	49	75	74	87	109	123	104	104	74	76	87
1266	Aquadulce	61	110	122	53	53	70	78	87	110	123	105	102	75	77	88
1933	Sevilla Giant	60	110	118	50	51	65	78	87	112	123	107	101	73	77	87
1813	Syrian Local Large (Long Pod)	63	112	118	52	55	65	77	87	110	123	105	103	75	76	87
1817	76TA 56809	62	110	119	51	54	75	75	87	109	123	103	102	73	77	87
1815	Lattakia Local	58	110	119	52	52	75	76	87	108	123	105	103	75	77	87
444	79S 97513	57	110	120	53	52	75	76	87	109	123	99	102	75	77	87
34	78S 49841	58	110	116	52	50	60	76	87	108	123	103	101	75	77	85
1814	79S 4	61	110	120	51	54	60	74	87	110	123	104	101	74	76	86
398	76TA 56246	61	110	119	51	53	75	79	87	109	123	107	103	75	77	88
1817	Lebanese Local Large	61	110	119	49	54	60	74	87	106	123	98	101	74	76	85
1805	Elegant 5MCI	60	110	118	49	52	60	73	87	105	123	99	100	74	76	85
1799	39 MB	62	110	116	52	54	65	74	87	108	123	103	101	74	76	86
605	78S 49694	60	110	116	53	51	55	70	87	105	123	92	96	75	75	83
1821	Turkish Local	60	110	120	51	54	75	79	87	110	123	103	101	75	77	88
X75TA 43	FLIP 83-8FB	54	110	119	50	54	65	74	87	108	123	102	101	75	76	86
1270	Reina Blanca	63	110	118	53	52	75	79	87	110	123	105	103	74	77	88
282	79SL 48590	61	110	119	51	53	75	74	87	108	123	104	104	75	76	87
371	74TA 516	58	110	117	50	53	65	74	87	105	123	102	101	75	76	85
31	74TA87	60	110	116	52	50	70	76	87	107	123	101	98	74	76	86
9	74TA 22	61	110	119	50	52	65	77	87	110	123	104	103	74	76	87
4	ILB 4	64	110	117	50	54	70	74	87	108	123	104	100	73	76	86
-	Local check	60	112	113	49	56	45	62	87	108	123	107	103	74	75	-
Location mean		60	110	118	51	53	66	75	87	108	123	103	101	74	76	

Table 4.1.3. Time to maturity (days) of entries at different locations in FBIYT-L during 1983/84.

ENTRY NAME ILB/ CROSS NO.	PEDIGREE	ARGENTINA Perico	CHILE Granerous	CHINA Zhejiang	EGYPT Mansoura	EGYPT Sakha	IRAN Gorgan	LEBANON Terbol	SYRIA Tel Hadya Irrigated	SYRIA Tel Hadya Rainfed	TURKEY Ankara	W.GERMANY Stuttgart	MEAN
1814	Syrian Local Large	198	205	217	149	180	144	207	189	167	125	159	176
1269	New Mammoth	195	205	212	149	180	144	204	183	164	124	157	174
1266	Aquadulce	195	205	213	151	180	144	204	183	164	125	159	175
1933	Sevilla Giant	193	205	213	148	180	144	204	183	164	124	158	174
1813	Syrian Local Large (Long Pod)	195	205	217	153	180	144	208	187	164	124	159	176
1817	76TA 56809	197	205	217	154	180	144	205	187	167	124	158	176
1815	Lattakia Local	192	205	213	151	180	144	207	186	166	125	159	175
444	79S 97513	191	205	214	151	180	144	206	187	165	126	161	175
34	78S 49841	193	205	214	148	180	144	209	188	166	126	159	176
1814	79S 4	193	205	214	150	180	144	207	188	166	125	159	176
398	76TA 56246	195	205	217	151	180	144	207	188	166	126	159	176
1817	Lebanese Local Large	193	205	213	150	180	144	204	183	164	125	158	174
1805	Elegant 5MCI	193	205	213	149	180	144	206	186	163	125	158	175
1799	39MB	194	205	213	153	180	144	207	184	164	126	159	175
605	78S 49694	195	205	212	147	180	144	207	189	166	125	158	175
1821	Turkish Local	193	205	216	151	180	144	208	187	164	124	159	176
X75TA 43	FLIP 83-8FB	190	205	216	149	180	144	209	187	164	124	158	175
1270	Reina Blanca	195	205	211	151	180	144	204	183	165	123	156	174
282	79SL 48590	194	205	214	151	180	144	202	187	166	123	158	175
371	74TA 516	193	205	212	151	180	144	204	187	166	124	158	175
31	74TA 87	193	205	214	151	180	144	205	187	168	123	157	175
9	74TA 22	193	205	212	149	180	144	205	187	164	123	158	175
4	ILB 4	196	205	215	153	180	144	208	184	164	124	160	176
-	Local check	194	205	216	157	160	144	205	188	165	128	164	-
Location mean		194	205	214	151	179	144	206	186	165	124	159	

Table 4.1.4 Plant height (cm) of entries at different locations in FBIYT-L during 1983/84.

ENTRY NAME ILB/ CROSS NO.	PEDIGREE	ARGENTINA Perico	CHILE Gramerous	CHINA Zhejiang	CHINA Yunnan	ETHIOPIA Debre Zeit	EGYPT Mansoura	IRAN Gorgan	LEBANON Terbol	SYRIA Tel Hadya-Irrigated	SYRIA Tel Hadya-Rainfed	TURKEY Ankara	W.GERMANY Stuttgart	MEAN
1814	Syrian Local Large	68	99	84	30	93	121	70	149	77	36	46	111	82
1269	New Mammoth	71	79	71	26	89	106	55	144	66	35	47	111	75
1266	Aquadulce	83	95	73	26	100	122	60	146	70	34	51	114	81
1933	Sevilla Giant	77	93	77	27	103	125	75	141	72	39	53	111	83
1813	Syrian Local Large (Long Pod)	75	99	83	28	99	120	65	145	71	39	53	114	83
1817	76TA 56809	72	105	83	28	90	128	75	155	65	39	50	115	84
1815	Lattakia Local	79	94	75	24	91	125	80	153	71	36	49	110	82
444	79S 97513	66	85	89	24	95	126	70	145	75	40	50	119	82
34	78S 49841	83	106	83	33	95	119	75	141	77	40	52	118	85
1814	79S 4	81	98	74	26	91	125	75	146	76	34	47	110	82
398	76TA 56246	74	93	78	29	90	116	65	144	80	34	48	109	80
1817	Lebanese Local Large	70	85	71	27	88	113	65	146	69	38	46	105	77
1805	Elegant 5MCI	65	85	68	26	94	121	70	149	66	34	45	109	78
1799	39MB	74	100	68	29	95	129	70	141	72	34	50	111	81
605	78S 49694	72	95	76	26	96	125	80	141	74	36	50	109	82
1821	Turkish Local	69	94	84	28	81	120	65	143	68	38	48	111	79
X75TA 43	FLIP 83-8FB	96	101	91	33	93	123	70	154	75	39	51	119	87
1270	Reina Blanca	65	83	62	23	91	122	60	139	59	32	45	95	73
282	79SL 48590	66	93	72	27	95	118	60	149	63	38	46	106	78
371	74TA 516	77	96	81	28	85	107	85	143	69	38	49	108	81
31	74TA 87	68	85	82	25	95	118	60	141	75	38	49	105	78
9	74TA 22	75	88	78	25	91	134	70	145	74	35	48	113	81
4	ILB 4	75	98	76	30	91	123	60	138	73	39	47	113	80
-	Local check	61	100	107	69	88	122	73	141	73	36	49	124	-
Location mean		73	94	78	29	92	121	69	145	71	37	49	111	

Table 4.1.5. Correlation (df=21) among three agronomic characters and seed yield for entries in the FBIYT-L during 1983/84.

TRAIT	Time to maturity	Plant height	Seed yield
Time to flowering	0.02	-0.22	0.20
Time to maturity		0.49*	-0.28
Plant height			0.12

* $P \leq 0.05$; ** $P \leq 0.01$

The seed yield and rank of different entries at different locations is given in Table 4.1.6. The location mean of entries varied from 138 kg/ha at Yunnan in China to 5953 kg/ha at Granerous in Chile. The entry means, however, varied from 2751 kg/ha for FLIP 83-8FB to 2063 kg/ha for 79S 97513. The CV for the experiment was highest for Yunnan in China (228.9%) where most of the lines were severally affected by root rot and were followed by Debre Zeit in Ethiopia (173.9%) and Lattakia in Syria (61.0%). At other locations CV ranged from 5.2 to 46.1%. The ANOVA revealed that out of 17 locations, at 10 locations the mean squares due to entries were significant. However, the LSD estimates showed that only at Mansoura in Egypt; Terbol in Lebanon and Ankara in Turkey, 5, 1, and 22 entries exceeded the respective local checks by significant margins. The five heaviest seed yielding entries at the individual locations are listed in Table 4.1.7. The perusal of Table 4.1.8 revealed that New Mammoth (ILB 1269) was the top yielder on the basis of 3 years (1981-1984) and was followed by 76TA 56809 (ILB 1817). Another entry, Aquadulce (ILB 1266) was among the top three on the basis of 2 years (1982-84). Like 1982/83, the seed yield performance at Tel Hadya location in 1983/84 also did not show any association with that of at any other locations (Table 4.1.9).

4.2. FABA BEAN INTERNATIONAL YIELD TRIAL-SMALL SEED (FBIYT-S)

Material

The Faba Bean International Yield Trial - Small Seed comprised of 23 test entries and one local check to be supplied by the cooperator. These entries were selected on the basis of their performance either in the International Screening Nursery Small Seed or FBIYT-S conducted during 1982/83.

Methods and Management

The material was suggested to be sown in a randomised complete

'Table 4.1.6. Seed yield (Y=kg/ha) and Rank (R) of entries at different locations in FBIYT-L during 1983/84.

ENTRY NAME		ARGENTINA		CHILE		CHINA				EGYPT				ETHIOPIA		IRAN		LEBANON		SPAIN	
ILB/	PEDIGREE	Perico		Granerous		Zhejiang		Yunnan		Mansoura		Sakha		Debre Zeit		Gorgan		Terbol		Cordoba	
CROSS NO.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1814	Syrian Local Large	1888	21	6375	7	2830	2	15	13	3508	22	3264	24	341	15	2764	7	1569	21	3036	18
1269	New Mammoth	2800	8	6219	8	2104	13	44	5	3058	24	5250	7	1346	3	1931	23	2681	1	3618	5
1266	Aquadulce	3196	3	6156	9	1902	15	163	3	3675	18	5217	9	552	7	2625	11	2102	5	3587	6
1933	Sevilla Giant	2608	11	5969	13	2349	7	39	7	5450	5	4717	18	504	9	2403	14	2093	7	3567	7
1813	Syrian Local Large (Long Pod)	2317	17	6813	2	2173	11	102	4	4000	15	4162	22	1053	4	3090	2	1259	24	2797	21
1817	76TA 56809	1846	22	5953	15	2616	4	24	9	4350	13	5333	4	184	23	2736	8	1759	16	3188	16
1815	Lattakia Local	3192	4	6469	5	1858	16	9	17	4816	10	4933	15	317	18	2861	6	1843	13	3655	4
444	79S 97513	1692	24	5469	18	1788	18	7	19	3558	19	5100	12	328	17	2243	20	1542	22	2694	23
34	78S49841	2613	10	6813	2	1268	24	16	12	3942	16	4683	19	231	21	1979	22	1634	20	3382	10
1814	79S 4	2225	18	6438	6	1807	17	11	16	5375	6	3375	23	1891	1	2535	12	1667	18	3261	15
398	76TA 56246	2717	9	6156	9	2227	10	267	2	4850	9	4975	14	110	24	2882	4	1652	12	3415	8
1817	Lebanese Local Large	2521	12	4719	23	1675	22	17	11	5100	8	6341	1	373	11	1792	24	2241	3	3297	12
1805	Elegant 5MCI	2383	14	5844	16	2262	9	5	21	3796	17	5125	11	910	5	2403	14	2231	4	3145	17
1799	39 MB	2350	15	5406	20	1929	14	28	8	4263	14	4833	17	204	22	2875	5	2023	8	3321	11
605	78S 49694	2817	6	5469	18	1336	23	3	23	5575	4	4192	21	682	6	2375	16	1856	11	2712	22
1821	Turkish Local	2050	19	5969	13	2435	6	14	14	3558	19	4308	20	541	8	2368	17	1718	17	3279	13
X75TA 43	FLIP 83-8FB	3400	1	7297	1	2652	3	8	18	7017	1	5183	10	373	11	2979	3	1644	19	3572	3
1270	Reina Blanca	2321	16	4563	24	1752	20	42	6	6196	2	5633	3	338	16	2132	21	1796	14	4085	1
282	79SL 48590	2817	6	5813	17	1758	19	2	24	5703	3	5233	8	369	13	2285	18	2097	6	3384	9
371	74TA 516	2025	20	6125	11	2286	8	7	19	4500	12	5258	6	312	19	2493	13	2005	9	2362	24
31	74TA 87	1813	23	5063	22	2485	5	4	22	3513	21	4867	16	365	14	2674	9	1380	23	2951	19
9	74TA 22	2842	5	5156	21	1738	21	13	15	5275	7	5083	13	1648	2	2660	10	2519	2	3272	14
4	ILB 4	2496	13	6000	12	2145	12	20	10	4733	11	5333	4	473	10	2257	19	1792	15	2902	20
-	Local check	3217	2	6625	4	3608	1	2447	1	3458	23	5750	2	311	20	3667	1	1917	10	3792	2
Location mean		2506		5953		2124		138		4553		4923		573		2542		1884		3266	
C.V.%		33.1		20.8		35.2		228.9		30.2		18.7		173.9		28.7		23.6		15.6	
L.S.D. at 5%		NS		NS		1055		445		1936		1298		NS		NS		626		718	
S.E.		415.1		619.7		374.2		157.6		686.6		460.2		498.3		365.3		221.9		254.9	
No. of entries significantly exceeding the local check		-		-		0		0		5		0		-		-		1		0	

Cont'd. 2...

ENTRY NAME		SYRIA						TUNISIA				TURKEY		W.GERMANY			
ILB/	PEDIGREE	Lattakia		Tel Hadya Irrigated		Tel Hadya Rainfed		Beja		El-Kef		Ankara		Stuttgart		Mean	
CROSS NO.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1814	Syrian Local Large	81	21	2013	2	555	2	742	16	1517	22	1008	14	4754	23	2133	22
1269	New Mammoth	197	12	1656	16	481	8	1025	6	2358	2	816	20	6264	6	2462	6
1266	Aquadulce	407	4	1735	14	393	16	883	9	1925	11	1106	7	5773	13	2435	7
1933	Sevilla Giant	396	5	2069	1	337	22	1173	1	1917	13	1333	1	5885	10	2518	2
1813	Syrian Local Large (Long Pod)	197	12	1791	9	508	5	942	7	1792	16	1250	2	5881	11	2361	13
1817	76TA 56809	456	3	1393	23	531	4	517	22	1867	14	1175	4	5471	19	2318	15
1815	Lattakia Local	195	14	1569	19	490	6	758	14	1983	10	1225	3	6187	7	2492	5
444	79S 97513	79	22	1934	4	365	20	500	23	2042	8	1100	8	4622	24	2063	23
34	78S 49841	217	11	1809	8	462	12	758	14	1800	15	1083	9	5860	12	2268	17
1814	79S 4	117	20	1832	7	481	8	1125	2	1775	18	1074	10	5689	15	2393	11
398	76TA 56246	367	7	1930	5	393	16	533	21	1792	16	992	16	5579	16	2414	9
1817	Lebanese Local Large	676	1	1596	18	425	15	1083	3	1242	24	792	22	5503	18	2317	16
1805	Elegant 5MCI	373	6	1689	15	476	11	692	18	2108	5	692	23	6314	5	2379	12
1799	39 MB	182	15	1444	22	481	8	1075	4	1683	20	925	18	5364	22	2258	20
605	78S 49694	153	16	1772	11	314	23	817	11	1733	19	892	19	5740	14	2261	19
1821	Turkish Local	236	10	1462	21	490	6	783	13	2092	7	1026	12	6134	8	2263	18
X75TA 43	FLIP 83-8FB	257	9	1749	12	430	14	692	18	1433	23	979	17	7003	2	2751	1
1270	Reina Blanca	570	2	1485	20	393	16	933	8	2267	3	797	21	5514	17	2401	10
282	79SL 48590	132	18	1944	3	582	1	1075	4	2083	6	1008	14	6511	3	2517	3
371	74TA 516	-		1749	12	356	21	842	10	1925	11	1012	13	5376	20	2415	8
31	74Ta 87	125	19	1781	10	231	24	683	20	2167	4	1052	11	5370	21	2148	21
9	74TA 22	139	17	1874	6	457	13	367	24	2008	9	1165	6	6434	4	2509	4
4	ILB 4	264	8	1379	24	545	3	700	17	1575	21	1167	5	6018	9	2341	14
-	Local check	-		1615	17	383	19	792	12	2542	1	621	24	8646	1	-	
Location mean		246		1720		440		812		1901		1012		5912			
C.V.%		61.0		28.2		35.5		46.1		13.6		5.2		9.6			
L.S.D. at 5%		212		NS		N.S		N.S		425		74		802			
S.E.		75.2		242.7		78.1		216.2		149.4		26.1		284.4			
No. of entries significantly exceeding the local check		-		-		-		-		0		22		0			

Table 4.1.7. The five heaviest seed yielding entries at the individual locations in FBIYT-L during 1983/84.

RANK	ARGENTINA Perico ILB/ cross No.	Pedigree	CHILE Granerous ILB/ cross No.	Pedigree	CHINA Zhejiang ILB/ cross NO.	Pedigree	CHINA Yunnan ILB/ cross No.	Pedigree	ETHIOPIA Debre Zeit ILB/ cross No.	Pedigree
1	X75TA43	FLIP 83-8FB	X75TA43	FLIP 83-8FB		Local check		Local check	1814	79S 4
2		Local check	34	78S49841	(1) 1814	Syrian Local Large	398	76TA 56246	9	74TA 22
3	1266	Aquadulce	1813	Syrian Local Large (long pod)	X75TA 43	FLIP 83-8FB	1266	Aquadulce	1269	New Mammoth
4	1815	Lattakia Local		Local check	1817	76TA 56809	1813	Syrian Local Large (long pod)	1813	Syrian Local Large (long pod)
5	9	74TA 22	1815	Lattakia Local	31	74TA 87	1269	New Mammoth	1805	Elegant 5MCI

Cont'd

RANK	EGYPT Mansoura ILB/ cross No.	Pedigree	EGYPT Sakha ILB/ cross No.	Pedigree	IRAN Gorgan ILB/ cross No.	Pedigree	LEBANON Terbol ILB/ cross No.	Pedigree	SPAIN Cordoba ILB/ cross No.	Pedigree
1	X75TA 43	FLIP 83-8FB	1817	Lebanese Local Large		Local check	1269	New Mammoth	1270	Reina Blanca
2	1270	Reina Blanca		Local check	1813	Syrian Local Large (long pod)	9	74TA 22		Localcheck
3	282	79SL 48590	1270	Reina Blanca	X75TA 43	FLIP 83-8FB	1817	Lebanese Local Large	X75TA 43	FLIP 83-8FB
4	605	78S 49694	1817	76TA 56809	398	76TA 56246	1805	Elegant 5MCI	1815	Lattakia Local
5	1933	Sevilla Giant	4	ILB 4	1799	39 MB	1266	Aquadulce	1269	New Mammoth

Cont'd 2...

RANK	SYRIA Lattakia ILB/ cross No.	Pedigree	SYRIA Tel Hadya Irrigated ILB/ cross No.	Pedigree	SYRIA Tel Hadya Rainfed ILB/ cross No.	Pedigree	TUNISIA Beja ILB/ cross No.	Pedigree	TUNISIA EL Kef ILB/ cross No.	Pedigree
1	1817	Lebanese Local Large	1933	Sevilla Giant	282	79SL 48590	1933	Sevilla Giant		Local check
2	1270	Reina Blanca	1814	Syrian Local Large	1814	Syrian Local Large	1814	79S 4	1269	New Mammoth
3	1817	76TA 56809	282	79SL 48590	4	ILB 4	1817	Lebanese Local Large	1270	Reina Blanca
4	1266	Aquadulce	444	79S 97513	1817	76TA 56809	1799	39 MB	31	74TA 87
5	1933	Sevilla Giant	398	76TA 56246	1813	Syrian Local Large (Long pod)	282	79SL 48590	1805	Elegant 5MCI

Cont'd...

RANK	TURKEY Ankara ILB/ cross No.	Pedigree	W.GERMANY Stuttgart ILB/ cross No.	Pedigree
1	1933	Sevilla Giant		Local check
2	1813	Syrian Local Large (Long pod)	X75TA 43	FLIP 83-8FB
3	1815	Lattakia Local	282	79SL 48590
4	1817	76TA 56809	9	74TA 22
5	4	ILB 4	1805	Elegant 5MCI

Table 4.1.8. The mean yield (Y=kg/ha) and rank (R) of the common entries in the FBIYT-L during 1981-1984.

ENTRY NAME	PEDIGREE	1981/82		1982/83		1983/84		AVERAGE 1*		AVERAGE 2*	
		Y	R	Y	R	Y	R	Y	R	Y	R
ILB 1814	Syr.L.L	1998	5	2557	6	2133	7	2345	8	2229	5
ILB 1269	New Mammoth	2143	1	2781	2	2462	2	2622	1	2462	1
ILB 1266	Aquadulce	–	–	2748	3	2435	3	2592	3	–	–
ILB 1933	Sevilla Giant	–	–	2543	7	2518	1	2531	4	–	–
ILB 1817	76TA 56809	2055	7	2896	1	2318	4	2607	2	2423	2
ILB 444	79S 97513	–	–	2655	5	2063	8	2359	7	–	
ILB 34	78S 49841	2045	4	2508	8	2268	5	2388	6	2274	4
ILB 1799	39 MB	2100	2	2719	4	2258	6	2489	5	2359	3

1* Average over 1982-84

2* Average over 1981-84

Table 4.1.9. Correlation (df=21) among different Locations for the seed yield of entries in the FBIYT-L during 1983/84

COUNTRY	LOCATION	CHILE	CHINA		EGYPT		ETHIOPIA	IRAN	LEBANON	SPAIN	SYRIA (1)			TUNISIA		TURKEY	W.GERMANY
		Granerous	Zhejiang	Yunnan	Mansoura	Sakha	Debre Zeit	Gorgan	Terbol	Cordoba	Lattakia	Tel-Hadya Irrigated	Tel-Hadya Rainfed	Beja	El-Kef	Ankara	Stuttgart
ARGENTINA	Perico	0.31	-0.30	0.24	0.48*	0.23	0.11	0.08	0.42	0.54**	0.12	0.06	0.07	0.13	-0.13	-0.01	0.73**
CHILE	Granerous		0.29	0.15	-0.04	-0.43*	0.07	0.41	-0.28	-0.01	-0.34	0.20	0.36	-0.01	-0.21	0.37	0.35
CHINA	Zhejiang			0.06	-0.18	-0.17	-0.17	0.48*	-0.22	0.08	0.01	-0.01	0.01	-0.19	-0.06	0.14	0.04
China	Yunnan				-0.10	0.05	-0.12	0.30	0.01	0.21	0.27	0.17	-0.11	-0.09	-0.02	0.09	-0.08
EGYPT	Mansoura					0.19	-0.01	0.08	0.04	0.34	0.25	0.05	-0.06	0.15	-0.30	-0.01	0.42
EGYPT	Sakha						-0.33	0.40	0.46*	0.25	0.65**	-0.38	-0.15	0.07	0.07	-0.28	0.19
ETHIOPIA	Debre Zeit							-0.04	0.31	-0.01	-0.29	0.16	0.14	0.13	0.21	0.01	0.32
IRAN	Gorgan								-0.40	-0.09	-0.31	0.10	0.06	-0.28	-0.16	0.42	0.05
LEBANON	Terbol									0.30	0.26	-0.05	0.10	0.16	0.22	-0.35	0.37
SPAIN	Cordoba										0.46*	-0.15	0.15	0.24	0.18	-0.13	0.41
SYRIA	Lattakia(1)											0.38	0.11	0.18	-0.16	-0.28	0.02
SYRIA	Tel-Hadya Irrigated												0.25	0.01	0.01	0.22	-0.11
SYRIA	Tel-Hadya Rainfed													0.06	-0.17	0.06	0.27
TUNISIA	Beja														-0.07	-0.15	0.06
TUNISIA	El-Kef															-0.05	0.10
TURKEY	Ankara																-0.02

(1) df=20 for SYRIA Lattakia

* $P \leq 0.05$

** $P \leq 0.01$

Table 4.2.1. Agronomic data for different locations in the FBIYT-S during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
ARGENTINA	Perico	26.4.1984	203				5	Lorsban
CANADA	Manitoba	9.5.1984	108					
CANADA	Saskatoon	3.5.1984	91					Sencor
EGYPT	Gemmiza		156					
EGYPT	Sids	18.11.1983	163		75		5	Igran
ETHIOPIA	Debre Zeit	30.6.1984	128					
FRANCE	Montauben	9.11.1983	183		130	130		Herbalt,Peltar
IRAN	Gorgan	15.1.1984	144					Diazinon
IRAQ	Sulaimaniya	7.11.1983	124	40	80			
LEBANON	Terbol	9.11.1983	209		50			Kerb,Tribunil,Metasystox
MOROCCO	Douyet	25.11.1983	179	88	120	120		Glyphosate
MOROCCO	Sidi Kacem	28.11.1983	175	30	60	70		
PAKISTAN	Tarnab	27.10.1983	189					
QATAR	Rawdat Harma	6.11.1983	153	120	240		13	
SUDAN	Hudeiba	9.11.1983	118				9	
SYRIA	Lattakia	15.11.1983	211					
SYRIA	Tel Hadya-Irrigated	18.11.1983	.189					
SYRIA	Tel Hadya-Rainfed	2.11.1983	168					
TURKEY	Ankara	5.3.1984	121	20	50			Basudine
TUNISIA	Beja							
TUNISIA	El-Kef							
W.GERMANY	Stuttgart	27.3.1984	160		116	199		Tribunil,Thiodan

Table 4.2.2. Time to flowering (days) of the entries at different locations in FBIYT-S during 1983/84.

ENTRY NAME		ARGENTINA	CANADA		EGYPT		ETHIOPIA	FRANCE	IRAN	IRAQ	LEBANON	MOROCCO	PAKISTAN	QATAR		SUDAN	SYRIA		TURKEY	W.GERMANY	MEAN
ILB/ Cross No.	PEDIGREE	Perico	Manitoba	Saskatoon	Gemmiza	Sids	Debre Zeit	Montauben	Gorgan	Sulaimaniya	Terbol	Douyet	Tarnab	Rawdat	Harma	Hudeiba	Tel Hadya-Irrigated	Tel Hadya-Rainfed	Ankara	Stuttgart	
1813	Syrian Local Large (Long pod)	98	50	60	60	77	52	90	85	60	107	95	113	62		52	101	99	74	76	78
1819	Giza 3	74	46	58	54	69	47	91	85	59	105	95	106	52		46	93	94	74	74	73
1816	78S 48561	78	50	58	58	72	49	88	85	61	109	92	110	54		48	98	98	74	75	75
5	FLIP 83-1FB	74	45	58	57	74	47	90	85	60	106	95	112	54		47	93	94	71	75	74
277	ILB 277	74	47	58	53	70	47	91	85	59	105	92	112	53		46	93	90	74	75	74
360	74TA 498	82	47	58	56	72	50	91	85	60	107	92	110	55		50	94	97	75	75	75
269	74TA 367	82	46	58	58	77	48	89	85	61	108	95	113	53		48	99	96	76	75	76
33	74TA 95	84	46	58	56	75	46	90	85	61	107	92	111	52		46	96	91	76	75	75
287	77Hs 88323	85	47	58	59	72	52	91	85	61	107	95	113	56		50	99	99	74	75	77
X77TA 148	80S 45579	90	49	58	65	78	53	89	85	60	111	95	115	58		54	107	98	75	77	79
X77Sd 92	80S 46593	85	48	58	58	73	51	89	85	61	107	95	112	56		50	94	96	74	76	76
X77Sd 13	80S 45727	87	49	58	62	77	51	90	85	60	109	95	114	55		53	104	101	76	76	78
29	FLIP 83-7FB	80	47	58	56	71	47	91	85	60	107	92	110	52		46	94	97	74	75	75
295	75TA 26467	83	49	58	61	73	52	90	85	59	110	92	116	60		55	106	99	75	75	78
112	78S 49288	83	47	58	58	75	47	90	85	61	107	92	111	56		48	94	94	76	75	75
22	FLIP 83-2FB	88	48	58	59	74	48	88	85	60	108	95	113	56		48	97	94	76	75	76
18	77TA 80023	81	48	59	60	78	48	90	85	62	109	95	112	54		48	99	97	76	75	76
1266	78S 49171	88	48	58	59	73	49	89	85	60	108	95	113	56		49	99	98	74	76	77
X77TA 82	80S 44371	88	50	58	61	76	51	88	85	60	107	92	117	58		53	101	99	74	75	77
X77Sd 70	80S 46341	83	49	58	63	79	52	89	85	60	110	92	114	57		49	105	94	74	76	77
32	74TA 91	87	47	58	58	75	50	89	85	59	107	92	115	55		48	96	95	74	75	76
X77TA 88	80S 44539	76	46	58	52	70	47	88	85	59	106	95	104	50		47	87	92	74	75	73
285	78S 48476	74	45	58	54	73	47	89	85	60	105	95	106	50		48	91	91	76	75	73
-	Local check	91	56	60	50	62	46	91	85	61	109	95	116	46		41	108	98	76	76	-
Location mean		83	48	58	58	73	49	90	85	60	107	94	112	54		49	98	96	75	75	-

Table 4.2.3. Time to maturity (days) of the entries at different locations in FBIYT-S during 1983/84.

ENTRY NAME		ARGENTINA	CANADA		EGYPT	FRANCE	IRAN	IRAQ	LEBANON	MOROCCO		PAKISTAN	QATAR	SUDAN	SYRIA		TURKEY	W.GERMANY	MEAN
ILB/ Cross No.	PEDIGREE	Perico	Manitoba	Saska-toon	Gemmiza	Mont-auben	Gorgan	Sulaima-niya	Terbol	Douyet	Sidi-Kacem	Tarnab	Rawdat Harma	Hudeiba	Tel Hadya-Irrigated	Tel Hadya-Rainfed	Ankara	Stuttgart	
1813	Syrian Local Large (Long pod)	203	106	91	152	181	144	123	208	179	175	184	155	114	181	164	121	155	155
1819	Giza 3	197	101	89	151	181	144	123	204	179	175	185	145	113	186	166	120	157	154
1816	78S 48561	197	102	91	153	179	144	124	206	176	175	185	147	117	185	165	120	159	154
5	FLIP 83-1FB	197	100	89	152	179	144	123	204	176	175	186	142	114	186	165	119	155	153
277	ILB 277	197	101	89	149	183	144	123	204	176	175	184	140	114	184	165	120	154	153
360	74TA 498	197	99	90	152	180	144	124	204	176	175	184	145	113	186	165	119	157	154
269	74TA 367	199	101	89	154	181	144	124	208	179	175	188	146	116	185	167	118	156	155
33	74TA 95	199	102	89	155	179	144	123	209	176	175	188	145	116	186	165	118	159	155
287	77Ms 88323	199	100	91	151	181	144	123	203	179	175	185	147	118	185	165	120	154	154
X77TA 148	80S 45579	199	103	90	158	179	144	124	205	179	175	189	147	117	186	165	121	159	155
X77Sd 92	80S 46593	199	101	89	150	181	144	124	206	179	175	185	145	115	186	166	120	157	154
X77Sd 13	80S 45727	200	104	89	154	180	144	123	204	179	175	188	145	116	185	168	121	156	155
29	FLIP 83-7FB	199	101	90	153	181	144	124	208	179	175	184	145	115	184	165	119	155	154
295	75TA 26467	199	101	89	151	180	144	124	204	179	175	185	148	114	185	167	120	153	154
112	78S 49288	200	101	90	154	180	144	124	204	179	175	184	146	118	187	166	119	155	154
22	FLIP 83-2FB	200	101	89	154	180	144	123	205	179	175	186	145	116	187	165	118	154	154
18	77TA 80023	200	104	89	155	180	144	124	205	179	175	189	143	114	189	166	120	155	155
1266	78S 49171	201	106	90	156	181	144	123	208	179	175	189	147	115	187	166	120	160	156
X77TA 82	80S 44371	200	102	90	155	179	144	123	204	179	175	186	153	115	187	167	120	155	155
X77Sd 70	80S 46341	197	100	89	156	179	144	124	205	179	175	185	148	116	189	165	119	154	154
32	74TA 91	200	99	89	154	179	144	123	205	179	175	184	145	118	185	164	119	156	154
X77TA 88	80S 44539	199	100	90	150	179	144	124	204	179	175	187	142	116	181	166	121	156	154
285	78S 48476	195	102	90	152	180	144	123	205	179	175	185	140	116	187	164	117	154	153
-	Local check	200	108	91	145	182	144	123	208	179	175	180	145	110	190	166	127	164	-
Location mean		199	102	90	153	180	144	123	205	178	175	186	146	115	186	165	120	156	

Table 4.2.4. Plant height (cm) of the entries at different locations in FBIYT-S during 1983/84.

ENTRY NAME		ARGENTINA	CANADA		EGYPT	ETHIOPIA	FRANCE	IRAN	IRAQ	LEBANON	PAKISTAN	QATAR	SYRIA		TURKEY	W.GERMANY	MEAN
ILB/ Cross No.	PEDIGREE	Perico	Manitoba	Saska-toon	Gemmiza	Debre Zeit	Mont-auben	Gorgan	Sulaima-niya	Terbol	Tarnab	Rawdat Harma	Tel Hayda-Irrigated	Tel Hadya-Rainfed	Ankara	Stuttgart	
1813	Syrian Local Large (Long pod)	85	55	46	70	101	70	70	45	144	57	98	74	38	51	103	74
1819	Giza 3	93	59	42	71	100	60	70	62	151	64	95	75	43	53	120	77
1816	78S 48561	80	58	46	72	98	70	75	51	153	59	95	80	39	54	120	77
5	FLIP 83-1FB	95	55	45	70	89	70	75	50	150	63	106	74	38	52	105	76
277	ILB 277	96	57	43	71	108	70	63	54	146	60	99	73	40	55	109	76
360	74TA 498	80	57	43	76	99	65	60	48	148	61	114	71	38	52	108	75
269	74TA 367	90	59	45	78	103	70	70	55	151	53	101	74	37	55	106	76
33	74TA 95	77	58	43	79	99	70	70	51	148	66	98	85	40	53	110	76
287	77Ms 88323	84	58	43	64	86	70	70	48	153	52	101	73	36	54	105	73
X77TA 148	80S 45579	93	62	46	79	115	70	75	63	154	58	109	84	38	59	118	82
X77Sd 92	80S 46593	87	58	44	65	98	70	85	54	146	64	101	75	41	57	116	77
X77Sd 13	80S 45727	105	65	49	90	104	70	105	54	151	59	101	76	39	57	121	83
29	FLIP 83-7FB	79	59	46	73	100	70	65	48	148	64	100	73	38	53	113	75
295	75TA 26467	99	56	46	80	99	70	70	54	156	61	104	72	43	54	110	78
112	78S 49288	104	58	46	71	101	70	65	54	149	61	89	76	34	54	108	76
22	FLIP 83-2FB	99	56	45	71	110	65	50	46	153	65	81	73	38	54	109	74
18	77TA 80023	92	52	44	69	98	70	65	45	144	60	100	80	39	54	101	74
1266	78S 49171	85	61	47	69	114	70	70	53	154	62	103	75	40	53	110	78
X77TA 82	80S 44371	99	57	48	78	111	65	85	52	150	61	94	78	39	54	118	79
X77Sd 70	80S 46341	88	63	46	79	109	65	85	58	154	57	108	88	39	53	114	80
32	74TA 91	78	62	46	67	98	70	60	52	146	65	106	75	40	54	114	76
X77TA 88	80S 44539	92	61	46	70	96	65	85	59	149	59	108	76	41	57	115	79
285	78S 48476	104	58	50	71	99	65	75	53	143	63	109	76	39	56	111	78
-	Local check	63	89	46	65	106	80	70	49	156	65	90	74	41	59	144	-
Location mean		89	60	45	73	102	69	72	52	150	61	100	76	39	54	113	

block design with 4 replications. The suggested plot size was 4 rows 4 m long with inter row spacings of 50 cm accomodating 150 seeds per plot. Thirty six sets of trial were distributed to cooperators in 24 countries. Results were reported from 22 trials covering 16 countries. Agronomic data received from the cooperators are presented in Table 4.2.1.

Results and Discussion

The time to flowering (Table 4.2.2) was earliest at Manitoba in Canada (48 days) and was closely followed by Debre Zeit in Ethiopia and Hudeiba in Sudan (49 days), Radwat Horma in Qatar (54 days), Gemmiza in Egypt and Saskatoon in Canada (58 days) and Sulaimaniya in Iraq (60 days). Overall mean over locations revealed that the entries 80S 44539 (X77TA 88), 78S 48476 (ILB 285), and Giza 3 (ILB 1819) were the earliest to flower in 73 days. In general, the earlier flowering locations were also early in maturity and at most of the locations the local check was late in flowering as well as maturity (Table 4.2.3). Plant height varied from 39 cm at Tel Hadya-Rainfed site to 150 cm at Terbol in Lebanon. The range in plant height (Table 4.2.4) among the entries overall locations was 73 for 77MS 88323 to 83 days for 80S 45727. The correlations between agronomic variables (Table 4.2.5) exhibited that time to flowering is significantly and positively correlated with time to maturity and negatively correlated with seed yield.

Table 4.2.5. Correlation (df=21) among three agronomic characters and seed yield for entries in the FBIYT-S during 1983/84.

TRAIT	Time to maturity	Plant height	Seed yield
Time to flowering	0.61**	0.27	-0.53*
Time to maturity		0.21	-0.22
Plant height			0.001

* $P \leq 0.05$; ** $P \leq 0.01$

The mean seed yield and rank of entries at different locations are given in Table 4.2.6. The mean seed yield at Stuttgart in W.Germany was the highest (6532 kg/ha) and was followed by Montauben in France (3726 kg/ha); Gorgan in Iran (2962 kg/ha); Gemmiza in Egypt (2913 kg/ha); and Perico in Argentina (2714 kg/ha). The lowest yields were, however, recorded at Lattakia in Syria (228 kg/ha); Hudeiba in

Table 4.2.6. Seed yield (Y=kg/ha) and rank (R) of the entries at different locations in FBIYT-S during 1983/84.

ENTRY NAME		ARGENTINA		CANADA				EGYPT		ETHIOPIA		FRANCE		IRAN		IRAQ		LEBANON		MOROCCO				PAKISTAN	
ILB/	PEDIGREE	Perico		Manitoba		Saskatoon		Gemmiza		Debre Zeit		Montauben		Gorgan		Sulaimaniya		Terbol		Douyet		Sidi Kacem		Tarnab	
Cross No.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1813	Syrian Local Large (Long Pod)	2588	14	1577	23	634	23	3163	6	1048	4	4596	2	3597	1	729	8	2583	1	990	23	670	3	1288	7
1819	Giza 3	2371	22	2245	13	1127	5	3392	5	1151	3	3558	17	2590	21	1031	2	1236	20	1042	21	536	16	1350	4
1816	78S 48561	2596	13	1994	17	811	21	3111	8	1541	2	3173	23	2528	22	677	13	1569	11	1250	11	685	2	922	19
5	FLIP 83-1FB	2538	16	1731	22	1124	7	2846	15	663	12	3423	22	3174	8	510	18	1648	9	1172	17	610	7	1531	3
277	ILB 277	2704	12	1827	20	1001	14	2979	11	636	13	3865	8	2083	24	708	10	1796	5	1250	11	565	11	859	22
360	74TA 498	2817	8	2256	11	1038	12	3508	3	833	9	3471	19	2785	17	479	20	1657	8	1615	1	506	19	1131	11
269	74TA 367	2467	19	2198	14	1100	8	2442	22	768	10	3750	10	3049	12	583	15	1514	13	1510	3	476	22	969	17
33	74TA 95	2467	19	2364	3	938	19	2571	20	225	24	4125	3	3410	2	865	3	1560	12	1536	2	565	11	1250	8
287	77Ms 88323	2358	23	2251	12	591	24	2675	17	857	7	4625	1	2694	19	531	17	2056	3	1120	20	491	21	875	20
X77TA 148	80S 45579	2729	10	2556	1	969	15	2508	21	413	21	3529	18	3243	6	719	9	1338	18	1016	22	521	17	931	18
X77Sd 92	80S 46593	2467	19	2361	4	1013	13	2608	19	345	22	4067	4	3139	10	542	16	1122	21	1224	13	506	19	1188	10
X77Sd 13	80S 45727	2504	17	2531	2	1125	6	3154	7	443	19	3567	15	3305	3	417	22	1088	22	1380	8	476	22	869	21
29	FLIP 83-7FB	2554	15	2315	8	942	18	1946	24	440	20	3644	13	2743	18	865	3	1616	10	1510	3	580	10	1213	9
295	75TA 26467	2800	9	1822	21	1064	9	3383	4	542	15	4010	5	2896	15	375	23	1028	23	1198	16	565	11	984	16
112	78S 49288	3208	3	2334	7	949	16	3021	10	1008	5	3654	11	3201	7	760	5	1486	15	1224	13	670	3	1328	5
22	FLIP 83-2FB	2854	6	2179	15	1158	4	2863	13	278	23	3577	14	2389	23	333	24	1417	17	1276	10	595	9	1000	14
18	77TA 80023	2321	24	1546	24	945	17	2692	16	452	18	3952	6	3250	5	500	19	2116	2	1172	17	521	17	1563	2
1266	78S 49171	2833	7	1956	19	937	20	2663	18	517	17	3760	9	2694	19	698	11	1505	14	1458	5	432	24	991	15
X77TA 82	80S 44371	3225	2	2352	6	1309	2	3096	9	1008	5	3894	7	3021	13	760	5	1773	6	1432	6	744	1	1313	6
X77Sd 70	80S 46341	3050	4	2167	16	1232	3	2863	13	523	16	3554	11	2833	16	760	5	1731	7	1224	13	610	7	1047	12
32	74TA 91	2471	18	2359	5	1056	11	2379	23	547	14	3019	24	3153	9	688	12	1472	16	1432	6	565	11	844	23
X77TA 88	80S 44539	2721	11	2301	9	1317	1	3588	1	850	8	3471	19	2938	14	1042	1	894	24	1354	9	551	15	1747	1
285	78S 48476	3013	5	1969	18	1060	10	2942	12	738	11	3567	15	3299	4	448	21	1917	4	990	23	670	3	1031	13
-	Local check	3488	1	2292	10	720	22	3517	2	3650	1	3462	21	3076	11	646	14	1264	19	1146	19	655	6	566	24
Location mean		2714		2145		1007		2913		811		3726		2962		653		1558		1272		574		1116	
C.V.%		30.8		15.7		16.9		19.4		38.4		18.1		20.9		64.7		27.4		28.4		23.0		27.7	
L.S.D. at 5%		NS		474		240		797		439		NS		NS		NS		602		NS		NS		436	
S.E.		418.6		168.1		85.2		282.5		155.6		337.4		309.3		211.0		213.4		180.8		66.1		154.7	
No. of entries significantly exceeding the local check		-		0		15		0		0		-		-		-		4		-		-		13	

Cont'd. 2/...

ENTRY NAME		QATAR		SUDAN		SYRIA						TUNISIA				TURKEY		W.GERMANY		MEAN	
ILB/	PEDIGREE	Rawdat Harma		Hudeiba		Lattakia		Tel Hadya-Irrigated		Tel Hadya-Rainfed		Beja		El-Kef		Ankara		Stuttgart			
Cross No.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1813	Syrian Local Large (Long Pod)	1169	22	100	19	68	23	1833	7	690	12	925	4	2042	5	916	23	4899	24	1719	9
1819	Giza 3	2050	4	531	3	296	5	1574	13	671	17	1142	1	1792	19	1156	10	7405	2	1821	4
1816	78S 48561	1500	15	156	11	354	3	1727	9	745	4	442	20	1800	17	915	24	6615	12	1672	13
5	FLIP 83-1FB	1631	10	271	4	294	6	1662	11	731	8	733	11	1842	13	1341	4	6455	17	1711	10
277	ILB 277	1581	12	177	7	206	14	2037	2	718	9	733	11	1858	11	1273	8	6643	9	1690	11
360	74TA 498	2556	3	163	10	479	2	1866	5	676	14	933	3	1708	23	934	22	7330	4	1845	1
269	74TA 367	1338	20	115	16	168	18	1486	16	435	24	592	16	1842	13	1009	19	6682	8	1643	19
33	74TA 95	1750	6	108	18	184	15	1838	6	699	10	392	22	2067	3	1363	2	6021	20	1728	8
287	77Ms 88323	1419	18	122	14	234	9	1264	20	574	20	875	7	1925	7	1019	18	5715	23	1632	20
X77TA 148	80S 45579	1025	24	91	21	184	15	1389	19	699	10	708	13	1775	20	1295	7	6078	19	1606	23
X77Sd 92	80S 46593	1781	5	128	13	152	20	1532	15	736	5	375	24	1892	8	998	20	5586	21	1608	22
X77Sd 13	80S 45727	1544	13	194	5	262	7	1139	21	532	22	800	10	2150	1	1065	13	6313	18	1660	15
29	FLIP 83-7FB	1725	7	83	22	222	12	1139	21	667	18	442	20	2108	2	1348	3	7365	3	1689	12
295	75TA 26467	1700	8	80	23	161	19	1039	23	736	5	992	2	1683	24	1118	12	6510	15	1652	17
112	78S 49288	1505	14	167	8	115	22	1625	12	676	14	925	4	2050	4	973	21	6745	7	1792	5
22	FLIP 83-2FB	1038	23	118	15	173	17	2005	4	898	1	883	6	1825	16	1313	5	6822	6	1666	14
18	77TA 80023	1656	9	97	20	121	21	1806	8	810	2	567	18	1867	10	1313	5	5585	22	1660	15
1266	78S 49171	1300	21	66	24	222	12	1565	14	537	21	467	19	1833	15	1032	15	6572	13	1621	21
X77TA 82	80S 44371	1469	17	167	8	566	1	1463	18	690	12	833	9	1933	6	1040	14	6626	10	1843	2
X77Sd 70	80S 46341	1619	11	149	12	232	11	1477	17	620	19	383	23	1742	22	1128	11	7165	5	1724	7
32	74TA 91	1481	16	115	16	233	10	2162	1	491	23	642	15	1858	11	1021	17	6556	14	1645	18
X77TA 88	80S 44539	2625	2	569	2	256	8	917	24	676	14	875	7	1892	8	1448	1	6490	16	1834	3
285	78S 48476	1419	18	194	5	302	4	2032	3	764	3	650	14	1800	17	1221	9	6621	11	1745	6
-	Local check	3206	1	4250	1	0	24	1699	10	736	5	583	17	1758	21	1032	15	7963	1	-	-
Location mean		1670		342		228		1595		675		704		1877		1136		6532			
C.V.%		22.1		93.5		79.8		38.5		25.0		45.8		16.1		4.1		13.8			
L.S.D. at 5%		521		451		257		NS		NS		NS		NS		66		1272			
S.E.		184.7		159.9		91.1		307.0		84.6		186.3		174.2		23.3		451.0			
No. of entries significantly exceeding the local check		0		0		7		-		-		-		-		12		0			

Table 4.2.7. The five heaviest seed yielding entries at the individual locations in FBIYT-S during 1983/84.

RANK	ARGENTINA Perico ILB/ Cross No.	ARGENTINA Perico PEDIGREE	CANADA Manitoba ILB/ Cross No.	CANADA Manitoba PEDIGREE	CANADA Saskatoon ILB/ Cross No.	CANADA Saskatoon PEDIGREE	EGYPT Gemmiza ILB/ Cross No.	EGYPT Gemmiza PEDIGREE	ETHIOPIA Debre Zeit ILB/ Cross No.	ETHIOPIA Debre Zeit PEDIGREE	FRANCE Montauben ILB/ Cross No.	FRANCE Montauben PEDIGREE
1		Local check	X77TA 148	80S 45579	X77TA 88	80S 44539	X77TA 88	80S 44539		Local check	287	77Ms 88323
2	X77TA 82	80S 44371	X77Sd 13	80S 45727	X77TA 82	80S 44371		Local check	1816	78S 48561	1813	Syrian Local Large (Long Pod)
3	112	78S 49288	33	74TA 95	X77Sd 70	80S 46341	360	74TA 498	1819	Giza 3	33	74TA 95
4	X77Sd 70	80S 46341	X77Sd 92	80S 46593	22	FLIP 83-2FB	295	75TA 26467	1813	Syrian Local Large (Long Pod)	X77Sd 92	80S 46593
5	285	78S 48476	32	74TA 91	1819	Giza 3	1819	Giza 3	112 X77TA 82	78S 49288 80S 44371 (1)	295	75TA 26467

Cont'd. ...

RANK	IRAN Gorgan ILB/ Cross No.	IRAN Gorgan PEDIGREE	IRAQ Sulaimaniya ILB/ Cross No.	IRAQ Sulaimaniya PEDIGREE	LEBANON Terbol ILB/ Cross No.	LEBANON Terbol PEDIGREE	MOROCCO Douyet ILB/ Cross No.	MOROCCO Douyet PEDIGREE	MOROCCO Sidi-Kacem ILB/ Cross No.	MOROCCO Sidi-Kacem PEDIGREE	PAKISTAN Tarnab ILB/ Cross No.	PAKISTAN Tarnab PEDIGREE
1	1813	Syrian Local Large (Long Pod)	X77TA 88	80S 44539	1813	Syrian Local Large (Long Pod)	360	74TA 498	X77TA 82	80S 44371	X77TA 88	80S 44539
2	33	74TA 95	1819	Giza 3	18	77TA 80023	33	74TA 95	1816	78S 48561	18	77TA 80023
3	X77Sd 13	80S 45727	33	74TA 95	287	77Ms 88323	269	74TA 367	1813	Syrian Local Large (Long Pod)	5	FLIP 83-1FB
4	285	78S 48476	29	FLIP 83-7FB	285	78S 48476	29	FLIP 83-7FB	112	78S 49288	1819	Giza 3
5	18	77TA 80023	112 X77TA 82 X77Sd 70	78S 49288 80S 44371 80S 46341	277	ILB 277	1266	78S 49171	285	78S 48476	112	78S 49288

Cont'd. ...

RANK	QATAR Rawdat Harma ILB/ Cross No.	QATAR Rawdat Harma PEDIGREE	SUDAN Hudeiba ILB/ Cross No.	SUDAN Hudeiba PEDIGREE	SYRIA Lattakia ILB/ Cross No.	SYRIA Lattakia PEDIGREE	SYRIA Tel Hadya-Irrigated ILB/ Cross No.	SYRIA Tel Hadya-Irrigated PEDIGREE	SYRIA Tel Hadya-Rainfed ILB/ Cross No.	SYRIA Tel Hadya-Rainfed PEDIGREE
1		Local check		Local check	X77TA 82	80S 44371	32	74TA 91	22	FLIP 83-2FB
2	X77TA 88	80S 44539	X77TA 88	80S 44539	360	74TA 498	277	ILB 277	18	77TA 80023
3	360	74TA 498		Giza 3	1816	78S 48561	285	78S 48476	285	78S 48476
4	1819	Giza 3	5	FLIP 83-1FB	285	78S 48476	22	FLIP 83-2FB	1816	78S 48561
5	X77Sd 92	80S 46593	X77Sd 13 285	80S 45727 78S 48476	1819	Giza 3	360	74TA 498	X77Sd 92 295 Local check	80S 46593 75TA 26467

Cont'd.

RANK	TUNISIA Beja ILB/ Cross No.	TUNISIA Beja PEDIGREE	TUNISIA El-Kef ILB/ Cross No.	TUNISIA El-Kef PEDIGREE	TURKEY Ankara ILB/ Cross No.	TURKEY Ankara PEDIGREE	W.GERMANY Stuttgart ILB/ Cross No.	W.GERMANY Stuttgart PEDIGREE
1	1819	Giza 3	X77Sd 13	80S 45727	X77TA 88	80S 44539		Local check
2	295	75TA 26467	29	FLIP 83-7FB	33	74TA 95	1819	Giza 3
3	360	74TA 498	33	74TA 95	29	FLIP 83-7FB	29	FLIP 83-7FB
4	1813	Syrian Local Large (Long Pod)	112	78S 49288	5	FLIP 83-1FB	360	74TA 498
5	112	78S 49288	1813	Syrian Local Large (Long Pod)	22 18	FLIP 83-2FB 77TA 80023	X77Sd 70	80S 46341

(1) The brackets indicate entries having the same rank.

Sudan (342 kg/ha); Sidi Kacem in Morocco (574 kg/ha); and Sulaimaniya in Iraq (653 kg/ha). The CV ranged from 4.1% at Ankara in Turkey to 93.5% at Hudeiba in Sudan. The ANOVA for the design revealed that the differences between the entries were significant at 11 of the 21 locations. The LSD estimates at different locations revealed that 15, 4, 13, 7 and 12 entries exceeded the respective local checks at Saskatoon (Canada), Terbol (Lebanon), Ternab (Pakistan), Lattakia (Syria) and Ankara (Turkey), respectively. On the basis of average over locations, the five heaviest seed yielding entries overall locations included 74TA 498 (ILB 360), 80S 44371 (X77TA 82), 80S 44539 (X77TA 88), Giza 3 (ILB 1819) and 78S 49288 (ILB 112) with average yields of 1845, 1843, 1834, 1921 and 1792 kg/ha, respectively. The five heaviest seed yielding entries at individual locations are given in Table 4.2.7. The frequency of occurence of the entries among the top five yielders was highest for Giza 3 and was closely followed by 78S 48476 (ILB 285). This indicated that these lines were, in general, more adaptable than the others. The overall mean yield and rank of the four common entries during 1982-84 (Table 4.2.8) revealed that 77MS 88323 (ILB 287) was the poor yielder during both the years, however, the other three entries changed their positions in ranking.

Table 4.2.8. The mean yield (Y=kg/ha) and rank (R) of the common entries in the FBIYT-S during 1983/84.

ENTRY NAME	PEDIGREE	1982/83		1983/84		AVERAGE[1]	
		Y	R	Y	R	Y	R
ILB 1816	78S 48561	2553	1	1672	3	2113	2
ILB 277	-	2372	3	1690	2	2031	3
ILB 360	74TA 498	2400	2	1845	1	2123	1
ILB 287	77MS 88323	2298	4	1632	4	1965	4

The correlations between different locations for seed yields of entries (Table 4.2.9) revealed that, in general, Tel Hadya irrigated or rainfed had no significant association with other locations except Terbol (Lebanon) and Sidi Laidi (Morocco) where positive correlations were recorded. The performance of lines at Gemmiza in Egypt and Hudeiba in Sudan was associated with at least 4 other locations.

Table 4.2.9. Correlation (df=21) among different locations for the seed yield of entries in the FBIYT-S during 1983/84.

COUNTRY	LOCATION	CANADA		EGYPT	ETHIOPIA	FRANCE	IRAN	IRAQ	LEBANON	MOROCCO		PAKISTAN	QATAR	SUDAN	SYRIA			TUNISIA		TURKEY	W.GERMANY
		Manitoba	Saskatoon	Gemmiza	Debre Zeit	Montauben	Gorgan	Sulaimaniya	Terbol	Douyet	Sidi-Kacem	Tarnab	Rawdat Harma	Hudeiba	Lattakia	Tel-Hadya-Irrigated	Tel-Hadya-Rainfed	Beja	El-Kef	Ankara	Stuttgart
ARGENTINA	Perico	0.10	0.39	0.29	0.13	-0.16	-0.07	-0.01	-0.01	0.03	0.55**	-0.01	-0.10	-0.07	0.32	0.03	0.19	0.13	-0.17	-0.11	0.36
CANADA	Manitoba		0.29	-0.17	-0.17	-0.27	0.03	0.25	-0.56**	0.36	-0.19	-0.22	0.12	0.13	0.26	-0.31	-0.35	-0.03	0.24	-0.03	0.31
CANADA	Saskatoon			0.26	-0.19	-0.53*	-0.09	0.10	-0.57**	0.28	0.08	0.27	0.35	0.46*	0.40	-0.16	0.03	0.03	-0.25	0.36	0.55**
EGYPT	Gemmiza				0.50*	-0.04	-0.11	0.01	-0.18	-0.19	0.20	0.27	0.49*	0.57**	0.34	-0.12	0.24	0.65**	-0.29	-0.16	0.10
ETHIOPIA	Debre Zeit					-0.10	-0.15	0.30	0.21	-0.22	0.47*	0.13	0.15	0.38	0.39	0.01	-0.06	0.36	-0.11	-0.49*	0.12
FRANCE	Montauben						0.19	-0.08	0.48*	-0.25	-0.08	0.06	-0.19	-0.29	-0.36	-0.16	0.06	0.09	0.29	-0.13	-0.64**
IRAN	Gorgan							-0.04	0.16	-0.14	0.12	0.30	-0.11	-0.14	-0.23	-0.04	-0.14	-0.09	0.38	-0.07	-0.55**
IRAQ	Sulaimaniya								-0.10	0.08	0.14	0.41	0.34	0.52*	0.05	-0.20	-0.20	-0.04	0.24	0.21	0.19
LEBANON	Terbol									-0.27	0.34	0.01	-0.36	-0.39	-0.06	0.48*	0.10	-0.07	0.14	-0.20	-0.38
MOROCCO	Douyet										-0.26	-0.06	0.34	-0.16	0.33	-0.07	-0.39	-0.29	0.19	-0.05	0.39
MOROCCO	Sidi-Kacem											0.21	-0.17	0.03	0.26	0.25	0.44*	0.10	0.09	-0.06	0.04
PAKISTAN	Tarnab												0.51*	0.55**	0.02	-0.19	0.34	0.16	0.16	0.41	-0.10
QATAR	Rawdat Harma													0.62**	0.36	-0.26	0.01	0.18	-0.12	0.16	0.34
SUDAN	Hudeiba														0.26	-0.25	0.04	0.45*	-0.08	0.31	0.29
SYRIA	Lattakia															-0.01	-0.03	0.14	-0.23	-0.15	0.48*
SYRIA	Tel Hadya-Irrigated																0.24	-0.12	-0.17	-0.12	-0.05
SYRIA	Tel Hadya-Rainfed																	0.11	-0.18	0.41	-0.10
TUNISIA	Beja																		-0.11	-0.09	0.09
TUNISIA	El-Kef																			0.05	-0.30
TURKEY	Ankara																				0.11

* $P \leq 0.05$; ** $P \leq 0.01$

4.3. FABA BEAN INTERNATIONAL SCREENING NURSERY-LARGE SEED (FBISN-L)

Material

The Faba Bean International Screening Nursery Large Seed comprised of 36 entries, and three checks two of them were provided (Syrian Local Large and Reina Blanca) and the third was to be supplied by the cooperator. The entries in this nursery were selected on the basis of their performance either in local trials or from the last year's international screening nursery.

Methods and Management

The test entries and the three checks were suggested to be sown in single row plots of 4 m length with inter- and intra row spacings of 50- and 10 cm respectively. The whole experimental unit was divided into three blocks each comprising 12 test entries and three checks repeated in each block. The augmented design was followed for analysis. Thirty-eight sets of the nursery were distributed to cooperators in 24 countries. The results were, however, received for 18 sets and are reported. The agronomic details for the locations reporting the data are presented in Table 4.3.1.

Results and Discussion

The data pertaining to time to flowering, time to maturity and plant height are given in Tables 4.3.2, 4.3.3, and 4.3.4 respectively. Overall location mean for entries ranged from 86 to 97 days for time to flowering, 163 to 165 days for time to maturity and 63 to 74 cm for plant height. The overall mean of entries at locations, however, ranged from 48 to 149 days for time to flowering, 118 to 235 days for time to maturity, and 33 to 148 cm for plant height.

The adjusted yield performance and ranking of different entries in the nursery at each location are given in Table 4.3.5. The coefficient of variation for the experiment at different locations varied from 5.4 to 301.4 per cent. The locations showing less than 30 per cent coefficient of variation included Sakha in Egypt, Gorgan in Iran, Sulaimaniya in Iraq, Tel Hadya-rainfed in Syria, Beja and El-Kef in Tunisia and Ankara in Turkey. The ANOVA for the augmented design revealed that 1, 8, 3, 4, and 1 entries exceeded the local check by a significant margin at Sakha in Egypt, Sulaimaniya in Iraq, Lattakia and Tel Hadya-rainfed in Syria and Beja in Tunisia. The five heaviest yielders across the locations included FLIP 82-29FB (2245 kg/ha), 80S 44027 (2212 kg/ha), 80S 43587 (2173 kg/ha), FLIP 82-29FB (2157 kg/ha), and 80S 44178 (144 kg/ha) respectively. The five heaviest seed yielding entries at individual locations are given in Table 4.3.6. Except at few locations namely Zhejiang (China), Sids (Egypt), Debre Zeit (Ethiopia), Douyet (Morocco), La Molina (Peru), and El-Kef (Tunisia) where the local check ranked 1, 1, 1, 1, 1, and 2 respectivley, the top five were the ICARDA supplied materials.

Table 4.3.1. Agronomic data for different locations in the FBISN-L during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
CHINA	Yunnan 1)	20.10.1983	189	36	67		2	Propineb cygon
CHINA	Zhejiang	28.10.1983	219	26	58	22		
EGYPT	Sakha	24.10.1983	179	35	70		4	Igran
EGYPT	Sids	20.11.1983	165	37	75		5	Igran
ETHIOPIA	Debre Zeit	27.6.1984	151					
IRAN	Gorgan	15.1.1984	144					Diazinon
IRAQ	Sulaimaniyah	17.11.1983	120	40	80			
LEBANON	Terbol	9.11.1983	208		50			Kerb,Metasystox,Tribunil
MOROCCO	Douyet	26.11.1983	162	88	120	120		
PAKISTAN	Islamabad	25.10.1983	207				1	
PAKISTAN	Karak 2)	24.10.1983		20	50			
PERU	La Molina	27.10.1983	272					Tamaron
SYRIA	Lattakia	15.11.1983	212					
SYRIA	Tel Hadya-Irrigated	6.11.1983	187					
SYRIA	Tel Hadya-Rainfed	17.11.1983	171					
TUNISIA	Beja 3)							
TUNISIA	El-Kef 3)							
TUNISIA	Mateur 3)							
TURKEY	Ankara	5.3.1984	124	20	50			Basudine
W.GERMANY	Stuttgart 2)	27.3.1984	159		116	199		Tribunil,Thiodan

1) Trial was severally effected by heavy snow during December 1983-January 1984.
2) Yield data not reported by cooperator.
3) Agronomic details not reported by the cooperator.

Table 4.3.2. Time to flowering (days) of entries at different locations in FBISN-L during 1983/84.

ENTRY NAME		CHINA	EGYPT		ETHIOPIA	IRAN	IRAQ	LEBANON	MOROCCO	PAKISTAN		PERU	SYRIA		TURKEY	W.GERMANY	MEAN
ILB/ Cross No.	PEDIGREE	Yunnan	Sakha	Sids	Debre Zeit	Gorgan	Sulaimaniya	Terbol	Douyet	Islamabad	Karak	La Molina	Tel Hadya-Irrigated	Tel Hadya-Rainfed	Ankara	Stuttgart	
X79S 70	80S 80026	122	70	75	58	87	50	111	149	135	110	124	107	102	74	76	97
12	FLIP 83-4FB	120	50	65	45	87	50	105	149	135	-	121	92	98	74	74	90
1933	Sevilla Giant	121	70	75	56	87	51	111	149	135	102	126	103	98	76	75	96
263	77TA 88311	116	65	70	46	87	51	107	149	135	-	125	103	102	74	75	93
X79S 1018	FLIP 82-26FB	121	55	70	48	87	50	105	149	135	88	-	92	91	74	74	89
77TA 72	80S 44178	120	50	72	44	87	53	105	149	135	100	123	95	91	74	76	92
X75TA 116	79S 79180	122	65	65	49	87	54	107	149	135	102	-	103	91	76	74	91
X79L 25	FLIP 82-29FB	121	60	72	46	87	50	105	149	135	-	120	99	98	75	75	92
X79S 74	FLIP 82-25FB	121	65	70	56	87	54	111	149	135	-	121	103	98	74	75	94
X79S 72	80S 80028	121	65	75	48	87	57	111	149	135	86	123	107	102	74	75	94
1814	79S 653	116	75	72	49	87	51	109	149	135	-	126	103	102	74	75	95
41	76TA 56297	121	50	70	49	87	50	111	149	135	85	123	103	102	76	74	92
X79S 131	FLIP 82-27FB	116	55	72	49	87	51	109	149	135	102	123	103	102	74	75	93
X79S 178	FLIP 82-28FB	113	70	70	46	87	51	109	149	135	110	121	103	98	74	74	94
X79S 12	FLIP 83-3FB	116	65	65	45	87	53	107	149	135	84	125	96	91	74	74	91
X75TA 115	78S 33200	113	40	70	47	87	50	109	149	135	86	121	99	102	74	75	90
1817	FLIP 82-45FB	116	70	68	48	87	50	109	149	135	84	121	99	91	74	75	92
23	FLIP 82-53FB	117	50	65	46	87	51	105	149	135	84	121	89	91	74	74	89
29	FLIP 83-6FB	117	60	68	44	87	53	105	149	135	86	123	92	91	74	75	91
1817	FLIP 82-46FB	114	65	72	50	87	53	109	149	135	90	124	107	102	74	75	94
X79S 103	80S 80064	121	55	72	49	87	53	107	149	135	101	120	107	102	74	75	94
41	FLIP 82-54FB	120	70	70	57	87	49	107	149	135	109	125	106	102	74	74	96
X79S 155	80S 80123	121	55	70	46	87	51	107	149	-	86	-	92	102	76	75	86
X75TA 209	FLIP 82-39FB	116	65	68	48	87	52	109	149	135	83	-	92	102	74	74	90
1817	FLIP 82-47FB	117	55	70	47	87	53	107	149	135	108	124	107	102	74	76	94
X77TA 31	80S 43587	118	45	65	46	87	51	107	149	135	88	121	92	91	74	75	90
X79L 130	FLIP 82-30FB	113	65	72	50	87	50	111	149	135	88	123	99	102	74	75	93
X79L 153	80S 81054	114	75	72	49	87	55	111	149	135	101	117	103	102	76	75	95
282	76TA 56356	113	75	65	46	87	51	109	149	135	104	122	106	98	74	75	94
X79S 171	80S 80135	116	55	70	43	87	51	107	149	135	85	124	96	94	74	74	91
1814	79S 546	116	65	75	50	87	56	111	149	135	100	125	107	102	76	74	95
X79S 160	80S 80128	116	50	68	46	87	51	107	149	135	87	124	99	98	76	75	91
22	FLIP 83-5FB	116	70	68	44	87	53	107	149	135	88	123	103	102	74	75	93
10	78S 49907	116	65	72	45	87	50	107	149	135	103	125	106	102	76	74	94
X77TA 64	80S 44027	112	60	70	50	87	57	105	149	-	89	123	92	91	74	74	88
1817	FLIP 82-48FB	113	60	72	44	87	54	111	149	135	104	121	107	102	74	75	94
1814	Syrian Local Large	121	63	72	54	87	51	111	149	113	107	126	106	102	75	76	94
1270	Reina Blanca	120	67	75	56	87	53	109	149	135	110	118	107	103	76	75	96
-	Local check	113	52	55	45	87	51	110	149	135	103	115	107	101	76	73	-
Location mean		117	61	70	48	87	52	108	149	135	95	122	101	99	75	75	

Table 4.3.3. Time to maturity (days) of entries at different locations in FBISN-L during 1983/84.

ENTRY NAME		CHINA	EGYPT	IRAN	IRAQ	LEBANON	MOROCCO	PERU	SYRIA		TURKEY	W.GERMANY	MEAN
ILB/ Cross No.	PEDIGREE	Zhejiang	Sids	Gorgan	Sulaimaniya	Terbol	Douyet	La Molina	Tel Hadya-Irrigated	Tel Hadya-Rainfed	Ankara	Stuttgart	
X79S 70	80S 80026	219	165	144	120	200	182	216	186	171	122	151	171
12	FLIP 83-4FB	219	155	144	119	200	182	233	182	164	121	156	170
1933	Sevilla Giant	212	160	144	118	205	182	-	181	164	122	156	164
263	77TA 88311	219	155	144	117	200	182	-	186	169	118	159	165
X79S 101B	FLIP 82-26FB	219	155	144	119	200	182	-	181	164	118	152	163
77TA 72	80S 44178	219	155	144	117	205	182	-	181	164	118	155	164
X75TA 116	79S 79180	211	155	144	117	200	182	-	181	171	123	151	164
X79L 25	FLIP 82-29FB	219	155	144	120	200	182	-	182	164	118	155	164
X79S 74	FLIP 82-25FB	216	155	144	116	208	182	-	186	169	118	150	164
X79S 72	80S 80028	215	155	144	117	200	182	232	186	171	118	152	170
1814	79S 653	219	160	144	118	205	182	220	182	171	119	156	171
41	76TA 56297	214	160	144	119	208	182	238	187	171	122	156	173
X79S 131	FLIP 82-27FB	219	155	144	117	205	182	232	184	171	119	151	171
X79S 178	FLIP 82-28FB	216	155	144	120	205	182	248	184	165	121	154	172
X79S 12	FLIP 83-3FB	219	150	144	116	205	182	242	184	165	118	151	171
X75TA 115	78S 33200	216	155	144	118	208	182	223	182	165	122	151	170
1817	FLIP 82-45FB	216	155	144	117	205	182	-	181	165	121	152	164
23	FLIP 82-53FB	214	160	144	118	205	182	-	181	165	118	159	165
29	FLIP 83-6FB	219	155	144	120	205	182	272	182	168	118	158	175
1817	FLIP 82-46FB	219	160	144	119	208	182	246	181	165	119	150	172
X79S 103	80S 80064	219	155	144	120	205	182	216	181	165	118	155	169
41	FLIP 82-54FB	219	150	144	118	203	182	211	181	165	119	152	168
X79S 155	80S 80123	219	160	144	118	203	182	-	182	164	118	150	164
X75TA 209	FLIP 82-39FB	214	155	144	117	205	182	-	182	165	118	152	163
1817	FLIP 82-47FB	216	160	144	116	203	182	-	185	165	118	150	164
X77TA 31	80S 43587	214	155	144	118	208	182	-	185	165	120	158	165
X79L 130	FLIP 82-30FB	219	155	144	117	203	182	209	182	165	119	151	168
X79L 153	80S 81054	217	155	144	116	203	182	214	185	165	119	150	168
282	76TA 56356	219	150	144	117	203	182	255	182	165	122	152	172
X79S 171	80S 80135	219	155	144	119	205	182	245	181	171	119	161	173
1814	79S 546	219	160	144	116	205	182	220	187	165	122	152	170
X79S 160	80S 80128	214	155	144	120	200	182	224	182	165	117	152	169
22	FLIP 83-5FB	214	155	144	119	200	182	242	186	165	118	151	171
10	78S 49907	215	160	144	117	203	182	-	182	165	120	151	164
X77TA 64	80S 44027	217	160	144	120	203	182	241	182	165	123	152	172
1817	FLIP 82-48FB	214	155	144	116	200	182	247	182	165	118	152	170
1814	Syrian Local Large	217	162	144	119	208	182	260	186	169	124	154	175
1270	Reina Blanca	214	158	144	118	202	182	219	181	164	118	151	168
-	Local check	216	148	144	117	205	182	260	183	168	124	160	-
Location mean		217	156	144	118	204	182	235	183	166	120	154	

Table 4.3.4. Plant height (cm) of entries at different locations in FBISN-L during 1983/84.

ENTRY NAME		CHINA		EGYPT	ETHIOPIA	IRAN	IRAQ	LEBANON	PAKISTAN	PERU	SYRIA		TURKEY	W.GERMANY	MEAN
ILB/ Cross No.	PEDIGREE	Yunnan	Zhejiang	Sids	Debre Zeit	Gorgan	Sulaimaniya	Terbol	Islamabad	La Molina	Tel Hadya-Irrigated	Tel Hadya-Rainfed	Ankara	Stuttgart	
X79S 70	80S 80026	33	79	105	75	70	30	140	43	40	60	35	58	100	67
12	FLIP 83-4FB	29	87	95	100	60	20	160	41	45	80	40	56	105	71
1933	Sevilla Giant	30	75	85	90	45	35	145	34	35	73	40	58	100	65
263	77TA 88311	36	85	105	95	65	35	160	45	40	70	40	55	105	72
X79S 101B	FLIP 82-26FB	30	86	100	85	60	30	155	44	-	73	35	51	100	71
77TA 72	80S 44178	29	87	110	90	80	35	155	49	40	75	40	55	110	73
X75TA 116	79S 79180	35	63	85	85	60	30	145	36	-	55	42	58	95	66
X79L 25	FLIP 82-29FB	49	80	115	90	65	20	135	34	38	73	45	58	100	69
X79S 74	FLIP 82-25FB	28	82	110	85	80	40	145	45	37	65	35	58	100	70
X79S 72	80S 80028	30	69	95	90	70	25	140	37	30	75	35	65	90	65
1814	79S 653	34	71	110	90	75	45	150	47	30	68	40	55	100	70
41	76TA 56297	37	64	110	100	60	40	150	44	29	70	42	57	100	69
X79S 131	FLIP 82-27FB	43	80	100	90	80	40	140	41	36	60	40	53	100	69
X79S 178	FLIP 82-28FB	40	77	110	90	65	35	140	50	33	65	35	53	95	68
X79S 12	FLIP 83-3FB	46	80	105	95	75	45	150	43	30	70	35	53	105	72
X75TA 115	78S 33200	45	68	110	100	70	30	135	48	45	50	45	52	100	69
1817	FLIP 82-45FB	48	78	105	90	85	35	155	37	16	70	37	54	95	70
23	FLIP 82-53FB	35	67	105	90	65	40	145	56	25	80	40	53	100	69
29	FLIP 83-6FB	30	81	115	95	75	35	145	31	38	77	40	51	105	71
1817	FLIP 82-46FB	48	73	110	90	85	30	150	32	34	85	35	55	100	71
X79S 103	80S 80064	41	74	120	90	70	25	145	44	43	62	32	54	90	68
41	FLIP 82-54FB	39	71	110	90	65	20	135	45	25	65	40	54	105	66
X79S 155	80S 80123	36	86	110	95	60	20	155	-	-	68	35	46	100	74
X75TA 209	FLIP 82-39FB	41	83	110	85	60	40	125	41	-	75	35	55	100	71
1817	FLIP 82-47FB	45	74	95	80	65	30	165	41	40	75	45	53	100	70
X77TA 31	80S 43587	40	84	115	80	70	35	170	33	22	70	40	58	105	71
X79L 130	FLIP 82-30FB	40	87	120	85	85	30	155	42	31	70	35	49	100	71
X79L 153	80S 81054	38	71	105	80	75	35	150	31	43	72	40	48	100	68
282	76TA 56356	47	81	100	95	80	35	150	40	37	75	40	50	95	71
X79S 171	80S 80135	41	87	100	95	65	35	150	46	22	68	40	53	105	70
1814	79S 546	43	88	130	95	75	30	140	30	33	75	45	52	100	72
X79S 160	80S 80128	37	69	130	95	85	35	140	44	33	72	37	54	105	72
22	FLIP 83-5FB	41	69	95	75	60	45	155	37	42	65	40	54	105	68
10	78S 49907	40	76	125	95	75	30	155	39	27	70	35	50	100	71
X77TA 64	80S 44027	39	84	105	95	75	30	150	-	48	68	35	51	100	73
1817	FLIP 82-48FB	45	74	100	75	80	30	160	34	68	80	40	52	100	72
1814	Syrian Local Large	39	75	103	88	72	33	158	49	39	80	42	55	97	72
1270	Reina Blanca	31	62	95	90	68	28	145	37	28	55	32	53	92	63
-	Local check	69	107	100	90	67	35	148	44	54	70	39	56	113	
Location mean		39	78	106	89	70	33	148	41	36	70	39	54	100	

Table 4.3.5. Adjusted seed yield (Y=kg/ha) and rank (R) of entries at different locations in FBISN-L during 1983/84.

ENTRY NAME		CHINA		EGYPT				ETHIOPIA		IRAN		IRAQ		LEBANON		MOROCCO		PERU		SYRIA						TUNISIA						TURKEY		MEAN	
ILB/ Cross No.	PEDIGREE	Zhejiang		Sakha		Sids		Debre Zeit		Gorgan		Sulaimaniya		Terbol		Douyet		LaMolina		Lattakia		Tel Hadya-Irrigated		Tel Hadya-Rainfed		Beja		El-Kef		Mateur		Ankara			
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
X79S 70	80S 80026	2089	18	7296	9	3830	35	0	35	2222	36	500	17	2156	13	1157	17	0	22	354	19	925	23	855	2	994	28	2322	19	2950	11	1184	13	1802	29
12	FLIP 83-4FB	2402	10	6407	18	7886	5	217	25	2944	16	334	30	1786	21	1157	17	97	13	241	22	925	23	374	24	344	38	2922	3	2250	26	1118	17	1963	19
1933	Sevilla Giant	1745	23	8463	2	4219	31	0	35	2500	32	1042	3	1119	37	1366	3	-	-	2154	2	1110	16	485	14	1244	17	2672	7	1750	36	1224	11	2073	9
263	77TA 88311	3371	2	5574	28	7775	7	3	34	2556	30	625	15	1156	34	949	31	-	-	248	21	740	32	226	34	0	39	2406	16	2050	34	891	26	1905	24
X79S 101 B	FLIP 82-26FB	2122	16	8074	4	7164	13	30	32	2722	25	375	26	1453	30	1157	17	-	-	201	26	814	29	263	31	444	37	2056	26	2500	22	591	37	1998	15
X77TA 72	80S 44178	2800	5	7796	5	6441	16	383	10	2889	22	709	10	2712	6	1366	3	-	-	207	25	962	21	226	34	544	36	2356	18	1750	36	1024	21	2144	5
X75TA 116	79S 79180	1206	32	6352	21	4164	33	10	33	1944	37	459	21	2305	11	1366	3	-	-	1414	4	999	20	892	1	2678	1	2072	24	2200	27	1184	13	1950	20
X79L 25	FLIP 82-29FB	2466	8	8352	3	8497	2	330	15	1667	39	292	33	1230	33	1157	17	-	-	201	26	1073	17	596	6	944	31	2472	13	2200	27	878	27	2157	4
X79S 74	FLIP 82-25FB	2100	17	6685	15	5608	22	0	35	3389	7	459	21	675	39	1366	3	-	-	534	14	962	21	300	27	1044	26	2422	15	2850	16	1556	3	1997	16
X79S 72	80S 80028	1863	21	6685	15	4691	26	0	35	1944	37	375	26	1564	28	1157	17	0	22	215	23	703	35	411	20	1144	21	1756	35	2700	18	1524	5	1671	34
1814	79S 653	1885	20	6407	18	7886	5	0	35	3611	3	667	14	1860	19	1157	17	0	22	2621	1	1147	15	263	31	844	32	1772	34	2550	21	838	31	2094	7
41	76TA 56297	1658	27	7352	8	5997	19	36	31	2500	32	709	10	2305	11	1366	3	0	22	214	24	777	30	448	17	1094	24	2672	7	2900	13	1558	3	1974	17
X79S 131	FLIP 82-27FB	2509	7	7370	7	7312	9	92	27	2907	20	1028	4	1712	23	1366	3	129	7	161	29	1320	9	509	12	1228	18	1672	36	3000	9	878	27	2075	8
X79S 178	FLIP 82-28FB	1163	33	6481	17	7978	4	659	4	3185	11	487	18	1564	28	1157	17	241	2	0	33	765	31	361	25	1328	13	2256	22	2750	17	1111	19	1968	18
X79S 12	FLIP 83-3FB	1540	29	6815	14	7756	8	339	13	3019	15	820	7	2453	10	949	31	91	15	894	9	1209	12	621	5	1478	9	2306	20	2200	27	1044	20	2096	6
X75TA 115	78S 33200	1066	34	4593	36	7228	12	112	26	2630	29	695	12	1934	18	1366	3	133	6	0	33	913	26	547	9	1778	5	2272	21	2600	19	1311	10	1924	27
1817	FLIP 82-45FB	2315	12	7648	6	7312	9	339	13	3185	11	695	12	2008	17	1366	3	-	-	354	19	1542	7	806	3	1278	14	1822	32	2100	32	911	24	2245	1
23	FLIP 82-53FB	689	39	7148	10	4701	25	79	28	2352	35	1153	1	1156	34	1157	17	-	-	447	17	2654	1	584	7	978	29	2022	27	1650	39	1376	9	1877	26
29	FLIP 83-6FB	1895	19	6093	24	7312	9	299	19	3296	8	445	24	2527	7	1157	17	107	11	0	33	1616	6	435	18	1128	22	2472	13	2450	24	911	24	2009	14
1817	FLIP 82-46FB	2283	13	4593	36	2923	36	219	24	2796	23	820	7	971	38	949	31	158	4	454	16	1728	3	398	21	628	35	1906	31	1750	35	811	32	1462	38
X79S 103	80S 80064	1734	24	5204	31	8256	3	225	23	2685	27	445	24	2527	7	1366	3	104	12	681	11	572	39	398	21	2078	2	2706	6	3050	8	544	39	2036	12
41	FLIP 82-54FB	1820	22	5426	30	4367	29	45	30	3074	14	487	18	2045	16	949	31	86	16	381	18	653	38	435	18	1878	4	2022	27	2475	23	644	36	1674	33
X79S 155	80S 80123	2251	15	4704	34	6701	15	239	22	2796	23	320	32	2082	15	741	38	-	-	8	32	1320	9	472	16	778	33	1556	38	2100	32	564	38	1775	30
X75TA 209	FLIP 82-39FB	1368	31	5981	26	5423	23	252	21	2907	20	1153	1	1156	34	1157	17	-	-	1074	7	1691	4	584	7	1028	27	2572	11	3600	4	811	32	2050	11
1817	FLIP 82-47FB	1497	30	6000	25	2080	39	305	17	2648	28	721	9	1428	31	810	35	-	-	0	33	740	32	324	26	1278	14	2856	4	3900	2	664	34	1683	32
X77TA 31	80S 43587	2434	9	7056	11	5969	20	612	5	2926	17	930	6	2465	9	1227	12	-	-	172	28	1036	18	547	9	978	29	2522	12	2600	19	1117	18	2173	3
X79L 130	FLIP 82-30FB	3069	4	5889	27	5302	24	305	17	4314	1	0	35	3947	1	1019	28	75	17	559	12	703	35	287	28	1078	25	2722	5	2150	30	1011	22	2027	13
X79L 153	80S 81054	840	36	4944	32	4191	32	685	3	2370	34	0	35	2132	14	1227	12	135	5	1145	6	703	35	176	36	1128	22	2372	17	3750	3	864	29	1666	35
282	76TA 56356	818	37	6278	22	4302	30	445	9	3481	4	0	35	3132	4	1019	28	109	9	1998	3	1962	2	509	12	1478	9	2172	23	3950	1	1431	7	2068	10
X79S 171	80S 80135	3155	3	4833	33	4469	28	532	6	4037	2	971	5	1391	32	1227	12	109	9	1319	5	1184	13	287	28	2028	3	1806	33	2150	30	1464	6	1935	22
1814	79S 546	2531	6	3167	39	2192	38	312	16	3481	4	0	35	1650	26	810	35	67	18	498	15	1221	11	176	36	1378	12	1922	30	3600	5	1398	8	1525	37
X79S 160	80S 80128	904	35	6222	23	6330	17	972	2	2537	31	346	28	2798	5	1435	2	45	19	912	8	740	32	398	21	1628	8	1572	37	3000	10	564	29	1919	23
22	FLIP 83-5FB	754	38	6389	20	5692	21	359	11	3204	10	471	20	1613	27	1227	12	119	8	139	30	925	23	695	4	1478	9	2072	25	1850	35	1184	13	1761	31
10	78S 49907	1691	26	6833	13	2636	37	352	12	3481	4	221	34	3243	3	602	39	-	-	0	33	851	28	287	28	1228	18	-	-	2900	13	1144	16	1819	28
X77TA 64	80S 44027	2380	11	9611	1	6136	18	465	8	2926	17	0	35	3798	2	1227	12	94	14	0	33	1184	13	139	38	778	33	1972	29	2950	12	1731	1	2212	2
1817	FLIP 82-48FB	1734	24	4667	35	3969	34	299	19	2926	17	346	28	1687	24	810	35	207	3	0	33	1036	18	139	38	1228	18	2606	9	3300	6	664	34	1601	36
1814	Syrian Local Large	2283	13	4556	38	6991	14	60	29	2704	26	446	23	1716	22	972	30	24	20	80	31	1637	5	526	11	1267	16	3017	1	2367	25	1625	2	1892	25
1270	Reina Blanca	1648	28	6981	12	4667	27	504	7	3296	8	514	16	1840	20	1042	27	20	21	862	10	872	27	230	33	1633	6	2583	10	3183	7	1191	12	1942	21
-	Local check	3608	1	5574	28	9056	1	1444	1	3167	13	333	31	1654	25	1458	1	523	1	555	13	1415	8	477	15	1633	6	2967	2	2900	13	987	23	-	-
Location mean		1941		6320		5780		296		2903		523		1973		1141		107		546		1111		428		1208		2280		2639		1073			
C.V.%		43.6		14.2		33.5		97.9		17.8		22.7		49.5		30.4		301.4		57.0		50.0		11.6		20.6		16.9				5.4			
L.S.D. at 5% for:																																			
Checks		1993		2013		4502		740		1179		254		2178		787		444		683		1288		112		573		889				135			
Checks Vs. test entries		3254		3288		7353		1208		1925		415		2557		1285		725		1116		2103		183		937		1453				220			
Test entries in the same block		3451		3487		7797		1281		2042		440		3772		1363		769		1183		2231		194		993		1541				233			
Test entries in different blocks		3985		4026		9004		1479		2358		509		4356		1574		888		1366		2576		224		1147		1779				269			
S.E. for:																																			
Checks		718		725		1622		266		425		92		785		284		160		246		464		40		207		320				48			
Checks Vs. test entries		1172		1184		2648		435		694		150		1281		463		261		402		758		66		337		523				79			
Test entries in the same block		1243		1256		2809		461		736		159		1359		491		277		426		804		70		358		555				84			
Test entries in different blocks		1436		1450		3243		533		849		183		1569		567		320		492		928		81		413		641				97			
No. of entries significantly exceeding the local check		0		1		0		0		0		8		0		0		0		3		0		4		1		0							

Table 4.3.6. The five heaviest seed yielding entries at the individual locations in FBISN-L during 1983/84.

RANK	CHINA		EGYPT				ETHIOPIA		IRAN		IRAQ	
	Zhejiang		Sakha		Sids		Debre Zeit		Gorgan		Sulaimaniya	
	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE
1		Local check	X77TA 64	80S 44027		Local check		Local check	X79L 130	FLIP 82-30FB	23	FLIP 82-53FB
2	263	77TA 88311	1933	Sevilla Giant	X79L 25	FLIP 82-29FB	X79S 160	80S 80128	X79S 171	80S 80135	X75TA 209	FLIP 82-39FB
3	X79S 171	80S 80135	X79L 25	FLIP 82-29FB	X79S 103	80S 80064	X79L 153	80S 81054	1814	79S 653	1933	Sevilla Giant
4	X79L 130	FLIP 82-30FB	X79S 101 B	FLIP 82-26FB	X79S 178	FLIP 82-28FB	X79S 178	FLIP 82-28FB	282	76TA 56356	X79S 131	FLIP 82-27FB
5	77TA 72	80S 44178	X77TA 72	80S 44178	12	FLIP 83-4FB (1)	X77TA 31	80S 43587	1814	79S 546	X79S 171	80S 80135
					1814	79S 653			10	78S 4990		

Cont'd. ...

RANK	LEBANON		MOROCCO		PERU		SYRIA					
	Terbol		Douyet		La Molina		Lattakia		Tel Hadya-Irrigated		Tel Hadya-Rainfed	
	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE
1	X79L 130	FLIP 82-30FB		Local check		Local check	1814	79S 653	23	FLIP 82-53FB	X75TA 116	79S 79180
2	X77TA 64	80S 44027	X79S 160	80S 128	X79S 178	FLIP 82-28FB	1933	Sevilla Giant	282	76TA 56356	X79S 70	80S 80026
3	10	78S 49907	1933	Sevilla Giant	1817	FLIP 82-4FB	282	76TA 56356	1817	FLIP 82-46FB	1817	FLIP 82-45FB
4	282	76TA 56356	77TA 72	80S 44178	1817	FLIP 82-46FB	X75TA 116	79S 79180	X75TA 209	FLIP 82-39FB	22	FLIP 83-5FB
5	X79S 160	80S 80128	X75TA 116	79S 79180	X79L 153	80S 81054	X79S 171	80S 80135	1814	Syrian Local Large	X79S 12	FLIP 83-3FB
			X79S 74	FLIP 82-25FB								
			41	76TA 56297								
			X79S 131	FLIP 82-27FB								
			X75TA 115	78S 33200								
			1817	FLIP 82-45FB								
			79S 103	80S 80064								

Cont'd. ...

RANK	TUNISIA						TURKEY	
	Beja		El-Kef		Mateur		Ankara	
	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE	ILB/ Cross No.	PEDIGREE
1	X75TA 116	79S 79180	1814	Syrian Local Large	282	76TA 56356	X77TA 64	80S 44027
2	X79S 103	80S 80064		Local check	1817	FLIP 82-47FB	1814	Syrian Local Large
3	X79S 171	80S 80135	12	FLIP 83-4FB	X79L 153	80S 81054	41	76TA 56297
4	41	FLIP 82-54FB	1817	FLIP 82-47FB	X75TA 209	FLIP 82-39FB	X79S 74	FLIP 82-25FB
5	X75TA 115	78S 33200	X79L 130	FLIP 82-30 FB	1814	79S 546	X79S 72	80S 80028

(1) The brackets indicate entries having the same rank.

4.4. FABA BEAN INTERNATIONAL SCREENING NURSERY-SMALL SEED (FBISN-S)

Material

The Faba Bean International Screening Nursery - Small Seed comprised of 48 test entries and three checks two of them namely Giza 4 (ILB 1820) and F 402 (ILB 1278) were supplied and the third was to be supplied by the cooperator. The entries in this trial were chosen from the local trials, regional trials and international screening nurseries from 1982/83 on the basis of their superior performance.

Methods and Management

The test entries and the three checks were suggested to be sown in single row plots of 4 m length with inter- and intra row spacings of 50- and 10 cm, respectively, in an augmented block design. The whole experimental unit was divided into four blocks. Thirty eight sets of the nursery were distributed to the cooperators in 26 countries and the results were received from 21 locations. The agronomic data received from the cooperators are presented in Table 4.4.1.

Results and Discussion

The entry means over all the locations revealed that F402 (ILB 1278) flowered earliest in 78 days and was followed by 80S 43651; FLIP 82-19FB etc. whereas 80S 43859, 80S 44150 and 80S 43064 flowered latest in 99 days (Table 4.4.2). The data on time to maturity (Table 4.4.3) revealed that the entries 78S 33011, FLIP 82-36FB, FLIP 82-19FB, FLIP 82-2FB, and F402 matured earliest in 162 days. Among the locations the entries flowered earliest in 48 days at Manitoba (Canada) and which was followed by Debre Zeit in Ethiopia (51 days) and Mansoura in Egypt (53 days) etc. and latest in 153 days at Coulommiers in France. The early flowering locations were not the early maturing. For plant height (Table 4.4.4), the entries 78S 48434 FLIP 82-19FB, FLIP 82-33FB were shortest (74 cm) and the entries 80S 44203 and 80S 43859, were tallest (86-87 cm). The plant height of the entries was least at Tel Hadya-rainfed (39 cm) and maximum at Terbol in Lebanon (144 cm). The adjusted seed yield for the entries in different locations based on augmented design is presented in Table 4.4.5. The coefficient of variation of the experiment at different locations varied from 5.3 to 176.7%. The location means revealed that the adjusted seed yields were highest at Boulawan in Morocco (4945 kg/ha) and were followed by Gemmiza in Egypt (4446 kg/ha). However, the poor yielding locations included Debre Zeit in Ethiopia (538 kg/ha), Lattakia (558 kg/ha) and Tel Hadya-rainfed (533 kg/ha) in Syria, and Sidi Kacem (663 kg/ha) in Tunisia. The LSD estimates at different locations revealed that 1, 1, 47, 2, and 35 entries exceeded the respective local checks by a significant margin at Gorgan (Iran), Sidi Kacem (Morocco), Lattakia (Syria), El-Kef (Tunisia) and Ankara (Turkey), respectively. The five

Table 4.4.1. Agronomic data for different locations in the FBISN-S during 1983/84

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P205	K20	Irrigation	Insecticide/ Fungicide/ Herbicide
CANADA	MANITOBA	9-5-1984	108					
CHILE	VALDIVIA	28-8-1984	156		150	100		Afalon
EGYPT	GEMMIZA		161					
EGYPT	MANSOURA	15-11-1984	161	20	32		5	
EGYPT	SIDS*	17-11-1983	163	38	75		5	Igran
ETHIOPIA	DEBRE ZEIT	27-6-1984	150					
FRANCE	COULOMMIERS	28-10-1983	257		50			Zolome
IRAN	GORGAN	15-1-1984	144					Diazinon
IRAQ	DOHUK	31-11-1983	209	40	100		3	
LEBANON	TERBOL	8-11-1983	208		50			Kerb, Tribunil Metasystox
MOROCCO	BOULAOWAN	9-11-1983	179	50	60	60	5	
MOROCCO	SIDI KACEM	26-11-1983	192			70		
PAKISTAN	ISLAMABAD**	25-10-1983	207				1	
QATAR	RAWDAT HARMA	6-11-1983	156	120	240		13	
SYRIA	LATTAKIA	15-11-1983	211					
SYRIA	TEL-HADYA IRRIGATED	6-11-1983	193					
SYRIA	TEL-HADYA RAINFED	18-11-1983	171					
TUNISIA	BEJA***							
TUNISIA	EL-KEF***							
TUNISIA	MATEUR***							
TURKEY	ANKARA	5-3-1984	123	20	50			Basudine
W.GERMANY	STUTTGART	27-3-1984	162		116	199		Tribunil, Illoxan Thiodan

* The crop was severally effected by residual effect of herbicides supplied to the previous crop.

** The data on seed yield was not reported.

*** The data was not supplied by the cooperator.

Table 4.4.2. Time to flowering (days) of entries at different locations in FBISN-S during 1983/84

ENTRY NAME ILB/ CROSS NO.	PEDIGREE	CANADA	CHILE	EGYPT			ETHIOPIA	FRANCE	IRAN	IRAQ	LEBANON	MOROCCO	PAKISTAN	QATAR	SYRIA		TURKEY	W.GERMANY	MEAN
		Manitoba	Valdivia	Gemmiza	Mansoura	Sids	Debre Zeit	Coulmmiers	Gorgan	Dohuk	Terbol	Boulaowan	Islamabad	Rawdat Harma	Tel-Hadya Irrigated	Tel-Hadya Rainfed	Ankara	Stuttgart	
X77TA 118	80S 45057	47	74	75	52	75	51	153	87	120	109	73	134	59	103	101	75	75	86
X72TA 33	80S 43651	47	72	67	57	70	50	152	87	119	107	73	91	56	96	90	74	74	81
X77TA 48	80S 43859	49	74	87	49	80	56	152	87	118	111	83	134	63	110	104	76	75	89
X77TA 85	FLIP 82-21FB	45	72	70	51	75	53	154	87	118	103	71	134	57	99	97	74	75	84
905	78S 35513	49	74	87	51	75	51	155	87	121	111	83	134	64	103	104	76	77	88
X76TA34	FLIP 82-16FB	51	74	70	53	75	56	154	87	120	107	83	134	57	103	101	74	75	87
X77Sd 60	80S 46121	49	74	70	52	72	56	154	87	120	103	71	134	56	99	101	76	75	85
1105	79S 97330	49	74	75	54	75	56	152	87	118	111	83	134	65	107	101	74	76	88
320	78S 48434	49	74	71	53	75	50	153	87	118	109	73	134	59	99	101	75	76	86
X77Sd48	FLIP 82-13FB	47	72	70	48	75	57	155	87	119	105	73	134	55	99	101	75	75	85
X75TA10	80S 43238	47	72	64	56	65	49	154	87	121	103	63	134	53	96	90	74	75	83
X75TA 7	78S 33011	47	72	67	51	68	49	152	87	119	105	63	134	53	99	97	74	74	83
X77TA 70	80S 44150	51	74	75	56	80	53	156	87	119	111	73	134	67	111	107	76	77	89
X75TA 15	FLIP 82-15FB	47	74	62	52	70	50	152	87	120	103	71	134	56	95	101	74	75	84
X77TA 48	80S 43856	49	74	75	53	80	50	154	87	120	111	73	134	64	106	107	74	75	87
407	79S 49395	47	72	72	51	75	51	151	87	121	109	73	134	57	99	107	74	74	86
X75TA 14	FLIP 82-35FB	49	72	69	58	70	51	155	87	120	103	71	134	61	96	101	74	74	85
X75TA 15	80S 43341	45	74	71	53	80	49	153	87	120	109	83	134	60	103	107	76	75	87
X77TA 33	FLIP 82-9FB	48	72	65	50	72	49	154	87	121	107	63	134	55	96	90	74	74	83
X77TA 72	80S 44203	49	74	72	52	80	57	154	87	119	111	83	134	62	99	107	76	77	88
X77TA 81	80S 44358	47	74	73	49	80	50	155	87	121	111	71	91	61	107	101	76	75	84
X77TA 81	FLIP 82-20FB	45	74	68	55	80	54	152	87	120	109	83	134	63	103	104	76	74	87
X75TA 20	FLIP 82-36FB	49	72	64	57	62	47	151	87	120	105	63	134	55	90	104	74	74	83
X77TA 72	FLIP 82-17FB	47	74	65	55	65	48	154	87	121	109	63	91	56	96	97	76	74	81
X75TA 150	80S 50088	50	72	72	50	80	51	156	87	121	109	83	134	63	107	107	74	75	88
X77TA 60	80S 43977	49	74	75	50	75	51	154	87	121	113	83	134	63	107	107	74	76	88
X77Sd 100	FLIP 82-24FB	51	72	69	50	85	55	153	87	121	103	83	134	62	103	97	74	74	87
X75TA 3	80S 43064	49	74	70	51	90	61	154	87	120	113	83	134	64	110	107	76	76	89
X77TA 88	FLIP 82-22FB	51	74	68	52	85	55	155	87	119	111	73	134	64	103	97	76	76	87
X75TA 193	80S 50106	45	74	58	50	70	51	151	87	120	107	63	134	55	96	101	74	75	83
1817	76TA 56267	51	74	68	56	95	53	154	87	121	111	63	134	55	107	93	74	75	87
X77TA 60	80S 43971	50	72	76	50	80	50	153	87	121	113	71	134	55	107	107	76	75	87
X75TA 8	FLIP 82-33FB	47	72	68	51	72	55	151	87	119	103	68	134	55	96	101	74	75	84
352	77MS 88158	47	74	69	52	80	50	156	87	121	107	71	134	56	96	93	76	76	85
336	78S 48437	45	72	67	52	75	51	153	87	118	105	71	134	56	99	101	76	75	85
X75TA 14	FLIP 82-1FB	45	72	64	54	65	47	152	87	121	103	83	91	53	95	101	74	74	81
X75TA 14	FLIP 82-34FB	45	72	64	59	62	51	153	87	121	105	63	134	48	95	97	74	74	83
X77TA 81	FLIP 82-19FB	47	72	69	48	70	48	153	87	107	103	63	134	50	92	90	74	74	81
X77TA 117	80S 45050	51	72	70	54	80	53	154	87	118	105	68	134	53	103	97	74	76	85
X77Sd 11	80S 45676	51	74	75	53	90	50	153	87	120	107	63	134	66	111	107	74	77	88
308	FLIP 82-2FB	47	72	68	44	72	49	151	87	119	105	71	134	55	99	93	74	75	83
49	74TA 133	49	74	70	54	82	44	153	87	120	111	83	134	56	107	101	74	75	87
1816	FLIP 82-38FB	49	74	70	56	75	49	154	87	118	111	73	134	51	103	101	74	76	86
X75TA 105	FLIP 82-12FB	47	74	70	57	80	53	152	87	118	107	71	134	59	99	97	74	75	86
X75TA 43	FLIP 83-9FB	45	74	70	52	80	51	153	87	118	111	63	134	64	92	97	76	75	85
X77TA 51	FLIP 82-11FB	49	72	70	55	80	49	152	87	119	109	83	134	57	107	107	74	75	37
X77TA 66	80S 44056	51	74	72	52	80	53	152	87	118	111	73	134	59	107	101	74	75	87
X77TA 86	80S 44474	47	72	69	56	68	50	153	87	119	105	63	134	50	89	97	74	75	83
1820	Giza 4	47	73	67	56	71	51	152	87	120	105	63	113	55	94	100	74	74	82
1278	F 402	46	73	62	54	64	48	154	87	106	104	58	91	52	87	89	74	74	78
	Local check	56	72	59	51	62	48	166	87	119	108	81		47	106	103	76	80	
Location mean		48	73	70	53	75	51	153	87	119	108	72	129	58	101	100	75	75	

Table 4.4.3. Time to maturity (days) of entries at different locations in FBISN-S during 1983/84

ENTRY NAME ILB/ CROSS NO.	PEDIGREE	CANADA Manitoba	CHILE Valdivia	EGYPT Gemmiza	EGYPT Mansoura	FRANCE Coulommiers	IRAN Gorgan	IRAQ Dohuk	LEBANON Terbol	MOROCCO Boulaowan	QATAR Rawdat Harma	QATAR Tel-Hadya Irrigated	QATAR Tel-Hadya Rainfed	TURKEY Ankara	W.GERMANY Stuttgart	MEAN
X77TA 118	80S 45057	98	135	164	149	255	144	209	205	174	150	185	164	118	154	165
X75TA 33	80S 43651	96	132	161	151	254	144	209	200	174	147	185	164	120	158	164
X77TA 48	80S 43859	100	137	164	154	254	144	209	203	179	153	182	164	118	159	166
X77TA 85	FLIP 82-21FB	98	132	161	149	253	144	209	205	164	147	184	162	120	158	163
905	78S 35513	100	143	161	154	255	144	209	200	179	155	187	165	122	153	166
X76TA 34	FLIP 82-16FB	100	143	160	155	253	144	209	200	179	147	185	163	121	156	165
X77Sd 60	80S 46121	96	132	162	160	256	144	209	203	172	146	182	164	118	152	164
1105	79S 97330	100	132	160	143	256	144	209	200	179	155	187	170	119	158	165
320	78S 48434	96	137	160	148	253	144	209	200	172	150	184	164	118	160	164
X77Sd 49	FLIP 82-13FB	100	132	160	152	255	144	209	203	174	147	185	164	117	153	164
X75TA 10	80S 43238	98	140	160	152	254	144	209	200	172	145	185	165	122	152	164
X75TA 7	78S 33011	94	132	156	150	253	144	209	203	169	145	185	164	118	151	162
X77TA 70	80S 44150	100	137	156	161	253	144	209	208	172	155	185	165	120	153	166
X75TA 16	FLIP 82-15FB	96	135	159	151	251	144	209	200	169	147	183	171	118	151	163
X77TA 48	80S 43856	98	135	159	158	255	144	209	205	169	153	184	171	121	152	165
407	78S 49395	98	132	160	153	253	144	209	205	172	147	181	165	118	152	164
X75TA 14	FLIP 82-35FB	100	137	159	160	254	144	209	203	172	150	182	165	122	152	165
X75TA 16	80S 43341	100	143	160	139	255	144	209	200	179	150	185	164	122	160	165
X77TA 33	FLIP 82-9FB	102	135	160	143	255	144	209	203	169	145	182	163	119	151	163
X77TA 72	80S 44203	102	143	161	148	254	144	209	200	179	150	184	165	121	161	166
X77TA 81	80S 44358	98	137	161	142	250	144	209	203	174	150	182	165	118	153	163
X77TA 81	FLIP 82-20FB	96	143	160	150	254	144	209	205	179	156	184	168	118	150	165
X75TA 20	FLIP 82-36FB	96	135	151	152	254	144	209	203	169	145	182	160	118	151	162
X77TA 72	FLIP 82-17FB	98	137	159	151	255	144	209	200	169	148	181	164	118	151	163
X75TA 150	80S 50088	98	137	161	148	254	144	209	200	179	153	182	165	122	153	165
X77TA 60	80S 43977	104	143	160	143	255	144	209	200	179	153	182	165	119	156	165
X77Sd 100	FLIP 82-24FB	98	135	153	145	252	144	209	203	179	150	185	165	122	153	164
X75TA 3	80S 43064	96	137	154	155	251	144	209	200	179	155	185	169	122	152	165
X77TA 88	FLIP 82-22FB	100	135	155	152	254	144	209	205	174	156	181	169	123	160	166
X75TA 193	80S 50106	98	137	157	152	256	144	209	208	169	145	181	162	119	152	164
1817	76TA 56267	107	137	153	161	253	144	209	200	169	148	182	165	123	153	165
X77TA 60	80S 43971	107	137	158	152	255	144	209	205	174	149	182	165	120	158	165
X75TA 8	FLIP 82-33FB	100	135	152	151	254	144	209	200	174	148	182	165	121	153	163
352	77MS 88158	100	135	161	148	254	144	209	205	174	148	182	164	120	160	165
336	78S 48437	96	132	156	151	253	144	209	208	174	148	184	165	122	155	164
X75TA 14	FLIP 82-1FB	100	137	156	146	254	144	209	205	179	145	182	162	120	158	164
X75TA 14	FLIP 82-34FB	100	132	148	160	252	144	209	205	169	145	183	160	120	154	163
X77TA 81	FLIP 82-19FB	100	132	153	146	251	144	209	200	169	146	183	165	120	153	162
X77TA 117	80S 45050	98	137	158	153	253	144	209	200	172	146	185	165	120	156	164
X77Sd 11	80S 45676	100	143	161	149	253	144	209	203	169	156	184	169	121	161	166
308	FLIP 82-2FB	100	132	151	140	250	144	209	200	174	148	185	164	120	153	162
49	74TA 133	98	135	153	151	253	144	209	203	179	148	185	165	120	156	164
1816	FLIP 82-38FB	100	132	152	153	251	144	209	200	174	150	193	171	120	153	164
X75TA 105	FLIP 82-12FB	104	137	156	155	253	144	209	203	174	155	183	169	120	154	165
X75TA 43	FLIP 83-9FB	102	137	161	154	250	144	209	203	169	156	185	165	122	153	165
X77TA 51	FLIP 82-11FB	100	135	152	151	256	144	209	200	179	148	183	165	121	160	165
X77TA 66	80S 44056	104	132	156	151	253	144	209	205	172	153	185	171	120	155	165
X77TA 86	80S 44474	100	135	151	156	253	144	209	200	169	146	182	160	118	159	163
1820	Giza 4	99	135	159	154	254	144	209	202	169	147	183	164	118	155	164
1278	F 402	98	135	154	151	253	144	209	202	164	145	182	163	119	154	162
	Local check	108	156	152	147	257	144	209	204	179	144	185	168	122	162	-
Location mean		100	136	157	151	254	144	209	202	173	149	184	165	120	155	

Table 4.4.4. Plant height (cm) of entries at different locations in FBISN-S during 1983/84.

ENTRY NAME		CANADA	CHILE	EGYPT		ETHIOPIA	FRANCE	IRAN	IRAQ	LEBANON	PAKISTAN	Qatar	SYRIA		TURKEY	W.GERMANY	MEAN
ILB/ CROSS NO.	PEDIGREE	Manitoba	Valdivia	Gemmiza	Mansoura	Debre Zeit	Coulommiers	Gorgan	Dohuk	Terbol	Islamabad	Rawdat Harma	Tel-Hadya Irrigated	Tel-Hadya Rainfed	Ankara	Stuttgart	
X77TA 118	80S 45057	58	65	100	120	95	64	90	43	155	37	100	65	40	44	110	79
X75TA 33	80S 43651	65	52	91	102	105	92	75	43	140	53	100	75	40	54	105	79
X77TA 48	80S 43859	67	62	117	145	105	93	80	45	160	45	100	70	40	51	105	86
X77TA 85	FLIP 82-21FB	61	56	83	105	120	84	65	48	140	42	85	80	45	55	110	79
905	78S 35513	69	69	84	90	110	85	90	44	140	48	90	85	40	56	100	80
X75TA 34	FLIP 82-16FB	59	68	98	117	120	104	85	48	140	56	95	70	45	55	110	85
X77Sd 60	80S 46121	64	51	98	125	100	87	70	41	140	46	105	58	35	56	100	78
1105	79S 97330	65	47	78	91	105	91	65	44	140	41	85	80	45	51	110	76
320	78S 48434	57	53	94	82	85	80	80	37	140	40	95	60	40	49	115	74
X77Sd 48	FLIP 82-13FB	61	54	94	112	85	74	75	40	145	49	115	70	45	52	110	79
X75TA 10	80S 43238	64	72	88	115	115	100	85	47	150	52	90	65	35	56	95	82
X75TA 7	78S 33011	53	52	76	120	125	101	65	40	140	46	85	63	35	51	100	77
X77TA 70	80S 44150	69	68	62	137	130	84	80	35	155	47	55	76	35	55	110	80
X75TA 16	FLIP 82-15FB	61	60	83	122	115	97	80	33	150	56	75	75	35	54	110	80
X77TA 48	80S 43856	70	53	72	112	115	80	75	41	145	43	60	70	35	52	110	76
407	78S 49395	70	61	85	109	110	92	80	41	135	38	65	57	35	54	110	76
X75TA 14	FLIP 82-35FB	71	57	84	120	120	83	85	40	140	51	65	62	40	54	110	79
X75TA 16	80S 43341	78	70	65	136	120	104	90	42	150	62	70	70	45	53	110	84
X77TA 33	FLIP 82-9FB	65	52	75	92	105	95	90	39	145	49	85	78	45	53	100	78
X77TA 72	80S 44203	67	88	101	121	125	97	90	46	150	56	75	80	45	56	110	87
X77TA 81	80S 44358	65	57	84	136	85	99	65	37	155	45	70	60	35	52	105	77
X77TA 81	FLIP 82-20FB	65	51	98	98	120	99	70	40	160	54	75	65	40	55	105	80
X75TA 20	FLIP 82-36FB	60	60	67	95	100	98	80	41	135	52	80	70	35	56	90	75
X77TA 72	FLIP 82-17FB	68	71	82	132	100	106	80	41	140	52	75	75	35	56	110	82
X75 TA 150	80S 50088	70	63	80	125	120	117	70	43	135	40	75	55	45	44	100	79
X77TA 60	80S 43977	66	75	80	105	100	104	70	38	135	51	65	77	40	54	105	78
X77Sd 100	FLIP 82-24FB	62	55	83	114	125	87	70	38	155	40	65	65	40	54	100	77
X75TA 3	80S 43064	75	62	73	145	135	96	90	51	160	48	75	73	35	55	105	85
X77TA 88	FLIP 82-22FB	64	54	78	138	120	66	65	42	140	48	65	73	37	57	105	77
X75TA 193	80S 50106	72	63	78	105	130	118	70	48	135	46	80	66	45	56	100	81
1317	76TA 56267	69	60	63	145	115	92	80	51	150	39	65	65	40	55	105	80
X77TA 60	80S 43971	71	70	73	124	115	109	75	42	135	41	70	82	40	50	95	79
X75TA 8	FLIP 82-33FB	62	64	72	112	95	102	65	39	150	32	70	70	35	52	95	74
352	77MS 88158	75	65	82	104	115	101	90	42	155	49	75	70	35	53	100	81
336	78S 48437	64	52	75	103	115	87	60	45	150	39	75	78	40	58	110	77
X75TA 14	FLIP 82-1FB	60	64	73	88	125	113	75	43	125	33	70	60	35	55	100	75
X75TA 14	FLIP 82-34FB	65	60	67	75	95	99	65	41	150	36	105	80	40	53	110	76
X77TA 81	FLIP 82-19FB	60	46	73	113	90	90	60	44	135	40	85	83	45	52	100	74
X77TA 117	80S 45050	63	71	87	99	100	96	90	37	135	48	85	69	40	53	115	79
X77Sd 11	80S 45676	68	75	92	103	105	98	80	43	135	43	85	100	40	55	115	82
309	FLIP 82-2FB	63	56	78	127	95	84	75	44	140	39	95	70	40	54	95	77
49	74 TA 133	74	67	82	98	90	92	85	43	130	45	85	85	35	53	110	78
1816	FLIP 82-38FB	69	69	64	87	110	101	50	47	150	46	90	84	45	53	105	78
X 75TA 105	FLIP 82-12FB	61	62	83	92	115	106	70	42	140	29	90	70	35	48	100	76
X75TA 43	FLIP 83-9FB	60	61	90	90	105	89	80	43	145	42	100	75	35	52	95	77
X77TA 51	FLIP 82-11FB	68	72	83	101	120	97	80	40	140	38	85	73	40	54	110	80
X77TA 66	80S 44056	66	60	83	88	110	102	70	37	140	43	80	75	37	54	95	76
X77TA 86	80S 44474	66	63	90	83	85	85	60	41	150	39	100	80	45	55	105	76
1820	Giza 4	63	57	90	118	105	95	75	44	143	51	81	70	41	51	104	79
1278	F 402	63	59	77	99	108	96	73	45	136	41	89	65	39	56	100	76
	Local check	98	99	61	120	113	130	61	45	148		74	78	43	55	139	
Location mean		66	62	82	110	109	95	75	42	144	45	82	72	39	53	105	

Table 4.4.5. Adjusted seed yield (kg/ha) of entries at different locations in FBISN-S during 1983/84.

ENTRY NAME		CANADA		CHILE		EGYPT				ETHIOPIA		FRANCE		IRAN		IRAQ		LEBANON		MOROCCO				QATAR	
ILB/	PEDIGREE	Manitoba		Valdivia		Gemmiza		Mansoura		Debre Zeit		Coulommiers		Gorgan		Dohuk		Terbol		Boulaowan		Sidi-Kacem		Rawdat Harma	
CROSS NO.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
X77TA 118	80S 45057	3101	10	1034	20	4636	23	3094	14	978	10	657	50	3130	16	1134	10	667	48	5714	12	526	32	1092	35
X75TA 33	80S 43651	3024	12	867	28	3969	37	4761	2	1245	5	3968	14	2185	37	1007	24	1185	43	4191	31	526	32	1392	28
X77TA 49	80S 43859	3488	5	727	39	3769	39	2161	28	872	12	5853	4	3296	12	1134	10	889	46	2952	49	526	32	492	46
X77TA 85	FLIP 82-21FB	3083	11	841	30	3703	40	3228	10	1058	8	2550	35	1019	50	1141	9	1926	40	4381	29	883	7	1242	30
905	78S 35513	3482	6	821	31	2036	49	2761	19	832	15	3057	26	2963	24	1281	5	1037	45	3952	36	526	32	1092	35
X76TA 34	FLIP 82-16FB	2946	15	1141	14	2603	48	3094	14	885	11	3110	24	2407	33	1121	12	2148	36	4143	33	526	32	1892	17
X77Sd 60	80S 46121	2577	26	794	36	4769	17	2428	24	1032	9	693	49	2574	29	1301	3	1074	44	5238	19	1002	4	1692	20
1105	79S 97330	2786	20	874	27	1869	50	2761	19	3592	1	3435	18	1630	44	1034	19	519	50	3143	48	526	32	892	39
320	78S 48434	2155	41	907	26	5136	13	1761	37	1212	6	2253	43	3185	15	827	37	593	49	3667	41	645	23	2092	13
X77Sd 48	FLIP 82-13FB	2833	18	974	22	4503	25	3094	14	825	16	2000	45	1574	45	1121	12	0	51	2762	51	526	32	2092	13
X75TA 10	80S 43238	2810	19	1841	1	1003	51	4161	5	1125	7	3964	15	2019	39	1174	7	814	47	5524	13	883	8	1192	31
X75TA 7	78S 33011	2185	39	801	33	5436	10	1494	39	1505	4	3064	25	2407	33	760	44	1852	42	6667	5	1240	1	2892	4
X77TA 70	80S 44150	2105	42	1374	7	4047	34	3606	8	0	40	3594	17	3759	6	894	33	2790	17	3810	37	685	19	1158	32
X75TA 16	FLIP 82-15FB	2105	42	721	41	5647	9	1939	32	238	25	2722	33	2981	20	474	51	3790	1	5000	21	446	40	2158	11
X77TA 48	80S 43856	1319	50	647	43	4014	35	1939	32	0	40	2644	34	4870	2	841	36	2049	39	2857	50	446	40	858	40
407	78S 49395	1659	48	981	21	4981	15	2272	26	0	40	4283	11	4370	4	801	39	3086	8	4762	22	804	11	1458	26
X75TA 14	FLIP 82-35FB	2188	38	801	34	4514	24	3939	6	0	40	2022	44	3093	17	907	32	2346	31	3810	37	685	19	1708	19
X75TA 16	80S 43341	2558	27	1414	6	3581	42	2606	22	0	40	4354	10	3537	8	701	46	2086	37	4143	34	446	40	1658	21
X77TA 33	FLIP 82-9FB	1313	51	687	42	4481	27	2272	26	252	24	2897	27	3259	14	621	49	2716	20	5381	18	923	5	2358	8
X77TA 72	80S 44203	2558	27	1054	19	4447	29	2939	17	212	30	2747	32	3870	5	741	45	2901	14	4000	35	446	40	1508	24
X77TA 81	80S 44358	2260	35	854	29	4281	30	3272	9	0	40	490	51	3426	9	881	34	3642	2	11905	1	1042	2	2158	11
X77TA 81	FLIP 82-20FB	2248	37	1061	18	5114	14	4606	3	0	40	2440	39	2981	20	1021	21	2086	37	4762	22	804	11	1858	18
X75TA 20	FLIP 82-36FB	1825	47	1347	9	5181	12	606	49	0	40	3726	16	2981	20	641	47	2383	30	5952	10	685	19	3058	3
X77TA 72	FLIP 82-17FB	2677	23	1121	17	4014	35	4606	3	2252	3	2269	42	1981	40	827	37	2531	26	5810	11	656	26	2458	7
X75TA 150	80S 50088	2450	32	323	50	4169	31	3828	7	234	26	3363	21	3037	18	632	48	2185	34	3619	43	685	19	1258	29
X77TA 60	80S 43977	2909	16	1643	3	3403	44	1561	38	0	40	6334	3	2481	31	1165	8	2926	13	3810	39	565	26	608	43
X77Sd 100	FLIP 82-24FB	2063	44	809	32	5836	7	494	50	147	34	4570	9	3315	10	792	42	2556	25	5524	13	804	11	1108	33
X75TA 3	80S 43064	1355	49	489	47	4503	25	1494	39	0	40	4820	8	3037	18	925	28	2296	32	3333	47	804	11	1108	33
X77TA 88	FLIP 82-22FB	1974	45	1203	11	7503	1	2161	28	214	28	2499	37	4704	3	1412	2	3148	7	6238	7	1042	2	1508	24
X75TA 193	80S 50106	2992	13	916	24	4169	31	1494	39	54	35	4184	12	2593	28	1012	23	3000	9	4762	22	804	11	1458	26
1817	76TA 56267	2397	34	1509	4	6336	3	1361	43	214	28	2295	41	3759	6	1252	6	3593	3	10238	2	923	5	608	43
X77TA 60	80S 43971	2748	22	796	35	2903	47	828	47	7	39	6645	2	2204	36	1072	16	3222	5	3429	46	565	26	508	45
X75TA 8	FLIP 82-33FB	3230	9	643	44	5703	8	2161	28	41	36	4938	7	2870	26	932	27	3000	9	6000	9	565	26	1908	16
352	77Ms 88158	3938	1	916	24	3903	38	2494	23	361	22	3370	20	2481	31	918	30	2778	18	4476	27	327	48	908	38
336	78S 48437	2421	33	643	44	5903	6	1161	44	193	32	4024	13	5204	1	1092	14	2741	19	4619	26	804	11	1608	22
X75TA 14	FLIP 82-1FB	1891	46	416	49	6003	5	1828	34	741	17	2891	29	3315	10	872	35	2704	21	4191	32	565	26	2608	6
X75TA 14	FLIP 82-34FB	2772	21	1189	12	4981	15	472	51	836	14	3429	19	1574	45	1081	15	2617	24	7000	4	724	17	2342	9
X77TA 81	FLIP 82-19FB	2522	29	203	51	3481	43	3139	12	369	21	1701	47	1574	45	1021	21	2506	27	6667	6	129	51	1542	23
X77TA 117	80S 45050	2635	24	1496	5	4647	22	1472	42	29	37	3244	23	1407	48	921	29	2506	27	4762	22	605	24	292	49
X77Sd 11	80S 45676	3492	4	503	46	3647	41	3139	12	0	40	5608	5	2519	30	581	50	2691	22	3619	43	367	45	142	51
308	FLIP 82-2FB	3302	7	1349	8	4481	27	2806	18	276	23	2512	36	1296	49	1041	18	2802	16	5476	16	724	17	1942	15
49	74TA 133	3587	3	1123	16	4714	20	4806	1	416	19	2897	27	3296	12	1047	17	2840	15	5048	20	605	24	842	41
1816	FLIP 82-38FB	2504	30	723	40	2947	46	1806	35	169	33	2454	38	1019	50	801	39	3173	6	5476	17	843	9	942	37

Cont'd 2...

Table 4.4.5. cont'd

ENTRY NAME ILB/ CROSS NO.	PEDIGREE	SYRIA Lattakia Y	R	Tel-Hadya Irrigated Y	R	Tel-Hadya Rainfed Y	R	TUNISIA Beja Y	R	El-Kef Y	R	Mateur Y	R	TURKEY Ankara Y	R	MEAN Y	R
X77TA 118	80S 45057	995	6	1267	29	514	27	1758	6	2267	23	2750	21	846	48	1903	29
X75TA 33	80S 43651	928	7	2007	6	699	11	1158	29	1967	38	3350	7	1233	30	2087	10
X77TA 48	80S 43859	781	15	563	50	291	46	1058	36	1617	47	2900	18	1166	34	1818	37
X77TA 85	FLIP 82-21FB	409	34	1674	14	440	34	908	42	1667	45	2700	25	1539	15	1810	38
905	78S 35513	435	32	2193	4	477	29	358	51	2067	33	2600	27	1686	7	1771	42
X76TA 34	FLIP 82-16FB	1181	3	2007	6	588	18	808	44	1417	50	2200	37	1419	19	1876	32
X77Sd 60	80S 46121	868	11	563	50	551	22	1158	29	2067	33	2500	31	1186	32	1793	39
1105	79S 97330	461	28	2674	1	365	41	1708	7	1467	49	2500	31	1319	24	1766	44
320	78S 48434	1281	2	970	41	365	41	958	40	2317	22	2750	21	926	44	1789	40
X77Sd 48	FLIP 82-13FB	655	19	1415	25	477	29	1108	34	1567	48	1950	45	953	42	1602	49
X75TA 10	80S 43238	567	21	1563	18	217	48	558	49	2067	33	3850	3	1406	20	1934	26
X75TA 7	78S 33011	428	33	1156	33	625	16	1208	28	2067	33	2000	42	953	42	2039	16
X77TA 70	80S 44150	581	20	1477	22	588	18	1225	27	1917	40	3125	12	1735	3	2025	19
X75TA 16	FLIP 82-15FB	928	7	1180	32	440	34	1325	22	1667	45	2000	42	1068	38	1938	25
X77TA 48	80S 43856	854	12	1106	36	291	46	1525	13	2667	8	3250	8	1215	31	1757	45
407	78S 49395	2020	1	1291	27	477	29	1375	19	2017	37	3475	5	1268	26	2178	8
X75TA 14	FLIP 82-35FB	460	29	1588	17	477	29	1375	19	2667	8	3400	6	1721	4	1984	21
X75TA 16	80S 43341	201	41	1736	10	662	14	625	48	1817	43	2550	29	1322	23	1895	30
X77TA 33	FLIP 82-9FB	894	10	1699	13	588	18	725	47	2417	17	2150	39	1255	27	1941	24
X77TA 72	80S 44203	734	17	2032	5	699	11	875	43	2117	30	1850	49	1668	9	1968	23
X77TA 81	80S 44358	0	49	995	40	588	18	2775	1	2617	13	2000	42	1768	2	2366	3
X77TA 81	FLIP 82-20FB	20	47	1551	20	477	29	2075	4	2117	30	2750	21	1502	16	2078	11
X75TA 20	FLIP 82-36FB	1054	4	2291	3	514	27	1275	24	2167	29	2850	20	882	47	2075	12
X77TA 72	FLIP 82-17FB	521	23	2365	2	662	14	1275	24	2217	26	2750	21	1468	17	2230	6
X75TA 150	80S 50088	916	9	649	49	538	23	1375	19	1750	44	2700	25	1575	13	1857	34
X77TA 60	80S 43977	842	13	872	45	612	17	1125	33	2650	10	3950	2	1442	18	2047	15
X77Sd 100	FLIP 82-24FB	482	27	1464	23	427	36	2275	3	2650	10	1950	45	1342	22	2032	18
X75TA 3	80S 43064	449	31	798	48	131	50	1625	10	1900	41	2950	15	1828	1	1781	41
X77TA 88	FLIP 82-22FB	729	18	1501	21	353	43	1775	5	2900	6	3250	8	1575	13	2405	2
X75TA 193	80S 50106	368	37	1057	38	353	43	1325	23	2100	32	1600	50	1095	36	1860	33
1817	76TA 56267	192	42	1279	28	204	49	2425	2	2550	15	3850	3	1695	6	2456	1
X77TA 60	80S 43971	1002	5	909	44	427	36	1475	15	2400	18	3000	13	1042	39	1852	35
X75TA 8	FLIP 82-33FB	782	14	1464	23	538	23	1475	15	2400	18	2950	15	1708	5	2279	4
352	77Ms 88158	456	30	946	42	390	40	975	39	2650	10	300	13	908	46	1905	28
336	78S 48437	382	36	1094	37	94	51	1475	15	2250	25	2600	27	1075	37	2073	14
X75TA 14	FLIP 82-1FB	182	42	872	45	316	45	1625	11	2200	28	2175	38	575	50	1893	31
X75TA 14	FLIP 82-34FB	179	44	1378	26	1020	1	1092	35	3117	2	2350	33	1244	28	2074	13
X77TA 81	FLIP 82-19FB	745	16	1674	14	835	5	1642	8	3317	1	2925	17	1637	10	1980	22
X77TA 117	80S 45050	125	46	859	47	427	36	792	45	2267	23	1925	48	1151	35	1661	47
X77Sd 11	80S 45676	0	49	1119	34	723	6	1592	12	2467	16	3250	8	803	49	1909	27
308	FLIP 82-2FB	491	24	1711	11	723	6	1142	31	2967	3	2250	35	1404	21	2037	17
49	74TA 133	232	40	1119	34	871	4	992	37	-		1500	51	1671	8	2089	9
1816	FLIP 82-38FB	495	25	1711	11	946	2	1142	31	2967	3	2550	29	971	40	1770	43

Table 4.4.5. Cont'd

ENTRY NAME		CANADA		CHILE		EGYPT				ETHIOPIA		FRANCE		IRAN		IRAQ		LEBANON		MOROCCO				QATAR	
TLB/	PEDIGREE	Manitoba		Valdivia		Gemmiza		Mansoura		Debre Zeit		Coulommiers		Gorgan		Dohuk		Terbol		Boulaowan		Sidi-Kacem		Rawdat Harma	
CROSS NO.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
X75TA 105	FLIP 82-12FB	2171	40	749	38	6247	4	806	48	389	20	2344	40	1852	42	934	26	1914	41	3810	40	367	45	242	50
X75TA 43	FLIP 83-9Fb	2837	17	1136	15	4114	33	1139	45	16	38	1597	48	2130	38	914	31	2173	35	4286	30	486	39	442	47
X77TA 51	FLIP 82-11FB	2581	25	1169	13	4714	20	2139	31	0	40	5533	6	2963	24	774	43	2691	22	3667	42	367	45	692	42
X77TA 66	80S 44056	2492	31	483	48	3314	45	1139	45	203	31	3309	22	1685	43	1027	20	2210	33	3571	45	248	49	442	47
X77TA 86	80S 44474	3296	8	1243	10	6647	2	1806	35	216	27	2829	31	1963	41	1294	4	2951	11	6190	8	248	50	2642	5
1820	Giza 4	2967	14	948	23	5258	11	3167	11	733	18	2831	30	2972	23	800	41	3352	4	7967	3	417	44	2263	10
1278	F 402	2259	36	793	37	4758	18	2667	21	837	13	1885	46	2361	35	1002	25	2491	29	5505	15	565	26	3275	1
	Local check	3690	2	1653	2	4725	19	2317	25	2625	2	7708	1	2667	27	1500	1	2935	12	4410	28	833	10	3188	2
Location mean		2603		956		4446		2413		538		3306		2741		965		2336		4945		633		1507	
C.V.%		15.1		21.2		27.5		62.6		176.7		24.1		27.3		17.2		55.4		0		20.2		31.6	
L.S.D. AT 5% for:																									
Checks		697		361		2148		2662		1955		1432		1290		293		2320		0		220		940	
Checks Vs. test entries		1272		659		3922		4861		3570		2615		2355		535		4237		0		401		1716	
Test entries in the same block		1394		721		4296		5324		3910		2864		2580		586		4641		0		440		1880	
Test entries in different blocks		1609		833		4960		6148		4515		3308		2979		677		5358		0		508		2170	
S.E. for:																									
Checks		285		147		878		1088		799		585		527		120		948		0		90		384	
Checks Vs. test entries		520		269		1603		1986		1459		1069		963		219		1731		0		164		701	
Test entries in the same block		569		295		1755		2176		1598		1171		1054		240		1896		0		180		768	
Test entries in different blocks		658		340		2027		2512		1845		1352		1217		277		2190		0		207		887	
No. of entries significantly exceeding the local check		0		0		0		0		0		0		1		0		0				1		0	

Table 4.4.5. Cont'd

ENTRY NAME ILB/ CROSS NO.	PEDIGREE	SYRIA Lattakia Y	Lattakia R	Tel-Hadya Irrigated Y	Tel-Hadya Irrigated R	Tel-Hadya Rainfed Y	Tel-Hadya Rainfed R	TUNISIA Beja Y	Beja R	El-Kef Y	El-Kef R	Mateur Y	Mateur R	TURKEY Ankara Y	Ankara R	MEAN Y	MEAN R
X75TA 105	FLIP 82-12FB	0	49	933	43	686	13	1642	8	2917	5	1950	45	1271	25	1643	48
X75TA 43	FLIP 83-9Fb	385	35	1267	29	538	23	792	45	2567	14	4000	1	1237	29	1687	46
X77TA 51	FLIP 82-11FB	298	39	1007	39	723	6	542	50	1867	42	3150	11	71	51	1839	36
X77TA 66	80S 44056	152	45	1674	14	872	3	942	41	2217	26	2350	33	971	40	1542	50
X77TA 86	80S 44474	485	25	1970	8	723	6	992	37	2817	7	2050	40	1637	10	2210	7
1820	Giza 4	540	22	1202	31	526	26	1250	26	2363	20	2225	36	1175	33	2261	5
1278	F 402	307	38	1563	18	424	39	1500	14	2350	21	2050	40	1613	12	2011	20
	Local check	0	48	1887	9	702	10	1425	18	1938	39	2888	19	917	45		
Location mean		558		1399		533		1287		2270		2659		1277			
C.V.%		67.8		29.4		31.2		33.9		16.27				5.3			
L.S.D. AT 5% for:																	
Checks		598		722		289		763		627				117			
Checks Vs. test entries		1093		1319		528		1394		1145				214			
Test entries in the same block		1197		1445		578		1527		1255				234			
Test entries in different blocks		1382		1669		668		1763		1449				270			
S.E. for:																	
Checks		245		295		118		311		256				48			
Checks Vs. test entries		447		539		216		570		468				87			
Test entries in the same block		489		591		236		624		513				96			
Test entries in different blocks		565		682		273		720		592				110			
No. of entries significantly exceeding the local check		47		0		0		0		2				35			

Table 4.5.2. Time to flowering (days) of entries at different locations in $FBIF_3N$ during 1983/84

ENTRY NAME	EGYPT		ETHIOPIA	LEBANON	SYRIA		MEAN
	Sakha	Sids	Debre Zeit	Terbol	Tel-Hadya-Irrigated	Tel-Hadya-Rainfed	
S82368	60	82	51	113	103	101	85
S82028	60	70	49	107	103	97	81
S82098	65	75	51	109	99	101	83
S82144	70	75	58	109	103	104	87
S82083	70	75	54	111	107	104	87
S82106	70	70	51	105	92	90	80
S82390	60	75	49	109	99	101	82
S82012	70	70	50	107	96	90	81
S82124	70	80	58	113	110	107	90
S82121	60	82	53	113	107	101	86
S82134	70	65	50	107	92	97	80
S82435	50	75	50	105	92	93	78
S82165	60	75	51	107	103	101	83
S82052	45	70	54	105	96	93	77
S82143	55	65	49	107	96	97	78
S82407	70	80	54	107	107	101	87
S82120	65	70	55	111	103	104	85
S82170	55	68	52	105	92	90	77
S82081	60	68	51	107	99	104	82
S82113	55	68	51	109	99	101	81
S82084	70	72	52	111	103	90	83
S82176	70	70	54	109	103	101	85
S82051	50	70	51	109	99	97	79
S82117	70	70	55	109	99	104	85
S82031	60	72	57	111	99	104	84
S82415	55	65	52	105	99	97	79
S82478	55	65	47	105	92	97	77
S82166	70	70	54	109	106	101	85
S82375	65	80	50	113	103	104	86
S82171	70	70	49	109	92	97	81
S82463	60	65	55	105	96	97	80
S82131	55	68	52	107	99	97	80
S82158	55	70	52	107	93	90	80
S82132	60	62	52	107	92	97	78
S82408	65	75	57	111	103	104	86
S82115	65	75	57	111	103	104	86
S82155	55	72	57	107	99	97	81
S82005	60	70	51	107	103	101	82
S82021	60	75	50	109	103	101	83
S82434	65	90	54	107	99	101	86
S82149	65	68	57	109	103	104	84
S82102	60	75	49	107	92	97	80
S82104	65	68	49	107	103	97	82
S82388	50	68	50	105	99	90	77
S82357	50	65	50	105	96	101	78
S82057	55	75	51	105	92	97	79
S82153	70	72	57	111	103	101	86
S82128	50	70	50	105	99	97	79
S82097	60	75	51	107	99	101	82
S82141	65	68	52	107	99	90	80
S82474	65	75	52	107	99	97	83
S82175	60	70	49	107	99	101	81
S82409	60	70	57	107	92	101	81
S82049	75	80	57	111	107	104	89
S82136	70	70	56	107	107	104	86
S82167	70	70	52	107	103	101	84
S82020	75	70	56	109	103	104	86
S82163	55	75	49	107	99	101	81
S82417	60	70	50	107	96	97	80
S82010	60	75	51	107	99	97	82
S82139	65	75	50	107	99	101	83
S82087	70	75	52	109	99	101	84
S82164	60	75	55	105	99	90	81
S82025	65	80	51	107	107	104	86
S82142	65	80	54	111	107	104	87
S82061	70	80	52	111	107	101	87
S82133	75	70	52	109	106	104	86
S82034	75	80	57	111	107	104	89
S82130	65	65	50	105	92	97	79
S82161	55	75	56	111	103	97	83
S82079	55	70	49	107	99	101	80
S82145	60	80	56	111	103	101	85
S82147	65	80	52	109	99	101	84
S82178	70	80	52	109	107	101	87
S82484	60	75	50	109	99	104	83
S82105	60	65	50	107	92	97	79
S82101	65	70	51	107	103	97	82
S82082	60	70	49	107	99	97	80
S82156	70	75	55	113	107	104	87
S82413	55	70	51	105	99	101	80
S82014	75	75	57	109	106	101	87
S82418	75	80	58	113	107	104	90
S82411	70	75	52	111	106	101	86
S82416	55	68	50	107	96	101	80
Syrian Local Large	70	77	54	110	106	103	87
Reina Blanca	69	78	56	110	107	104	87
Local check	44	56	49	108	107	103	-
Location mean	63	73	52	108	101	100	

heaviest yielders at each location are presented in Table 4.4.6. It is apparent that except at five locations, namely, Manitoba (Canada), Valdivia (Chile), Debre Zeit (Ethiopia), Dohuk (Iraq), and Rawdat Harma (Qatar) where the local check ranked among the top five yielders, at all other locations the five heaviest yielders were from the materials supplied from ICARDA.

4.5. FABA BEAN INTERNATIONAL F_3 NURSERY ($FBIF_3N$)

The Faba Bean International F_3 Trial was changed into Faba Bean International F_3 Nursery so as to overcome the problem of shortage of seed which was needed in replicated trial.

Material

The Faba Bean International F_3 Nursery was comprised of 84 F_3 test populations and three checks, two namely Syrian Local Large and Reina Blanka were supplied and the third to be added by the cooperator. The material should have provided a wide range of intra- and inter population variation. The cooperators were suggested to make single plant selections from the border rows for their use in breeding program.

Methods and Management

The test entries and the three checks were suggested to be sown in four row plots of 4 m length with inter- row spacings of 50 cm accomodating 120 plants. The whole experimental unit was divided into seven blocks and material was planted using augmented design layout plan. Seventeen sets of nursery were supplied to cooperators in 11 countries and the results were received from eight locations from five countries. The data on agronomic practices supplied by the cooperators are presented in Table 4.5.1.

Results and Discussion

The population means over all the locations revealed that the populations S82052, S82170, S822478 and S82388 were earliest to flower in 77 days, whereas S82124 and S82418 took 90 days and were latest to flower (Table 4.5.2). At Sids and Sakha in Egypt none of the populations was early in flowering than the respective local check whereas at other locations some of the entries flowered earlier or at the same time when the local check flowered. Egyptian and Ethiopian locations were early in flowering whereas Syrian and Lebanese were late. There were very little differences in time to maturity (Table 4.5.3) among different entries on the basis of average over locations (range 179-184 days). The plant height data (Table 4.5.3) revealed that the populations ranged from 75 cm for S82079 to 100 cm for S82014. The plant height also varied greatly from location to location. The

Table 4.5.1. Agronomic data for different Locations in the $FBIF_3N$ during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	k20	Irrigation	Insecticide/ Fungicide/ Herbicide
EGYPT	Sakha	24-10-1983	170	35	70			Igran
EGYPT	Sids	17-11-1983	164	38	75		5	Igran
ETHIOPIA	Debre Zeit	26-6-1984	129					
LEBANON	Terbol	8-11-1983	210		50			Kerb, Tribunil, Metasystox
SYRIA	Tel Hadya-Irrigated	6-11-1983	193					
SYRIA	Tel Hadya-Rainfed	18-11-1983	169					
TUNISIA	Beja	N.A.						
TUNISA	El-Kef	N.A.						

N.A. Not Available.

Table 4.4.6. The five heaviest seed yielding entries at the individual locations in FBISN-S during 1983/84

RANK	CANADA		CHILE		EGYPT				ETHIOPIA		FRANCE		IRAN	
	Manitoba		Valdivia		Gemmiza		Mansoura		Dedbre Zeit		Coulommiers		Gorgan	
	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree
1	352	77Ms 88158	X75TA 10	80S 43238	X77TA 88	FLIP 82-22FB	49	74TA 133	1105	79S 97330		Local check	336	78S 48437
2		Local check		Local check	X77TA 86	80S 44474	X75TA 33	80S 43651		Local check	X77TA 60	80S 43971	X77TA 48	80S 43856
3	49	74TA 133	X77TA 60	80S 43977	1817	76TA 56267	X77TA 72	FLIP 82-17FB (1)	X77TA72	FLIP 82-17FB	X77TA 60	80S 43977	X77TA 88	FLIP82-22FB
4	X77Sd 11	80S 45676	1817	76TA 56267	X75TA 105	FLIP 82-12FB	X77TA 81	FLIP 82-20FB	X75TA 7	78S 33011	X77TA 48	80S 43859	407	78S 49395
5	X77TA 48	80S 43859	X77TA 117	80S 45050	X75TA 14	FLIP 82-1FB	X75TA 10	80S 43238	X75TA33	80S 43651	X77Sd 11	80S 45676	X77TA 72	80S 44203

Cont'd ...

Table 4.4.6. cont'd .

RANK	IRAQ		LEBANON		MOROCCO				QATAR	
	Dohuk		Terbol		Boulaowan		Sidi Kacem		Rawdat Harma	
	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree
1		Local check	X75TA 16	FLIP 82-15FB	X77TA 81	80S 44358	X75TA 7	78S 33011	1278	F402
2	X77TA 88	FLIP 82-22FB	X77TA 81	80S 44358	1817	76TA 56267	X77TA 81	80S 44358		Local check
3	X77Sd 60	80S 46121	1817	76TA 56267	1820	Giza 4	X77TA 88	FLIP 82-22FB	X75TA 20	FLIP 82-36FB
4	X77TA 86	80S 44474	1820	Giza 4	75TA 14	FLIP 82-34FB	X77Sd 60	80S 46121	X75TA 7	78S 33011
5	905	78S 35513	X77TA 60	80S 43971	X75TA 7	78S 33011	1817	76TA 56267	X77TA 86	80S 44474

Cont'd ...

Table 4.4.6. cont'd .

RANK	SYRIA						TURKEY		TUNISIA					
	Lattakia		Tel-Hadya Irrigated		Tel-Hadya Rainfed		Ankara		Beja		El-Kef		Mateur	
	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree	ILB/ Cross No.	Pedigree
1	407	78S 49395	1105	79S 97330	X75TA 14	FLIP 82-34FB	X75TA 3	80S 43064	X77TA 81	80S 44358	X77TA 81	FLIP 82-19FB	X75TA 43	FLIP 83-9FB
2	320	78S 48434	X77TA 72	FLIP 82-17FB	1816	FLIP 82-38FB	X77TA 81	80S 44358	1817	76TA 56267	X75TA 14	FLIP 82-34FB	X77TA 60	80S 43977
3	X76TA 34	FLIP 82-16FB	X75TA 20	FLIP 82-36FB	X77TA 66	80S 44056	x77TA 70	80S 44150	X77Sd 100	FLIP 82-24FB	1816	FLIP 82-38FB	X75TA 10	80S 43238
4	X75TA 20	FLIP 82-36FB	905	78S 35513	49	74TA 133	X75TA 14	FLIP 82-35FB	X77TA 81	FLIP 82-20FB	308	FLIP 82-2FB	1817	76TA 56267
5	X77TA 60	80S 43971	X77TA72	80S 442o3	X77TA 81	FLIP 82-19FB	X75TA 8	FLIP 82-33FB	X77TA 88	FLIP 82-22FB	X75TA 105	FLIP 82-12FB	407	78S 49395

(1) The brackets indicate entries having the same rank

Table 4.5.3. Time to maturity (days) and plant height (cm) of entries at different locations in FBIF3N during 1983/84.

Entry Name	Time to maturity (days)					Plant Height (cm)				
	EGYPT	LEBANON	SYRIA		MEAN	ETHIOPIA	LEBANON	SYRIA		MEAN
	Sakha	Terbol	Tel-Hadya Irrigated	Tel-Hadya Rainfed		Debre Zeit	Terbol	Tel-Hadya Irrigated	Tel-Hadya Rainfed	
S82368	170	200	183	164	179	95	130	50	35	78
S82028	170	205	183	164	181	115	140	72	35	91
S82098	170	205	182	164	180	85	150	50	35	80
S82144	170	200	183	164	179	110	155	65	40	93
S82083	170	200	188	164	181	105	140	80	35	90
S82106	170	200	183	169	181	120	150	70	40	95
S82390	170	210	183	164	182	110	185	68	40	101
S82012	170	208	183	167	182	115	155	80	40	98
S82124	170	208	183	164	181	85	140	65	30	80
S82121	170	203	185	164	181	85	155	62	35	84
S82134	170	200	183	169	178	85	125	70	40	80
S82435	170	203	183	164	180	90	140	45	40	79
S82165	170	203	185	164	181	130	145	80	40	99
S82052	170	203	193	164	183	110	155	80	35	95
S82143	170	203	188	167	182	115	145	84	35	95
S82407	170	205	188	167	183	90	145	85	30	88
S82120	170	205	193	164	183	105	145	92	35	94
S82170	170	208	183	164	181	110	160	75	35	95
S82081	170	203	186	167	182	105	165	70	40	95
S82113	170	210	184	164	182	105	130	80	35	88
S82084	170	203	183	164	180	95	155	62	35	87
S82176	170	200	193	164	182	90	160	75	40	91
S82051	170	200	185	167	181	100	140	85	35	90
S82117	170	205	183	164	181	90	150	72	30	86
S82030	170	208	182	169	182	100	150	62	40	88
S82415	170	208	183	169	183	100	125	100	40	91
S82478	170	205	185	165	181	90	140	65	35	83
S82166	170	208	185	164	182	95	150	75	40	90
S82375	170	205	183	165	181	110	145	65	40	90
S82171	170	208	185	164	182	85	150	80	45	90
S82463	170	205	183	164	181	85	145	55	30	79
S82131	170	203	183	164	180	115	145	65	30	89
S82158	170	203	185	164	181	105	160	70	40	94
S82132	170	200	182	164	179	125	145	63	40	93
S82408	170	205	183	169	182	110	140	55	35	85
S82115	170	210	185	169	184	125	145	70	40	95
S82155	170	203	182	165	180	110	145	60	40	89
S82005	170	205	183	165	181	95	135	63	35	82
S82021	170	203	182	165	180	70	135	65	35	76
S82434	170	205	183	167	181	90	145	50	30	79
S82149	170	203	185	167	181	120	130	70	40	90
S82102	170	203	183	165	180	95	140	60	35	83
S82104	170	210	183	165	182	110	140	85	35	93
S82388	170	208	182	165	181	95	170	60	35	90
S82357	170	200	191	167	182	95	135	80	40	88
S82057	170	203	182	165	180	105	140	50	40	84
S82153	170	203	182	165	180	75	140	85	40	85
S82128	170	200	183	165	180	95	145	75	40	89
S82097	170	200	185	165	180	100	140	85	38	91
S82141	170	203	185	165	181	105	145	85	37	93
S82474	170	205	183	165	181	100	140	70	35	86
S82175	170	203	183	165	180	110	160	75	40	96
S82409	170	200	183	165	180	125	160	63	37	96
S82049	170	203	182	167	181	105	140	55	36	84
S82136	170	200	183	165	180	110	170	80	35	99
S82167	170	200	182	165	179	70	170	73	45	90
S82020	170	205	183	165	181	120	145	77	39	95
S82163	170	203	183	165	180	105	150	85	39	95
S82417	170	203	185	165	181	110	125	75	33	86
S82010	170	203	185	166	181	90	150	70	36	87
S82139	170	203	183	165	180	120	150	60	34	91
S82097	170	200	182	165	179	125	135	75	38	93
S82164	170	203	183	165	180	110	160	78	42	98
S82025	170	203	183	169	181	105	135	70	34	86
S82142	170	205	185	165	181	95	145	83	41	91
S82061	170	203	182	165	180	90	135	75	42	86
S82133	170	203	185	167	181	95	160	65	40	90
S82034	170	205	183	165	181	100	155	65	32	88
S82130	170	208	183	167	182	115	145	70	33	91
S82161	170	203	182	165	180	95	140	75	43	88
S82079	170	205	183	165	181	75	135	50	40	75
S82145	170	203	183	165	180	120	140	73	37	93
S82147	170	203	183	165	180	110	145	75	36	92
S82178	170	203	182	165	180	90	140	40	44	79
S82484	170	208	183	165	182	90	145	53	40	82
S82105	170	203	182	165	180	105	155	65	37	91
S82101	170	203	183	165	180	110	135	70	38	88
S82082	170	203	182	165	180	105	160	48	42	89
S82156	170	203	182	165	180	115	160	50	43	92
S82413	170	200	183	169	181	95	165	65	40	91
S82014	170	210	185	165	183	110	155	90	45	100
S82419	170	203	185	165	181	85	140	72	37	84
S82411	170	203	182	165	180	100	145	60	34	85
S82416	170	203	182	164	180	85	140	65	49	85
Syrian Local large	170	208	184	167	182	97	143	73	37	88
Reina Blanca	170	202	182	164	180	98	146	47	33	81
Local check	164	205	186	166	–	106	149	68	34	–
Location mean	170	204	184	165		102	147	69	38	–

Table 4.5.4. Adjusted seed yield (Y-kg/ha) and rank (R) of entries at different locations in FBIF3N during 1983/84

ENTRY NAME	EGYPT Sakha		ETHIOPIA Debre Zeit		LEBANON Terbol		SYRIA Tel-Hadya Irrigated		SYRIA Tel-Hadya Rainfed		TUNISIA Beja		TUNISIA El-Kef		Mean	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
S82368	5366	3	8	77	1043	86	957	61	471	57	677	39	1908	48	1490	58
S82028	2144	80	32	73	1636	82	2512	2	490	54	277	78	2058	30	1307	71
S82098	4172	28	8	77	1543	83	513	80	601	37	502	62	2177	20	1359	68
S82144	2589	73	185	34	2321	68	1068	53	212	83	577	56	1958	41	1273	74
S82093	3339	56	0	82	2265	71	1790	19	230	80	652	44	1608	71	1412	63
S82106	1894	83	125	43	1802	80	1049	55	249	77	877	22	2114	26	1159	81
S82390	1894	83	5	79	2006	78	586	79	416	65	377	74	2202	19	1069	84
S82012	2311	76	0	82	1080	85	2420	3	527	49	652	45	1333	86	1189	79
S82124	2116	81	0	82	2395	64	883	69	304	74	552	59	1914	46	1166	80
S82121	1589	85	198	32	1488	84	1549	29	619	34	927	16	2502	4	1267	75
S82134	1505	86	168	37	2191	73	1698	24	119	86	877	22	1933	44	1212	77
S82435	3978	32	158	37	1932	79	420	85	304	74	452	67	2164	22	1344	69
S82165	3857	37	217	30	2938	37	1895	11	891	7	714	36	1739	59	1750	23
S82052	2913	65	414	10	2679	57	1747	21	613	35	489	65	2377	5	1605	41
S82143	3468	52	207	31	3216	25	1562	28	520	50	889	19	1614	69	1639	36
S82407	3468	52	171	36	4142	2	1932	10	465	58	64	85	2021	35	1752	21
S82120	3913	36	67	56	2735	53	2784	1	669	29	564	58	1614	69	1764	19
S82170	3302	57	427	7	2883	45	1784	20	687	24	889	19	1821	53	1685	29
S82091	3940	35	157	39	2698	55	302	86	595	38	614	51	1821	53	1447	62
S82113	3746	42	304	13	3272	23	2321	4	1150	1	639	46	2064	28	1928	9
S82094	3902	40	274	20	3105	29	1062	54	761	16	664	42	1758	57	1632	38
S82176	5024	8	91	50	3068	31	1802	18	817	13	414	72	2352	6	1938	7
S82051	3385	54	251	24	3586	11	1136	46	595	38	239	79	1664	66	1551	51
S82117	3524	50	61	60	2290	69	951	62	1150	1	414	72	2233	15	1518	56
S82030	6311	1	242	25	2772	49	1284	40	557	48	614	51	2258	13	2005	3
S82415	4755	12	242	25	2772	49	1173	43	409	68	439	70	1764	56	1651	33
S82478	4894	10	222	29	4420	1	2006	7	1150	1	1089	10	2646	3	2347	1
S82166	5172	5	135	42	2346	66	1580	26	928	6	839	26	2052	33	1865	11
S82375	4394	22	152	40	3420	18	1154	44	965	5	1421	5	1733	60	753	86
S82171	3116	61	228	27	2160	74	1821	17	780	15	889	19	2064	28	1580	44
S82463	3700	44	252	23	3716	5	1414	32	1150	1	1264	6	2039	34	1934	8
S82131	5255	4	295	15	2772	49	858	70	520	50	489	65	2152	24	1763	20
S82158	5033	7	228	27	2494	63	914	65	428	61	817	27	2346	7	1751	22
S82132	4729	11	125	43	2938	37	1377	33	835	12	964	14	1458	85	1775	18
S82408	4255	26	115	45	3383	20	969	60	891	7	1446	3	1733	60	1827	13
S82115	4755	12	95	49	2272	70	1154	44	483	55	639	46	1758	57	1594	43
S82155	4329	23	423	8	3136	27	1130	48	669	29	1146	9	2339	9	1882	10
S82005	2718	67	316	12	2728	54	1741	22	669	29	771	30	1871	50	1545	52
S82021	3690	45	286	17	2099	75	944	63	595	38	846	24	1189	87	1378	65
S82434	3385	54	190	33	3025	33	889	68	224	81	746	31	1908	48	1481	61
S82149	3496	51	666	3	3247	24	1130	48	428	61	1021	12	2058	30	1721	26
S82102	4024	30	433	6	3136	27	815	75	446	60	746	31	3002	1	1800	14
S82104	3579	48	356	11	3395	19	1852	14	243	79	746	31	1621	68	1685	30
S82388	2607	71	280	18	1747	81	852	73	39	87	321	77	1464	84	1044	85
S82357	1940	82	686	2	2562	62	1296	38	317	73	696	38	1589	74	1298	72
S82057	4218	27	460	5	3617	10	981	59	502	52	621	48	2133	25	1790	15
S82153	4413	20	493	4	2840	46	1111	51	335	72	769	29	2171	21	1737	25
S82128	2413	75	420	9	3691	6	1000	58	687	24	746	31	1939	43	1557	48
S82097	2663	69	4	80	2957	36	1475	31	416	65	921	17	1983	39	1488	59
S82141	3107	62	104	46	3623	9	1735	23	378	70	171	82	2333	10	1636	37
S82474	2579	74	4	80	2938	37	790	76	730	22	596	53	1971	40	1373	67
S82175	3079	63	291	16	4142	2	475	82	416	65	446	68	2058	30	1558	47
S82409	2635	70	64	58	2920	43	290	87	267	76	346	75	2214	17	1248	76
S82049	2218	78	184	35	3438	16	1012	57	193	84	671	40	1933	44	1378	66
S82136	4302	24	77	54	3179	26	475	82	564	47	846	24	1839	52	1612	40
S82167	3552	49	84	53	4142	2	1364	34	675	28	1446	3	1558	79	1832	12
S82020	3857	37	24	75	2623	60	920	64	841	11	596	53	1721	62	1512	57
S82163	3857	37	54	64	2994	34	1827	16	193	84	346	75	2327	11	1657	32
S82417	2607	71	61	60	549	87	2049	6	341	71	421	71	1564	78	1084	83
S82010	3024	64	74	55	2772	49	1679	25	249	77	621	48	1958	41	1482	60
S82139	4616	16	253	22	2778	48	1272	41	483	55	446	68	1558	79	1629	39
S82097	2700	68	60	62	3333	21	457	84	595	38	21	86	2239	14	1344	70
S82164	3728	43	43	67	3333	21	660	78	632	33	496	63	1996	37	1555	49
S82025	3283	58	0	82	2648	59	1883	12	428	61	621	48	1914	46	1540	53
S82142	3672	46	90	51	2685	56	846	74	650	32	171	82	1583	77	1385	64
S82061	4561	17	50	65	2667	58	494	81	705	23	496	63	2214	17	1598	42
S82133	2311	76	63	59	3574	12	1235	42	761	16	1596	1	2308	12	1693	27
S82034	3228	60	50	65	2333	67	2198	5	224	81	671	40	2077	27	1540	53
S82130	4533	18	256	21	3519	14	1864	13	391	69	946	15	2164	23	1953	6
S82161	3950	34	33	71	2926	42	1846	15	576	44	546	60	1608	71	1641	35
S82079	4005	31	150	41	2889	44	1346	36	465	58	571	57	1589	74	1574	46
S82145	2200	79	43	67	2259	72	1364	34	428	61	0	87	1589	74	1126	82
S82147	4940	9	90	51	3673	8	1580	26	872	9	1233	8	1721	62	2016	2
S82178	4774	11	23	76	2969	35	895	66	817	13	1033	11	2008	36	1788	16
S82484	3607	47	280	18	2599	61	1117	50	854	10	908	18	1508	82	1553	50
S82105	5135	6	40	69	3052	32	1043	56	502	52	1008	13	1689	65	1783	17
S82101	4524	19	96	48	3432	17	1506	30	743	20	508	61	2927	2	1962	5
S82082	6302	2	66	57	3080	30	858	70	687	24	1258	7	1639	67	1984	4
S82156	3802	40	0	82	3488	15	1136	46	576	44	658	43	1858	51	1645	34
S82411	4302	24	33	71	2377	65	1321	37	595	38	808	28	1608	71	1578	45
S82014	3274	59	26	74	2932	40	1951	9	743	20	221	80	1558	79	1529	55
S82418	1496	87	0	82	3525	13	858	70	687	24	171	82	1721	62	1208	78
S82411	4635	15	100	47	2932	40	895	66	761	16	208	81	2233	15	1681	31
S82416	3969	33	56	63	2080	76	1988	8	761	16	1508	2	1483	83	1692	28
Syrian local large	2810	66	34	70	2034	77	1082	52	588	43	585	55	1793	55	1275	73
Reina Blanca	4155	29	301	14	3688	7	775	77	572	46	707	37	1989	38	1741	24
Local check	4413	20	1213	1	2796	47	1291	39	604	36	721	35	2346	7	–	–
Location mean	3643		176		2815		1288		571		686		1938			
C.V.%	32.4		73.5		25.6		41.7		36.6		41.2		14.1			
L.S.D. at 5% for:																
Checks	1383		199		842		605		245		321		308			
Checks VS. test entries	3195		460		1944		1398		565		717		688			
Test entries in the same block	3659		527		2227		1602		647		849		814			
Test entries in different blocks	4226		608		2571		1850		747		949		910			
S.E. for:																
Checks	635		91		386		278		112		153		146			
Checks VS. test entries	1466		211		892		642		259		341		327			
Test entries in the same block	1679		242		1022		735		297		404		387			
Test entries in different blocks	1939		279		1180		849		343		452		433			
No. of test entries significantly exceeding the local check	0		0		0		1		0		4		0			

Table 4.5.5. The five heaviest seed yielding entries at the individual locations in the FBIF3N during 1983/84

RANK	EGYPT Sakha	ETHIOPIA Debre Zeit	LEBANON Terbol	SYRIA Tel-Hadya Irrigated	SYRIA Tel-Hadya Rainfed	TUNISIA Beja	TUNISIA El-Kef
1	S82030	Local check	S82478 (1)	S82120	S82113	S82133	S82102
2	S82082	S82357	S82407	S82028	S82117	S82416	S82101
3	S82368	S82149	S82175	S82012	S82478	S82408	S82478
4	S82131	S82153	S82167	S82113	S82463	S82167	S82121
5	S82166	S82057	S82463	S82034	S82375	S82375	S82052

(1) The brackets indicate entries having the same rank

least plant height was observed at Tel Hadya-rainfed (38 cm) whereas it was maximum at Terbol in Lebanon (147 cm).

The adjusted seed yields of populations (Table 4.5.4) exhibited that Sakha in Egypt (3643 kg/ha) was the highest yielding location and was followed by Terbol in Lebanon (2815 kg/ha) and El-Kef in Tunisia (1938 kg/ha). However, the yields were lowest at Debre Zeit in Ethiopia (176 kg/ha) and were followed by Tel Hadya-rainfed in Syria (571 kg/ha) and Beja in Tunisia (686 kg/ha). The CV for the experiment ranged from 14.1% at El-Kef in Tunisia to 73.5% at Debre Zeit in Ethiopia. The ANOVA for the experimental design revealed that at Tel Hadya-irrigated in Syria and Beja in Tunisia, 1 and 4 populations out yielded the respective local checks by significant margins. Except at Debre Zeit in Ethiopia where the local check ranked no. 1, at all other places the ranking of the local checks was very low. This indicated that the plant selections from the populations which are giving even numerically greater yield than the respective check may result in better breeding materials for future use. The top five populations at individual locations are given in Table 4.5.5.

4.6. FABA BEAN INTERNATIONAL F_3 NURSERY - EARLY ($FBIF_3N$-E)

Material

The Faba Bean International F_3 Screening Nursery - Early ($FBIF_3N$-E) comprised of 36 test entries and three checks two of them namely Syrian Local Large and Reina Blanca were supplied and the third local check was to be supplied by the cooperator. The material was supposed to provide a wide range of variability within and between the F_3 populations to allow the cooperators to effect selections under their local conditions. The cooperators were suggested to use border rows for single plant selections for their use in breeding program.

Methods and Management

The test entries and the three checks were suggested to be sown in 4 row plots of 4 m length with inter row spacings of 50 cms accomodating 120 plants per plot. The whole experimental unit was divided into three blocks each comprising 12 test entries and three checks repeated in each block. The augmented design was followed for analysis. Twenty nine sets of nursery were supplied to 20 countries and the results were returned for 16 sets covering 10 countries. The trial at Islamabad (Pakistan) had very poor germination and the data were not worth analysis. The agronomic details of the locations reporting the data are given in Table 4.6.1.

Results and Discussion

Out of the 14 locations reporting the data on time to flowering (Table 4.6.2), at 8 locations most of the F_3 populations were earlier

Table 4.6.1. Agronomic data for different locations in the $FBIF_3N$-E during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
CANADA	Manitoba	9. 5.1984	109	-	-	-		
CHINA	Yunnan	20.10.1983	189	36	67	-	2	Propineb cygon
EGYPT	Gemmiza	N.A.	161	-	-	-		
EGYPT	Mansoura	24.11.1983	160	-	-	-	5	
EGYPT	Sakha	24.10.1983	170	35	70	-	4	Igran
EGYPT	Shandweel	1.11.1983	158	18	30	-	4	Igran
EGYPT	Sids	20.11.1983	165	37	75	-	5	Igran
ETHIOPIA	Debre Zeit	27. 6.1984	151	-	-	-		
FRANCE	Coulommiers	28.10.1983	259	-	50	-		Herbalts zolone
ITALY	Salerno	14.12.1983	215	-	120	-		
MOROCCO	Sidilaidi	12.12.1983	155	30	60	70		
PAKISTAN	Islamabad	N.A.						
SYRIA	TH-Irrigated	6.11.1983	185	-	-	-		
SYRIA	TH-Rainfed	18.11.1983	169	-	-	-		

N.A. = Not Available.

Table 4.6.2. Time to flowering (days) of entries at different locations in $FBIF_3N$-E during 1983/84.

ENTRY NAME	CANADA	CHINA	EGYPT					ETHIOPIA	FRANCE	ITALY	MOROCCO	SYRIA		MEAN
	Manitoba	Yunnan	Gemmiza	Mansoura	Sakha	Shandweel	Sids	Debre Zeit	Coulommiers	Salerno	Sidi Laidi	Tel Hadya-irrigated	Tel Hadya-rainfed	
S82004	49	116	67	51	60	63	62	49	154	115	89	92	97	82
S82008	47	118	68	52	60	65	65	49	156	125	89	92	97	83
S82009	49	116	71	53	60	68	70	54	160	115	89	103	97	85
S82013	49	120	77	51	70	70	75	62	162	122	89	107	104	89
S82015	45	116	69	52	65	67	65	49	155	115	89	99	97	83
S82017	47	119	74	53	60	67	65	54	160	115	89	103	101	85
S82018	51	116	70	52	60	67	70	59	159	115	89	99	97	85
S82023	47	116	78	54	70	68	75	54	158	115	89	107	104	87
S82076	47	119	73	50	75	70	75	51	157	122	89	106	97	87
S82027	51	118	75	48	65	65	70	49	158	125	89	99	101	86
S82029	47	118	67	55	60	67	70	49	157	115	89	99	97	84
S82037	51	116	71	49	70	69	75	56	160	122	89	99	101	87
S82054	45	118	75	52	60	62	75	57	156	125	89	107	101	86
S82064	45	116	68	52	55	59	62	52	158	115	89	92	97	82
S82068	45	117	70	51	60	59	62	52	162	122	89	92	97	83
S82069	45	116	73	54	55	65	70	49	158	122	89	96	101	84
S82077	47	121	76	51	70	69	75	55	160	122	89	107	104	88
S82085	49	116	70	49	60	65	65	56	159	115	89	96	101	84
S82088	49	118	69	56	65	68	72	52	153	115	89	107	104	86
S82091	49	117	67	50	65	65	65	56	158	115	89	99	101	84
S82095	47	118	70	57	60	68	65	63	158	115	89	99	97	85
S82096	49	120	69	54	60	67	72	49	160	122	89	106	101	86
S82099	47	114	67	49	65	66	70	49	159	115	89	99	101	84
S82103	47	118	71	56	55	66	70	51	156	122	89	99	97	84
S82107	45	120	69	52	70	66	72	54	159	115	89	107	101	86
S82110	47	116	73	48	60	65	70	56	154	122	89	103	101	85
S82112	49	117	73	57	60	70	72	53	154	122	89	103	97	86
S82129	49	118	71	48	70	68	72	57	158	115	89	103	104	86
S82146	47	118	75	58	60	68	70	56	157	115	89	103	101	86
S82151	49	116	71	52	70	68	72	58	-	122	89	99	104	81
S82154	51	120	74	50	70	73	75	59	156	115	89	107	104	88
S82169	45	121	69	54	60	65	65	54	158	122	89	92	97	84
S82179	47	121	70	49	60	67	70	55	157	115	89	99	97	84
S82425	49	119	75	51	75	70	72	54	-	125	89	107	104	83
S82426	47	116	72	52	55	66	70	52	155	122	89	96	97	84
S82379	47	114	76	50	55	68	70	55	160	115	89	99	104	85
Syrian local large	48	119	74	51	70	70	75	56	157	116	89	107	103	87
Reina Blanca	50	118	74	55	72	72	75	55	157	130	89	107	104	89
Local check	53	112	60	55	45	54	55	49	165	111	89	107	101	-
Location mean	48	117	71	52	63	67	70	54	158	119	89	101	100	

Table 4.6.3. Time to maturity (days) of entries at different locations in $FBIF_3N$-E during 1983/84.

ENTRY NAME	CANADA	EGYPT					FRANCE	ITALY	MOROCCO	SYRIA		MEAN
	Manitoba	Gemmiza	Mansoura	Sakha	Shandweel	Sids	Coulommiers	Salerno	Sidi Laidi	Tel Hadya-irrigated	Tel Hadya-rainfed	
S82004	107	157	155	170	151	150	254	203	155	183	167	168
S82008	100	160	155	170	153	155	254	204	155	183	165	169
S82009	108	152	155	170	156	160	257	205	155	185	165	170
S82013	102	160	149	170	155	160	254	205	155	182	165	169
S82015	102	152	157	170	156	155	258	205	155	182	165	169
S82017	104	160	158	170	153	155	253	200	155	183	169	169
S82018	108	152	157	170	153	155	254	203	155	185	167	169
S82023	107	162	151	170	156	160	258	202	155	183	165	170
S82976	105	159	150	170	152	160	257	203	155	183	165	169
S82027	108	160	153	170	152	155	253	204	155	183	165	169
S82029	104	160	153	170	155	155	257	207	155	183	165	169
S82037	107	161	150	170	156	160	253	209	155	183	169	170
S82054	104	160	152	170	151	160	254	206	155	183	165	169
S82064	107	161	154	170	148	160	252	199	155	183	165	169
S82068	108	161	150	170	156	155	254	200	155	182	165	169
S82069	104	161	155	170	152	165	254	207	155	182	165	170
S82077	108	161	156	170	151	160	254	201	155	183	165	169
S82085	102	160	153	170	153	155	254	204	155	185	168	169
S82088	107	152	156	170	155	155	254	205	155	183	169	169
S82091	102	160	152	170	155	150	254	199	155	184	168	168
S82095	104	151	158	170	152	150	254	203	155	187	165	168
S82096	102	152	154	170	155	155	254	200	155	185	165	168
S82099	104	157	156	170	152	155	253	203	155	183	165	168
S82103	104	160	161	170	156	155	257	200	155	183	165	170
S82107	98	152	157	170	150	160	254	203	155	182	165	168
S82110	100	160	150	170	151	160	254	201	155	183	167	168
S82112	102	159	156	170	155	165	254	207	155	182	165	170
S82129	96	152	150	170	156	155	254	203	155	182	165	167
S82146	100	157	159	170	155	155	257	200	155	183	165	169
S82151	107	152	157	170	152	155	-	200	155	185	165	160
S82154	98	160	158	170	151	155	253	204	155	182	165	168
S82169	98	151	156	170	153	155	256	202	155	183	165	168
S82179	100	152	152	170	155	155	254	200	155	183	165	167
S82425	98	152	150	170	158	155	-	205	155	183	163	159
S82426	96	160	150	170	150	155	250	206	155	182	165	167
S82379	100	157	149	170	156	155	254	203	155	183	165	168
Syrian local large	105	160	155	170	157	162	258	201	155	184	168	170
Reina Blanca	103	154	154	170	156	158	252	215	155	182	165	169
Local check	109	146	160	155	137	147	259	199	155	185	166	-
Location mean	103	157	154	170	153	156	255	203	155	183	166	

Table 4.6.4. Plant height (cm) of entries at different locations in $FBIF_3N$-E during 1983/84.

ENTRY NAME	CANADA	CHINA	EGYPT				ETHIOPIA	FRANCE	ITALY	SYRIA		MEAN
	Manitoba	Yunnan	Gemmiza	Mansoura	Shandweel	Sids	Debre Zeit	Coulommiers	Salerno	Tel Hadya-irrigated	Tel Hadya-rainfed	
S82004	61	26	68	110	80	135	105	75	98	60	40	78
S82008	56	32	78	118	95	95	120	67	100	82	40	80
S82009	59	26	52	119	90	85	90	69	85	60	35	70
S82013	59	25	80	109	95	80	110	76	86	75	35	75
S82015	61	37	58	112	115	115	85	71	95	75	30	78
S82017	62	20	66	121	100	110	105	85	105	80	40	81
S82018	56	23	56	138	105	105	100	54	78	65	35	74
S82023	59	31	61	128	95	85	110	85	100	75	40	79
S82076	54	29	68	112	110	120	115	69	100	70	40	81
S82027	63	25	59	120	95	125	120	72	100	70	35	80
S82029	62	24	62	124	100	105	90	71	105	80	40	78
S82037	65	24	57	107	125	90	80	56	60	70	40	70
S82054	62	36	73	130	90	115	75	55	86	80	40	77
S82064	64	38	64	129	120	95	95	120	98	65	40	84
S82068	63	30	82	96	105	90	57	45	92	65	40	70
S82069	58	30	67	99	115	95	50	44	95	80	35	70
S82077	64	29	72	118	115	120	85	60	100	75	35	79
S82085	64	38	66	96	95	115	100	65	98	80	40	78
S82088	57	22	64	107	130	110	120	106	90	60	35	82
S82091	59	39	80	107	140	75	95	74	98	80	40	81
S82095	64	25	59	125	120	95	95	112	100	80	35	83
S82096	56	25	62	110	135	115	100	97	62	77	40	80
S82099	59	27	55	109	115	115	120	104	85	80	30	82
S82103	64	28	82	112	115	100	125	72	90	85	35	83
S82107	66	31	65	106	120	110	120	80	84	75	45	82
S82110	71	29	67	110	120	100	120	69	80	80	40	81
S82112	65	33	71	115	120	95	120	102	80	60	40	82
S82129	67	28	92	120	115	90	101	110	90	70	35	83
S82146	51	36	86	121	140	100	120	105	87	50	40	85
S82151	55	33	58	130	120	85	115	-	60	82	40	78
S82154	59	22	89	108	140	95	105	85	87	65	35	81
S82169	61	28	61	121	100	85	130	82	55	85	40	77
S82179	63	22	69	121	95	105	115	64	60	75	40	75
S82425	59	32	60	99	115	110	135	-	63	75	35	78
S82426	61	34	90	131	110	105	120	114	70	53	40	84
S82379	63	32	69	96	110	85	140	79	72	70	40	78
Syrian local large	59	25	67	113	115	108	103	77	77	72	37	78
Reina Blanca	66	27	53	105	97	98	108	78	82	61	35	74
Local check	56	73	60	120	108	98	112	139	118	77	38	-
Location mean	61	30	68	115	111	102	105	81	86	72	38	

Table 4.6.5. Adjusted seed yield (Y=kg/ha) and rank (R) of entries at different locations in $FBIF_3N$-E during 1983/84.

ENTRY NAME	CANADA		CHINA		EGYPT										ETHIOPIA		FRANCE		ITALY		MOROCCO		SYRIA				TUNISIA				MEAN	
	Manitoba		Yunnan		Gemmiza		Mansoura		Sakha		Shandweel		Sids		Debre Zeit		Coulommiers		Salerno		Sidi Laidi		Tel Hadya-irrigated		Tel Hadya-rainfed		Beja		El-Kef			
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
S82004	1867	34	68	2	2578	17	5917	1	3034	18	1556	14	3228	7	1014	23	3424	8	12000	14	714	12	1998	8	578	23	750	24	2177	9	2727	6
S82008	2278	23	54	6	2814	12	4683	6	4506	1	722	33	1284	31	1724	11	3089	12	11667	19	714	12	905	27	467	31	775	22	1977	19	2511	11
S82009	1641	37	54	6	1856	30	1517	34	2562	25	1889	7	3340	6	1247	19	1246	32	9867	26	490	26	1775	12	874	2	0	-	2427	1	2052	24
S82013	2572	10	63	4	3425	3	3850	9	4506	1	2000	6	2465	16	2381	4	1592	27	13000	9	731	11	1090	25	633	17	250	36	1702	36	2684	7
S82015	2287	22	54	6	2273	22	3850	9	2951	20	2278	4	1284	31	2114	6	3358	10	12667	10	486	28	1294	22	411	32	975	6	2327	4	2574	10
S82017	2325	19	54	6	2828	11	5017	5	2562	25	1889	7	1367	30	1627	12	4007	5	14000	5	574	21	1386	19	707	11	825	19	1896	27	2738	5
S82018	2412	14	62	5	2106	26	5183	4	2395	29	1528	16	1978	20	1104	22	1699	24	9667	29	397	32	2053	5	615	20	0	-	2221	6	2228	17
S82023	3049	2	54	6	1606	36	5350	3	2617	24	1833	9	422	39	1414	16	2430	19	12200	13	174	38	312	38	652	15	725	25	1752	33	2306	16
S82076	2674	6	54	6	2231	24	3917	8	1951	38	944	29	4423	2	1531	13	2096	22	14533	3	900	4	1757	14	337	36	650	29	2202	8	2680	8
S82027	1882	33	65	3	2286	20	3850	9	2284	33	889	31	2840	10	1281	18	3314	11	7600	32	910	3	2035	6	393	33	875	14	1677	37	2145	21
S82029	1950	32	54	6	2634	15	5683	2	2895	21	2611	3	3617	5	2024	7	2926	15	14333	4	619	17	1794	10	485	30	550	31	1927	22	2940	2
S82037	2376	16	54	6	1925	29	4100	7	3090	17	1444	19	534	38	764	29	2110	21	7333	33	524	24	2294	1	689	12	0	-	2227	5	1964	29
S82054	2333	18	0	17	3046	6	2267	28	2154	35	2037	5	1154	33	0	34	0	36	10444	25	319	34	843	28	578	23	488	32	1946	20	1841	32
S82064	2101	29	0	17	3060	5	1700	33	1988	37	759	32	1682	26	152	33	1388	29	11778	18	248	36	2121	4	856	4	633	28	2146	13	2043	25
S82068	3042	3	0	17	2810	13	1167	35	2960	19	634	36	960	34	785	27	0	36	9778	27	421	31	399	35	763	8	813	21	1802	31	1756	35
S82069	2786	5	0	17	2935	9	1933	31	2377	30	259	39	1765	23	362	30	251	35	13111	8	286	35	1732	16	633	17	888	13	1796	32	2074	22
S82077	2274	24	0	17	2990	7	600	36	3127	14	926	30	2377	17	0	34	811	34	13644	7	1031	1	1010	26	541	26	913	10	2152	12	2160	20
S82085	2417	12	0	17	2643	14	0	39	2460	27	1759	12	1738	24	0	34	1901	23	11644	20	469	29	2140	3	819	6	963	7	1902	26	2057	23
S82088	2339	17	0	17	1768	33	100	37	3099	16	1481	17	4210	3	0	34	2742	16	4111	39	436	30	565	31	615	20	763	23	2096	15	1622	37
S82091	2152	28	0	17	3379	4	100	37	2099	36	1148	25	654	35	0	34	826	33	11111	22	488	27	1751	15	874	2	913	10	1952	29	1823	33
S82095	1592	38	0	17	2351	19	3567	14	2377	30	1537	15	2710	12	932	25	2988	13	11111	22	833	7	1806	9	893	1	913	10	1946	21	2370	13
S82096	1863	35	0	17	2532	18	3100	22	1904	39	1648	13	627	36	0	34	3897	6	6111	36	640	16	1140	23	744	9	363	35	1652	38	1748	36
S82099	2298	20	0	17	2184	25	3433	18	3432	10	648	35	4015	4	262	31	3686	7	8111	31	610	18	1436	18	374	34	488	32	2096	15	2205	18
S82103	2616	9	0	17	1990	28	1767	32	2377	30	704	34	1932	21	252	32	1674	25	9778	27	-	-	1362	21	689	12	863	15	1752	33	1850	31
S82107	2163	27	0	17	1487	37	2550	26	3590	8	1074	26	2673	13	1007	24	2727	17	9222	30	776	10	633	30	633	17	713	26	1321	39	2038	27
S82110	2172	26	0	17	1848	31	3817	12	3562	9	1463	18	2951	8	1294	17	1259	31	12556	11	566	22	522	33	374	34	613	30	1921	22	2328	15
S82112	2639	8	0	17	2251	23	3283	20	2867	22	1296	22	1590	27	2284	5	4609	3	16889	1	674	15	374	37	726	10	688	27	2052	18	2815	3
S82129	2231	25	0	17	2612	16	3483	16	4340	3	3296	2	2756	11	1421	15	2950	14	13756	6	686	14	707	29	578	23	1163	3	2221	7	2813	4

Cont'd....

Table 4.6.5. Adjusted seed yield (Y=kg/ha) and rank (R) of entries at different locations in $FBIF_3N$-E during 1983/84. (cont'd)

ENTRY NAME	CANADA Manitoba		CHINA Yunnan		EGYPT Gemmiza		EGYPT Mansoura		EGYPT Sakha		EGYPT Shandweel		EGYPT Sids		ETHIOPIA Debre Zeit		FRANCE Coulommiers		ITALY Salerno		MOROCCO Sidi Laidi		SYRIA Tel Hadya-irrigated		SYRIA Tel Hadya-rainfed		TUNISIA Beja		TUNISIA El-Kef		MEAN	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
S82146	2838	4	0	17	1710	35	3183	21	4312	4	1185	24	2534	14	1151	21	4504	4	12222	12	976	2	300	39	670	14	936	8	2121	14	2578	9
S82151	2410	15	0	17	0	39	3450	17	2451	28	1407	20	2228	18	1171	20	0	36	6756	35	843	6	2022	7	856	4	1288	1	2077	17	1797	34
S82154	3231	1	0	17	4196	1	2017	30	3228	13	1796	10	2895	9	2977	2	4646	2	15756	2	833	7	448	34	652	15	838	18	1927	22	3029	1
S82169	2044	30	0	17	2098	27	2950	24	3867	6	1019	27	2034	19	1881	8	2338	20	5556	38	833	7	1541	17	522	29	1263	2	1727	35	1978	28
S82179	1710	36	0	17	2987	8	2883	25	4062	5	1796	10	2478	15	1727	10	1636	36	6089	37	595	20	559	32	115	39	825	20	1808	30	1951	30
S82425	1416	39	0	17	1237	38	2083	29	3117	15	963	28	590	37	771	28	0	36	6889	34	602	19	2189	2	170	38	863	16	2177	10	1538	38
S82426	2416	13	0	17	3432	2	2550	26	2840	23	1352	21	1923	22	1517	14	1375	30	10556	24	386	33	393	36	819	6	1138	4	1920	25	2174	19
S82379	2449	11	1	15	1848	31	3550	15	3395	11	574	37	1423	29	1854	9	2639	18	11889	15	214	37	1763	13	300	37	938	9	2352	2	2346	14
Syrian local large	2015	31	0.3	16	1759	34	3056	23	2241	34	1222	23	1583	28	810	26	1393	28	11222	21	848	5	1115	24	602	22	858	17	1867	28	2039	26
Reina Blanca	2289	21	18	14	2856	10	3639	13	3620	7	481	38	1685	25	2491	3	3419	9	11889	15	543	23	1380	20	535	28	400	34	2175	11	2495	12
Local check	2649	7	3133	1	2285	21	3356	19	3324	12	3519	1	4750	1	4878	1	6100	1	11889	15	505	25	1794	10	541	26	1042	5	2333	3	-	
Location mean	2303		99		2381		3038		2988		1425		2172		1236		2335		10839		602		1301		598		744		1991			
CV%	18.6		46.2		16.3		14.8		36.8		30.1		52.1		37.6		54.3		31.9				56.1		63.8		48.3		6.8			
LSD at 5% for:																																
Checks	970		224		872		1034		2499		1001		2641		1181		3075		7917				1676		856		720		273			
Checks vs.test entries	1584		366		1424		1688		4081		1634		4314		1928		5022		12930				2738		1399		1139		432			
Test entries in the same block	1680		388		1510		1790		4328		1733		4575		2045		5326		13712				2904		1483		1247		474			
Test entries in different blocks	1940		448		1744		2067		4998		2001		5283		2361		6150		15834				3353		1713		1394		529			
SE for:																																
Checks	349		81		314		372		900		360		951		425		1108		2852				604		308		294		111			
Checks vs.test entries	571		132		513		608		1470		589		1554		694		1809		4658				986		504		465		177			
Test entries in the same block	605		140		544		645		1559		624		1648		737		1919		4939				1046		534		510		194			
Test entries in different blocks	699		161		628		745		1800		721		1903		851		2215		5704				1208		617		570		216			
No. of entries significantly exceeding the local check	0		0		1		4		0		0		0		0		0		0				0		0		0		0			

Table 4.6.6. The five heaviest seed yielding entries at individual locations in the $FBIF_3N$-E during 1983/84.

RANK	CANADA	CHINA	EGYPT					ETHIOPIA
	Manitoba	Yannan	Gemmiza	Mansoura	Sakha	Shandweel	Sids	Debre Zeit
1	S82154	Local check	S82154	S82004	S82008 (1)	Local check	Local check	Local check
2	S82023	S82004	S82426	S82029	S82013	S82129	S82076	S82154
3	S82068	S82027	S82013	S82023	S82129	S82029	S82088	Reina Blanca
4	S82146	S82013	S82091	S82018	S82146	S82015	S82099	S82013
5	S82069	S82018	S82064	S82017	S82179	S82054	S82029	S82112

RANK	FRANCE	ITALY	MOROCCO	SYRIA		MOROCCO	
	Coulommiers	Salerno	Sidi Laidi	Tel Hadya-irrigated	Tel Hadya-rainfed	Beja	El-Kef
1	Local check	S82112	S82077	S82037	S82095	S82151	S82009
2	S82154	S82154	S82146	S82425	S82009	S82169	S82379
3	S82112	S82076	S82027	S82085	S82091	S82129	Local check
4	S82146	S82029	S82076	S82064	S82064	S82426	S82015
5	S82017	S82017	Syrian Local Large	S82018	S82151	Local check	S82037

(1) The brackets indicate entries having the same rank.

than the respective local checks. Similarly for time to maturity (Table 4.6.2) out of 11 locations reporting the data, at 6 locations a large number of F_3 populations either took similar time or were earlier than the respective local checks. The population S82425 was the earliest maturing (taking 159 days) on the basis of average over locations. The populations were tallest (Table 4.6.4) at Mansoura (115 cm) and Shandweel (111 cm) in Egypt and shortest at Yunnan (30 cm) in China and Tel Hadya (38 cm) in Syria. The range in plant height for different populations was 70 to 85 cm.

The adjusted seed yield (Table 4.6.5) at different locations revealed that the yield levels were exceptionally high at Salerno (10839 kg/ha) in Italy and high at Mansoura (3038 kg/ha) and Sakha (2988 kg/ha) in Egypt. At Yunnan in China, most of the populations almost gave negligible yield as compared to the check. The CV for experiment design varied from 6.8 to 63.8%. The LSD estimates revealed that only at two locations, namely, Gemmiza and Mansoura in Egypt, 1 and 4 populations excelled the local check in yield by a significant margin. The top five seed yielding entries at different locations are given in Table 4.6.6. It is apparent from this Table that at large number of locations the F_3 populations were among the top yielders.

4.7. FABA BEAN INTERNATIONAL DISEASE SCREENING NURSERIES

Faba bean entries having a moderate to a high level of resistance to chocolate spot, Ascochyta blight and rust were identified in the screening program of ICARDA's germplasm collection at Lattakia sub-station in Syria. Seeds from these resistant sources were multiplied and used to form the Faba Bean International Chocolate Spot, Ascochyta Blight, and Rust Screening Nurseries.

4.7.1. FABA BEAN INTERNATIONAL CHOCOLATE SPOT NURSERY (FBICSN)

Material

The Faba Bean International Chocolate Spot Nursery included 19 test entries. These entries were selections from the materials which originated from Greece, Holland, Lebanon, Ecuador, Turkey, Spain, Syria, Ethiopia, Egypt and some unknown places.

The susceptible check was the local land race from the location where the nursery was to be grown.

Methods and Management

The suggested experimental design was randomised complete block design with two replications. The suggested plot size was one row 1 m long accomodating 10 plants. The susceptible check was repeatedly sown after every four test entries/rows to serve as an indicator cum spreader row. In the absence of natural infestation, the cooperators

were advised to do the artificial inoculation as detailed in the instruction sheet provided. A 1-9 scale was recommended for scoring the disease severity.

Five sets of FBICSN were distributed to cooperators in Egypt, France, Morocco, Netherlands, and U.K. and the results were received for four sets. Among the reported results, at Morocco there was very little disease infestation and thus the results are not included.

Results and Discussion

The performance of the entries at each location is presented in Table 4.7.1 and discussed as under:

Table 4.7.1. Reaction of chocolate spot on different Vicia faba entries in FBICSN during 1983/84.

Selection Lat.	Accession	Country of origin	Disease reaction[a)] Egypt 1984	Netherland 1984	England 1984
81-24694	BPL 261	Greece	R	S	S
81-24698	BPL 266	Greece	R	S	S
81-24701	BPL 274	Holland	R	S	S
81-24801-1	BPL 470	Lebanon	R	S	S
81-24857	BPL 710	Ecuador	R	R	R
81-24948	BPL 1179	Ecuador	R	R	R
81-24900	BPL 1055	Turkey	R	S	S
81-24950-2	BPL 1196	Spain	R	R	R
81-24957	BPL 1178	Syria	R	S	S
81-25001	BPL 1544	Unknown	R	S	S
81-25004	BPL 1547	Unknown	R	S	S
81-25005-1	BPL 1548	Unknown	R	S	S
81-25007	BPL 1550	Unknown	R	S	S
81-25099	BPL 1763	Ethiopia	R	S	S
81-25000	BPL 1543	Unknown	R	S	S
81-25114	BPL 1821	Ethiopia	R	S	S
Rebaya-40	-	Egypt	R	S	S
Syrian Local Large	ILB 1814[c)]	Syria	R	S	S
Optica[c)]		Netherland	NT[b)]	S	NT
Maris bead[c)]		England	NT	NT	S

a) R=Resistance, denote 1, 3 or 5; and S=Susceptibility, denote 7 or 9 on the 1-9 scoring scale mentioned in the text.
b) NT=Not tested
c) Local faba bean cultivar in respective countries.

Egypt: All the entries except Rebaya -40 (from Egypt) were resistant.

Netherland: In Netherland, only three entries namely Sel.LAT-81-24857, Sel.Lat-81-24948 and Sel.Lat-81-24950-2 were resistant.

U.K.: In U.K., only three lines namely Sel.Lat-81-24857, Sel.Lat-81-24948 and Sel.Lat-81-24950-2 were resistant.

On the basis of data across locations three entries namely Sel.Lat-81-24857, Sel.Lat-81-24948 and Sel.Lat-81-24950-2 were rated resistant and were thus comparatively stable sources of resistance.

4.7.2. FABA BEAN INTERNATIONAL ASCOCHYTA BLIGHT NURSERY (FBIABN)

Material

The Faba Bean International Ascochyta Blight Nursery included 30 test entries. These entries were selections from the materials which originated from Morocco, Greece, Spain, Lebanon, U.K., Ethiopia, Iraq, Egypt and Syria.

The susceptible check was the local land race from the location where the nursery was to be grown.

Methods and Management

The suggested experimental design was randomised complete block design with two replications. The suggested plot size was one row 1 m long accomodating 10 plants. The susceptible check was repeatedly sown after every three test entries/rows to serve as an indicator cum spreader row. In the absence of natural infestation the cooperators were advised to do the artificial inoculation as detailed in the instruction sheet provided. A 1-9 scale was recommended for scoring the disease severity.

Five sets of FBIABN were distributed to cooperators in Canada, Morocco, Tunisia, U.K. and Syria. There was very little disease infestation at Morocco and Tunisia and thus the results are not included.

Results and Discussion

The performance of the entries in each location is presented in Table 4.7.2 and discussed as under:

Syria: Two entries namely Giza 4 (ILB 1820) and Syrian Local (ILB 1814) were susceptible whereas all other entries were rated eithr moderately resistant, resistant or highly resistant.

U.K.: Two entries namely Giza 4 (ILB 1820) and local check were susceptible in U.K. whereas all other entries were rated as resistant.

Canada: The entries were tested against two isolates, Y and A, in Canada. Five lines namely, 14422-2 (BPL 460), 14422-4 (BPL 460), 14435-1 (BPL 472), 14435-5 (BPL 472) and 14998-1 (BPL 646) were uniformly resistant to both the isolates.

On the basis of disease reaction across countries, all the entries except Giza 4, Syrian Local and respective local checks, were moderately to highly resistant.

Table 4.7.2. Ascochyta blight reaction of entries in FBIABN, 1983/84.

Sel.80-LAT	BPL	Disease reaction			
		U.K.	Canada		Syria
			Y	A	
14200-1	230	MR	MR	MR	R
14336	365	MR	R	R	R
14398	435	MR	R	R	MR
14422-1	460	MR	HR	R	R
" -2	460	HR	HR	R	R
" -3	460	R	HR	MR	MR
" -4	460	MR	HR	HR	MR
14434-1	471	R	MR	MR	R
" -2	471	MR	MR	MR	R
" -3	471	MR	MR	HR	R
14435-1	472	MR	HR	MR	R
" -2	472	MR	R	R	R
" -3	472	HR	HR	R	R
" -4	472	MR	MR	MR	R
" -5	472	MR	HR	MR	R
" -7	472	MR	MR	MR	MR
14998-1	646	HR	HR	HR	R
" -2	646	MR	R	MR	R
" -3	646	R	R	MR	R
15035-2	818	MR	MR	R	HR
14986-1	266	MR	MR	MR	R
" -2	266	MR	R	R	R
" -3	266	MR	R	MR	MR
Sel.82-Lat-A2	-	MR	R	MR	HR
Sel.83-Lat-10026	248[illegible]	MR	R	R	HR
Sel.79-Lat-70015-1	74	R	R	R	HR
" -3	74	R	R	R	HR
" -4	74	R	R	R	HR
Giza 4	ILB 1820	S	R	MR	HS
Syrian Local	ILB 1814	R	MR	MR	S
Local check	-	S	S	D	-

4.7.3. FABA BEAN INTERNATIONAL RUST NURSERY (FBIRN)

Material

The Faba Bean International Rust Nursery included 11 test entries. These entries were selections from the materials which originated from Ecuador, Greece, Jordan, Syria and U.K.

The susceptible check was the local land race from the location where the nursery was to be grown.

Methods and Management

The suggested experimental design was randomised complete block design with two replications. The suggested plot size was one row 1 m long accomodating 10 plants. The susceptible check was repeatedly sown after every four test entries/rows to serve as an indicator cum spreader row. In the absence of natural infestation the cooperators were advised to do the artificial inoculation as detailed in the instruction sheet provided. A 1-9 scale was recommended for scoring the desiease severity.

Five sets of FBIRN were distributed to cooperators in Canada, Egypt, Morocco, Syria and Tunisia. The disease in Morocco and Tunisia was not reported, thus the reaction to rust has been presented for Egypt, Canada and Syria only.

Results and Discussion

The disease reaction of the entries at different locations is given in Table 4.7.3. In Canada, the reaction has been recorded against 3 races namely SP-51, SP-82 and SP-121.

Table 4.7.3. Rust reaction of entries in FBIRN, during 1983/84.

Selection	BPL/		Disease reaction			
LAT	ILB	Egypt	Canada[1]			Syria
			SP-51	SP-82	SP-121	
82-15563-3-A	-	MR	HR	HR	HS	R
82-15563-3-B	-	S	R	R	HS	S
82-7002(F_6)	ILB 2760	S	HR	R	HS	MR
82-7004(F_{17})	ILB 2764	S	HR	HR	HS	S
81-24948-2	BPL 1179	R	HR	HR	R	R
81-24857-1	BPL 710	R	HR	HR	HS	R
81-24694-1	BPL 261	R	R	HR	HS	MR
83-30010	BPL 8	MR	HR	HR	HS	MR
83-30094	BPL 150	MR	HR	HR	HS	MR
Syrian Local	ILB 1814	S	HR	HR	R	S
Local check	-	S	HR	R	HS	-

1 = SP-51, SP-82 and SP-121 are three different isolates in Canada.

* Disease readings were taken on a 1-9 rating scale where 1= Highly resistant(HR), 3= Resistant(R), 5= Moderately resistant(MR), 7= Susceptible(S) and 9= Highly susceptible(HS).

Egypt: Seven entries namely, Sel.Lat-82-15563-3-A, Sel.Lat-81-24948-1, Sel.Lat-81-24948-2, Sel.Lat-81-24857-1,Sel.Lat-81- 24694-1, Sel.Lat-83-30010 and Sel.Lat-81-30094 were rated resistant on moderately resistant. All other entries showed susceptible reaction.
Syria: Eight entries, namely Sel.Lat-82-15563-3-A, Sel.Lat-82-7002(F6), Sel.Lat-81-24948-1, Sel.Lat-81-24948-2, Sel.Lat-81-24857-1, Sel.Lat-81-24694-1, Sel.Lat-83-30010 and Sel.Lat-83-30094 were rated resistant to moderately resistant. Other entries were susceptible.
Canada: All the entries were rated resistant or highly resistant to isolates SP-51 and SP-82. However, against isolate SP-121, only two entries namely Sel.Lat-81-24948-1 and Syrian Local were resistant.

On the basis of disease reaction across locations, only one entry Sel.Lat-81-24948-1 was resistant or highly resistant. All other entries showed differential behaviour.

4.8. FABA BEAN INTERNATIONAL *Orobanche* NURSERY (FBION)

Material

The material comprised of 18 test entries and three checks, two of them one resistant and one susceptible were to be added by the cooperator and the third repeated susceptible check namely, Syrian Local Large was supplied. The test entries have been identified as resistant at ICARDA sites.

Method and Management

The experiment was suggested to be sown in a randomised complete block design with 3 replications in 2 row plots 1 m long. Twenty seeds per plot were suggested for sowing. It was advised to plant the material in an area known to be heavily intested with *Orobanche*.

Results and Discussion

Ten sets of FBION were distributed to cooperators in 5 countries, however, the results were received from six locations. The number of *Orobanche* and weight of *Orobanche* per plot for the locations reporting data are given in Table 4.8.1. At Shandweel (Egypt), however, the visual score on *Orobanche* infestation was recorded. The results are discussed as under:

Egypt: The mean weight of *Orobanche* per plot at Giza, revealed that BPL 1474 had minimum number of *Orobanche* and was closely followed by BPL 2270, BPL 2062, BPL 54, BPL 1722, and BPL 2210 etc.

The visual score at Shandweel, however, revealed that almost all the entries except BPL 561, and Local resistant check were highly susceptible to *Orobanche*.

Morocco: A few lines namely F 331, BPL 2210, BPL 1722, and F 402 had comparatively less number of Orobanche than others at Douyet.

Spain: At Cordoba, the Orobanche infestation on 1-9 scale revealed that F 402 was moderately resistant. The entries namely, BPL 54, BPL 472, BPL 561, BPL 1009 and BPL 2062 were moderately susceptible (rating 6 or 7) and the remaining were highly susceptible (rating=9).

Syria: At Tel Hadya, F 402 had the least Orobanche weight and number and was most tolerant. A few more lines tolerant to Orobanche included BPL 1636, BPL 2270, Local Resistant Check and BPL 561 etc.

Tunisia: At Beja, the visual infestation scoring was done on 1-5 scale (1= little or infestation and 5= heavy infestation). The entries F 402 and BPL 561 had the lowest rating and were resistant, the two other lines which closely followed included BPL 733, and BPL 1636.

On the basis of Orobanche infestation across locations, Family 402, BPL 561, and BPL 2062 were comparatively more tolerant than others.

Table 4.8.1. Number of Orobanche per plot, number, weight of Orobanche per plot (gm), rating, and seed yield (kg/ha) for the entries in FBION during 1983/84.

ENTRY	ORIGIN	EGYPT			MOROCCO		SPAIN	SYRIA			TUNISIA	
		Giza		Shandweel	Douyet		Cordoba	Tel Hadya			Beja	
		Weight of Orobanche	Yield (kg/ha)	Rating (1-5)	No. of Orobanche	Yield (kg/ha)	Rating (1-9)	No. of Orobanche	Weight of Orobanche	Yield (kg/ha)	Rating (1-5)	Yield (kg/ha)
BPL 4	JORDAN	238	97	5	6.7	2167	9	65.0	186	437	3	1600
BPL 54	IRAQ	50	167	5	10.3	1500	7	69.0	283	793	4	2200
BPL 375	TURKEY	52	56	5	34.7	1167	9	59.3	142	300	4	1233
BPL 472	LEBANON	139	264	5	5.0	1500	7	35.3	120	480	4	1933
BPL 553	EGYPT	128	14	5	3.3	1333	9	48.6	160	539	3	1400
BPL 561	EGYPT	55	208	4	3.0	2333	7	30.7	92	1290	2	733
BPL 733	SWEDEN	58	69	5	7.3	400	9	52.7	141	40	2	1100
BPL 799	AFGHANISTAN	250	28	5	7.7	500	9	46.7	93	43	2	367
BPL 1009	IRAQ	52	0	5	4.3	1500	7	43.7	163	593	3	1833
BPL 1474	UNKNOWN	28	306	5	6.3	1833	9	46.7	119	790	2	2100
BPL 1636	UNKNOWN	56	0	5	4.7	1500	9	13.7	52	577	2	1400
BPL 1656	UNKNOWN	55	111	5	4	1167	9	55.7	148	353	2	767
BPL 1722	ETHIOPIA	50	69	5	1	1500	9	34.7	114	670	2	1367
BPL 2062	ETHIOPIA	47	111	5	3	1000	7	37.0	121	667	2	1067
BPL 2210	ETHIOPIA	50	69	5	0.3	1867	9	51.7	146	303	2	1300
BPL 2270	ETHIOPIA	45	1097	5	4.3	2000	9	15.0	65	870	3	1667
F 402	EGYPT	60	1931	5	1.7	2000	5	13.3	42	1197	2	1633
F 331	MOROCCO	80	125	5	0.3	1667	9	23.3	122	350	3	1233
Local check (Resi.)	-	852	814	4	4.7	1667	9	21.7	63	1317	3	2067
Local check (Susc.)	-	55	0	5	6.3	2000	9	100.0	290	303	3	1867
Syrian Local Large	SYRIA	88	62	5	15.9	1319	9	61.7	269	376	4	2948
C.V.%		-	318	10.9	60.8	34.7	24.3	63.0	46	64.9	38.4	38.1
L.S.D. at 5%		-	NS	0.86	6.4	870.9	NS	NS	106	627	1.4	953

5. LENTIL INTERNATIONAL TRIALS AND NURSERIES

Fourteen lentil international trials and nurseries were available to cooperators in the 1983/84 season.These included yield trials, screening nurseries, F3 trials and agronomy trials. Cooperators were free to use these materials directly or indirectly for the improvement of lentils in their own national programs.The results reported from cooperators are presented in the following pages.

5.1. LENTIL INTERNATIONAL YIELD TRIAL - LARGE SEED (LIYT-L)

Material

The Lentil International Yield Trial - Large Seed comprised of 23 test entries originating from 11 countries and one local check to be supplied by the cooperator. The test entries were selections from germplasm with a seed size greater than 4.5g/100 seeds, which had performed well in the Lentil International Screening Nursery - Large Seed in the previous year.

Methods and Management

The material was suggested to be sown in a randomised complete block design with 3 replications. The recommended plot size was four rows, each 4 m long with inter row spacing of 25 cm and a planting density of 200 plants/m^2

Forty sets of the LIYT-L were distributed to different cooperators in 21 countries. The results were returned from 28 locations in 19 countries and were analysed. The agronomic data provided by the cooperators are given in Table 5.1.1.

Results and Discussion

The location mean for time to flowering (Table 5.1.2) varied from 49 days at Toshevo in Bulgaria to 182 days at Ankara in Turkey. Across the entries, Precoz was the earliest to flowers in 102 days and was followed by ILL 19, ILL 20, ILL 842 and ILL 857 which flowered in 110 days. The entry ILL 465 was, however, the latest and took 124 days to flower. Similarly the data on time to maturity (Table 5.1.3) also revealed that Precoz was the earliest in maturity at most of the locations and was followed by ILL 8, ILL 19, ILL 857, ILL 20, ILL 842 and ILL 4606. However, ILL 323 was the latest in maturity taking 174 days. The entry means at different locations revealed that the entries matured earliest in 86 days at Toshevo in Bulgaria and latest in 248 days at La Molina in Peru.

The data on plant height (Table 5.1.4) revealed that mean plant height varied from 24 cm at Toshevo in Bulgaria to 55 cm at Izmir in Turkey. The mean height of the entries overall locations varied from 32 to 39 cm.

Table 5.1.1. Agronomic data for different locations in the LIYT-L during 1983/84.

COUNTRY	LOCATION	Planting date	crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide Fungicide Herbicide
ALGERIA	KHROUB	20-11-1983						
ARGENTINA	SALTA	26-6-1984	169				4	Sencorex
BULGARIA	TOSHEVO	21-4-1984	90	30	60			Aphalon Galant Benlate+CalixinM Actellic
CHILE	CHILLAN	18-6-1984	183		90			Limuron
CHILE	GRANEROUS	15-5-1984	196				1	
ECUADOR	PICHINCHA	1-12-1983	160					
EGYPT	GEMMIZA		155					
EGYPT	SAKHA	20-11-1983	170	35	70			Gesagard
ETHIOPIA	DEBRE ZEIT	13-7-1984	142					bravo
INDIA	NEW DELHI	24-11-1983	141	20	40		2	Basalin Metasystox
IRAN	KARAJ	4-11-1983	136	30	70			Metasystox Treflan
IRAQ	DOHUK	31-10-1983	172	40	100			
LEBANON	TERBOL	11-11-1983	207		50			
MOROCCO	MARCHOUCH	28-11-1983	175					
MOROCCO	SIDI LAIDI	29-11-1983	167					
PAKISTAN	ISLAMABAD	30-10-1983	190	20	50			
PAKISTAN	QUETTE	23-10-1983	217	20	50		4	
PERU	LA MOLINA	27-10-1983	260				2	Tamaron
PERU	SAN LORENZO	21-10-1983	235				3	Aphalon Tamarin
POLAND	PULAWY	30-3-1984	135		100	160		Azogard Benlate+calixinM+Actellic
SYRIA	TEL HADYA	17-11-1983	182		50			
TUNISIA	EL-KEF	19-11-1983	198	30	100			
TURKEY	ANKARA	14-11-1983	218	20	50			
TURKEY	IZMIR	29-12-1983	162	3	8			

Table 5.1.2. Time to flowering (days) of entries at different-locations in the LIYT-L during 1983/84.

ENTRY NAME ILL/ CROSS NO.	PEDIGREE	ORIGIN	ALGERIA Khroub	ARGENTINA Salta	BRAZIL Santa Maria	BULGARIA Toshevo	CHILE Chillan	CHILE Granerous	ECUADOR Pichincha	EGYPT Gemmiza	EGYPT Sakha	ETHIOPIA Debre Zeit	INDIA New Delhi	IRAN Karaj	IRAQ Dohuk
8	78S 26002	Jordan	133	81	110	47	117	136	69	93	95	57	90	53	137
19	78S 26018	Jordan	128	88	110	47	113	137	75	90	93	55	92	51	127
20		Jordan	129	86	110	49	112	137	71	92	98	56	92	47	127
26	78S 26032	Syria	126	100	120	50	120	140	89	111	113	98	107	47	137
26	78S 26033	Syria	121	98	120	49	117	140	83	105	103	72	107	52	137
28	74TA 19	Syria	129	96		49	117	142	89	106	110	72	107	54	136
43	78S 26038	Syria	131	104	118	49	120	140	87	112	120	98	109	51	137
5441	Araucana-INIA	CHile	135	96		50	120	145	88	109	103	72	107	52	140
54	74TA 72	Iraq	124	98	117	48	120	143	80	113	100	59	102	52	137
193	78S 26066	Syria	126	100	118	50	117	140	88	108	123	97	105	51	135
254	74TA 264	Greece	125	102		50	118	141	88	107	110	83	109	52	137
262	74TA 276	Hungary	128	95	114	49	117	138	83	102	100	62	105	52	135
323	76TA 66136	Yugoslavia	124	110		50	120	147	90	117	113	99	111	51	144
465		Chile	125	110		51	125	151	92	117	115	98	112	52	145
707		Hungary	120	99	118	49	117	136	87	108	93	72	104	52	136
841	78S 26181	Lebanon	126	101		49	118	144	88	107	123	87	101	49	137
842		Lebanon	125	86	110	49	112	137	75	96	98	56	96	47	126
857		Algeria	122	88	112	47	117	136	70	93	95	54	98	50	128
4400	Syrian local	Syria	130	97		50	117	139	88	106	108	85	103	52	136
4523		Syria	125	90	114	49	117	139	81	101	110	63	93	49	135
4605	Precoz	Argentina	125	80	62	49	110	120	58	79	85	52	80	47	121
4606	Nablus	Palestine	123	88	110	47	117	136	69	95	98	57	94	52	129
253X210	FLIP 84-1L	ICARDA	128	101	118	49	119	140	91	107	110	91	108	50	136
	Local check		127	78		48	125	145	91	79	78	56	79	52	136
Location mean			126	95	111	49	118	140	82	102	104	73	100	51	135

ENTRY NAME ILL/ CROSS NO.	PEDIGREE	ORIGIN	LEBANON Terbol	MOROCCO Marchouch	MOROCCO Sidi Laidi	PAKISTAN Islamabad	PAKISTAN Quette	PERU La Molina	POLAND Pulawy	SYRIA Tel Hadya	TUNISIA El Kef	TURKEY Ankara	TURKEY Izmir	MEAN
8	78S 26002	Jordan	144	118	111	138	173	120	69	127	140	180	121	111
19	78S 26018	Jordan	144	118	111	131	173	125	69	123	135	180	121	110
20		Jordan	144	118	111	133	168	125	70	123	140	180	121	110
26	78S 26032	Syria	147	129	121	143	167	128	71	136	140	182	130	119
26	78S 26033	Syria	152	118	121	140	162	125	73	137	149	186	131	117
28	74TA 19	Syria	146	122	121	142	162	129	71	134	140	182	123	116
43	78S 26038	Syria	150	136	121	146	163	136	71	136	140	181	127	120
5441	Araucana-INIA	Chile	152	119	121	148	167	127	73	137	152	188	132	119
54	74TA 72	Iraq	153	122	121	148	170	125	71	141	155	186	130	117
193	78S 26066	Syria	149	121	121	143	168	128	70	134	140	182	131	119
254	74TA 264	Greece	151	140	121	145	167	127	72	134	140	186	132	119
262	74TA 276	Hungary	146	118	121	142	167	127	71	133	145	182	128	115
323	76TA 66136	Yugoslavia	154	136	121	153	165	128	74	137	143	186	134	122
465		Chile	154	136	121	153	172	134	73	141	153	180	131	124
707		Hungary	146	122	121	142	168	127	71	134	140	180	118	115
841	78S 26181	Lebanon	150	118	121	149	172	127	70	136	140	182	126	118
842		Lebanon	143	118	96	135	167	126	70	125	137	180	123	110
857		Algeria	144	118	96	133	167	126	70	124	137	180	124	110
4400	Syrian local	Syria	146	122	114	144	162	129	71	133	140	182	132	117
4523		Syria	146	118	114	144	167	135	71	127	140	181	124	114
4605	Precoz	Argentina	143	100	92	118	173	124	72	110	157	178	116	102
4606	Nablus	Palestine	145	118	111	136	167	124	69	125	149	180	123	111
253X210	FLIP 84-1L	ICARDA	150	136	119	149	163	130	71	137	149	182	130	119
	Local check		154	136	121	120	163	132	72	133	149	182	134	
Location mean			148	123	115	141	167	128	71	132	144	182	127	

Cont'd ...

Table 5.1.3. Time to maturity (days) of entries at different locations in the LIYT-L during 1983/84.

ENTRY NAME ILL/ CROSS NO.	PEDIGREE	ARGENTINA Salta	BULGARIA Toshevo	CHILE Chillan	CHILE Granerous	ECUADOR Pichincha	EGYPT Gemmiza	EGYPT Sakha	ETHIOPIA Debre Zeit	INDIA New Delhi	IRAN Karaj	IRAQ Dohuk	LEBANON Terbol	MOROCCO Marchouch	MOROCCO Sidi Laidi
8	78S 26002	145	83	180	182	139	140	150	116	130	113	169	199	165	162
19	78S 26018	150	82	179	182	138	140	150	126	130	108	171	198	165	162
20		150	82	181	187	139	142	150	126	129	112	170	199	165	162
26	78S 26032	153	90	179	196	139	150	170	138	140	112	171	201	165	167
26	78S 26033	155	89	182	193	138	148	170	132	140	114	171	206	171	167
28	74TA 19	154	88	183	191	139	147	170	138	138	116	172	201	171	167
43	78S 26038	156	86	179	185	146	147	170	139	140	113	170	199	171	167
5441	Araucana-INIA	153	89	183	195	160	149	170	133	137	112	174	200	173	167
54	74TA 72	163	83	179	193	139	149	163	138	135	113	170	203	173	167
193	78S 26066	151	87	183	189	139	147	170	138	136	114	170	202	172	167
254	74TA 264	154	89	183	194	146	146	170	138	140	107	174	202	172	167
262	74TA 276	151	87	181	191	138	144	170	129	137	113	169	199	172	167
323	76TA 66136	169	90	180	194	160	155	163	138	141	112	174	207	173	167
465		153	90	183	193	160	155	163	138	140	114	174	203	175	167
707		150	89	180	195	138	144	170	127	136	112	169	199	171	167
841	78S 26181	151	89	180	195	160	150	170	138	135	114	169	202	171	167
842		153	83	180	192	139	142	150	116	135	114	170	199	165	156
857		151	85	179	194	139	141	150	114	134	107	169	198	167	156
4400	Syrian local	155	89	183	192	146	148	170	138	136	113	172	202	171	167
4523		151	85	180	192	146	146	170	139	136	113	169	199	172	167
4605	Precoz	140	84	179	184	138	131	130	96	104	136	169	193	145	149
4606	Nablus	150	82	181	187	139	141	150	126	131	117	171	196	165	162
253X210	FLIP 84-IL	154	88	183	188	139	144	170	142	138	110	170	202	170	167
	Local check	138	81	184	198	160	139	150	109	124	114	170	204	172	167
Location mean		152	86	181	191	144	145	162	130	134	113	171	201	169	165

ENTRY NAME ILL/ CROSS NO.	PEDIGREE	PAKISTAN Islamabad	PAKISTAN Quetta	PERU La Molina	PERU San Lorenzo	POLAND Pulawy	SYRIA Tel Hadya	TUNISIA El Kef	TURKEY Ankara	TURKEY Izmir	MEAN
8	78S 26002	179	207	243	220	122	175	183	212	156	164
19	78S 26018	179	212	246	214	122	170	178	212	161	164
20		181	210	257	215	122	170	183	212	159	165
26	78S 26032	182	210	234	220	123	179	183	217	160	169
26	78S 26033	182	213	232	223	129	179	196	216	161	170
28	74TA 19	182	213	248	224	123	179	183	216	161	170
43	78S 26038	182	207	247	219	122	179	183	215	160	169
5441	Araucana-INIA	187	215	249	235	129	181	193	216	161	172
54	74TA 72	180	215	245	223	116	179	191	216	162	169
193	78S 26066	182	210	248	227	120	179	183	216	162	169
254	74TA 264	182	217	260	229	130	179	191	218	161	172
262	74TA 276	180	208	254	230	123	179	185	217	16[illegible]	169
323	76TA 66136	187	215	262	227	135	182	198	218	160	174
465		190	217	251	231	130	182	198	218	161	173
707		180	213	262	220	124	177	183	213	153	168
841	78S 26181	183	215	256	222	123	179	183	218	161	171
842		180	213	258	216	125	174	181	213	157	166
857		180	213	226	225	123	170	181	210	159	164
4400	Syrian local	183	213	245	225	125	179	182	217	160	170
4528		182	210	239	225	124	179	184	216	162	169
4605	Precoz	150	213	246	216	123	160	175	210	156	158
4606	Nablus	180	212	256	220	122	173	188	215	159	166
253X210	FLIP 84-IL	183	207	238	229	123	180	188	216	161	169
	Local check	150	213	258	231	129	174	197	216	162	
Location mean		179	212	248	224	124	177	186	215	160	

Cont'd ....

Table 5.1.4. Plant height (cm) of the entries at difference locations in LIYT-L during 1983/84.

ENTRY NAME		ALGERIA	ARGENTINA	BULGARIA	CHILE		ECUADOR	ETHIOPIA	INDIA	IRAN	IRAQ	LEBANON	PAKISTAN	PERU		POLAND	SYRIA	TURKEY		MEAN
ILL/ CROSS NO.	PEDIGREE	Khroub	Salta	Toshevo	Chillan	Granerous	Pichincha	Debre Zeit	New Delhi	Karaj	Dohuk	Terbol	Quette	La Molina	San Lorenzo	Pulawy	Tel Hadya	Ankara	Izmir	
8	78S 26002	24	24	23	46	37	40	34	41	21	28	35	19	38	25	36	29	34	58	33
19	78S 26018	29	23	19	43	38	38	40	43	19	30	46	21	38	26	35	34	31	60	34
20		31	24	22	44	42	40	37	44	23	30	38	19	34	26	32	33	31	55	34
26	78S 26032	27	27	25	45	40	43	35	43	27	28	37	21	34	29	40	27	32	49	34
26	78S 26033	28	26	26	44	40	42	37	39	25	31	37	20	38	28	43	28	32	57	35
28	74TA 19	29	27	26	45	40	43	38	39	25	31	34	20	37	31	42	25	34	54	34
43	78S 26038	28	24	23	39	42	35	35	37	23	29	40	20	37	32	39	26	34	58	33
5441	Araucana-INIA	28	33	27	59	43	47	41	43	32	33	40	19	49	29	48	34	34	55	39
54	74TA 72	28	32	23	47	37	35	35	41	28	32	47	19	33	29	33	33	38	57	35
193	78S 26066	27	28	24	47	42	42	46	46	25	30	40	20	36	29	36	25	33	58	35
254	74TA 264	29	31	25	41	43	43	38	46	24	34	37	18	39	29	51	30	31	56	36
262	74TA 276	28	25	24	42	40	42	37	38	31	30	36	19	40	26	34	26	28	50	33
323	76TA 66136	27	27	27	40	47	40	35	38	23	29	43	18	24	32	46	28	29	58	34
465		30	29	25	58	43	45	36	42	25	31	40	18	31	32	40	33	33	61	36
707		31	28	23	40	42	40	40	40	35	29	36	20	32	25	36	28	32	49	34
841	78S 26181	22	27	24	41	42	37	31	37	23	30	37	20	32	32	36	26	32	54	32
842		28	29	22	46	42	47	38	32	25	33	40	18	37	26	42	31	31	56	35
857		25	27	23	46	38	43	35	35	31	30	38	20	34	26	37	32	31	52	34
4400	Syrian local	27	27	24	46	47	42	37	30	36	31	39	19	36	26	44	25	33	54	35
4523		27	29	24	50	38	40	35	41	24	31	41	18	42	26	40	32	32	57	35
4605	Precoz	25	22	21	38	38	33		38	22	26	33	19	43	23	42	28	29	51	32
4606	Nablus	30	29	21	49	40	38	39	43	19	30	43	19	38	25	36	35	30	52	34
253X210	FLIP 84-IL	29	27	25	45	37	47	37	42	25	32	39	18	41	34	41	30	33	57	36
	Local check	31	22	30	60	48	60	37	36	24	29	44	20	32	34	56	28	35	50	
Location mean			27	24	46	41	42	37	40	26	30	39	19	36	28	40	29	32	55	

The correlations among different agronomic characters (Table 5.1.5) revealed that plant height, time to flowering and time to maturity were significantly and positively associated with each other. However, all these characters had significant and negative association with yield.

Table 5.1.5. Correlation (df=21) among different agronomic characters in the LIYT-L during 1983/84.

TRAIT	Time to maturity	Plant height	Seed yield
Time to flowering	0.94**	0.44*	-0.70**
Time to maturity		0.49*	-0.67**
Plant height			-0.43*

* $P \leq 0.05$; ** $P \leq 0.01$

The mean seed yield and rank of the entries at different locations are given in Table 5.1.6. The location mean was highest for Granerous in Chile (1715 kg/ha) and was followed by Quette in Pakistan (1525 kg/ha), Dohuk in Iraq (1500 kg/ha), Gemmiza in Egypt (1469 kg/ha), Beja (1449 kg/ha) and El-Kef (1391 kg/ha) in Tunisia. However, some of the locations namely San Lorenzo (Peru), Sidi Laidi (Morocco), and Pichincha (Ecuador) gave extremely poor seed yield ranging from 10 to 39 kg/ha. The coefficient of variation for the experimental design ranged from 5.7% at Ankara (Turkey) to 106.4% at Pichincha (Ecuador). The ANOVA for the experimental design revealed that the differences between the entries were significant at most of the locations except at Pichincha (Ecuador), Marchouch (Morocco) and Quette (Pakistan). For Kharoub (Algeria) data were available on a single replication and were thus not analysed. The LSD estimates at different locations revealed that 16 entries at Pulawy (Poland), 14 at Izmir (Turkey), 5 each at Salta (Argentina), Terbol (Lebanon) and Beja (Tunisia), 3 each at El-Kef 2 (Tunisia) and Ankara (Turkey); two each at Dohuk (Iraq), and La Molina (Peru); one each at Granerous (Chile), Sakha (Egypt), Debre Zeit (Ethiopia), Karaj (Iran) and Islamabad (Pakistan) exceeded the respective local checks by significant margins. The top five entries at each location are given in Table 5.1.7. It is apparent that ILL 4606 (13 times), ILL 8, ILL 19, ILL 857 (11 times each) and ILL 20 (10 times) occured more frequently among the five heaviest yielders at different locations and were comparatively more adaptable than others. On the basis of average over all locations ILL 8 ranked first (1144 kg/ha) and was followed by ILL 20 (1026 kg/ha), and ILL 857 (1015 kg/ha), ILL 4606 (984 kg/ha) and ILL 707 (979 kg/ha).

Table 5.1.6. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in the LIYT-L during 1983/84

ENTRY NAME ILL/ CROSS NO.	PEDIGREE	ALGERIA (1) Khroub Y	R	ARGENTINA Salta Y	R	BULGARIA Toshevo Y	R	CHILE Chillan Y	R	CHILE Granerous Y	R	ECUADOR Pichincha Y	R	EGYPT Gemmiza Y	R	EGYPT Sakha Y	R	ETHIOPIA DebreZeit Y	R	INDIA New Delhi Y	R	IRAN Karaj Y	R	IRAQ Dohuk Y	R	LEBANON Terbol Y	R
8	78S 26002	1660	3	1578	3	467	9	1434	6	3625	1	73	5	1333	11	874	4	433	7	813	1	263	7	1736	4	1168	14
19	78S 26018	1700	2	978	14	283	21	1020	21	1542	15	7	19	1856	4	763	5	445	6	613	5	66	20	1800	1	1472	2
20		1620	5	1300	7	442	10	1241	11	2333	5	42	8	1356	10	704	6	585	3	679	3	147	14	1702	6	1245	10
26	78S 26032	1500	8	1444	4	367	17	1094	15	2292	6	40	9	1022	23	341	16	63	17	296	14	274	5	1727	5	1162	15
26	78S 26033	1480	9	689	24	375	16	1032	17	1125	19	12	16	1144	21	296	17	185	13	192	19	268	6	1560	12	870	23
28	74 TA 19	1330	14	911	22	317	19	1590	4	1417	17	87	2	1278	13	380	14	50	19	238	16	397	2	1493	14	1425	4
43	78S 26038	1570	6	1089	13	417	14	1599	3	1917	10	15	15	644	24	200	22	10	24	113	20	118	17	1391	18	1287	9
5441	Araucana-INIA	1420	12	933	20	433	13	1229	12	1667	12	31	10	1262	15	469	9	263	12	221	17	110	18	1358	19	1032	20
54	74TA 72	1470	10	978	14	442	10	873	23	875	21	8	18	1544	8	287	19	275	11	442	10	131	15	1653	9	968	22
193	78S 26066	1630	4	1200	9	208	23	1602	2	1083	20	23	12	1644	6	187	24	25	21	271	15	50	21	1556	13	1347	6
254	74TA 264	1070	22	957	19	575	5	1290	9	2125	8	18	13	1233	17	491	8	118	14	217	18	249	11	1347	20	1241	11
262	74TA 276	1320	15	1244	8	658	3	1213	13	1958	9	77	3	1878	3	259	21	358	8	650	4	92	19	1698	7	1181	13
323	76TA 66136	1350	13	1144	10	542	6	1164	14	1500	16			1189	20	439	10	15	23	19	24	979	1	1231	21	644	24
465		1060	23	1111	11	200	24	1324	8	333	24			1289	12	352	15	48	20	42	23	261	9	996	23	986	21
707		1080	21	1689	1	642	4	1029	18	2375	3	18	13	1367	9	431	11	298	10	304	13	129	16	1647	10	1222	12
841	78S 26181	1150	20	978	14	483	7	1036	16	792	22			1267	14	280	20	23	22	67	22	33	24	1771	2	1139	16
842		1430	11	978	14	333	18	1023	20	1625	14	65	6	2022	2	1000	1	313	9	446	9	250	10	1642	11	1106	17
857		1790	1	1400	5	475	8	1029	18	2458	2	75	4	1678	5	906	3	525	4	567	8	331	3	1678	8	1343	7
4400	Syrian local	1260	16	933	20	267	22	1657	1	1875	11	11	17	1056	22	194	23	63	17	100	21	327	4	1411	16	1389	5
4523		1560	7	956	18	308	20	1517	5	2375	3	61	7	1200	19	296	17	98	16	317	12	239	12	1471	15	1486	1
4605	Precoz	1210	17	1111	11	675	2	895	22	1667	12			1211	18	389	13	1378	1	571	7	40	23	787	24	1329	8
4606	Nablus	1180	18	1600	2	400	15	1250	10	2292	6	98	1	1578	7	935	2	460	5	604	6	223	13	1742	3	1440	3
253X210	FLIP 84-IL	1180	18	1311	6	442	10	692	24	708	23	30	11	1256	16	426	12	108	15	321	11	41	22	1187	22	1080	18
	Local check	980	24	844	23	908	1	1373	7	1208	18			3944	1	657	7	1055	2	800	2	262	8	1411	16	1056	19
Location mean		1371		1140		444		1217		1715		39		1469		481		299		371		220		1500		1192	
C.V.%				25.9		31.5		16.5		46.4		106.4		33.0		38.7		46.9		74.7		82.1		13.6		16.1	
L.S.D. at 5%				485		230		331		1307		N.S		796		306		291		455		297		336		315	
S.E.				170.5		80.7		116.2		459.4		24.5		279.8		107.4				159.9		104.2		118.1		110.8	
No. of entries significantly exceeding the local check				5		0		0		1				0		1		1		0		1		2		5	

Cont'd ....

ENTRY NAME ILL/ CROSS NO.	PEDIGREE	MOROCCO Marchouch Y	R	MOROCCO Sidi-Laidi Y	R	PAKISTAN Islamabad Y	R	PAKISTAN Quette Y	R	PERU La Molina Y	R	PERU San Lorenzo Y	R	POLAND Pulawy Y	R	SYRIA Tel Hadya Y	R	TUNISIA Beja Y	R	TUNISIA El-Kef1 Y	R	TUNISIA El-Kef2 Y	R	TURKEY Ankara Y	R	TURKEY Izmir Y	R	MEAN Y	R
8	78S 26002	1324	9	34	3	465	13	1500	12	47	16	9	9	188	20	847	6	1475	11	1075	13	1627	4	1593	1	1911	2	1144	1
19	78S 26018	1292	10	27	7	1136	1	1278	19	71	13	22	3	307	15	1003	3	1692	3	1442	1	1420	12	1013	13	1229	9	962	7
20		1348	5	40	2	1013	2	1611	10	87	9	7	11	158	21	1064	2	2167	1	767	22	1420	12	1264	3	1247	7	1026	2
26	78S 26032	1329	8	13	19	373	16	2111	3	65	15	12	5	585	4	750	10	1242	19	1250	6	1581	5	656	24	1027	14	916	9
26	78S 26033	900	22	20	15	299	18	1322	18	27	21	3	21	98	24	655	18	1625	4	875	19	1310	16	907	17	756	23	697	22
28	74TA 19	1248	12	26	9	416	15	1578	11	38	18	5	15	591	3	547	23	1558	9	1275	5	1410	14	1062	9	967	15	825	13
43	78S 26038	1529	1	14	18	608	9	1667	9	109	6	4	17	612	2	588	21	1083	23	1100	12	1717	2	1082	8	1236	8	847	12
5441	Araucana-INIA	1338	6	9	20	155	22	1778	7	105	7	3	21	125	22	710	13	1350	17	800	21	1353	15	1289	2	891	18	799	15
54	74TA 72	733	24	32	5	277	19	1333	16	297	2	23	2	768	1	716	12	1358	16	1175	10	1277	17	924	16	933	16	761	19
193	78S 26066	1419	4	17	17	607	10	889	22	85	10	4	17	548	5	675	16	1242	19	1333	4	1430	11	1142	7	876	20	791	17
254	74TA 264	1138	17	26	9	327	17	1500	12	14	24	3	21	327	13	687	14	1408	14	958	17	1070	22	1027	11	769	22	808	14
262	74TA 276	1133	18	26	9	936	3	2056	4	223	3	12	5	538	6	619	20	1008	24	1050	14	1567	6	1020	12	1158	13	949	8
323	76TA 66136	762	23	10	22	0	23	1444	15	40	17	4	17	462	10	564	22	1167	21	833	20	1030	23	1029	10	913	17	753	20
465		1262	11	9	20	0	23	1833	6	315	1	4	17	213	19	541	24	1317	18	567	24	1207	19	902	18	776	21	639	23
707		1167	15	23	14	730	5	1333	16	103	8	7	11	518	7	739	11	1417	13	1175	10	2040	1	1187	4	1451	3	979	5
841	78S 26181	1038	19	8	24	453	14	2333	1	21	23	3	21	518	7	679	15	1375	15	1242	7	1450	9	869	22	1187	10	798	16
842		1500	2	31	6	693	7	2167	2	77	11	9	9	216	18	827	7	1617	5	1400	2	1477	8	889	19	1364	6	966	6
857		1243	13	53	1	631	8	856	23	25	22	10	7	298	16	965	4	1592	6	1208	8	1510	7	887	20	1427	4	1015	3
4400	Syrian local	995	20	10	22	255	20	1500	12	37	20	7	11	343	12	641	19	1583	7	975	16	1263	18	967	14	882	19	778	18
4523		976	21	27	7	494	12	1222	20	128	5	5	15	320	14	784	8	1567	8	1208	8	1643	3	871	21	1187	10	891	10
4605	Precoz	1338	6	24	12	588	11	611	24	38	18	49	1	472	9	769	9	1458	12	883	18	1077	21	758	23	2024	1	885	11
4606	Nablus	1452	3	33	4	856	4	900	21	73	12	21	4	368	11	1100	1	1850	2	767	22	968	24	944	15	1402	5	984	4
253X210	FLIP 84-IL	1171	14	24	12	224	21	1778	7	70	14	6	14	255	17	661	17	1508	10	983	15	1443	10	1149	5	1180	12	741	21
	Local check	1167	15	18	16	701	6	2011	5	145	4	10	7	121	23	922	5	1108	22	1383	3	1107	20	1147	6	676	24		
Location mean		1200		23		510		1525		93		10		373		752		1449		1072		1391		1024		1144			
C.V.%		23.3		48.2		47.6		53.5		81.9		77.0		24.0		20.6		20.8		24.7		22.8		5.7		18.1			
L.S.D.at 5%		N.S		18		399		N.S		126		13		147		254		496		435		520		96		340			
S.E.		161.6		6.4		140.1		470.8		44.1		4.5		51.7		89.2		174.1		152.9		182.8		33.9		119.4			
No. of entries significantly exceeding the local check				2		1				2		1		16		0		5		0		3		3		14			

(1) one replication only.

Table 5.1.7. The five heaviest seed yielding entries at the individual locations in the LIYT-L during 1983/84.

RANK	ALGERIA Khroub		ARGENTINA Salta		BULGARIA Toshevo		CHILE Chillan		CHILE Granerous		ECUADOR Pichincha		EGYPT Gemmiza		EGYPT Sakha		ETHIOPIA Debre Zeit	
	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection
1	857		707			Local check	4400	Syrian local	8	78S 26002	4606	Nablus		Local check	842		4605	Precoz
2	19	78S 26018	4606	Nablus	4605	Precoz	193	78S 26066	857		28	74TA 19	842		4606	Nablus		Local check
3	8	78S 26002	8	78S 26002	262	74TA 276	43	78S 26038	707	(1)	262	74TA 276	262	74TA 276	857		20	
4	193	78S 26066	26	78S 26032	707		28	74TA19	4523		857		19	78S 26018	8	78S 26002	857	
5	20		857		254	74TA 264	4523		20		8	78S 26002	857		19	78S 26018	4606	Nablus

Cont'd 2...

Table 5.1.7. cont'd

RANK	INDIA New Delhi		IRAN Karaj		IRAQ Dohuk		LEBANON Terbol		MOROCCO Marchouch		MOROCCO Sidi-Laidi		PAKISTAN Islamabad		PAKISTAN Quette	
	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection
1	8	78S 26002	323	76TA 66136	19	78S 26018	4523		43	78S 26038	857		19	78S 26018	841	78S 26181
2		Local check	28	74TA 19	841	78S 26181	19	78S 26018	842		20		20		842	
3	20		857		4606	Nablus	4606	Nablus	4606	Nablus	8	78S 26002	262	74TA 276	26	78S 26032
4	262	74TA 276	4400	Syrian local	8	78S 26002	28	74TA 19	193	78S 26066	4606	Nablus	4606	Nablus	262	74TA 276
5	19	78S 26018	26	78S 26032	26	78S 26032	4400	Syrian local	20		54	74TA 72	707			Local check

Cont'd 3...

Table 5.1.7. cont'd

RANK	PERU La Molima		PERU San Lorenzo		POLAND Pulawy		SYRIA Tel-Hadya		TUNISIA Beja		TUNISIA El-Kef1		TUNISIA El-Kef2		TURKEY Ankara		TURKEY Izmir	
	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection	ILL	Selection
1	465		4605	Precoz	54	74TA 72	4606	Nablus	20		19	78S 26018	707		8	78S 26002	4605	Precoz
2	54	74TA 72	54	74TA 72	43	78S 26038	20		4606	Nablus	842		43	78S 26038	5441	Araucana-INIA	8	78S 26002
3	262	74TA 276	19	78S 26018	28	74TA 19	19	78S 26018	19	78S 26018		Local check	4523		20		707	
4		Local check	4606	Nablus	26	78S 26032	857		26	78S 26033	192	78S 26066	8	78S 26002	707		857	
5	4523		26	78S 26032	193	78S 26066		Local check	842		28	74 19	26	78S 26032	253x210	FLIP 84-IL	4606	Nablus
			262	74TA 276														

(1) The brackets indicate entries having the same rank.

Table 5.1.8. The mean yield (y=kg/ha) and rank (R) of the common entries in LIYT-L during 1981-1984.

ENTRY NAME	PEDIGREE	1981/82		1982/83		1983/84		AVERAGE1*		AVERAGE2*	
		Y	R	Y	R	Y	R	Y	R	Y	R
ILL 8	78S 26002	1397	1	1197	3	1144	1	1171	1	1246	1
ILL 28	74TA 19	1190	3	1265	2	825	9	1045	5	1093	3
Ill 193	78S 26066	1152	6	1083	9	791	12	937	12	1009	7
ILL 254	74TA 264	1158	5	1094	8	808	10	951	10	1020	6
ILL 262	74TA 276	1178	4	1098	7	949	6	1024	6	1075	4
ILL 323	76TA 66136			908	14	753	14	831	14		
ILL 707		1146	7	1272	1	979	4	1126	2	1132	2
ILL 841	78S 26181			1042	12	798	11	920	13		
ILL 842				1174	4	966	5	1070	3		
ILL 857				1106	6	1015	2	1061	4		
ILL 4400	Syrian local	1228	2	1124	5	778	13	951	10	1043	5
ILL 4523				1074	10	891	7	983	8		
ILL 4605	Precoz			1028	13	885	8	957	9		
ILL 4606	Nablus			1051	11	984	3	1018	7		

1* Average over 1982-84
2* Average over 1981-84

Table 5.1.9. Correlation (df=21) among different locations for the seed yield of entries in the LIYT-L during 1983/84

COUNTRY	LOCATION	ARGENTINA Salta	BULGARIA Toshevo	CHILE Chillan	CHILE Granerous	ECUADOR(1) Pichincha	EGYPT Gemmiza	EGYPT Sakha	ETHIOPIA Debre Zeit	INDIA New Delhi	IRAN Karaj	IRAQ Dohuk	LEBANON Terbol	MOROCCO Marchouch	MOROCCO Sidi Laidi
ALGERIA	Khroub	-0.01	-0.29	0.16	0.36	0.04	0.18	0.27	0.08	0.42	0.01	0.45*	0.19	0.17	0.44*
ARGENTINA	Salta		0.31	-0.11	0.54**	0.37	0.12	0.39	0.22	0.47*	-0.04	0.25	0.15	0.35	0.34
BULGARIA	Toshevo			-0.44*	0.31	0.10	-0.02	0.04	0.48*	o.27	-0.01	-0.10	-0.20	-0.17	0.19
CHILE	Chillan				0.27	0.15	-0.30	-0.24	-0.39	-0.23	0.18	0.03	0.39	0.21	-0.22
CHILE	Granerous					0.44	-0.02	0.46*	0.29	0.56**	0.11	0.38	0.37	0.27	0.47*
ECUADOR(1)	Pichincha						0.34	0.50*	0.35	0.51*	0.42	0.32	0.31	0.33	0.50*
EGYPT	Gemmiza							0.54**	0.26	0.56**	-0.16	0.41	1.12	0.13	0.51*
EGYPT	Sakha								0.40	0.63**	0.10	0.34	0.15	0.41	0.67**
ETHIOPIA	Debre Zeid									0.68**	-0.28	-0.19	0.24	0.26	0.48*
INDIA	New Delhi										-0.32	0.39	0.37	0.33	0.78**
IRAN	Karaj											-0.13	-0.44*	-0.41	-0.10
IRAQ	Dohuk												0.22	0.05	0.37
LEBANON	Terbol													0.48*	0.35
MOROCCO	Marchouch														0.16
MOROCCO	Sidi_Laidi														

1 df = 17 for ECUADOR pichincha
* $p \leq 0.05$
** $p \leq 0.01$

Cont'd 2....

Table 5.1.9. cont'd

COUNTRY	LOCATION	PAKISTAN		PERU		POLAND	SYRIA	TUNISIA			TURKEY	
		Islamabad	Quette	La Molina	San Lorenzo	Pulawy	Tel Hadya	Beja	El-Kef1	El-Kef2	Ankara	Izmir
ALGERIA	Khroub	0.35	-0.22	-0.12	-0.02	-0.10	0.57**	0.17	0.43*	0.29	0.19	0.15
ARGENTINA	Salta	0.31	-0.15	-0.01	0.13	0.10	-0.07	0.05	-0.05	0.32	0.29	0.53*
BULGARIA	Toshevo	0.14	-0.06	-0.14	0.32	0.19	0.06	-0.21	-0.16	0.06	0.09	0.45*
CHILE	Chillan	-0.04	-0.05	-0.03	-0.40	0.06	-0.22	-0.10	-0.01	0.08	0.26	-0.23
CHILE	Granerous	0.39	-0.20	-0.35	0.06	-0.15	0.23	0.21	0.10	0.33	0.36	0.54**
ECUADOR(1)	Pichincha	0.26	0.01	-0.09	0.11	-0.08	-0.28	0.18	-0.03	-0.06	0.02	0.50*
EGYPT	Gemmiza	0.52*	-0.06	0.19	0.21	-0.10	0.20	0.21	0.36	-0.02	0.01	0.15
EGYPT	Sakha	0.41	-0.14	-0.26	0.17	-0.48*	0.21	0.58**	0.06	-0.08	0.22	0.49*
ETHIOPIA	Debre Zeit	0.45*	-0.50*	-0.10	-0.84**	0.13	0.29	0.35	-0.15	-0.18	-0.05	0.75**
INDIA	New Delhi	0.70**	-0.29	0.01	0.52*	-0.15	0.35	0.42	0.15	0.12	0.28	0.68**
IRAN	Karaj	-0.44	-0.03	-0.20	-0.26	-0.03	-0.19	-0.09	-0.21	-0.32	-0.05	-0.24
IRAQ	Dohuk	0.55**	0.20	-0.10	-0.23	0.09	0.19	0.25	0.53*	0.42	0.15	0.02
LEBANON	Terbol	0.61**	-0.36	-0.22	0.25	0.11	0.09	0.35	0.39	0.21	-0.05	0.33
MOROCCO	Marchouch	0.47*	0.01	-0.14	0.12	-0.17	0.03	0.15	0.10	0.19	0.18	0.40
MOROCCO	Sidi Laidi	0.54**	-0.40	-0.08	0.26	-0.16	0.37	0.54**	0.20	0.10	0.14	0.46*
PAKISTAN	Islamabad		-0.18	-0.10	0.32	0.05	0.29	0.39	0.38	0.31	0.07	0.47*
PAKISTAN	Quette			0.17	-0.49*	-0.03	0.03	-0.26	0.07	0.26	0.01	-0.30
PERU	La molina				0.05	0.22	-0.13	-0.30	-0.21	0.07	-0.06	-0.23
PERU	San Lorenzo					0.24	0.05	0.12	0.01	-0.30	-0.33	0.59**
POLAND	Pulawy						-0.25	-0.53*	0.40	0.14	-0.31	-0.03
SYRIA	Tel Hadya							0.25	0.38	0.41	0.16	0.24
TUNISIA	Beja								-0.11	-0.16	0.10	0.21
TUNISIA	El-Kef1									0.52*	-0.13	0.13
TUNISIA	El-Kef2										0.27	0.24
TURKEY	Ankara											0.17

1) df = 17 for ECUADOR pichincha
* $p \leq 0.05$
** $p \leq 0.01$

The mean seed yield of the common entries during 1981-84 are given in Table 5.1.8. Among the common entries, ILL 8 (78S 26002) ranked first and was followed by ILL 707.

The correlations between seed yields of different locations (Table 5.1.9) revealed that the performance at Tel Hadya (winter sowing) in Syria was not related with any other location except that of Khroub in Algeria. Some of the locations namely New Delhi (India), Sidi Laidi (Morocco), Islamabad (Pakistan) and Izmir (Turkey) showed significant and positive correlations among each other.

5.2. LENTIL INTERNATIONAL YIELD TRIAL - SMALL SEED (LIYT-S)

Material

The material for the Lentil International Yield Trial - Small Seed comprised 23 test entries which were supplied by ICARDA and one local check to be added by the cooperator. The test entries were selections with a seed size less than 4.5 g/100 seeds performing well in Lentil International Screening Nursery.

Methods and Management

The material was sown in a randomised complete block design with 4 replications. The suggested plot size was 4 rows, 4 m long with 200 plants per row. The spacing between rows was suggested to be 25 cm.

Thirty eight sets of the trial were sent to cooperators in 21 countries and the results were received for 20 sets from 14 countries. The agronomic data received from cooperators are presented in Table 5.2.1. The trials at Santa Maria (Brazil) failed due to heavy infestation of Colletotrichum and at Hudeiba (sudan) due to wilt.

Results and Discussion

The data on time to flowering (Table 5.2.2) showed that the entries flowered earliest at Leonessa in Italy in 45 days and latest at Dohuk (Iraq) in 154 days. The comparison of location mean with local check values at each location showed that the materials supplied by ICARDA were earlier than the local check at Toshevo (Bulgaria), Dohuk (Iraq), Terbol (Lebanon), Marchouch and Sidi Laidi (Morocco), Tel Hadya (Syria), and Izmir (Turkey). Averaged over locations the entries ranged in time to flowering from 100 days for 76TA 66005 to 113 days for 78S 26013. Further the entries matured earliest at Leonessa in Italy in 80 days and latest at Dohuk in Iraq in 201 days (Table 5.2.3). Except at Mallawi (Egypt), Dohuk (Iraq), Terbol (Lebanon), Marchouch and Sidi Laidi (Morocco), and Tel Hadya (Syria), at all other locations the local check was equal or late in maturity.

The plant height (Table 5.2.4) ranged from 22 cm at Toshevo (Bulgaria) and Leonessa (Italy) to 52 cm at Izmir (Turkey). The

Table 5.2.1. Agronomic data for different locations in the LIYT-S during 1983/84.

COUNTRY	Location	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ fungicide/ Herbicide
ARGENTINA	Perico	25.4.1984	196				4	Metribuzin
ARGENTINA	Salta	28.6.1984	157				4	Sencorex
BRAZIL	Santa Maria	18.5.1984						
BULGARIA	Toshevo	21.4.1984	86	30	60			Aphalon,Benlate, Calixin M,Actellic
EGYPT	Mallawi	10.12.1983	141	15	30		2	Prometrin
EGYPT	Sids	22.11.1983	160	37	75		3	Prometrin
ETHIOPIA	Debre Zeit	13.7.1984	142					Bravo
IRAQ	Dohuk	31.10.1983	204	40	100			
ITALY	Leonessa	17.5.1984	81	70	150			Benlate,Calixin M,Actellic
LEBANON	Terbol	11.11.1983	202		50			
MOROCCO	Marchouch	27.11.1983	170					
MOROCCO	Sidi Laidi	28.11.1983	170	30	50	60		
PAKISTAN	Bahawalpur	12.11.1983	157	18	46		2	Thiodan
PAKISTAN	Chakwal	15.10.1983	202	20	50			
PAKISTAN	Dokri	22.11.1983	133					
PAKISTAN	Islamabad	30.10.1983	186	20	50			
SUDAN	Hudeiba	16.11.1983					7	
SYRIA	Tel Hadya	17.11.1983	179					
TURKEY	Izmir	29.12.1983	159	3	8			
N.YEMEN	Sanaa	26.2.1984	120				5	

Table 5.2.2. Time to flowering (days) of entries at different locations in LIYT-S during 1983/84.

ENTRY NAME		ORIGIN	ARGENTINA		BRAZIL	BULGARIA	EGYPT	ETHIOPIA	IRAQ	ITALY	LEBANON	MOROCCO		PAKISTAN				SYRIA	TURKEY	N.YEMEN	MEAN
ILL/ Cross No.	PEDIGREE		Perico	Salta	Santa Maria	Toshevo	Sids	Debre Zeit	Dohuk	Leonessa	Terbol	Marchouch	Sidi-Laidi	Bahawalpur	Chakwal	Dokri	Islamabad	Tel Hadya	Izmir	Sana'a	
1	76TA 66005	Jordan	116	88	112	47	81	54	149	46	143	119	99	93	128	98	123	123	111	63	100
8	78S 26003	Jordan	116	87	110	47	94	57	154	44	143	119	99	98	121	101	138	127	112	67	102
9	78S 26004	Jordan	123	86	114	48	94	56	155	45	143	119	99	109	123	100	136	125	112	69	103
13	78S 26009	Jordan	129	96	122	48	94	89	157	45	150	119	99	117	135	100	144	131	100	93	109
15	78S 26010	Jordan	116	92	114	49	103	93	153	45	143	119	113	116	142	99	143	125	114	85	109
16	78S 26013	Jordan	131	95	132	48	104	90	157	45	150	117	117	117	143	102	143	130	122	91	113
25	78S 26030	Syria	131	93	107	49	107	86	159	45	146	129	122	117	145	99	143	139	122	82	112
40	-	Syria	121	95	114	48	92	69	155	43	143	156	99	114	132	101	145	134	122	89	110
99	76TA 66054	Morocco	105	87	110	49	99	62	150	45	143	119	113	110	127	100	134	136	116	73	104
112	78S 26052	Turkey	129	95	122	49	90	73	156	45	151	121	119	115	128	100	141	127	118	86	109
223	76TA 66088	Iran	126	94	121	49	93	98	155	45	150	119	99	118	131	101	143	125	118	96	110
495	74TA 565	Mexico	129	92	110	49	94	84	155	44	143	129	99	114	132	97	145	139	130	85	109
851	-	Lebanon	105	89	112	48	94	57	152	44	144	119	99	99	121	97	138	125	116	71	102
920	-	Tunisia	126	92	122	49	100	84	157	45	146	119	117	115	141	99	141	137	121	81	111
975	-	Chile	105	91	110	48	94	57	150	45	146	119	113	102	123	99	135	123	112	69	102
1939	-	Morocco	129	93	114	49	104	35	152	44	151	123	99	114	133	100	143	131	117	83	109
X75TA 1	FLIP 84-62L	ICARDA	126	91	114	47	103	74	155	45	143	119	124	114	122	101	140	136	122	76	108
X75TA 20	FLIP 84-63L	ICARDA	131	91	122	49	104	71	159	45	146	123	99	113	131	100	147	136	124	72	109
X75TA 55	FLIP 84-64L	ICARDA	116	96	114	49	100	84	153	46	143	119	117	113	126	101	141	131	123	80	108
X75TA 83	FLIP 84-65L	ICARDA	109	94	112	49	100	62	150	45	146	119	117	112	129	101	137	131	119	93	107
X76TA 89	FLIP 84-66L	ICARDA	118	94	114	49	101	62	156	43	146	123	117	110	128	101	145	135	121	79	108
X76TA 271	FLIP 84-67L	ICARDA	120	86	112	48	96	53	152	45	146	119	114	110	124	100	136	125	114	67	104
4401	Syrian Local	Syria	126	91	114	48	108	90	155	45	143	127	124	117	135	100	144	134	127	83	112
-	Local check		75	85	110	49	78	54	156	45	154	137	124	76	98	88	122	133	128	46	-
Location mean			119	91	115	48	97	73	154	45	146	123	110	110	129	99	140	131	118	78	

Table 5.2.3. Time to maturity (days) entries at different locations in LIYT-S during 1983/84.

ENTRY NAME		ARGENTINA		BULGARIA	EGYPT		ETHIOPIA	IRAQ	ITALY	LEBANON	MOROCCO		PAKISTAN				SYRIA	TURKEY	N.YEMEN	MEAN
ILL/ Cross No.	PEDIGREE	Perico	Salta	Toshevo	Mallawi	Sids	Debre Zeit	Dohuk	Leonessa	Terbol	Marchouch	Sidi-Laidi	Bahawalpur	Chakwal	Dokri	Islamabad	Tel Hadya	Izmir	Sana'a	
1	76TA 66005	195	151	83	132	145	125	200	79	199	165	163	146	181	133	179	170	158	112	151
8	78S 26003	195	141	82	131	146	125	200	79	196	149	163	149	174	132	182	173	158	115	149
9	78S 26004	195	151	84	130	150	123	200	79	199	161	163	150	175	132	180	170	158	116	151
13	78S 26009	195	141	85	131	150	139	200	80	197	168	163	150	191	132	182	172	155	117	153
15	78S 26010	194	141	84	131	153	139	201	80	194	149	167	153	201	132	182	170	155	117	152
16	78S 26013	196	152	83	130	155	140	200	80	194	165	167	154	200	132	181	170	156	118	154
25	78S 26030	192	146	85	141	155	139	200	81	202	172	168	149	202	133	184	179	159	120	156
40	-	196	145	86	134	154	137	200	79	195	170	163	149	188	132	183	175	155	117	153
99	76TA 66054	196	149	85	131	145	119	200	79	198	166	167	153	180	131	178	174	154	116	151
112	78S 26052	196	151	86	139	151	132	201	80	197	165	167	159	181	132	181	173	156	117	154
223	76TA 66088	196	156	84	131	150	142	199	81	196	149	163	149	184	133	183	170	154	119	152
495	74TA 565	196	156	86	132	151	137	204	81	202	172	163	150	187	133	184	179	155	116	155
851	-	196	151	86	129	153	132	201	79	199	169	163	157	179	133	183	173	156	120	153
920	-	196	152	84	140	155	127	204	81	202	160	167	155	199	133	184	179	155	118	155
975	-	196	155	84	141	150	133	200	80	199	149	167	152	174	132	181	171	155	117	152
1939	-	196	153	83	135	155	135	200	79	197	167	163	154	189	131	179	173	156	116	153
X75TA 1	FLIP 84-62L	196	151	84	139	155	127	204	80	199	149	170	155	173	132	183	178	157	117	153
X75TA 20	FLIP 84-63L	196	155	83	135	160	125	200	81	197	170	163	151	184	132	185	177	158	115	154
X75TA 55	FLIP 84-64L	196	154	85	140	150	135	204	80	199	149	167	152	177	133	182	176	156	117	153
X75TA 83	FLIP 84-65L	196	156	84	140	160	139	202	79	200	169	167	154	181	133	185	179	155	119	155
X76TA 89	FLIP 84-66L	196	155	83	140	158	129	200	79	194	166	167	152	182	132	186	176	157	115	154
X76TA 271	FLIP 84-67L	196	151	83	134	150	120	200	79	200	164	167	150	176	132	179	170	158	115	151
4401	Syrian Local	196	157	84	132	160	139	200	80	200	172	170	153	192	131	186	178	154	116	156
-	Local check	155	130	82	135	140	116	202	79	202	172	170	126	158	126	156	179	155	76	-
Location mean		194	150	84	135	152	131	201	80	198	163	166	151	184	132	181	174	156	115	

Table 5.2.4. Plant height (cm) of entries at different locations in LIYT-S during 1983/84.

ENTRY NAME		ARGENTINA		BULGARIA	EGYPT	ETHIOPIA	IRAQ	ITALY	LEBANON	PAKISTAN			SYRIA	TURKEY	N.YEMEN	MEAN
ILL/ Cross No.	PEDIGREE	Perico	Salta	Toshevo	Mallawi	Debre Zeit	Dohuk	Leonessa	Terbol	Bahawalpur	Chakwal	Dokri	Tel Hadya	Izmir	Sana'a	
1	76TA 66005	42	33	23	47	31	29	20	40	33	33	38	30	50	34	35
8	78S 26003	46	31	25	47	35	31	24	35	36	35	35	27	53	40	36
9	78S 26004	42	32	22	47	31	27	22	37	36	37	34	29	49	37	34
13	78S 26009	41	32	20	43	34	29	22	41	29	33	34	32	53	38	34
15	78S 26010	41	31	19	44	32	29	19	37	29	32	35	28	54	37	33
16	78S 26013	43	33	23	43	34	28	23	44	32	30	35	27	54	43	35
25	78S 26030	41	32	20	45	29	27	22	32	29	37	36	22	52	39	33
40	-	41	35	20	44	32	28	22	33	24	35	33	25	55	38	33
99	76TA 66054	45	34	20	45	34	27	25	33	35	33	36	26	49	38	34
112	78S 26052	46	34	25	46	40	31	22	44	40	39	42	33	58	42	39
223	76TA 66088	41	34	24	43	35	28	26	45	36	31	35	30	51	39	36
495	74TA 565	42	45	25	42	39	29	20	38	34	36	38	24	54	42	36
851	-	41	36	20	46	33	30	22	47	31	33	36	29	50	39	35
920	-	40	31	21	42	32	28	22	34	27	37	34	24	52	40	33
975	-	39	32	22	42	33	29	22	41	35	33	36	29	48	38	34
1939	-	49	33	25	44	36	33	23	49	39	36	57	32	59	39	40
X75TA 1	FLIP 84-62L	49	33	27	43	39	31	22	40	32	31	36	26	52	49	36
X75TA 20	FLIP 84-63L	42	32	22	45	32	29	23	39	28	34	34	24	53	40	34
X75TA 55	FLIP 84-64L	49	32	22	42	33	28	22	43	31	35	36	30	52	44	36
X75TA 83	FLIP 84-65L	42	35	22	42	32	27	22	36	29	33	35	24	53	42	34
X76TA 89	FLIP 84-66L	41	29	19	43	23	27	24	34	26	34	32	26	42	37	31
X76TA 271	FLIP 84-67L	44	32	20	44	31	30	23	46	30	38	36	30	51	34	35
4401	Syrian Local	37	25	20	42	28	27	22	34	27	32	33	23	55	38	32
-	Local check	38	22	26	47	26	31	24	44	33	35	38	26	49	23	-
Location mean		42	32	22	44	33	29	22	39	32	34	36	27	52	39	

respective local checks at Toshevo (Bulgaria), Mallawi (Egypt), Dohuk (Iraq), Leonessa (Italy), Terbol (Lebanon), and Bahawalpur, Chakwal and Dokri (Pakistan) were taller than the respective location means, whereas at other locations they were shorter in height. The entry ILL 1939 was the tallest across the entry means over locations (40 cm). The correlations between different variables (Table 5.2.5) revealed significant and positive correlation between time to flowering and time to maturity. Both these characters were, negatively associated with yield. However, plant height had a positive and significant association with seed yield.

Table 5.2.5. Correlation (df=21) among three agronomic characters and seed yield for entries in the LIYT-S during 1983/84.

TRAIT	Time to maturity	Plant height	Seed yield
Time to flowering	0.74**	-0.10	-0.53*
Time to maturity		-0.22	-0.53*
Plant height			0.54**

* $P \leq 0.05$; ** $P \leq 0.01$

The seed yield of the entries at different locations is given in Table 5.2.6. It was observed that seed yield was highest, at Mallawi in Egypt (1995 kg/ha), Sana'a in N.Yemen (1719 kg/ha), Dohuk in Iraq (1628 kg/ha), and Marchouch in Morocco (1509 kg/ha). The seed yields were, however, lowest at Sidi Laidi in Morocco (94 kg/ha). The CV for the experimental design was high at Chakwal (62.1%) and Dokri (60.4%) in Pakistan, Sids in Egypt (55.3%), and Debre Zeit in Ethiopia (55.7%). At other locations the CV ranged from 13.6% (at Dohuk in Iraq) to 41.9% (at Islamabad in Pakistan). The ANOVA for the design revealed that the differences between the entries were significant at 15 out of 18 locations. The LSD estimates showed that the test entries exceeded the respective local check at nine locations. These included, Perico and Salta in Argentina, Mallawi in Egypt, Terbol in Lebanon, Marchouch and Sidi Laidi in Morocco, Tel Hadya in Syria, Izmir in Turkey, and Sana'a in North Yemen. The highest seed yield across locations was reported for ILL 112 (78S 26052) which was followed by ILL 9 (78S 26004), ILL 1 (76TA 66005), ILL 1939 and FLIP 84-67L (76TA 271) with 1080, 1015, 994, 989 and 986 kg/ha, respectively.

The five heaviest seed yielding entries at the individual locations are given in Table 5.2.7. The entries, namely, 78S 26052 (ILL 112), 76TA 66005 (ILL 1), 78S 26013 (ILL 16) and ILL 1939, were

Table 5.2.6. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in LIYT-S during 1983/84.

ENTRY NAME		ARGENTINA				BULGARIA		EGYPT				ETHIOPIA		IRAQ		ITALY		LEBANON		MOROCCO			
ILL/	PEDIGREE	Perico		Salta		Toshevo		Hallawi		Sids		Debre Zeit		Dohuk		Leonessa		Terbol		Marchouch		Sidi-Laidi	
Cross No.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	76TA 66005	1100	19	717	9	500	13	1875	17	1048	12	778	2	1892	3	412	21	1514	4	1771	4	106	7
8	78S 26003	1417	10	867	4	475	15	2135	8	1054	11	608	7	1613	13	518	12	1160	15	1529	15	84	17
9	78S 26004	1525	6	513	21	538	10	2292	4	1202	8	412	10	1888	4	600	7	1253	12	1596	10	111	6
13	78S 26009	1117	18	717	9	369	22	1760	19	690	20	173	21	1692	9	565	.9	1507	5	1507	16	112	5
15	78S 26010	1233	14	600	17	419	20	1760	19	798	17	208	19	1783	7	380	23	1448	6	1579	12	143	2
16	78S 26013	883	22	850	5	600	4	2557	2	762	18	172	22	1527	20	572	8	1622	2	1811	1	65	23
25	78S 26030	817	23	317	24	581	6	2646	1	1571	2	218	18	1632	11	462	18	1029	18	1379	18	71	20
40	-	1283	13	692	12	363	23	1927	15	1000	15	328	14	1393	21	418	20	993	20	1264	21	93	14
99	76TA 66054	1475	8	683	13	294	24	1917	16	268	24	808	1	1170	23	517	13	979	21	1696	6	97	11
112	78S 26052	1150	16	1117	1	463	17	2229	5	1280	6	627	6	1885	5	645	5	1604	3	1661	8	119	3
223	76TA 66088	950	21	683	13	556	8	2146	7	1036	13	145	24	1558	17	677	2	1399	7	1779	2	150	1
495	74TA 565	1758	2	750	8	888	1	1958	14	393	22	647	3	1110	24	560	10	847	24	1014	24	97	11
851	-	1083	20	567	19	500	13	2120	9	1357	4	315	15	1555	18	663	3	1378	9	1743	5	103	9
920	-	1417	10	908	2	594	5	1781	18	1214	7	350	12	1677	10	553	11	1083	17	1604	9	93	14
975	-	1150	16	467	22	450	19	2073	12	1333	5	397	11	1572	15	318	24	1382	8	1775	3	100	10
1939	-	1458	9	650	16	463	17	2344	3	524	21	330	13	1962	2	658	4	1712	1	1329	19	80	19
X75TA 1	FLIP 84-62L	1683	3	400	23	850	2	1620	22	857	16	638	4	1530	19	485	15	1319	10	1543	13	105	8
X75TA 20	FLIP 84-63L	1667	3	533	20	550	9	1354	23	1083	10	240	17	1245	22	462	18	1243	13	1468	17	82	18
X75TA 55	FLIP 84-64L	1767	1	667	15	469	16	2083	11	738	19	470	9	1695	8	701	1	1092	16	1693	7	113	4
X75TA 83	FLIP 84-65L	1667	4	600	17	531	11	1266	24	1476	3	282	16	1578	14	513	14	978	22	1018	23	69	21
X76TA 89	FLIP 84-66L	1517	7	808	6	563	7	1750	21	1036	13	163	23	1565	16	482	16	1017	19	1318	20	90	16
X76TA 271	FLIP 84-67L	1217	15	700	11	531	11	2021	13	1155	9	628	5	2107	1	388	22	1229	14	1589	11	66	22
4401	Syrian Local	1408	12	892	3	400	21	2167	6	274	23	195	20	1620	12	605	6	936	23	1536	14	94	13
-	Local check	400	24	758	7	781	3	2089	10	1798	1	568	8	1820	6	475	17	1267	11	1025	22	20	24
Location mean		1298		686		530		1995		998		404		1628		526		1250		1509		94	
C.V.%		19.3		28.2		29.9		18.7		55.3		55.7		13.6		31.2		17.6		16.6		41.6	
L.S.D. at 5%		354		273		224		525		NS		370		312		NS		310		353.6		55.2	
S.E.		125.4		96.7		79.4		186.0		390.3		126.5		110.5		82.2		109.9		125.4		19.6	
No. of entries significantly exceeding the local check		23		1		0		1		-		0		0		-		3		18		19	

Cont'd. ...

ENTRY NAME		PAKISTAN								SYRIA		TURKEY		N.YEMEN		MEAN	
ILL/	PEDIGREE	Bahawalpur		Chakwal		Dokri		Islamabad		Tel Hadya		Izmir		Sana'a			
Cross No.		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	76TA 66005	317	9	542	7	334	5	961	2	861	9	1445	1	1713	12	994	3
8	78S 26003	300	13	583	6	321	6	682	11	805	13	1257	6	2078	8	971	6
9	78S 26004	383	6	342	19	239	10	858	7	1007	6	1097	10	2417	1	1015	2
13	78S 26009	190	22	625	3	83	21	673	13	1090	4	1100	9	1132	21	839	18
15	78S 26010	267	17	542	7	198	13	660	14	943	7	1292	4	1498	17	875	14
16	78S 26013	400	4	250	24	71	22	504	19	1026	5	983	13	1530	15	899	11
25	78S 26030	217	21	358	18	63	23	457	20	647	18	832	20	1370	19	815	19
40	-	284	15	483	10	154	16	310	24	619	21	900	17	1405	18	773	22
99	76TA 66054	183	23	258	23	245	9	1039	1	848	11	1012	12	2393	2	882	13
112	78S 26052	225	20	408	15	270	7	930	4	1117	3	1402	2	2305	4	1080	1
223	76TA 66088	67	24	292	21	48	24	640	15	1208	1	1335	3	612	24	849	16
495	74TA 565	483	2	433	14	364	3	544	16	420	24	717	22	1017	22	778	21
851	-	317	9	383	16	384	2	960	3	698	16	1130	8	2117	7	965	7
920	-	283	16	892	1	121	20	524	17	778	14	965	14	1572	14	912	9
975	-	383	6	450	12	233	12	763	9	858	10	1037	11	2303	6	947	8
1939	-	267	17	368	17	181	14	756	10	1122	2	1268	5	2323	3	989	4
X75TA 1	FLIP 84-62L	250	19	508	9	139	18	909	6	669	17	773	21	2305	4	906	10
X75TA 20	FLIP 84-63L	300	13	667	2	128	19	772	8	846	12	903	16	2058	9	867	15
X75TA 55	FLIP 84-64L	467	3	333	20	359	4	453	21	603	22	657	23	1525	16	883	12
X75TA 83	FLIP 84-65L	317	9	458	11	260	8	520	18	627	20	927	15	798	23	771	23
X76TA 89	FLIP 84-66L	367	8	625	3	165	15	319	23	721	15	873	19	1880	11	848	17
X76TA 271	FLIP 84-67L	400	4	450	12	238	11	917	5	906	8	1223	7	1986	10	986	5
4401	Syrian Local	317	9	292	21	144	17	398	22	492	23	898	18	1703	13	798	20
-	Local check	567	1	617	5	748	1	676	12	641	19	447	24	1217	20	-	-
Location mean		315		465		229		676		815		1020		1719			
C.V.%		40.1		62.1		60.4		41.9		21.7		22.1		17.7			
L.S.D. at 5%		178		NS		195		400		249		317		430			
S.E.		63.1		144.4		69.0		141.8		88.3		112.6		152.3			
No. of entries significantly exceeding the local check		0		-		0		0		8		21		13			

Table 5.2.7. The five heaviest seed yielding entries at the individual locations in the LIYT-S during 1983/84.

RANK	ARGENTINA				BULGARIA		EGYPT				ETHIOPIA	
	Perico		Salta		Toshevo		Mallawi		Sids		Debre Zeit	
	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE
1	X75TA 55	FLIP 84-64L	112	78S 26052	495	74TA 565	25	78S 26030		Local check	99	76TA 66054
2	495	74TA 565	920	-	X75TA 1	FLIP 84-62L	16	78S 26013	25	78S 26030	1	76TA 66005
3	X75TA 1	FLIP 84-62L	4401	Syrian Local		Local check	1939	-	X75TA 83	FLIP 84-65L	495	74TA 565
4	X75TA 20	FLIP 84-63L (1)	8	78S 26003	16	78S 26013	9	78S 26004	851	-	X75TA 1	FLIP 84-62L
5	X75TA 83	FLIP 84-65L	16	78S 26013	920	-	112	78S 26052	975	-	X76TA 271	FLIP 84-67L

Cont'd.

RANK	IRAQ		ITALY		LEBANON		MOROCCO					
	Dohuk		Leonessa		Terbol		Marchouch		Sidi Laidi		Bahawalpur	
	ILL/ Cross No	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE
1	X76TA 271	FLIP 84-67L	X75TA 55	FLIP 84-64L	1939	-	16	78S 26013	223	76TA 66088		Local check
2	1939	-	223	76TA 66088	16	78S 26013	223	76TA 66088	15	78S 26010	495	74TA 565
3	1	76TA 66005	851	-	112	78S 26052	975	-	112	78S 26052	X75TA 55	FLIP 84-64L
4	9	78S 26004	1939	-	1	76TA 66005	1	76TA 66005	X75TA 55	FLIP 84-64L	16	78S 26013
5	112	78S 26052	112	78S 26052	13	78S 26009	851	-	13	78S 26009	X76TA 271	FLIP 84-67L

Cont'd.

RANK	PAKISTAN						SYRIA		TURKEY		N.YEMEN	
	Chakwal		Dokri		Islamabad		Tel Hadya		Izmir		Sana'a	
	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE	ILL/ Cross No.	PEDIGREE
1	920			Local check	99	76TA 66054	223	76TA 66088	1	76TA 66005	9	78S 26004
2	X75TA 20	FLIP 84-63L	851	-	1	76TA 66005	1939	-	112	78S 26052	99	76TA 66054
3	X76TA 89	FLIP 84-66L	495	74TA 565	851	-	112	78S 26052	223	76TA 66088	1939	
4	13	78S 26009	X75TA 55	FLIP 84-64L	112	78S 26052	13	78S 26009	15	78S 26010	X75TA 1	FLIP 84-62L
5		Local check	1	76TA 66005	X76TA 271	FLIP 84-67L	16	78S 26013	1939	-	112	78S 26052

(1) The brackets indicate entries having the same rank.

Table 5.2.8. The mean yield (Y=kg/ha) and rank (R) of the common entries in LIYT-S during 1981-84.

ENTRY NAME	PEDIGREE	1981/82		1982/83		1983/84		AVERAGE 1*		AVERAGE 2*	
		Y	R	Y	R	Y	R	Y	R	Y	R
ILL 1	76TA 66005	949	4	1476	1	994	3	1235	1	1140	2
ILL 8	78S 26003	952	3	1366	4	971	4	1169	3	1096	4
ILL 9	78S 26004	991	2	1422	2	1015	2	1219	2	1143	1
ILL 13	78S 26009	-		1295	6	839	8	1067	7	-	
ILL 16	78S 26013	1051	1	1378	3	899	6	1139	4	1109	3
ILL 112	78S 26052	-		1140	8	1080	1	1110	6	-	
ILL 223	76TA 66088	-		1259	7	849	7	1054	8	-	
ILL 495	74TA 565	849	5	1127	9	778	10	953	9	918	5
ILL 975	-	-		1304	5	947	5	1126	5	-	
ILL 4401	Syrian Local	804	6	1094	10	798	9	946	10	899	6

1* Average over 1982-84

2* Average over 1981-84

Table 5.2.9. Correlation (df=21) among different locations for the seed yield of entries in the LIYT-S during 1983/84.

COUNTRY	LOCATION	ARGENTINA	BULGARIA	EGYPT		ETHIOPIA	IRAQ	ITALY	LEBANON	MOROCCO		PAKISTAN				SYRIA	TURKEY	N.YEMEN
		Salta	Toshevo	Mallawi	Sids	Debre Zeit	Dohuk	Leonessa	Terbol	Marchouch	Sidi-Laidi	Bahawalpur	Chakwal	Dokri	Islamabad	Tel Hadya	Izmir	Sana'a
ARGENTINA	Perico	-0.02	0.27	-0.56**	-0.33	0.28	-0.29	0.10	-0.48*	-0.49*	-0.09	0.41	0.21	0.37	-0.07	-0.47*	-0.51*	0.15
ARGENTINA	Salta		-0.19	0.09	-0.27	0.12	0.12	0.34	0.07	0.09	0.05	0.04	0.13	0.11	-0.14	0.16	0.29	-0.05
BULGARIA	Toshevo			-0.08	0.08	0.13	-0.21	0.04	-0.14	-0.30	-0.12	0.31	0.13	0.02	-0.05	-0.31	-0.38	-0.15
EGYPT	Mallawi				-0.03	-0.05	0.28	0.32	0.26	0.35	-0.06	0.03	-0.59**	-0.08	-0.04	0.23	0.17	0.16
EGYPT	Sids					-0.15	0.30	-0.24	0.09	0.04	-0.13	-0.06	0.27	0.01	0.06	0.09	0.17	-0.01
ETHIOPIA	Debre Zeit						0.01	-0.14	-0.08	0.11	-0.03	0.17	-0.05	0.62**	0.61**	-0.12	0.15	0.43*
IRAQ	Dohuk							0.04	0.52*	0.28	0.06	0.01	0.03	0.04	0.22	0.46*	0.58**	0.21
ITALY	Leonessa								0.13	0.09	0.22	-0.11	-0.36	0.08	-0.04	0.15	-0.02	-0.10
LEBANON	Terbol									0.52*	0.25	-0.25	-0.07	-0.14	0.47*	0.80**	0.67**	0.25
MOROCCO	Marchouch										0.37	-0.19	-0.19	-0.04	0.46*	0.49*	0.42	0.35
MOROCCO	Sidi-Laidi											-0.39	-0.04	0.04	0.18	0.32	0.33	-0.14
PAKISTAN	Bahawalpur												0.01	0.52*	-0.20	-0.48*	-0.42	0.13
PAKISTAN	Chakwal													-0.09	-0.10	-0.06	0.01	-0.03
PAKISTAN	Dokri														0.35	-0.33	0.08	0.25
PAKISTAN	Islamabad															0.43*	0.53*	0.58**
SYRIA	Tel Hadya																0.74**	0.15
TURKEY	Izmir																	0.17

* $P \leq 0.05$; ** $P \leq 0.01$

the entries which ranked among the top five at 10, 7, 7 and 7 locations respectively and were thus more adaptable.

The mean yields of the common entries during 1981-84 are given in Table 5.2.8. Among the five common entries during 3 years, ILL 9 (78S 26004) ranked first with average yield of 1143 kg/ha and was closely followed by ILL 1 (76TA 66005), ILL 16 (78S 26013) and ILL 8 (78S 26003) with 1140, 1109 and 1096 kg/ha, respectively.

The correlations between mean seed yields of different locations (Table 5.2.9) revealed that the mean performance at Tel Hadya was significantly and positively correlated with a large number of locations including Dohuk (Iraq), Terbol (Lebanon), Marchouch (Morocco), Islamabad (Pakistan) and Izmir (Turkey). Similarly the performance at Islamabad was associated with 6 other locations namely Debre Zeit (Ethiopia), Terbol (Lebanon), Marchouch (Morocco), Tel Hadya (Syria), Izmir (Turkey) and Sana'a (N.Yemen).

5.3. LENTIL INTERNATIONAL SCREENING NURSERY - LARGE SEED (LISN-L)

Material

The Lentil International Screening Nursery - Large Seed comprised 46 test entries and 3 checks, two of the checks namely Syrian Local Large (ILL 4400) and 78S 26002 (ILL 8) were supplied, and one local check was to be added by the cooperator. Most of the entries in this nursery were selected from the materials developed and tested at ICARDA sites in Syria and Lebanon.

Methods and Management

The material comprising 46 test entries and three checks was sown in an augmented block design in four blocks each comprising 12 test entries, except the last comprising 10 test entries, and 3 checks repeated in every block. The suggested plot size was single row 4 m long accomodating 200 plants. The between row spacing of 25 cm was suggested.

Forty sets of the nursery were supplied to different cooperators in 22 countries. The results were received from 27 locations but were worth analyses for 25 locations. The agronomic data received from the cooperators is presented in Table 5.3.1.

Results and Discussion

The time to flowering (Table 5.3.2) revealed that the entries flowered earliest in 68 and 72 days in Santa Maria (Brazil) and Debre Zeit (Ethiopia) whereas at Ankara in Turkey the flowering was latest (182 days). Among the entries, Precoz and FLIP 84-78L were the earliest at most of the locations and averaged over locations these were the earliest among all taking 114-115 days to flower. Precoz was also the earliest in maturity taking 170 days (Table 5.3.3).

Table 5.3.1. Agronomic data for different locations in the LISN-L during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
ALGERIA	Setif	10.1.1984	179		46			Treflan
ARGENTINA	Salta	11.6.1984	171				4	Sencorex
BRAZIL	Santa Maria	20.8.1984		50	60	10		
CHILE	Casilla	20.7.1984	184		150	50		
CHILE	Chillan	18.6.1984	184		90			Linuron
ECUADOR	Quinto	1.12.1983	144					
EGYPT	Sakha	20.11.1983	170	35	70			Gesagard
ETHIOPIA	Debre Zeit	7.7.1984	138					
INDIA	New Delhi	24.11.1983	140	20	40		2	Basalin,Metasystox
JORDAN	Jubeiha	5.12.1983		20	25			
LEBANON	Terbol	11.11.1983	206		50			
MOROCCO	Marchouch	4.12.1983	178					
NEPAL	Khumaltar	3.11.1983	200	20	40			
PAKISTAN	Chakwal	18.10.1983	181	20	50			
PAKISTAN	Islamabad	25.10.1983	194				1	
PAKISTAN	Quette	23.10.1983	225	20	50		5	
PERU	Lamolina	27.10.1983	271				2	Tamaron
PERU	San Lorenzo	22.10.1983	242				3	Aphalon,Tamaron
SYRIA	Gelline	22.11.1983	190					
SYRIA	Heimo	22.11.1983	168					
SYRIA	Izra'a	22.11.1983	189					
SYRIA	Tel Hadya	16.11.1983	179		50			
TUNISIA	Beja							
TUNISIA	El-Kef							
TURKEY	Ankara	15.11.1983	219	20	50			
TURKEY	Izmir	29.12.1983	164	3	8			

Table 5.3.2. Time to flowering (days) of entries at different locations in the LISH-L during 1983/84.

ENTRY NAME		ORIGIN	ARGENTINA	BRAZIL	CHILE		ECUADOR	EGYPT	ETHIOPIA	INDIA	JORDAN	LEBANON	MOROCCO	PAKISTAN			PERU	SYRIA				TURKEY		MEAN
ILL/CROSS	PEDIGREE		Salta	Santa Maria	Casilla	Chillan	Quinto	Sakha	Debre Zeit	New Delhi	Jubeiha	Terbol	Marchouch	Chakwal	Islamabad	Quette	La-Molina	Gelline	Heimo	Izra'a	Tel-Hadya	Ankara	Izmir	
4400	BIS 30935	Syria	92	61	107	112	80	95	76	100	125	143	104	133	150	160	127	147	134	140	125	182	122	120
4400	BIS 38291	Syria	96	69	110	120	-	115	76	109	136	150	116	141	170	155	129	156	134	142	132	182	126	128
4400	BIS 38326	Syria	96	68	109	117	90	95	76	108	136	143	94	140	150	150	126	146	134	141	137	182	123	122
4400	BIS 38342	Syria	96	69	109	117	90	95	76	108	136	150	104	140	169	150	127	155	134	141	132	182	128	124
4515	-	Syria	106	62	111	120	90	110	76	110	136	146	107	141	150	160	127	154	134	141	134	182	128	125
4605	Precoz	Argentina	89	52	107	112	56	85	66	70	124	143	133	118	134	180	126	150	115	142	110	179	109	114
323x199	FLIP 84-68L	ICARDA	108	-	116	120	90	95	76	112	146	154	94	140	170	155	127	153	134	146	139	187	125	129
253x210	FLIP 84-69L	ICARDA	96	67	116	120	82	105	74	106	139	150	107	135	169	155	123	153	134	146	134	185	125	125
253x210	FLIP 84-70L	ICARDA	96	67	114	120	86	100	67	108	141	152	130	102	170	165	127	154	126	145	137	185	123	125
351x210	FLIP 84-71L	ICARDA	92	69	111	117	92	100	76	110	136	146	116	137	150	160	127	154	134	141	134	179	125	124
479x212	FLIP 84-72L	ICARDA	96	69	110	117	90	95	76	108	135	146	110	139	150	160	127	151	124	141	134	185	126	123
883x470	FLIP 84-73L	ICARDA	101	69	111	117	90	100	67	108	136	150	116	125	139	160	126	148	134	140	134	185	120	123
883x214	FLIP 84-74L	ICARDA	96	75	110	118	92	115	76	108	134	146	101	141	150	160	126	151	134	144	134	182	122	125
20x1LWL1*	FLIP 84-75L	ICARDA	96	58	108	117	75	95	63	94	125	145	103	133	150	160	128	147	124	141	125	181	123	119
39x984	FLIP 84-76L	ICARDA	96	67	109	117	82	100	76	104	135	145	101	140	150	160	127	151	134	142	134	182	120	122
20x1LWL1	FLIP 84-77L	ICARDA	96	61	109	117	71	95	63	94	125	146	98	119	150	155	127	149	134	141	132	182	122	118
883x470*	FLIP 84-78L	ICARDA	89	66	109	118	56	110	53	84	134	143	107	130	99	160	119	151	124	142	115	179	120	115
(351x173) X (251x199)	FLIP 84-79L	ICARDA	96	66	110	120	92	95	76	107	136	152	107	137	150	160	129	154	134	141	134	179	123	124
502x1719	FLIP 84-80L	ICARDA	96	66	105	117	88	110	71	102	126	143	107	116	150	160	125	145	126	139	127	179	122	120
889x588	FLIP 84-81L	ICARDA	96	66	109	118	83	110	73	106	133	146	100	140	150	160	127	150	134	140	134	181	118	123
20x1LWL1	FLIP 84-82L	ICARDA	92	76	107	120	71	100	63	92	125	145	107	130	150	185	127	144	122	140	125	181	124	120
20x1LWL1	FLIP 84-83L	ICARDA	92	76	108	112	74	115	63	91	126	143	94	114	150	160	124	145	124	140	125	182	123	118
445x35	FLIP 84-84L	ICARDA	96	68	109	117	87	110	72	106	134	145	104	114	150	160	125	156	134	140	132	182	123	122
445x470	FLIP 84-85L	ICARDA	101	66	109	120	92	90	74	114	135	150	103	135	150	180	127	151	134	140	134	185	125	125
333x199	FLIP 84-86L	ICARDA	96	69	111	118	90	105	73	109	136	150	117	140	150	180	126	146	134	142	134	182	124	125
253x35	FLIP 84-87L	ICARDA	92	66	108	117	85	95	73	105	127	143	100	141	150	160	127	146	126	140	130	185	122	121
470x470	FLIP 84-88L	ICARDA	92	66	108	117	85	100	74	109	128	146	104	138	150	160	125	150	134	139	134	180	123	122
253x470	FLIP 84-89L	ICARDA	96	66	108	117	82	100	74	108	128	146	94	137	150	160	123	147	134	139	134	180	122	121
101x262	FLIP 84-90L	ICARDA	96	76	111	120	88	110	75	102	128	150	107	141	150	160	127	156	134	143	134	180	122	124
262x350	FLIP 84-91L	ICARDA	96	65	109	117	83	100	74	100	128	146	101	140	150	160	126	150	134	140	134	181	123	122
262x445	FLIP 84-92L	ICARDA	96	69	112	118	92	95	74	108	134	152	104	138	150	160	126	146	134	141	137	181	123	123
262x470	FLIP 84-93L	ICARDA	92	66	109	117	83	120	73	107	129	143	102	141	150	180	127	151	134	141	132	181	130	124
262x470	FLIP 84-94L	ICARDA	92	65	106	117	87	105	73	105	126	143	101	142	150	160	128	147	126	139	130	185	123	121
39x321	FLIP 84-95L	ICARDA	96	69	109	117	89	115	72	109	129	146	101	135	150	160	127	146	134	142	130	181	129	123
101x321	FLIP 84-96L	ICARDA	96	69	109	117	90	105	66	104	133	146	107	140	150	160	127	155	134	141	132	181	126	123
39x479	FLIP 84-97L	ICARDA	96	69	109	117	92	115	72	106	134	146	107	138	169	160	127	143	134	142	130	185	130	125
262x35	FLIP 84-98L	ICARDA	92	67	108	117	82	120	73	100	134	143	107	137	150	160	127	150	134	141	132	185	123	123
101x35	FLIP 84-99L	ICARDA	101	64	111	118	92	95	73	107	134	150	107	140	150	160	127	147	134	141	137	185	121	124
101x445	FLIP 84-100L	ICARDA	96	76	111	118	92	100	73	110	136	150	130	120	150	185	129	155	134	142	137	179	123	126
345x470	FLIP 84-101L	ICARDA	101	75	112	118	92	105	73	110	136	152	114	138	150	160	126	150	134	141	134	179	130	125
262x35	FLIP 84-102L	ICARDA	96	67	107	117	83	100	67	106	127	146	104	141	150	160	124	143	134	139	127	181	122	121
253x35	FLIP 84-103L	ICARDA	96	69	110	117	92	105	76	107	134	150	107	132	150	185	126	155	134	142	132	182	123	125
253x470	FLIP 84-104L	ICARDA	92	65	110	117	84	95	76	106	130	146	107	118	150	160	125	147	134	141	137	182	130	122
253x470	FLIP 84-105L	ICARDA	92	65	109	117	84	100	74	105	128	146	107	125	150	160	126	147	134	143	137	182	123	122
39x479	FLIP 84-106L	ICARDA	92	74	107	117	86	120	76	107	132	143	107	142	150	160	128	155	134	142	132	185	122	124
39x784	FLIP 84-107L	ICARDA	96	62	108	118	80	105	76	95	129	145	94	116	150	180	125	151	126	141	125	185	120	120
4400	Syrian Local Large	Syria	96	71	111	119	91	105	75	110	135	148	108	135	150	165	127	150	132	143	133	182	124	124
8	78S 26002	Jordan	91	60	106	117	72	95	66	91	127	146	103	116	150	159	126	145	126	139	129	180	120	117
Local check			86	78	116	124	89	94	69	79	129	153	109	92	134	158	130	149	134	139	125	181	127	-
Location mean			95	68	110	118	85	103	72	103	132	147	106	132	150	163	126	150	132	141	131	182	123	

* The cross number for FLIP 84-75L and FLIP 84-78L were wrongly typed as 883x470 and (449x226) X (351x212) respectively in nursery information books and have been corrected in this Table.

Table 5.3.3. Time to maturity (days) of entries at different locations in the LISN-L during 1983/84.

ENTRY NAME		ARGENTINA	CHILE		ECUADOR	INDIA	LEBANON	MOROCCO	PAKISTAN			PERU	SYRIA				TURKEY		MEAN
ILL/ CROSS	PEDIGREE	Salta	Casilla	Chillan	Quinto	New Delhi	Terbol	Marchouch	Chakwal	Islamabad	Quette	San Lorenzo	Gelline	Heimo	Izra'a	Tel-Hadya	Ankara	Izmir	
4400	81S 30935	159	188	182	126	128	193	163	169	189	192	239	183	164	184	172	217	162	177
4400	81S 38291	165	173	184	144	137	203	163	180	194	190	238	187	167	189	179	212	161	180
4400	81S 38326	155	172	184	144	136	201	166	179	189	195	217	185	167	189	179	217	160	179
4400	81S 38342	171	173	184	144	142	203	176	179	194	185	242	187	167	187	180	211	162	182
4515	-	171	174	182	144	138	201	164	180	194	192	239	187	167	185	179	217	162	181
4605	Precoz	140	169	180	115	110	193	144	160	182	220	234	184	149	181	160	214	162	170
323x199	FLIP 84-68L	165	172	182	144	139	206	178	180	189	195	237	186	167	188	179	214	160	181
253x210	FLIP 84-69L	171	179	184	144	137	206	166	180	194	190	242	188	167	185	179	219	160	182
253x210	FLIP 84-70L	171	169	182	138	140	203	177	150	182	195	238	187	167	186	179	217	161	179
351x210	FLIP 84-71L	171	172	182	144	140	201	166	175	189	192	242	187	167	187	179	215	162	181
479x212	FLIP 84-72L	171	173	184	144	137	201	166	179	184	195	236	187	167	186	179	217	163	181
883x470	FLIP 84-73L	165	172	182	144	137	203	177	160	189	195	226	185	167	187	179	218	161	179
883x214	FLIP 84-74L	171	184	184	144	135	201	163	181	189	190	234	186	167	185	179	217	159	181
20x1LWL1	FLIP 84-75L	171	184	182	144	125	201	158	170	189	195	234	184	167	183	179	217	153	179
39x984	FLIP 84-76L	171	184	184	144	136	201	158	179	189	192	236	187	167	185	179	214	160	180
20x1LWL1	FLIP 84-77L	171	184	182	138	125	201	158	159	189	192	232	185	167	179	177	218	153	177
883x470	FLIP 84-78L	171	184	180	138	122	198	161	160	189	190	217	187	164	184	179	216	160	176
(351x173)x (251x199)	FLIP 84-79L	171	184	184	144	136	198	161	175	189	220	238	185	167	183	179	214	161	182
502x1719	FLIP 84-80L	165	161	182	144	132	198	158	158	189	192	237	185	164	179	172	214	159	176
889x588	FLIP 84-81L	159	171	184	138	136	198	159	178	189	192	236	185	167	182	179	219	161	178
20x1LWL1	FLIP 84-82L	171	157	184	138	122	201	158	160	189	220	220	182	164	183	172	217	157	176
20x1LWL1	FLIP 84-83L	165	184	182	144	121	201	158	157	189	195	211	184	164	182	173	217	156	175
445x35	FLIP 84-84L	165	184	182	144	133	198	161	158	194	190	213	184	167	180	179	219	158	177
445x470	FLIP 84-85L	171	171	186	-	145	203	158	175	189	220	217	183	167	183	174	214	163	182
333x199	FLIP 84-86L	171	174	180	144	139	201	166	180	189	220	223	184	167	185	180	217	162	181
253x35	FLIP 84-87L	171	171	184	144	135	203	158	181	182	192	227	187	167	184	178	219	164	179
470x470	FLIP 84-88L	171	176	178	144	139	203	158	176	192	190	234	188	167	182	179	217	154	179
253x470	FLIP 89L	171	171	180	144	138	201	161	176	192	192	244	185	167	182	179	217	164	180
101x262	FLIP 84-90L	171	177	180	144	133	206	166	180	192	192	219	188	167	181	179	217	154	179
262x350	FLIP 84-91L	165	174	184	144	134	198	161	180	189	192	238	187	167	183	179	217	164	180
262x445	FLIP 84-92L	171	171	180	-	138	201	163	176	192	192	232	188	167	184	179	217	164	182
262x470	FLIP 84-93L	171	171	184	138	136	193	158	180	189	225	221	187	167	181	174	217	162	180
262x470	FLIP 84-94L	171	173	186	144	136	206	158	181	189	192	219	184	164	184	174	217	164	179
39x321	FLIP 84-95L	171	184	184	144	135	195	163	175	189	195	234	186	167	183	179	219	163	180
101x321	FLIP 84-96L	171	171	184	144	133	203	166	180	192	190	240	183	167	184	179	217	154	180
39x479	FLIP 84-97L	171	171	182	144	137	193	161	176	189	192	230	184	167	181	178	221	164	179
262x35	FLIP 84-98L	159	172	180	138	132	201	163	176	189	195	228	188	167	183	179	217	153	178
101x35	FLIP 84-99L	171	173	180	138	137	201	168	180	189	192	236	188	167	187	178	219	156	180
101x445	FLIP 84-100L	165	174	182	138	137	201	165	160	189	225	230	187	167	186	178	217	157	180
345x470	FLIP 84-101L	165	173	180	-	140	201	164	176	189	192	238	187	167	183	179	218	160	182
262x35	FLIP 84-102L	159	171	180	138	136	201	158	180	189	192	213	186	167	184	175	218	157	177
253x35	FLIP 84-103L	159	171	182	160	136	206	161	162	189	225	234	188	167	184	179	216	160	181
253x470	FLIP 84-104L	165	173	180	138	136	201	161	162	189	190	234	187	167	186	179	217	157	178
253x470	FLIP 84-105L	171	171	180	138	137	201	158	-	189	190	237	183	167	186	178	216	154	179
39x479	FLIP 84-106L	159	176	182	-	136	198	158	-	189	192	232	188	168	185	175	217	158	181
39x784	FLIP 84-107L	159	172	180	138	126	201	158	-	189	225	242	190	164	183	173	219	158	180
4400	-	168	176	182	143	138	202	172	173	190	201	236	186	167	186	179	217	161	181
8	78S 26002	168	157	181	134	120	198	158	160	190	191	223	184	166	184	175	216	158	174
Local check		139	174	183	-	121	205	168	139	182	191	229	184	167	182	173	216	162	-
Location mean		166	174	182	141	134	201	163	172	189	198	231	186	166	184	177	217	160	

Table 5.3.4. Plant height (cm) of the entries at different locations in LISN-L during 1983/84.

ENTRY NAME		ALGERIA	ARGENTINA	BRAZIL	CHILE		ECUADOR	ETHIOPIA	INDIA	JORDAN	LEBANON	NEPAL	PAKISTAN			PERU		SYRIA				TURKEY		MEAN
ILL/CROSS	PEDIGREE	Setif	Salta	Santa-Maria	Casilla	Chillan	Quinto	Debre Zeit	New Delhi	Jubeiha	Terbol	Khumaltar	Chakwal	Islamabad	Quette	La Molina	San Lorenzo	Gelline	Heimo	Izra'a	Tel Hadya	Ankara	Izmir	
4400	BIS 30935	26	24	28	38	40	45	35	29	47	30	26	29	27	25	28	27	27	26	27	31	32	61	32
4400	BIS 38291	30	22	32	45	53	45	30	32	45	28	22	25	34	21	38	31	28	27	29	27	34	70	34
4400	BIS 38326	27	28	32	36	41	50	20	37	42	40	22	30	32	20	27	30	27	26	29	27	34	61	33
4400	BIS 38342	24	21	30	42	54	45	35	35	44	30	20	30	32	28	43	32	28	28	36	28	32	66	35
4515	-	25	21	28	43	65	45	30	33	44	36	25	30	33	23	31	28	27	28	27	27	31	66	34
4605	Precoz	18	19	32	37	37	40	40	35	35	27	25	25	25	22	39	23	23	23	22	26	33	44	30
323x199	FLIP 84-68L	30	24	-	35	46	50	20	38	38	40	23	31	30	18	26	33	29	24	30	25	33	65	33
253x210	FLIP 84-69L	31	22	28	44	47	55	35	34	42	40	32	28	36	21	38	33	30	26	25	32	29	60	35
253x210	FLIP 84-70L	28	24	27	39	47	50	30	46	42	38	26	30	36	19	27	36	30	26	33	25	29	60	34
351x210	FLIP 84-71L	25	18	30	39	55	50	25	28	40	42	24	31	34	21	27	35	26	26	31	27	34	63	33
479x212	FLIP 84-72L	24	22	28	47	53	50	40	34	40	46	-	30	38	25	38	35	32	27	28	27	34	66	36
883x470	FLIP 84-73L	26	24	30	39	48	45	20	33	50	35	24	30	32	18	33	40	27	25	30	25	38	54	33
883x214	FLIP 84-74L	27	22	24	39	67	50	35	37	55	43	-	31	34	25	33	33	26	28	29	27	33	65	36
20x1LWL1	FLIP 84-75L	28	22	22	36	52	40	25	32	52	40	35	30	35	21	38	32	26	29	27	32	31	50	33
39x984	FLIP 84-76L	27	21	22	38	43	40	35	38	52	36	29	34	32	20	31	35	27	25	26	27	33	61	33
20x1LWL1	FLIP 84-77L	25	19	19	35	45	50	25	30	47	36	-	32	31	20	26	28	23	27	28	27	37	56	32
883x470	FLIP 84-78L	27	28	24	46	65	45	40	38	50	42	-	32	39	21	34	31	28	30	34	31	33	69	37
(351x173) X (251x199)	FLIP 84-79L	26	25	20	39	48	45	45	32	50	34	-	29	27	16	36	27	25	26	29	25	32	92	35
502x1719	FLIP 84-80L	23	20	29	35	45	50	35	33	45	28	-	31	36	21	28	26	26	26	20	27	31	61	32
869x588	FLIP 84-81L	25	18	26	32	40	50	40	38	40	32	-	30	32	23	34	30	28	27	23	26	31	54	32
20x1LWL1	FLIP 84-82L	23	20	26	35	55	50	35	35	50	40	-	30	30	21	35	22	31	28	25	31	32	57	34
20x1LWL1	FLIP 84-83L	28	20	29	36	50	40	30	29	53	36	-	35	30	22	31	32	35	28	25	33	39	59	34
445x35	FLIP 84-84L	23	20	25	38	45	45	25	35	50	35	22	36	31	22	29	29	29	25	28	25	36	64	33
445x470	FLIP 84-85L	25	18	23	34	70	-	35	35	46	36	-	31	26	14	27	27	28	28	23	26	35	60	32
333x199	FLIP 84-86L	25	26	24	44	60	63	25	34	46	40	25	30	39	13	30	33	27	28	30	27	31	67	35
253x35	FLIP 84-87L	26	27	28	40	60	40	30	43	50	35	-	30	32	14	32	29	29	25	33	26	31	63	34
470x470	FLIP 84-88L	27	16	21	32	55	35	35	35	40	34	23	25	34	17	28	27	26	27	33	28	30	54	31
253x470	FLIP 84-89L	30	18	27	37	55	35	30	36	42	38	26	27	31	17	22	23	27	27	26	30	38	65	32
101x262	FLIP 84-90L	30	20	21	40	55	35	30	39	42	40	29	30	38	21	31	32	27	25	27	26	31	66	33
262x350	FLIP 84-91L	30	22	23	36	50	40	30	36	38	42	-	31	30	16	28	31	30	28	31	27	31	60	33
262x445	FLIP 84-92L	22	23	27	33	50	-	35	46	44	48	24	30	35	17	25	42	31	26	28	30	35	58	34
262x470	FLIP 84-93L	29	24	32	39	60	50	40	34	50	34	24	29	32	15	31	28	31	27	33	27	35	63	35
262x470	FLIP 84-94L	23	21	30	34	50	40	30	35	45	38	29	30	24	17	31	26	33	25	27	23	32	59	32
39x321	FLIP 84-95L	28	24	28	37	65	40	35	31	55	50	26	30	35	18	31	39	29	29	32	30	34	76	36
101x321	FLIP 84-96L	30	18	23	36	58	30	30	45	48	48	26	27	35	4	27	34	30	26	31	27	33	58	33
39x479	FLIP 84-97L	28	24	26	43	55	40	25	43	45	35	28	29	37	12	28	33	31	31	34	33	34	73	35
262x35	FLIP 84-98L	27	22	23	40	45	45	40	30	47	46	27	31	38	21	28	32	26	25	26	25	36	61	34
101x35	FLIP 84-99L	27	25	17	45	50	40	35	41	42	43	27	31	37	15	34	34	26	25	28	27	34	71	34
101x445	FLIP 84-100L	28	22	21	44	60	50	35	40	52	50	27	28	34	19	33	39	26	27	29	27	34'	69	36
345x470	FLIP 84-101L	27	22	20	45	60	-	35	35	55	42	22	30	35	19	34	43	27	26	34	29	37	54	35
262x35	FLIP 84-102L	30	24	22	36	48	40	35	41	48	50	30	31	39	17	26	32	29	24	26	27	35	55	34
253x35	FLIP 84-103L	30	28	22	42	45	40	30	45	48	45	-	30	37	18	30	34	22	25	30	27	33	56	34
253x470	FLIP 84-104L	27	24	24	40	45	45	35	41	37	46	35	32	27	20	-	31	24	29	28	27	36'	72	35
253x470	FLIP 84-105L	27	20	24	38	44	35	30	42	47	40	-	-	32	17	24	25	24	27	20	26	36	54	32
39x479	FLIP 84-106L	26	22	17	41	45	-	40	38	43	38	20	-	31	19	-	29	28	24	28	21	28	56	31
39x784	FLIP 84-107L	30	22	17	38	48	40	40	45	38	50	-	-	29	16	29	25	30	25	25	27	38	56	33
4400	-	28	25	26	41	53	47	31	37	49	39	22	29	40	19	28	34	29	28	28	28	34	66	35
8	78S 26002	27	21	23	36	45	48	28	33	42	33	-	35	31	17	32	28	27	28	28	27	32	61	32
Local check		22	20	26	42	60	-	35	35	44	47	-	31	28	19	29	38	30	27	30	29	35	62	-
Location mean		27	22	25	39	52	44	32	36	46	39	26	30	33	19	31	31	28	27	28	27	33	62	-

Table 5.3.5. Adjusted seed yield (Y=kg/ha) and rank (R) of entries at different locations in LIYT-L during 1983/84.

ENTRY NAME		ALGERIA		ARGENTINA		CHILE				ECUADOR		EGYPT		ETHIOPIA		INDIA		JORDAN		LEBANON		MOROCCO		NEPAL	
ILL/CROSS	PEDIGREE	Setif		Salta		Casilla		Chillan		Quinto		Sakha		Debre Zeit		New Delhi		Jubeiha		Terbol		Marchouch		Khumaltar	
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
4400	BIS 30935	3378	7	578	39	1943	26	1002	41	503	8	426	21	0	40	633	11	2843	1	1634	20	1236	7	-	-
4400	BIS 38291	3128	9	844	26	3049	6	1958	12	273	17	186	44	72	23	333	26	1613	22	1134	43	803	35	-	-
4400	BIS 38326	2569	30	1511	1	3025	7	1921	13	393	10	452	16	0	40	283	31	2113	5	2134	4	1269	5	-	-
4400	BIS 38342	3078	10	578	39	3317	4	2509	7	273	18	266	36	0	40	533	16	2013	9	1573	22	736	37	203	28
4515	-	3344	8	177	49	2775	10	1517	20	273	18	306	34	19	38	333	26	1313	35	1745	14	536	46	203	28
4605	Precoz	2203	39	711	34	1372	41	965	44	2133	1	119	47	72	23	783	5	2223	2	801	48	1269	5	-	-
323x199	FLIP 84-68L	2678	20	1111	10	1924	27	1406	27	-	-	186	44	0	40	183	40	1463	30	1190	42	569	45	203	28
253x210	FLIP 84-69L	2453	33	978	15	1236	42	1149	37	313	12	426	21	179	7	483	18	1343	32	1356	37	536	46	1003	2
253x210	FLIP 84-70L	2236	38	1111	10	1197	43	965	44	343	11	532	10	166	8	383	23	1743	18	1468	29	1169	14	653	9
351x210	FLIP 84-71L	2619	23	444	45	2868	9	2693	6	293	15	319	33	86	18	183	40	1643	20	1468	29	1136	17	203	28
479x212	FLIP 84-72L	2928	12	578	39	3604	2	2914	3	283	16	466	15	59	28	683	10	1513	28	2356	2	603	43	-	-
883x470	FLIP 84-73L	2902	13	1244	7	2539	13	1517	20	303	14	386	25	32	36	283	31	1973	10	1534	26	436	49	252	27
883x214	FLIP 84-74L	2589	28	978	15	1780	31	1823	15	60	32	448	18	0	40	167	43	1176	39	1968	7	814	32	519	14
20x1LWL1	FLIP 84-75L	2047	44	1378	3	2063	23	1014	40	200	20	568	7	0	40	567	14	1846	15	1912	8	681	40	119	34
39x984	FLIP 84-76L	2614	24	978	15	1451	39	1235	34	120	24	661	4	0	40	207	36	2016	7	1412	36	814	32	-	-
20x1LWL1	FLIP 84-77L	2106	41	978	15	973	48	1382	28	870	4	514	11	0	40	767	6	1886	13	1579	22	1047	21	819	5
883x470	FLIP 84-78L	1681	47	911	24	6660	1	1051	39	400	9	688	3	59	28	467	19	2166	3	1856	10	1414	1	869	3
(351x173)X (251x199)	FLIP 84-79L	2497	32	911	24	3548	3	1602	19	310	13	621	6	0	40	467	19	1496	29	1468	29	1314	2	719	8
502x1719	FLIP 84-80L	2647	21	1244	7	1753	33	1271	33	130	23	434	19	86	18	317	28	2146	4	1301	40	1014	25	419	16
889x588	FLIP 84-81L	2589	28	978	15	3128	5	1492	23	770	6	821	2	312	5	567	14	2016	7	1523	28	1214	10	769	7
20x1LWL1	FLIP 84-82L	2131	40	1111	10	2180	18	867	46	1530	2	474	14	6	39	767	6	1576	23	2079	5	1081	18	469	15
20x1LWL1	FLIP 84-83L	2314	36	844	26	2052	24	977	42	80	29	341	31	59	28	817	4	1066	42	1690	17	981	27	619	11
445x35	FLIP 84-84L	1864	46	844	26	2064	21	2374	10	110	25	194	43	46	32	417	21	1566	25	1745	14	1081	18	1119	1
445x470	FLIP 84-85L	2814	16	311	48	2420	15	977	42	-	-	501	12	0	40	117	47	1546	26	745	49	1047	22	819	5
333x199	FLIP 84-86L	1681	48	822	29	2377	16	2423	9	110	25	39	49	99	14	150	44	1643	20	1856	10	1314	3	396	17
253x35	FLIP 84-87L	2372	35	956	20	974	47	1504	22	160	22	146	46	86	18	350	24	1263	37	1079	45	914	31	0	37
470x470	FLIP 84-88L	2556	31	956	20	1429	40	1210	36	190	21	426	21	126	11	750	8	1653	19	1201	41	647	41	276	26
253x470	FLIP 84-89L	2789	17	556	42	1909	28	1284	32	40	34	359	28	86	18	200	37	1203	38	1356	37	1281	4	316	22
101x262	FLIP 84-90L	1531	49	822	29	1769	32	1100	38	60	32	332	32	125	12	250	33	843	46	1134	43	1047	21	346	20
262x350	FLIP 84-91L	2756	18	1089	13	2572	12	1431	26	100	28	652	5	472	4	600	12	813	48	1468	29	947	29	-	-
262x445	FLIP 84-92L	2681	19	1356	4	2064	21	1320	30	-	-	372	26	539	2	300	29	1573	24	1634	20	814	32	356	19
262x470	FLIP 84-93L	2597	25	1022	14	2309	17	843	47	1000	3	372	26	792	1	500	17	1033	43	1023	46	614	42	-	-
262x470	FLIP 84-94L	2597	25	689	35	622	49	843	47	40	34	492	13	192	5	150	44	603	49	958	47	447	48	96	35
39x321	FLIP 84-95L	2089	42	822	29	1978	25	1762	16	30	36	292	35	99	14	250	33	933	45	1690	17	714	38	396	17
101x321	FLIP 84-96L	3056	11	689	35	2476	14	2754	5	10	37	346	30	139	9	200	37	1323	34	1579	22	1147	16	46	36
39x479	FLIP 84-97L	2622	22	689	35	1873	29	843	47	110	25	452	16	112	13	250	33	1013	44	1534	26	1214	11	546	13
262x35	FLIP 84-98L	2253	37	956	20	1582	36	1664	17	0	38	88	48	63	25	900	3	839	47	1986	6	936	30	133	32
101x35	FLIP 84-99L	3761	4	956	20	3022	8	2914	3	0	38	221	40	77	22	200	37	1069	41	1875	9	703	39	313	23
101x445	FLIP 84-100L	3744	5	822	32	2132	20	3759	1	0	38	234	39	37	33	100	48	2019	6	2319	3	1169	15	-	-
345x470	FLIP 84-101L	3403	6	422	46	1103	44	2436	8	-	-	208	42	90	16	50	49	1149	40	1764	12	1236	7	283	24
262x35	FLIP 84-102L	3803	3	1489	2	1048	45	2950	2	0	38	221	40	63	25	600	12	1329	33	2431	1	1003	26	283	24
253x35	FLIP 84-103L	3978	2	489	44	1644	35	2105	11	0	38	568	7	37	33	300	29	1309	36	1319	39	969	28	633	10
253x470	FLIP 84-104L	1986	45	1356	4	1668	34	1222	35	526	7	261	37	90	16	400	22	1769	16	1653	19	1236	7	133	32
253x470	FLIP 84-105L	2053	43	1356	4	1456	38	1296	31	0	38	434	19	130	10	700	9	1929	11	1764	12	803	36	-	-
39x479	FLIP 84-106L	2828	15	1222	9	1820	30	1480	24	67	31	354	29	50	31	150	44	1869	14	1431	35	603	44	-	-
39x784	FLIP 84-107L	2594	27	422	46	1032	46	1333	29	0	38	1021	1	23	37	350	24	1529	27	1831	16	1203	13	-	-
4400	-	2425	34	617	38	2145	19	1829	14	70	30	260	38	60	27	175	42	1415	31	1556	25	1050	20	343	21
8	78S 26002	2867	14	817	33	1512	37	1443	25	820	5	400	24	33	35	950	2	1745	17	1444	34	1017	24	588	12
Local check		4167	1	500	43	2602	11	1645	18	-	-	550	9	523	3	1125	1	1918	12	1458	33	1208	12	828	4
Location mean		2665		882		2123		1632		302		397		110		422		1553		1572		960		440	
C.V.%		23.4		16.9		15.9		28.2		168.6		62.3		74.7		49.9		17.2		23.2		15.8		36.4	
L.S.D. at 5% for:																									
Checks		1117		245		577		803		696		427		156		405		468		626		270		237	
Checks vs. test entries		2039		448		1054		1466		1272		779		285		739		855		1143		492		432	
Test entries in the same block		2233		490		1154		1605		1393		853		312		809		937		1252		539		473	
Test entries in different blocks		2579		567		1333		1853		1609		985		360		935		1082		1446		623		547	
S.E. for:																									
Checks		456		100		236		328		284		174		64		165		191		256		110		97	
Checks vs. test entries		833		183		431		599		520		318		116		302		350		467		201		177	
Test entries in the same block		913		201		472		656		569		349		128		331		383		512		220		193	
Test entries in different blocks		1054		232		545		757		657		403		147		382		442		591		254		223	
The number of lines significantly exceeding the local check.		0		23		1		1		-		0		0		0		1		0		0		0	

Cont'd. 2.

Table 5.3.5. Cont'd. 2.

ENTRY NAME		PAKISTAN						PERU				SYRIA								TUNISIA				TURKEY				MEAN	
ILL/CROSS	PEDIGREE	Chakwal		Islamabad		Quette		La Molina		San Lorenzo		Gellino		Heimo		Izra'a		Tel Hadya		Beja		El-Kef		Ankara		Izmir			
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
4400	81S 30935	889	2	359	42	861	16	11	26	4	25	951	4	464	9	1171	13	1704	5	1367	11	1354	8	854	41	1681	13	1077	1
4400	81S 38291	356	33	275	45	928	14	10	33	4	25	1	44	308	24	1221	9	518	40	867	39	754	40	1281	10	494	47	850	30
4400	81S 38326	622	12	400	37	528	33	39	3	4	25	151	38	375	17	721	38	811	31	1267	15	704	43	1041	27	1306	24	985	11
4400	81S 38342	556	20	475	28	1194	3	12	25	4	25	121	41	217	35	1471	4	624	37	867	40	754	41	828	43	1174	27	935	16
4515	-	489	26	687	6	528	33	10	33	4	25	1	44	333	22	721	38	464	44	867	40	854	34	1068	25	748	40	773	42
4605	Precoz	289	38	543	19	194	47	9	35	4	25	171	37	682	2	121	49	598	38	417	48	504	48	881	36	1321	23	766	43
323x199	FLIP 84-68L	489	26	387	39	1194	3	27	7	4	25	101	43	227	33	971	26	838	26	1267	15	1504	2	1068	25	906	33	829	32
253x210	FLIP 84-69L	356	33	581	13	1194	3	9	35	5	16	321	30	244	29	421	45	518	40	617	46	704	44	1228	12	1414	20	763	44
253x210	FLIP 84-70L	622	12	362	41	861	16	11	26	4	25	1	44	208	36	371	48	171	49	317	49	704	44	934	32	934	32	699	47
351x210	FLIP 84-71L	622	12	556	16	1194	3	15	18	4	25	401	24	374	18	1371	5	691	35	967	33	1054	25	161	49	894	34	890	25
479x212	FLIP 84-72L	556	20	406	35	528	33	23	11	4	25	221	36	440	13	1221	9	864	26	1167	22	1454	4	1374	8	974	31	1051	5
883x470	FLIP 84-73L	822	4	337	43	794	26	17	16	4	25	0	47	233	31	471	43	518	40	1067	27	904	32	1108	22	828	37	820	35
883x214	FLIP 84-74L	778	5	742	3	861	16	31	5	5	16	304	32	107	44	954	31	1442	9	1183	19	854	34	1726	2	997	30	892	24
20x1LWL1	FLIP 84-75L	644	8	667	7	528	33	21	13	6	12	904	5	547	5	1204	11	1842	2	1383	9	1254	15	912	35	1277	25	943	15
39x984	FLIP 84-76L	884	3	655	8	1194	3	11	26	5	16	374	27	48	47	954	31	1269	12	1533	5	1354	8	726	45	1103	28	901	19
20x1LWL1	FLIP 84-77L	778	5	536	21	861	16	11	26	5	16	804	9	66	46	404	46	1256	14	1733	2	1304	11	1099	23	757	39	901	19
883x470	FLIP 84-78L	378	32	308	44	861	16	21	13	8	8	144	39	163	40	604	40	1322	11	983	31	1154	19	859	40	1477	19	1060	3
(351x173) X(251x199)	FLIP 84-79L	578	18	542	20	194	47	23	11	20	4	384	26	0	49	1054	20	1189	17	1083	24	1304	11	512	47	543	45	895	23
502x1719	FLIP 84-80L	644	8	742	3	661	31	11	26	5	16	604	16	356	21	604	40	1909	1	1233	18	1354	8	752	44	2463	3	964	12
889x588	FLIP 84-81L	644	8	786	2	128	49	26	9	5	16	624	14	149	41	1054	20	1549	7	1083	24	1404	6	686	46	570	44	995	8
20x1LWL1	FLIP 84-82L	644	8	455	30	661	31	24	10	5	16	854	8	613	3	1604	2	1589	6	1083	24	1654	1	1112	21	1837	10	1056	4
20x1LWL1	FLIP 84-83L	1178	1	399	38	528	33	14	24	5	16	1054	2	766	1	1254	8	1736	4	1483	7	1154	19	1499	5	1197	26	964	12
445x35	FLIP 84-84L	511	24	555	17	861	16	11	26	5	16	904	5	372	19	1104	16	1189	17	933	35	1404	6	1339	9	610	43	928	17
445x470	FLIP 84-85L	778	5	549	18	528	33	11	26	10	6	454	22	34	48	804	36	1229	15	1033	30	704	46	872	38	317	49	776	41
333x199	FLIP 84-86L	533	23	0	49	528	33	0	38	0	41	511	19	87	45	971	26	460	45	833	42	1004	27	1277	11	1574	15	828	33
253x35	FLIP 84-87L	267	39	271	46	528	33	0	38	0	41	311	31	454	12	1071	18	260	47	1533	6	754	42	1610	3	1506	16	733	45
470x470	FLIP 84-88L	200	44	655	8	861	16	0	38	55	1	331	29	297	27	1521	3	820	29	1933	1	1304	13	930	33	2146	4	899	22
253x470	FLIP 84-89L	133	45	442	33	1194	3	0	38	14	5	401	24	235	30	1121	15	1207	16	1633	3	1204	16	1130	20	1866	9	878	26
101x262	FLIP 84-90L	267	39	405	36	861	16	0	38	0	41	131	40	130	43	521	42	860	27	1433	8	904	32	1450	6	1721	12	722	46
262x350	FLIP 84-91L	400	29	449	32	1194	3	0	38	0	41	251	35	377	16	1171	13	913	22	1383	10	654	47	1437	7	1828	11	957	14
262x445	FLIP 84-92L	267	39	411	34	861	16	0	38	0	41	431	23	222	34	1071	18	1513	8	1633	3	1154	21	1090	24	2014	7	987	10
262x470	FLIP 84-93L	400	29	592	12	528	33	0	38	8	8	111	42	308	24	971	26	953	20	1183	19	1204	16	1157	17	2094	5	901	21
262x470	FLIP 84-94L	267	39	224	48	528	33	0	38	9	7	301	33	487	7	1271	7	700	34	983	31	804	39	930	33	1974	8	649	48
39x321	FLIP 84-95L	507	25	474	29	528	33	0	38	0	41	631	13	462	10	971	26	1327	10	1133	23	1004	27	863	39	1666	14	825	34
101x321	FLIP 84-96L	133	45	530	22	861	16	0	38	0	41	0	47	142	42	971	26	807	32	483	47	1504	3	877	37	1401	21	859	29
39x479	FLIP 84-97L	333	35	505	24	528	33	0	38	7	10	0	47	603	4	921	34	1260	13	883	38	854	36	1183	13	2026	6	815	37
262x35	FLIP 84-98L	600	15	622	11	1083	10	18	15	4	25	364	28	490	6	1054	20	593	39	1067	27	938	31	970	30	1041	29	810	38
101x35	FLIP 84-99L	600	15	728	5	1417	1	36	4	3	38	964	3	300	26	1204	11	1073	19	967	34	-	-	1183	13	1374	22	1046	6
101x445	FLIP 84-100L	267	39	565	14	750	27	27	7	0	41	254	34	387	15	1054	20	887	23	817	43	1138	22	1157	17	454	48	1004	7
345x470	FLIP 84-101L	333	35	647	10	417	45	15	18	0	41	1684	1	183	39	1004	25	727	33	817	43	1037	26	1143	19	866	36	876	27
262x35	FLIP 84-102L	467	28	378	40	1417	1	28	6	1	39	764	11	471	8	1304	6	1833	3	1367	12	1438	5	1037	28	894	34	1065	2
253x35	FLIP 84-103L	333	35	1097	1	417	45	15	18	1	39	484	20	228	32	1104	16	647	36	1367	12	1288	14	837	42	654	42	873	28
253x470	FLIP 84-104L	560	19	503	25	1083	10	15	18	21	3	864	7	193	38	454	44	260	47	1317	14	838	37	1170	16	1574	15	846	31
253x470	FLIP 84-105L	0	47	453	31	1083	10	46	1	22	2	614	15	200	37	404	46	500	43	1267	17	1138	22	997	29	2068	1	905	18
39x479	FLIP 84-106L	0	47	559	15	750	27	15	18	6	12	714	12	459	11	904	35	313	46	917	37	1138	22	370	48	1561	17	816	36
39x784	FLIP 84-107L	0	47	509	23	750	27	16	17	7	10	564	17	362	20	954	31	873	24	717	45	838	38	1183	13	734	41	785	40
4400	-	400	29	497	26	917	15	7	32	6	12	513	18	263	28	788	37	820	29	925	36	1162	18	950	31	807	38	799	39
8	78S 26002	550	22	492	27	1000	13	15	18	4	25	480	21	432	14	1038	24	870	25	1175	21	950	30	1510	4	2553	2	988	9
Local check		583	17	263	47	667	30	44	2	6	12	800	10	331	23	1988	1	943	21	1050	29	975	29	1943	1	510	46	-	-
Location mean		480		502		788		14		6		456		315		973		964		1115		1051		1067		1301			
C.V.%		46.5		17.9		26.8		322.4		62.7		52.9		37.3		36.6		31.8		13.5		28.4		6.7		20.7			
L.S.D. at 5% for:																													
Checks		385		150		372		61		6		439		207		650		520		256		516		132		464			
Checks vs. test entries		703		274		680		112		11		801		379		1187		950		468		942		240		847			
Test entries in the same block		770		300		744		123		12		877		415		1300		1041		513		1032		263		927			
Test entries in different blocks		889		346		860		142		14		1013		479		1501		1202		592		1192		304		1071			
S.E. for:																													
Checks		157		61		152		25		2		179		85		266		213		105		210		54		189			
Checks vs. test entries		287		112		278		46		5		327		155		485		388		191		385		98		346			
Test entries in the same block		315		123		304		50		5		358		170		531		425		209		422		108		379			
Test entries in different blocks		363		142		351		58		6		414		196		613		491		242		487		124		438			
The number of lines significantly exceeding the local check		0		20		2		0		4		1		1		0		1		6		0		0		21			

Table 5.3.6. The five heaviest seed yielding entries at the individual locations in the LISN-L during 1983/84.

RANK	ALGERIA Setif		ARGENTINA Salta		CHILE Casilla		CHILE Chillan		ECUADOR Quinto		EGYPT Sakha	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	-	Local check	4400	81S 38326	883x470	FLIP 84-78L	101x445	FLIP 84-100L	4605	Precoz	39x784	FLIP 84-107L
2	253x35	FLIP 84-103L	262x35	FLIP 84-102L	479x212	FLIP 84-72L	262x35	FLIP 84-102L	20x1LWL1	FLIP 84-82L	889x588	FLIP 84-81L
3	262x35	FLIP 84-102L	20x1LWL9	FLIP 84-75L	(351x173)X (251x199)	FLIP 84-79L	479x212	FLIP 84-72L	262x470	FLIP 84-93L	883x470	FLIP 84-78L
4	101x35	FLIP 84-99L	262x445	FLIP 84-92L (1)	4400	81S 38342	101x35	FLIP 84-99L	20x1LWL1	FLIP 84-77L	39x984	FLIP 84-76L
5	101x445	FLIP 84-100L	253x470	FLIP 84-104L	889x588	FLIP 84-81L	101x321	FLIP 84-96L	8	78S 26002	262x350	FLIP 84-91L
			253x470	FLIP 84-105L								

Cont'd. ...

RANK	ETHIOPIA Debre Zeit		INDIA New Delhi		JORDAN Jubeiha		LEBANON Terbol		MOROCCO Marchouch		NEPAL Khumaltar	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	262x470	FLIP 84-93L	-	Local check	4400	81S 30935	262x35	FLIP 84-102L	883x470	FLIP 84-78L	445x35	FLIP 84-84L
2	262x445	FLIP 84-92L	8	78S 26002	4605	precoz	479x212	FLIP 84-72L	(351x173)X (251x199)	FLIP 84-79L	253x210	FLIP 84-69L
3	-	Local check	262x35	FLIP 84-98L	883x470	FLIP 84-78L	101x445	FLIP 84-100L	333x199	FLIP 84-86L	883x470	FLIP 84-78L
4	262x350	FLIP 84-91L	20x1LWL1	FLIP 84-83L	502x1719	FLIP 84-80L	4400	81S 38326	253x470	FLIP 84-89L	-	Local check
5	889x588	FLIP 84-81L	4605	Precoz	4400	81S 38326	20x1LWL1	FLIP 84-82L	4400	81S 38326	445x470	FLIP 84-85L
									4605	Precoz	20x1LWL1	FLIP 84-77L

Cont'd. 2/...

RANK	PAKISTAN Chakwal		PAKISTAN Islamabad		PAKISTAN Quette		PERU La Molina		PERU San Lorenzo		SYRIA Gelline		SYRIA Heimo	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	20x1LWL1	FLIP 84-83L	253x35	FLIP 84-103L	101x35	FLIP 84-99L	253x470	FLIP 84-105L	470x470	FLIP 84-88L	345x470	FLIP 84-101L	20x1LWL1	FLIP 84-83L
2	4400	81S 30935	889x588	FLIP 84-81L	262x35	FLIP 84-102L	-	Local check	253x470	FLIP 84-105L	20x1LWL1	FLIP 84-83L	4605	Precoz
3	39x984	FLIP 84-76L	502x1719	FLIP 84-80L	253x470	FLIP 84-89L	4400	81S 38326	253x470	FLIP 84-104L	101x35	FLIP 84-99L	20x1LWL1	FLIP 84-82L
4	883x470	FLIP 84-73L	883x214	FLIP 84-74L	262x350	FLIP 84-91L	101x35	FLIP 84-99L	(351x173)X (251x199)	FLIP 84-79L	4400	81S 30935	39x479	FLIP 84-97L
5	883x214	FLIP 84-74L	101x35	FLIP 84-99L	4400	81S 38342	883x214	FLIP 84-74L	253x470	FLIP 84-89L	445x35	FLIP 84-84L	20x1LWL1	FLIP 84-75L
	20x1LWL1	FLIP 84-77L			323x199	FLIP 84-68L					20x1LWL1	FLIP 84-75L		
	445x470	FLIP 84-85L			253x210	FLIP 84-69L								
					351x210	FLIP 84-71L								
					39x984	FLIP 84-76L								

Cont'd. ...

RANK	SYRIA Izra'a		SYRIA Tel Hadya		TUNISIA Beja		TUNISIA El-Kef		TURKEY Ankara		TURKEY Izmir	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	-	Local check	502x1719	FLIP 84-80L	470x470	FLIP 84-88L	20x1LWL1	FLIP 84-82L	-	Local check	253x470	FLIP 84-105L
2	20x1LWL1	FLIP 84-82L	20x1LWL1	FLIP 84-75L	20x1LWL1	FLIP 84-77L	323x199	FLIP 84-68L	883x214	FLIP 84-74L	8	78S 26002
3	470x470	FLIP 84-88L	262x35	FLIP 84-102L	253x470	FLIP 84-89L	101x321	FLIP 84-96L	253x35	FLIP 84-87L	502x1719	FLIP 84-80L
4	4400	81S 38342	20x1LWL1	FLIP 84-83L	262x445	FLIP 84-92L	479x212	FLIP 84-72L	8	78S 26002	470x470	FLIP 84-88L
5	351x210	FLIP 84-71L	4400	81S 30935	39x984	FLIP 84-76L	262x35	FLIP 84-102L	20x1LWL1	FLIP 84-83L	262x470	FLIP 84-93L

(1) The brackets indicate entries having the same rank.

The plant height ranged from 19 cm at Quette in Pakistan to 62 cm at Izmir in Turkey (Table 5.3.4). Among the entries, FLIP 84-78L with an average height of 37 cm was the tallest at most of the locations.

The crop at Santa Maria (Brazil) was severally attacked by Colletotrichum and yield data could not be recorded. The adjusted seed yields at different locations (Table 5.3.5) showed that the performance of entries at Setif in Algeria was the best with average yield of 2665 kg/ha and was followed by Casilla (2123 kg/ha) in Chile. The CV of the experiment varied from 6.7% for Ankara in Turkey to 322.4% for La Molina in Peru.

The ANOVA for the experiment revealed that at some of the locations namely Salta in Argentina; Casilla and Chillan in Chile; Jubeiha in Jordan; Islamabad and Quette in Pakistan; Gelline, Heimo and Tel Hadya in Syria; Beja in Tunisia; and Izmir in Turkey 23, 1, 1, 1, 20, 2, 1, 1, 1, 6, and 21 entries, respectively, outyielded the local check by a significant margin. The entry mean over locations revealed that 81S 30935 (ILL 4400) was the top yielder with an average of 1077 kg/ha and was followed by FLIP 84-102L, FLIP 84-78L, FLIP 84-82L, FLIP 84-72L etc.

The five heaviest yielding entries at different locations are given in Table 5.3.6. The entry FLIP 84-102L occured most frequently (7 times) among the top five and was followed by FLIP 84-99L and FLIP 84-83L.

5.4. LENTIL INTERNATIONAL SCREENING NURSERY - SMALL SEED (LISN-S)

Material

The material for the Lentil International Screening Nursery - Small Seed comprised of 64 test entries. In addition, there were three checks, two namely Syrian Local Small (ILL 4401) and 78S 26013 (ILL 16) were supplied and one local check was to be used by the cooperator. These entries were selected from the materials developed and tested at ICARDA sites in Syria and Lebanon.

Methods and Management

The material was grown in an augmented block design. The entries were suggested to be accomodated in six blocks, each block containing twelve test entries and 3 checks except the last one having only 4 entries and 3 checks. The suggested plot size was single row 4 m long accomodating 200 seeds with inter row spacing of 25 cm. Thirty nine sets of screening nursery were sent to cooperators in 20 countries and the results were received from 19 locations from 11 countries. The agronomic data received from cooperators are given in Table 5.4.1.

Table 5.4.1. Agronomic data for different locations in the LISN-S during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha)			Irrigation	Insecticide/ Fungicide/ Herbicide
				N	P_2O_5	K_2O		
ARGENTINA	Salta	29.6.1984	155				1	Sencorex
EGYPT	Mallawi	10.12.1983	146	15	30		2	Prometrin
ETHIOPIA	Debre Zeit-1	18.7.1984	146					Bravo
ETHIOPIA	Debre Zeit-2	7.7.1984	145					
JORDAN	Jubeiha	5.12.1983	-	20	25			
LEBANON	Terbol	11.11.1983	203		50			
MOROCCO	Marchouch	4.12.1983	179					
PAKISTAN	Chakwal	18.10.1983	190	20	50			
PAKISTAN	Dokri	2.11.1983	157					
PAKISTAN	Islamabad	25.10.1983	201				1	Nogas+ Nuvacron
PAKISTAN	Quette	23.10.1983	210	20	50		5	
SYRIA	Gelline	22.11.1983	189					
SYRIA	Heimo	22.11.1983	175					
SYRIA	Izra'a	22.11.1983	192					
SYRIA	Tel Hadya	16.11.1983	179		50			
TURKEY	Izmir	29.12.1983	160	3	8			

Table 5.4.2. Time to flowering (days) for entries in the LISN-S at different locations during 1983/84.

ENTRY NAME		ORIGIN	ARGENTINA	ETHIOPIA		JORDAN	LEBANON	MOROCCO	PAKISTAN				SYRIA				TURKEY	MEAN
ILL/CROSS	PEDIGREE		Salta	Debre Zeit-1	Debre Zeit-2	Jubeiha	Terbol	Marchouch	Chakwal	Dokri	Islamabad	Quette	Gelline	Heimo	Izra'a	Tel Hadya	Izmir	
241	-	Syria	96	89	76	133	150	119	141	129	175	175	149	135	144	137	128	132
346	78S 26083	Mexico	98	85	68	128	146	116	141	124	157	162	149	134	143	132	130	128
1868	-	Syria	95	65	74	130	146	112	140	126	156	180	148	134	143	130	125	127
2194	-	Pakistan	97	87	74	130	146	116	144	127	175	162	149	134	146	139	131	130
4401	81S 38084	Syria	91	64	69	127	143	107	137	120	157	162	146	124	140	127	125	123
176x35	FLIP 84-2L	ICARDA	98	80	74	130	146	112	127	124	172	175	156	134	145	137	132	129
294x226	FLIP 84-3L	ICARDA	99	85	74	134	150	108	144	131	172	170	133	135	144	134	124	129
176x555	FLIP 84-4L	ICARDA	98	93	75	129	146	116	133	129	175	175	150	135	144	137	129	131
244x555	FLIP 84-5L	ICARDA	99	-	77	139	150	99	140	129	175	198	155	135	148	137	129	136
244x555	FLIP 84-6L	ICARDA	102	93	76	143	150	130	141	131	175	175	154	135	147	134	123	134
289x701	FLIP 84-7L	ICARDA	99	85	74	144	152	130	133	124	157	190	155	135	141	141	129	133
345x35	FLIP 84-8L	ICARDA	95	65	73	127	146	112	141	124	156	164	149	134	140	130	124	125
351x213	FLIP 84-9L	ICARDA	93	91	73	130	146	112	142	131	157	170	149	134	145	134	125	129
253x470	FLIP 84-10L	ICARDA	97	90	75	129	150	119	137	124	159	172	147	134	144	137	122	129
253x470	FLIP 84-11L	ICARDA	97	91	74	134	146	127	141	124	157	170	147	134	143	137	125	130
323x470	FLIP 84-12L	ICARDA	97	93	75	127	150	116	144	131	157	172	147	134	140	134	123	129
101x212	FLIP 84-13L	ICARDA	91	65	64	127	143	116	140	124	157	170	143	134	141	132	122	125
149x321	FLIP 84-14L	ICARDA	103	92	78	135	150	116	144	128	175	170	143	135	141	137	128	132
149x321	FLIP 84-15L	ICARDA	103	93	64	128	150	127	133	128	175	176	148	135	143	137	124	131
149x321	FLIP 84-16L	ICARDA	96	92	70	128	150	127	142	127	157	175	144	135	140	137	125	130
149x321	FLIP 84-17L	ICARDA	99	92	75	127	146	116	140	131	173	175	146	134	141	137	125	130
149x321	FLIP 84-18L	ICARDA	100	91	75	130	150	116	144	131	175	172	146	134	141	137	123	131
149x321	FLIP 84-19L	ICARDA	98	58	73	130	146	116	83	131	175	172	148	135	143	137	124	125
149x321	FLIP 84-20L	ICARDA	98	92	74	129	150	116	144	129	175	175	143	135	140	137	123	131
885x214	FLIP 84-21L	ICARDA	97	93	73	136	152	119	137	127	158	172	151	134	140	134	121	130
885x470	FLIP 84-22L	ICARDA	91	66	64	128	150	112	135	129	158	200	144	134	142	137	122	127
885x470	FLIP 84-66L	ICARDA	97	80	74	132	150	116	128	124	158	172	146	134	141	137	123	127
254x277	FLIP 84-24L	ICARDA	93	80	64	132	146	108	130	125	158	175	151	134	142	134	125	126
774x1LWL1	FLIP 84-25L	ICARDA	99	85	64	135	150	116	135	125	158	198	154	135	143	141	124	131
20x1LWL1	FLIP 84-26L	ICARDA	72	54	64	126	145	107	135	124	158	170	145	126	139	127	120	121
20x1LWL1	FLIP 84-27L	ICARDA	91	53	64	127	143	107	133	124	158	172	147	126	141	127	116	122
20x1LWL1	FLIP 84-67L	ICARDA	85	53	75	125	145	107	133	124	158	170	145	126	139	127	121	122
20x1LWL1	FLIP 84-29L	ICARDA	88	52	64	125	143	107	133	124	158	175	142	126	141	127	122	122
(176x35) X (445x35)	FLIP 84-30L	ICARDA	96	91	83	128	150	112	139	127	158	170	151	134	140	134	120	129
(176x470) X (289x470)	FLIP 84-31L	ICARDA	99	85	63	134	146	116	130	124	158	175	148	126	141	134	122	127
(176x470) X (289x470)	FLIP 84-32L	ICARDA	92	91	74	128	146	116	139	129	158	170	147	134	141	134	122	128
(289x470) X (445x35)	FLIP 84-33L	ICARDA	99	90	75	131	150	116	135	132	158	170	150	134	139	134	126	129
(289x470) X (445x35)	FLIP 84-34L	ICARDA	96	92	79	139	152	116	130	129	176	180	154	134	140	132	120	131
(449x470) X (445x199)	FLIP 84-35L	ICARDA	99	92	76	141	152	127	134	131	174	172	153	134	142	137	122	132
(176x550) X (333x173)	FLIP 84-36L	ICARDA	98	85	72	140	152	119	107	131	158	162	150	135	141	139	126	128
(176x555) X (333x210)	FLIP 84-37L	ICARDA	98	93	79	139	150	127	127	128	140	175	155	135	149	139	127	131
(176x555) X (333x210)	FLIP 84-38L	ICARDA	103	90	73	140	152	127	103	132	176	175	153	135	143	137	128	131
(176x555) X (333x210)	FLIP 84-39L	ICARDA	99	93	74	141	152	119	127	131	176	198	155	135	142	137	122	133
(176x555) X (333x210)	FLIP 84-40L	ICARDA	99	94	64	129	152	127	115	132	179	175	153	135	148	139	122	131
345x470	FLIP 84-41L	ICARDA	91	85	80	130	146	107	116	120	158	172	150	126	139	130	128	125
345x35	FLIP 84-42L	ICARDA	93	85	74	144	145	107	130	120	141	172	147	126	140	130	122	125
500x1719	FLIP 84-43L	ICARDA	98	90	73	131	152	112	141	132	157	100	156	135	141	137	123	125
500x1719	FLIP 84-44L	ICARDA	99	85	80	139	152	112	133	132	158	172	150	134	140	134	122	129
500x1719	FLIP 84-45L	ICARDA	99	94	67	139	150	116	130	131	157	170	150	134	144	137	125	130
610x784	FLIP 84-46L	ICARDA	99	90	79	139	150	116	139	124	157	200	147	134	145	132	126	132
39x784	FLIP 84-47L	ICARDA	98	85	76	130	146	107	137	133	157	172	151	134	139	130	124	128
262x35	FLIP 84-48L	ICARDA	82	86	79	130	146	107	135	124	157	168	149	134	141	130	123	126
262x35	FLIP 84-49L	ICARDA	97	80	77	128	146	107	135	124	157	170	146	124	142	130	122	126
262x784	FLIP 84-50L	ICARDA	97	91	80	139	150	116	137	124	176	168	146	134	146	137	125	131
883x470	FLIP 84-51L	ICARDA	82	49	54	132	145	107	134	107	106	172	150	124	140	116	121	116
262x445	FLIP 84-53L	ICARDA	93	94	64	129	146	127	117	133	142	168	152	134	144	137	119	127
883x470	FLIP 84-54L	ICARDA	123	88	83	130	146	107	128	124	157	170	153	134	143	130	122	129
-	FLIP 84-55L	ICARDA	123	85	74	140	152	112	138	121	157	172	150	134	142	132	120	130
-	FLIP 84-56L	ICARDA	98	89	74	126	145	112	139	124	157	200	149	126	141	125	122	128
500x35	FLIP 84-57L	ICARDA	95	85	64	138	146	107	127	124	157	170	151	134	143	132	123	126
39x479	FLIP 84-58L	ICARDA	98	90	75	127	143	107	133	124	157	166	147	126	140	123	125	125
39x784	FLIP 84-59L	ICARDA	99	90	73	130	152	116	139	121	157	170	148	136	144	132	123	129
500x254	FLIP 84-60L	ICARDA	91	58	73	127	143	107	128	107	157	170	145	124	142	127	125	122
253x470	FLIP 84-61L	ICARDA	98	80	73	138	146	116	139	124	157	164	146	134	139	132	126	127
4401	Syrian Local	Syria	98	90	72	129	147	115	140	129	160	171	150	134	142	132	122	129
16	78S 26013	Jordan	98	92	76	132	147	110	134	129	160	184	148	134	143	131	124	129
	Local check	-	87	58	67	129	154	126	92	103	141	176	147	134	140	127	123	-
Location mean			97	83	73	132	148	115	133	126	161	173	149	133	142	133	124	

Table 5.4.3. Time to maturity (days) for entries in the LISN-S at different locations during 1983/84.

ENTRY NAME		ARGENTINA	EGYPT	ETHIOPIA		LEBANON	MOROCCO	PAKISTAN				SYRIA				TURKEY	MEAN
ILL/CROSS	PEDIGREE	Salta	Mallawi	Debre Zeit-1	Debre Zeit-2	Terbol	Marchouch	Chakwal	Dokri	Islamabad	Quette	Galline	Heimo	Izra'a	Tel-Hadya	Izmir	
241	-	152	140	145	113	203	177	187	157	201	200	187	175	188	179	158	171
346	78S 26083	141	138	117	112	203	158	186	145	194	190	181	168	187	172	156	163
1868	-	145	129	119	114	193	159	186	148	194	220	182	168	183	172	154	164
2194	-	153	136	145	110	203	177	190	152	196	190	186	168	188	178	154	168
4401	81S 38084	147	144	114	107	201	158	182	138	189	190	186	168	181	167	154	162
176x35	FLIP 84-2L	157	137	115	113	201	163	168	153	196	195	184	168	187	174	156	164
294x226	FLIP 84-3L	147	139	145	114	203	163	191	150	196	200	187	175	188	177	154	169
176x555	FLIP 84-4L	145	139	145	113	203	159	176	153	194	190	186	168	186	174	155	166
244x555	FLIP 84-5L	147	130	146	140	203	166	186	153	201	210	185	175	191	176	154	171
244x555	FLIP 84-6L	155	139	146	144	203	175	186	150	201	200	188	175	192	178	154	172
289x701	FLIP 84-7L	156	140	120	110	201	166	176	154	194	205	189	168	189	179	158	167
345x35	FLIP 84-8L	150	138	119	114	193	159	187	147	194	200	184	168	185	172	154	164
351x213	FLIP 84-9L	155	140	120	105	198	158	187	149	196	200	184	168	182	173	156	165
253x470	FLIP 84-10L	144	143	146	135	198	163	181	152	196	210	186	168	189	179	153	170
253x470	FLIP 84-11L	147	139	145	118	198	166	186	150	196	200	187	168	184	179	156	168
323x470	FLIP 84-12L	144	140	145	135	198	159	190	152	196	210	184	168	191	173	153	169
101x212	FLIP 84-13L	135	143	118	105	195	158	186	152	189	200	183	168	185	167	153	162
149x321	FLIP 84-14L	140	140	145	105	195	158	190	154	196	210	182	168	182	173	157	166
149x321	FLIP 84-15L	145	143	145	106	195	158	176	149	196	198	182	168	184	172	154	165
149x321	FLIP 84-16L	140	146	145	105	198	158	187	153	196	210	182	168	180	173	156	166
149x321	FLIP 84-17L	147	146	145	107	195	158	185	149	196	200	181	168	186	173	154	166
149x321	FLIP 84-18L	151	143	145	106	198	158	191	148	196	200	182	168	184	173	154	166
149x321	FLIP 84-19L	145	144	145	105	193	158	144	150	199	200	183	168	182	173	156	163
149x321	FLIP 84-20L	143	128	145	105	195	158	191	150	196	210	182	168	182	173	157	166
885x214	FLIP 84-21L	140	141	120	110	203	163	182	149	196	200	185	168	184	176	158	165
885x470	FLIP 84-22L	145	140	117	105	201	161	180	147	196	225	184	168	185	176	158	166
885x470	FLIP 84-66L	145	132	117	106	201	175	170	150	196	205	182	168	183	173	158	164
254x277	FLIP 84-24L	145	131	120	105	201	163	173	149	196	205	184	168	187	176	157	164
774x1LWL1	FLIP 84-25L	145	134	145	105	195	161	181	151	196	220	182	168	184	178	158	167
20x1LWL1	FLIP 84-26L	140	130	120	106	201	161	180	157	196	200	183	168	186	172	160	164
20x1LWL1	FLIP 84-27L	143	139	120	106	201	158	175	154	196	205	184	168	187	173	156	164
20x1LWL1	FLIP 84-67L	139	132	120	110	203	159	176	153	196	200	186	168	186	173	154	164
20x1LWL1	FLIP 84-29L	145	143	119	110	201	158	176	148	196	200	185	168	185	172	157	164
(176x35) X (445x35)	FLIP 84-30L	147	140	145	110	203	163	186	154	196	200	185	168	187	179	160	168
(176x470) X (289x470)	FLIP 84-31L	147	138	145	107	195	163	172	152	201	210	182	168	183	173	156	166
(176x470) X (289x470)	FLIP 84-32L	143	133	145	110	193	159	187	152	196	200	183	168	183	173	162	166
(289x470) X (445x35)	FLIP 84-33L	143	139	122	106	198	161	180	151	189	210	184	168	181	173	154	164
(289x470) X (445x35)	FLIP 84-34L	150	130	145	145	203	163	172	156	196	210	188	168	186	173	160	170
(449x470) X (445x199)	FLIP 84-35L	143	140	145	106	203	179	180	153	189	200	186	168	181	173	154	167
(176x550) X (333x173)	FLIP 84-36L	147	133	119	105	201	178	143	153	201	190	187	168	185	178	154	163
(176x555) X (333x210)	FLIP 84-37L	150	138	145	145	203	179	169	149	196	200	189	168	187	178	160	170
(176x555) X (333x210)	FLIP 84-38L	147	140	145	144	203	178	137	152	201	195	179	168	185	178	156	167
(176x555) X (333x210)	FLIP 84-39L	153	134	145	144	203	175	169	157	169	220	188	168	187	179	160	170
(176x555) X (333x210)	FLIP 84-40L	153	137	145	141	203	179	153	154	169	200	188	168	182	178	161	167
345x470	FLIP 84-41L	135	140	119	105	198	158	154	153	196	205	185	168	182	167	158	162
345x35	FLIP 84-42L	143	131	120	110	201	158	172	151	189	200	185	168	181	172	154	162
500x1719	FLIP 84-43L	140	133	145	109	203	158	185	154	196	220	187	168	182	173	157	167
500x1719	FLIP 84-44L	147	137	145	106	198	158	175	152	196	205	186	168	182	173	157	166
500x1719	FLIP 84-45L	150	144	145	111	203	165	171	150	169	200	187	168	184	177	154	165
610x784	FLIP 84-46L	152	138	145	141	198	158	186	156	196	220	186	168	184	172	154	170
39x784	FLIP 84-47L	153	137	121	106	201	158	182	151	189	200	187	168	185	173	158	165
262x35	FLIP 84-48L	135	152	145	113	198	161	180	157	196	190	184	168	185	173	158	166
262x35	FLIP 84-49L	145	142	117	110	195	158	160	151	169	200	182	168	184	172	156	162
262x784	FLIP 84-50L	140	140	145	144	198	158	181	152	196	190	184	168	185	173	154	167
883x470	FLIP 84-51L	140	142	117	114	198	161	179	150	196	200	186	175	186	172	157	165
262x445	FLIP 84-53L	143	140	121	114	201	179	156	153	189	190	184	168	183	178	156	164
883x470	FLIP 84-54L	155	141	145	114	201	161	170	152	196	200	187	168	186	173	159	167
-	FLIP 84-55L	155	133	145	106	201	161	184	155	196	210	184	168	182	172	154	167
-	FLIP 84-56L	155	142	145	105	201	158	185	154	196	220	187	168	183	167	154	168
500x35	FLIP 84-57L	155	140	121	107	203	163	168	150	196	210	182	168	184	172	161	165
39x479	FLIP 84-58L	153	144	145	110	193	158	177	149	196	190	184	168	185	167	154	165
39x784	FLIP 84-59L	150	146	145	111	201	161	184	148	196	195	187	168	185	173	154	167
500x254	FLIP 84-60L	152	136	115	110	201	158	169	146	189	200	188	168	188	172	154	163
253x470	FLIP 84-61L	153	143	118	110	198	161	185	151	196	190	184	168	186	173	154	165
4401	Syrian Local	148	141	125	109	200	161	186	151	198	198	183	168	186	173	155	165
16	78S 26013	147	139	145	111	195	158	178	153	191	208	184	168	185	172	156	166
	Local check	130	140	118	108	203	177	152	125	186	205	183	168	184	168	156	-
Location mean		147	139	134	114	200	163	177	151	194	203	185	169	185	174	156	

Table 5.4.4. Plant height (cm) for entries in the LISN-S at different locations during 1983/84.

ENTRY NAME		ARGENTINA	EGYPT	ETHIOPIA		JORDAN	LEBANON	PAKISTAN				SYRIA				TURKEY	MEAN
ILL/CROSS	PEDIGREE	Salta	Mallowi	Debre Zeit-1	Debre Zeit-2	Jubeiha	Terbol	Chakwal	Dokri	Islamabad	Quette	Gelline	Heimo	Izra'a	Tel-Hadya	Izmir	
241	-	31	30	32	35	40	25	27	30	40	21	28	21	16	28	60	31
346	78S 26083	29	38	25	25	38	25	30	35	32	19	27	21	21	27	56	30
1868	-	24	37	32	20	40	29	31	28	36	21	24	22	22	27	52	30
2194	-	29	44	32	30	37	35	31	32	34	19	28	22	22	21	60	32
4401	81S 38084	20	45	29	25	42	26	30	31	29	21	27	23	20	24	39	29
176x35	FLIP 84-2L	28	42	36	25	40	32	33	32	41	18	30	20	24	25	52	32
294x226	FLIP 84-3L	31	41	34	20	38	26	33	28	36	21	28	20	27	28	51	31
176x555	FLIP 84-4L	28	48	30	25	40	27	29	33	37	20	26	22	20	23	50	31
244x555	FLIP 84-5L	29	31	29	30	41	30	29	32	37	22	28	22	18	26	56	31
244x555	FLIP 84-6L	35	37	33	40	42	35	31	34	37	20	30	20	19	30	59	33
289x701	FLIP 84-7L	27	46	33	30	43	42	30	39	42	18	27	23	25	22	61	34
345x35	FLIP 84-8L	26	44	28	25	40	38	30	29	29	21	26	20	24	25	51	30
351x213	FLIP 84-9L	28	42	26	25	37	40	25	30	32	15	27	20	25	24	59	30
253x470	FLIP 84-10L	30	46	28	25	39	30	30	32	34	20	30	25	21	25	56	31
253x470	FLIP 84-11L	28	44	33	25	40	30	30	30	32	17	29	20	25	25	62	31
323x470	FLIP 84-12L	27	45	28	20	38	32	29	27	34	20	30	23	27	20	58	31
101x212	FLIP 84-13L	24	45	34	30	36	28	30	23	28	18	28	20	24	27	60	30
149x321	FLIP 84-14L	22	48	26	20	30	31	31	24	29	17	27	20	23	20	52	28
149x321	FLIP 84-15L	16	48	23	20	32	30	29	26	31	20	26	20	18	22	52	28
149x321	FLIP 84-16L	25	47	28	25	35	33	30	20	28	18	29	20	24	25	49	29
149x321	FLIP 84-17L	25	40	25	20	35	22	29	20	35	20	29	22	17	21	46	27
149x321	FLIP 84-18L	27	52	29	20	36	25	30	26	30	20	29	21	17	23	50	29
149x321	FLIP 84-19L	24	50	26	20	34	38	29	27	29	20	29	21	19	23	45	29
149x321	FLIP 84-20L	25	43	21	25	34	33	30	24	31	17	27	22	22	22	47	28
885x214	FLIP 84-21L	27	46	27	25	40	44	31	29	39	20	27	24	32	35	58	34
885x470	FLIP 84-22L	23	39	29	35	42	33	29	25	29	18	30	22	25	25	60	31
885x470	FLIP 84-66L	26	44	36	25	50	35	30	25	35	17	28	21	20	22	63	32
254x277	FLIP 84-24L	26	46	41	35	40	45	29	31	36	21	26	22	25	30	62	34
774x1LWL1	FLIP 84-25L	28	43	32	20	40	45	30	32	37	18	29	21	27	22	66	33
20x1LWL1	FLIP 84-26L	29	50	36	30	43	28	31	32	40	20	27	23	28	37	54	34
20x1LWL1	FLIP 84-27L	25	42	36	45	48	37	30	34	38	21	26	22	26	36	68	36
20x1LWL1	FLIP 84-67L	25	47	36	30	42	32	35	36	37	21	25	21	30	37	60	34
20x1LWL1	FLIP 84-29L	25	45	39	30	38	37	30	34	38	20	27	24	29	37	57	34
(176x35) X (445x35)	FLIP 84-30L	31	42	34	30	39	35	-	33	41	21	26	22	30	30	54	33
(176x470) X (289x470)	FLIP 84-31L	25	41	36	35	46	47	30	31	36	20	29	20	29	25	46	33
(176x470) X (289x470)	FLIP 84-32L	27	44	26	30	44	40	30	27	30	19	29	20	26	25	68	32
(289x470) X (445x35)	FLIP 84-33L	34	34	26	25	37	40	30	31	33	19	28	20	25	21	52	30
(289x470) X (445x35)	FLIP 84-34L	30	41	28	40	45	40	30	33	31	20	27	21	35	26	71	35
(449x470) X (445x199)	FLIP 84-35L	30	40	29	20	40	35	30	30	33	20	28	18	24	19	48	30
(176x550) X (333x173)	FLIP 84-36L	28	44	36	30	45	44	27	54	45	17	28	20	37	22	51	35
(176x555) X (333x210)	FLIP 84-37L	35	39	35	30	55	46	28	38	44	20	31	23	37	23	77	37
(176x555) X (333x210)	FLIP 84-38L	30	43	32	20	47	44	25	51	45	17	26	22	40	30	70	36
(176x555) X (333x210)	FLIP 84-39L	35	44	37	35	47	46	30	44	42	20	27	20	30	25	70	37
(176x555) X (333x210)	FLIP 84-40L	31	42	34	30	40	50	29	35	40	17	35	22	31	21	61	35
345x470	FLIP 84-41L	31	35	29	35	45	47	-	32	36	21	26	20	37	21	59	34
345x35	FLIP 84-42L	24	47	33	20	42	27	30	31	31	20	24	20	27	20	61	30
500x1719	FLIP 84-43L	28	37	36	35	45	36	29	35	41	18	27	20	30	25	67	34
500x1719	FLIP 84-44L	27	41	39	45	42	45	29	40	41	20	26	22	26	33	64	36
500x1719	FLIP 84-45L	33	44	29	30	50	38	30	32	34	20	31	21	22	25	54	33
610x784	FLIP 84-46L	27	44	33	20	48	48	30	55	36	21	27	21	31	25	68	36
39x784	FLIP 84-47L	28	40	37	25	40	38	30	41	38	19	26	20	24	24	65	33
262x35	FLIP 84-48L	27	48	37	25	32	35	30	32	31	21	28	21	22	23	55	31
262x35	FLIP 84-49L	24	45	40	45	40	40	30	30	29	21	28	22	29	20	52	33
262x784	FLIP 84-50L	32	46	41	20	45	43	30	33	37	21	30	25	30	25	61	35
883x470	FLIP 84-51L	31	38	43	20	45	50	31	45	36	19	28	22	31	25	60	35
262x445	FLIP 84-53L	28	37	25	30	50	40	30	33	33	16	29	21	28	23	70	33
883x470	FLIP 84-54L	32	39	36	25	38	40	-	53	35	20	23	20	26	25	59	34
-	FLIP 84-55L	26	44	32	35	54	43	30	-	34	19	23	21	28	27	79	35
-	FLIP 84-56L	30	41	38	25	52	50	33	-	33	19	29	21	22	26	67	35
500x35	FLIP 84-57L	28	43	31	30	45	38	35	-	32	18	27	20	28	20	66	33
39x479	FLIP 84-58L	28	38	38	25	48	35	31	-	40	17	28	22	25	25	58	33
39x784	FLIP 84-59L	29	47	34	25	52	50	29	-	38	17	29	22	26	34	64	35
500x254	FLIP 84-60L	26	40	38	20	42	49	30	-	30	17	27	22	20	27	56	32
253x470	FLIP 84-61L	26	45	37	25	45	47	30	-	36	17	28	20	25	25	60	33
4401	Syrian Local	26	42	28	28	42	35	31	26	34	20	28	21	24	25	55	31
16	78S 26013	28	45	32	27	41	39	29	35	35	20	29	22	23	27	57	33
	Local check	24	47	37	33	40	51	30	37	31	19	30	21	27	29	54	-
Location mean		28	43	32	28	42	37	30	33	35	19	28	21	26	26	58	

Table 5.4.5. Adjusted seed yield (Y=kg/ha) and ranking (R) of entries in LISN-S at different locations during 1983/84.

ENTRY NAME		ARGENTINA		EGYPT		ETHIOPIA				JORDAN		LEBANON		MOROCCO		PAKISTAN							
ILL/CROSS	PEDIGREE	Salta		Mallawi		Debre Zeit-1		Debre Zeit-2		Jubeiha		Terbol		Marchouch		Chakwal		Dokri		Islamabad		Quette	
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
241	-	781	42	618	52	160	26	0	51	784	65	1053	42	1167	33	813	15	125	42	342	50	2126	2
346	78S 26083	1048	28	1826	3	54	50	0	51	1314	43	920	50	700	58	626	29	408	3	342	50	926	35
1868	-	648	50	951	38	210	21	0	51	1074	52	1498	25	934	46	559	39	258	5	530	29	1059	28
2194	-	1048	28	951	38	73	42	0	51	1674	25	1331	32	1300	23	626	29	150	30	480	33	526	64
4401	81S 38084	381	64	3243	1	85	39	0	51	924	58	1275	33	634	59	559	39	358	4	492	32	793	46
176x35	FLIP 84-2L	1181	15	1201	20	367	14	171	25	1064	53	1453	28	1000	40	786	20	183	15	305	56	793	46
294x226	FLIP 84-3L	2115	1	951	38	367	14	0	51	574	67	1520	23	934	46	586	38	141	37	798	7	859	45
176x555	FLIP 84-4L	1448	6	1243	15	17	55	0	51	854	62	1553	22	567	63	426	54	175	21	323	53	0	67
244x555	FLIP 84-5L	1181	15	1451	7	10	56	0	51	674	66	1720	17	1667	6	493	42	158	27	792	8	793	46
244x555	FLIP 84-6L	1448	6	1118	25	0	57	51	40	894	60	1775	14	1400	14	1093	4	116	43	373	47	793	46
289x701	FLIP 84-7L	2115	1	951	38	573	8	0	51	1124	50	1775	14	734	55	826	13	200	10	436	37	126	65
345x35	FLIP 84-8L	648	50	535	55	0	57	0	51	1094	51	1498	25	467	66	559	39	233	7	361	49	793	46
351x213	FLIP 84-9L	870	34	910	44	69	43	11	48	2117	7	960	45	1000	40	195	64	172	22	248	59	1326	20
253x470	FLIP 84-10L	737	45	1160	22	44	51	211	18	1797	21	1183	36	1634	7	261	63	180	19	317	54	1459	5
253x470	FLIP 84-11L	870	34	118	66	81	40	171	25	2177	4	1183	36	1034	39	728	22	180	19	217	61	1459	5
323x470	FLIP 84-12L	604	55	618	52	88	36	11	48	1627	28	794	55	1467	10	835	11	197	12	298	57	126	65
101x212	FLIP 84-13L	1137	22	201	65	313	17	51	40	2067	8	1349	31	1367	17	488	43	238	6	98	66	793	46
149x321	FLIP 84-14L	337	65	35	67	75	41	0	51	1377	41	849	52	1567	8	595	32	197	12	248	59	1459	5
149x321	FLIP 84-15L	0	67	993	32	56	48	0	51	907	59	872	51	1434	12	395	56	147	34	630	20	1059	28
149x321	FLIP 84-16L	604	55	660	50	56	48	0	51	1717	24	738	58	1300	23	328	58	147	34	92	67	1459	5
149x321	FLIP 84-17L	470	62	993	32	63	45	0	51	1587	35	683	62	900	48	301	61	147	34	380	44	659	59
149x321	FLIP 84-18L	1137	22	951	38	144	28	0	51	1597	33	938	49	1334	20	595	32	138	40	967	2	1059	28
149x321	FLIP 84-19L	870	34	826	45	88	36	78	36	1757	23	805	53	1367	17	328	58	163	26	155	65	1193	24
149x321	FLIP 84-20L	470	62	326	63	44	51	0	51	1607	30	738	58	1134	34	328	58	155	29	380	44	793	46
885x214	FLIP 84-21L	1159	17	1146	23	0	57	47	43	861	61	449	66	1089	36	470	51	150	30	561	25	748	54
885x470	FLIP 84-22L	493	60	1021	29	583	7	73	37	1991	12	616	64	1123	35	937	7	183	15	686	14	1281	22
885x470	FLIP 84-66L	1159	17	1271	14	502	10	47	43	1381	40	783	56	756	54	470	51	183	15	742	12	1140	26
254x277	FLIP 84-24L	1159	17	1604	5	471	11	60	38	1621	29	1672	18	1256	27	670	26	150	30	748	10	1415	15
774x1LWL1	FLIP 84-25L	826	40	1354	11	0	57	47	43	1281	45	1116	39	1056	38	404	55	141	37	373	47	1414	19
20x1LWL1	FLIP 84-26L	1693	4	1396	10	271	19	140	32	1921	15	1883	9	989	44	1137	3	183	15	530	29	748	54
20x1LWL1	FLIP 84-27L	493	60	1813	4	346	16	247	13	1591	34	1783	13	1389	16	590	36	158	27	1086	1	1415	15
20x1LWL1	FLIP 84-67L	1159	17	1896	2	596	6	220	17	1151	48	1672	18	1189	31	804	16	166	24	680	16	1015	32
20x1LWL1	FLIP 84-29L	626	54	938	43	677	5	113	33	1451	38	1838	10	1089	36	804	16	166	24	686	14	615	63
(176x35) X (445x35)	FLIP 84-30L	1159	17	813	46	96	33	180	23	1131	49	449	66	1289	25	4	66	200	10	536	28	1415	15
(176x470) X (289x470)	FLIP 84-31L	493	60	979	34	108	30	33	46	811	63	949	46	623	60	644	27	141	37	586	22	748	54
(176x470) X (289x470)	FLIP 84-32L	893	33	1229	16	21	53	60	38	961	57	949	46	956	45	804	16	150	30	836	4	881	40
(289x470) X (445x35)	FLIP 84-33L	737	45	632	51	0	57	149	27	1004	56	1005	44	1000	40	995	5	0	51	786	9	881	40
(289x470) X (445x35)	FLIP 84-34L	1070	27	507	58	0	57	256	12	1364	42	727	61	867	50	1261	2	0	51	680	16	881	40
(449x470) X (445x199)	FLIP 84-35L	1137	22	1007	30	0	57	149	27	1244	47	783	56	467	66	795	19	0	51	530	29	748	54
(176x550) X (333x173)	FLIP 84-36L	1404	10	1590	6	146	27	149	27	1604	31	1405	29	567	64	595	32	0	51	836	4	1548	3
(176x555) X (333x210)	FLIP 84-37L	870	34	424	61	0	57	442	4	1274	46	616	64	600	61	595	32	0	51	717	13	1015	32
(176x555) X (333x210)	FLIP 84-38L	804	41	965	36	0	57	269	11	804	64	1227	34	600	61	461	53	0	51	580	23	2215	1
(176x555) X (333x210)	FLIP 84-39L	870	34	1424	8	0	57	402	5	1384	39	949	46	1267	26	1395	1	0	51	192	62	881	40
(176x555) X (333x210)	FLIP 84-40L	1137	22	1174	21	0	57	376	7	1034	54	738	58	534	65	861	8	0	51	473	34	1148	26
345x470	FLIP 84-41L	1137	22	1007	30	127	29	176	24	1854	18	805	53	834	52	195	64	41	48	642	18	1015	32
345x35	FLIP 84-42L	604	57	1090	26	458	12	242	14	1804	19	672	63	1700	4	861	8	8	49	911	3	748	54
500x1719	FLIP 84-43L	1004	32	1340	12	96	33	149	27	2274	2	1838	10	1400	14	821	14	0	51	467	35	881	40
500x1719	FLIP 84-44L	1270	14	1049	27	108	30	149	27	2204	3	3227	1	1700	4	861	8	0	51	192	62	1415	15
500x1719	FLIP 84-45L	1048	28	438	60	63	45	202	19	1804	19	1627	20	1232	28	479	44	0	51	384	43	1459	5
610x784	FLIP 84-46L	648	50	771	47	106	32	309	9	1504	37	1794	12	865	51	746	21	205	9	634	19	793	46
39x784	FLIP 84-47L	648	50	354	62	294	18	229	15	1784	22	1994	8	1432	13	613	31	0	51	421	39	659	59
262x35	FLIP 84-48L	1848	3	521	56	206	22	562	3	1864	17	1072	40	1332	21	479	44	197	12	327	52	1459	5
262x35	FLIP 84-49L	248	66	521	56	875	3	762	2	2044	10	1516	24	1198	30	479	44	47	46	421	39	1459	5
262x784	FLIP 84-50L	1315	11	229	64	88	36	322	8	1024	55	1194	35	1498	9	346	57	0	51	746	11	1326	20
883x470	FLIP 84-51L	1048	31	479	59	1288	1	389	6	1644	26	2572	6	2132	1	279	62	138	40	427	38	1193	24
262x445	FLIP 84-53L	1315	11	1229	16	63	45	229	15	1514	36	1183	36	998	43	479	44	0	51	315	55	1459	5
883x470	FLIP 84-54L	1448	6	979	34	94	35	202	19	2164	5	2683	5	1732	3	0	67	0	51	421	39	1459	5
-	FLIP 84-55L	1448	6	1313	13	175	23	202	19	1964	13	1738	16	732	56	479	44	213	8.	615	21	1459	5
-	FLIP 84-56L	515	58	1146	23	169	25	202	19	2474	1	1405	29	1232	29	479	44	0	51	377	46	659	59
500x35	FLIP 84-57L	781	43	771	47	369	13	296	10	2004	11	1016	43	732	56	479	44	172	22	440	36	659	59
39x479	FLIP 84-58L	737	45	1215	18	173	24	7	50	1601	32	2849	3	1445	11	701	24	8	49	273	58	926	35
39x784	FLIP 84-59L	1670	5	715	49	254	20	0	51	1961	14	2794	4	1745	2	835	11	58	45	823	6	926	35
500x254	FLIP 84-60L	870	34	549	54	910	2	87	34	1901	16	3127	2	1178	32	968	6	1116	1	192	62	926	35
253x470	FLIP 84-61L	737	45	1215	18	542	9	33	46	1641	27	1627	20	778	53	701	24	0	51	417	42	926	35
4401	Syrian Local	656	49	1049	27	65	44	80	35	1310	44	1067	41	872	49	642	28	93	44	568	24	1044	31
16	78S 26013	778	44	965	36	18	54	51	40	2058	9	2194	7	1356	19	713	23	43	47	550	27	1200	23
Local check		1311	13	1424	8	811	4	836	1	2143	6	1454	27	1307	22	589	37	1071	2	552	26	1467	4
Location mean		964		991		212		148		1504		1366		1122		616		148		501		1046	
C.V.%		24.1		40.9		43.6		175.9		18.9		26.6		17.4		28.8		110.3		40.6		36.9	
L.S.D. at 5% for:																							
Checks		298		521		129		353		388		495		260		226		248		270		512	
Checks vs. test entries		643		1127		278		762		837		1070		562		488		535		583		1107	
Test entries in the same block		729		1277		315		864		949		1213		637		554		607		661		1254	
Test entries in different blocks		842		1475		364		998		1096		1400		736		639		701		763		1449	
S.E. for:																							
Checks		134		234		58		158		174		222		117		101		111		121		230	
Checks vs. test entries		289		506		125		342		376		480		252		219		240		262		497	
Test entries in the same block		327		573		141		388		426		544		286		248		272		297		563	
Test entries in different blocks		378		662		163		448		492		628		330		287		314		342		650	
The number of lines significantly exceeding the local check		2		1		1		0		0		6		1		4		0		0		0	

Cont'd. ...

Table 5.4.5. Cont'd. 2.

ENTRY NAME ILL/CROSS	PEDIGREE	SYRIA Gelline Y	Gelline R	Heimo Y	Heimo R	Izra'a Y	Izra'a R	Tel Hadya Y	Tel Hadya R	TURKEY Izmir Y	Izmir R	MEAN Y	MEAN R
241	-	662	19	263	45	667	47	669	40	2570	3	800	27
346	78S 26083	762	12	321	36	867	31	722	33	1143	51	749	38
1868	-	662	19	344	28	1167	10	749	32	690	59	708	46
2194	-	562	29	181	54	817	35	176	63	1250	48	697	50
4401	81S 38084	992	4	437	13	767	38	189	62	1303	46	777	32
176x35	FLIP 84-2L	462	41	327	33	967	22	376	58	1330	45	748	39
294x226	FLIP 84-3L	762	12	253	47	917	28	869	24	1410	40	816	23
176x555	FLIP 84-4L	662	19	245	48	767	38	136	65	1983	14	650	59
244x555	FLIP 84-5L	662	19	297	39	717	43	602	49	2543	4	860	14
244x555	FLIP 84-6L	1112	3	175	55	667	47	669	40	1436	39	820	22
289x701	FLIP 84-7L	462	41	123	60	817	35	0	67	1570	32	740	42
345x35	FLIP 84-8L	712	15	412	18	867	31	536	51	1103	52	614	63
351x213	FLIP 84-9L	369	52	265	43	983	20	967	16	1796	21	766	33
253x470	FLIP 84-10L	119	65	423	16	933	26	487	53	1970	16	807	25
253x470	FLIP 84-11L	369	52	193	50	1133	12	713	34	2036	13	791	28
323x470	FLIP 84-12L	819	10	551	4	1833	1	900	19	1356	41	758	34
101x212	FLIP 84-13L	419	47	330	32	1533	3	793	30	1956	17	821	20
149x321	FLIP 84-14L	319	59	301	38	1383	7	860	26	2263	6	742	40
149x321	FLIP 84-15L	469	37	289	41	883	29	700	36	1663	27	656	57
149x321	FLIP 84-16L	619	25	294	40	1433	4	967	16	2050	12	779	31
149x321	FLIP 84-17L	639	23	415	17	1283	8	807	29	2196	7	720	45
149x321	FLIP 84-18L	689	17	333	30	1083	14	980	15	1596	30	846	17
149x321	FLIP 84-19L	419	47	275	42	883	29	847	28	2076	10	758	34
149x321	FLIP 84-20L	249	61	255	46	1433	4	780	31	2156	8	678	52
885x214	FLIP 84-21L	429	46	265	43	950	24	620	46	1534	35	655	58
885x470	FLIP 84-22L	629	24	116	61	700	44	127	66	1921	18	780	30
885x470	FLIP 84-66L	579	27	109	63	700	44	393	56	1467	38	731	43
254x277	FLIP 84-24L	129	64	111	62	550	54	860	26	1974	15	903	10
774x1LWL1	FLIP 84-25L	579	27	81	64	1050	16	193	61	1747	23	729	44
20x1LWL1	FLIP 84-26L	879	7	454	11	850	33	2060	1	1694	26	1052	3
20x1LWL1	FLIP 84-27L	379	50	393	20	1200	9	1367	8	1494	36	984	5
20x1LWL1	FLIP 84-67L	379	50	519	6	950	24	1713	2	1334	42	965	7
20x1LWL1	FLIP 84-29L	699	16	431	14	700	44	1647	3	1547	33	877	13
(176x35) X (445x35)	FLIP 84-30L	79	66	145	57	650	49	660	43	1481	37	643	60
(176x470) X (289x470)	FLIP 84-31L	449	45	184	51	550	54	593	50	1174	39	567	66
(176x470) X (289x470)	FLIP 84-32L	479	35	184	51	600	50	660	43	1547	33	701	49
(289x470) X (445x35)	FLIP 84-33L	519	32	350	26	750	40	291	60	1747	23	678	53
(289x470) X (445x35)	FLIP 84-34L	469	37	346	27	1150	11	878	22	1641	28	756	36
(449x470) X (445x199)	FLIP 84-35L	369	52	389	21	500	57	611	48	1027	53	610	64
(176x550) X (333x173)	FLIP 84-36L	519	32	26	67	550	54	678	38	1334	42	809	24
(176x555) X (333x210)	FLIP 84-37L	469	37	125	58	800	37	384	57	1014	54	584	65
(176x555) X (333x210)	FLIP 84-38L	369	52	50	66	850	33	504	52	1334	42	690	51
(176x555) X (333x210)	FLIP 84-39L	469	37	55	65	1100	13	304	59	2134	9	802	26
(176x555) X (333x210)	FLIP 84-40L	419	47	174	56	600	50	144	64	1921	18	671	54
345x470	FLIP 84-41L	39	67	239	49	600	50	438	54	1001	55	634	62
345x35	FLIP 84-42L	219	62	365	24	300	62	664	42	1881	20	783	29
500x1719	FLIP 84-43L	169	63	327	33	400	60	864	25	1574	31	850	16
500x1719	FLIP 84-44L	269	60	311	37	1000	19	1158	12	1601	29	1032	4
500x1719	FLIP 84-45L	1122	1	482	7	267	63	1180	10	307	63	756	36
610x784	FLIP 84-46L	672	18	584	3	1417	6	1407	5	720	58	823	19
39x784	FLIP 84-47L	352	56	439	12	117	66	873	23	0	67	638	61
262x35	FLIP 84-48L	452	43	606	2	317	61	913	18	974	56	821	20
262x35	FLIP 84-49L	1122	2	462	9	1067	15	673	39	1174	49	879	12
262x784	FLIP 84-50L	752	14	343	29	167	64	620	46	587	60	660	55
883x470	FLIP 84-51L	452	43	331	31	417	58	1313	9	747	57	928	8
262x445	FLIP 84-53L	852	8	183	53	567	53	633	45	241	65	704	47
883x470	FLIP 84-54L	352	56	388	22	417	58	887	21	14	66	828	18
-	FLIP 84-55L	552	30	544	5	967	22	1393	6	441	62	890	11
-	FLIP 84-56L	522	31	608	1	67	67	1500	4	494	61	741	41
500x35	FLIP 84-57L	982	5	469	8	167	64	900	19	281	64	657	56
39x479	FLIP 84-58L	489	34	459	10	933	26	1087	14	2712	2	976	6
39x784	FLIP 84-59L	819	10	401	19	1033	17	1167	11	1739	25	1059	2
500x254	FLIP 84-60L	349	58	124	59	733	42	700	36	4739	1	1154	1
253x470	FLIP 84-61L	889	6	424	15	1033	17	433	55	2272	5	854	15
4401	Syrian Local	478	36	323	35	983	20	713	34	1296	47	702	48
16	78S 26013	600	26	370	23	750	40	1124	13	1749	22	907	9
Local check		828	9	356	25	1567	2	1382	7	2064	11	-	-
Location mean		546		313		833		779		1509			
C.V.%		49.0		35.6		22.7		32.0		82.1			
L.S.D. at 5% for:													
Checks		362		144		258		346		1679			
Checks vs. test entries		782		312		558		748		3628			
Test entries in the same block		887		354		633		849		4113			
Test entries in different blocks		1024		408		731		980		4749			
S.E. for:													
Checks		162		65		116		155		754			
Checks vs. test entries		351		140		250		336		1628			
Test entries in the same block		398		159		284		381		1846			
Test entries in different blocks		460		183		328		440		2132			
The number of lines significantly exceeding the local check		0		0		0		0		0			

Table 5.4.6. The five heaviest seed yielding entries at the individual locations in the LISN-S during 1983/84.

RANK	ARGENTINA		EGYPT		ETHIOPIA				JORDAN		LEBANON	
	Salta		Mallawi		Debre Zeit-1		Debre Zeit-2		Jubeiha		Terbol	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	294x226	FLIP 84-3L (1)	4401	81S 38084	883x470	FLIP 84-51L	-	Local check	-	FLIP 84-56L	500x1719	FLIP 84-44L
2	289x701	FLIP 84-7L	20x1LWL1	FLIP 84-67L	500x254	FLIP 84-60L	262x35	FLIP 84-49L	500x1719	FLIP 84-43L	500x254	FLIP 84-60L
3	262x35	FLIP 84-48L	346	78S 26083	262x35	FLIP 84-49L	262x35	FLIP 84-48L	500x1719	FLIP 84-44L	39x479	FLIP 84-58L
4	20x1LWL1	FLIP 84-26L	20x1LWL1	FLIP 84-27L	-	Local check	(176x555)x (333x210)	FLIP 84-37L	253x470	FLIP 84-11L	39x784	FLIP 84-59L
5	39x784	FLIP 84-59L	254x277	FLIP 84-24L	20x1LWL1	FLIP 84-29L	(176x555)x (333x210)	FLIP 84-39L	883x470	FLIP 84-54L	883x470	FLIP 84-54L

Cont'd. ....

RANK	MOROCCO		PAKISTAN							
	Marchouch		Chakwal		Dokri		Islamabad		Quetta	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	883x470	FLIP 84-51L	(176x555)x (333x210)	FLIP 84-39L	500x254	FLIP 84-60L	20x1LWL1	FLIP 84-27L	(176x555)x (333x210)	FLIP 84-38L
2	39x784	FLIP 84-59L	(289x470)x (445x35)	FLIP 84-34L	-	Local check	149x321	FLIP 84-18L	241	-
3	883x470	FLIP 84-54L	20x1LWL1	FLIP 84-26L	346	78S 26083	345x35	FLIP 84-42L	(176x550)x (333x173)	FLIP 84-36L
4	345x35	FLIP 84-42L	244x555	FLIP 84-6L	4401	81S 38084	(176x470)x (289x470)	FLIP 84-32L	-	Local check
5	500x1719	FLIP 84-44L	(289x470)x (445x35)	FLIP 84-33L	1868	-	(176x550)x (333x173)	FLIP 84-36L	253x470	FLIP 84-10L
									253x470	FLIP 84-11L
									149x321	FLIP 84-14L
									149x321	FLIP 84-16L
									500x1719	FLIP 84-45L
									262x35	FLIP 84-48L
									262x35	FLIP 84-49L
									262x445	FLIP 84-53L
									883x470	FLIP 84-54L
									-	FLIP 84-55L

Cont'd. ....

RANK	SYRIA								TURKEY	
	Gelline		Heimo		Izra'a		Tel Hadya		Izmir	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	500x1719	FLIP 84-45L	-	FLIP 84-56L	323x470	FLIP 84-12L	20x1LWL1	FLIP 84-26L	500x254	FLIP 84-60L
2	262x35	FLIP 84-49L	262x35	FLIP 84-48L	-	Local check	20x1LWL1	FLIP 84-67L	39x479	FLIP 84-58L
3	244x555	FLIP 84-6L	610x784	FLIP 84-46L	101x212	FLIP 84-13L	20x1LWL1	FLIP 84-29L	241	-
4	4401	81S 38084	323x470	FLIP 84-12L	149x321	FLIP 84-16L	-	FLIP 84-56L	244x555	FLIP 84-5L
5	500x35	FLIP 84-57L	-	FLIP 84-55L	149x321	FLIP 84-20L	610x784	FLIP 84-46L	253x470	FLIP 84-61L

(1) The brackets indicate entries having the same rank.

Results and Discussion

The location mean for time to flowering (Table 5.4.2), time to maturity (Table 5.4.3) and plant height (Table 5.4.4) ranged from 73 to 173 days, 114 to 203 days and 19 to 58 cm, respectively. However, the means of the entries over locations ranged from 116 to 136 days, 162 to 172 days, and 27 to 37 cm for time to flowering, time to maturity and plant height, respectively.

Adjusted seed yields of different entries over locations are given in Table 5.4.5. The location mean yield was highest at Izmir in Turkey (1509 kg/ha) and was followed by Jubeiha in Jordan (1504 kg/ha), Terbol in Lebanon (1366 kg/ha), Marchouch in Morocco (1122 kg/ha) and Quette in Pakistan (1046 kg/ha). The CV was very high at Debre Zeit 2 in Ethiopia (175.9%), Dokri in Pakistan (110.3%) and Izmir in Turkey (82.1%). However, at other locations it ranged from 17.4% to 49%. The LSD estimates at different locations revealed that out of 16 locations, only at 6 locations namely Salta (Argentina), Mallawi (Egypt), Debre Zeit 1 (Ethiopia), Terbol (Lebanon), Marchouch (Morocco), and Chakwal (Pakistan), 22, 1, 1, 6, 1, and 4 entries, respectively, exceeded the local check by a significant margin. The average performance of the entries over locations showed that FLIP 84-60L, FLIP 84-59L, FLIP 84-26L, FLIP 84-44L and FLIP 84-27L were the best lines. The five heaviest yielders at each location are given in Table 5.4.6.

5.5. LENTIL INTERNATIONAL SCREENING NURSERY - EARLY (LISN-E)

Material

The Lentil International Screening Nursery - Early (LISN-E) comprised of 59 test entries including elite germplasm accessions received from other centres and selections made at ICARDA. In addition, there were three checks, two namely ILL 4354 and ILL 4605 were supplied by ICARDA and the third check, the best local cultivar, was to be added by the cooperator.

Methods and Management

The nursery was grown in an augmented block design. The suggested plot size was a single row plot, 4 m long, with 200 seeds/plot. The cooperators were urged to use the locally recommended agronomic practices for the management of the nursery.

Forty sets of nursery were distributed to cooperators in 16 countries. Data were received from 22 sites and were analysable for 17 sites. The details of the agronomic practices supplied by the cooperators are given in Table 5.5.1.

Results and Discussion

The overall mean for entries ranged from 85 to 117 days for time to flowering (Table 5.5.2), 141 to 157 days for time to maturity

(Table 5.5.3), and 27 to 42 cm for plant height (Table 5.5.4). Precoz and L 830 were the lines taking least time to flowering and were the earliest in maturity also. With respect to plant height, F130 (ILL 813) was the tallest entry (42 cm). The comparison of location mean with local check for time to flowering at Chillan (Chile), Debre Zeit (Ethiopia), Marchouch (Morocco), and Tel Hadya (Syria), revealed that most of the entries supplied by ICARDA were earlier at these locations. At other locations also there were some entries which were earlier or at least flowering at the same time as that of local check. Similar was the trend with time to maturity. These entries which are as early as the local or earlier than the local need special consideration in breeding program.

The adjusted seed yields based on the augmented design are given in Table 5.5.5. The yield levels at Bahteem in Egypt, Debre Zeit 2 in Ethiopia, Heredia in Costa Rica, Sidi Laidi in Morocco, and Khumaltar in Nepal were very low (ranging from 187 to 311 kg/ha). The highest mean yield was recorded at Chillan in Chile (1194 kg/ha). The CV ranged from 19.1 per cent for Dokri in Pakistan to 181.2 per cent for Debre Zeit 2 in Ethiopia. The LSD estimates revealed that at Chillan in Chile; Debre Zeit in Ethiopia; Sidi Laidi in Morocco; Khumaltar in Nepal; Bahawalpur, Dokri, Islamabad and Lahore in Pakistan; Tel Hadya in Syria; and Beja in Tunisia, 10, 1, 4, 9, 17, 35, 20, 19, 5 and 2 entries, respectively, outyielded the local check by a significant margin. At some other locations one or two entries outyielded the local check. On the basis of average over locations, FLIP 84-112L, ILL 4354, FLIP 84-29L, ILL 4236, and ILL 3516, respectively, were the top yielders. The five heaviest yielding entries at individual locations are given in Table 5.5.6. It was noted that at almost all the locations the top five lines were the lines from ICARDA.

The frequency of occurence of lines among the top five was highest for FLIP 84-112L (7 times). All other lines occured among the top five for 4 or less times.

5.6. LENTIL INTERNATIONAL SCREENING NURSERY - TALL - ERECT (LISN-T-E)

Material

The material for the Lentil International Screening Nursery - Tall - Erect comprised of 48 test entries and 3 checks, two checks were supplied and one local check was to be added by the cooperator. The entries were selected on the basis of their performance from the germplasm collections and progenies from crosses grown at ICARDA. All the material was tall, considered to be suitable for mechanical harvesting with a cutter bar under normal growing conditions.

Table 5.5.1. Agronomic data for different locations in the LISN-E during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
CHILE	Chillan	18.6.1984	182		90			Linuron
COSTA RICA	Heredia	1.11.1984	134	15	150	15	1	Volaton
EGYPT	Bahteem	23.11.1983	157	25	75		3	
ETHIOPIA	Debre Zeit-1	16.7.1984	135					Bravo
ETHIOPIA	Debre Zeit-2	7.2.1984	107					
INDIA	New Delhi	24.11.1983	137	20	40		2	Basalin,Metasystox
MOROCCO	Marchouch	4.12.1983	166		29			
MOROCCO	Sidi Laidi	14.12.1983	154	30	50	60		
NEPAL	Khumaltar	3.11.1983	184	20	40			
NEPAL	Parwanipur	4.11.1983	140	20	20	20		
PAKISTAN	Bahawalpur	12.11.1983	157	18	46		2	Thiodan
PAKISTAN	Chakwal	18.10.1983	190	20	50			
PAKISTAN	Dokri	2.11.1983	140					
PAKISTAN	Islamabad	26.10.1983	194				1	Nogas, Nuvacron
PAKISTAN	Lahore	4.11.1983	162					
PAKISTAN	Quette	22.10.1983	220	20	50		5	
TUNISIA	Beja							
SYRIA	Tel Hadya	16.11.1983	178		50			

Table 5.5.2. Time to flowering of entries at different locations in the LISN-E during 1983/84.

ENTRY NAME ILL/ CROSS	PEDIGREE	ORIGIN	CHILE Chillan	COSTA RICA Heredia	EGYPT Bahteem	ETHIOPIA Debre Zeit-1	ETHIOPIA Debre Zeit-2	INDIA New Delhi	MOROCCO Marchouch	NEPAL Parwanipur	PAKISTAN Bahawalpur	PAKISTAN Chakwal	PAKISTAN Dokri	PAKISTAN Islamabad	PAKISTAN Lahore	PAKISTAN Quette	SYRIA Tel Hadya	MEAN
1	76TA 66005	Jordan	111	76	88	52	50	81	107	85	95	116	102	150	101	170	123	100
358	-	Mexico	113	95	102	72	67	96	116	85	109	119	102	150	111	170	134	109
784	Giza 9	Egypt	118	95	95	56	68	88	116	80	93	69	90	136	90	170	130	100
813	F-130	Egypt	120	85	98	80	65	110	132	75	107	116	101	150	108	180	139	111
1693	-	Ethiopia	111	66	95	50	61	85	116	-	95	116	88	134	106	170	116	101
1701	EL-31	Ethiopia	111	76	89	53	66	81	94	-	95	85	87	134	109	175	116	98
1712	-	Ethiopia	113	63	82	50	50	79	114	83	93	70	89	134	98	170	116	94
1713	EL-43	Ethiopia	113	63	82	51	49	84	114	-	82	92	87	134	98	170	116	95
1861	Selaim	Sudan	118	-	102	72	68	109	116	80	117	84	100	150	127	170	130	110
1866	-	Syria	118	95	102	57	68	91	114	-	117	85	101	150	123	170	130	109
1983	L528(75)	Ethiopia	113	63	92	47	48	89	116	71	96	133	89	134	104	170	130	100
2022	L1057	Ethiopia	113	63	86	48	48	85	114	79	93	84	87	134	96	160	127	94
2069	L1327	Ethiopia	117	76	98	50	49	89	125	79	109	103	94	150	120	170	134	104
2149	-	Jordan	111	79	98	68	65	89	107	-	100	119	102	150	116	170	127	107
2439	-	Ethiopia	111	63	85	55	50	81	114	72	93	100	88	134	106	170	116	96
2500	Pant.L.538	India	113	63	84	49	46	89	114	71	96	83	87	134	98	170	127	95
2501	Pant.L.406	India	111	63	86	49	47	81	125	80	90	104	87	134	96	160	123	96
2526	T-36	India	113	63	98	54	67	95	114	-	119	116	98	150	116	165	134	107
2532	-	India	118	87	80	52	49	99	114	75	82	106	88	150	96	170	127	100
2573	Pant.L.639	India	111	76	86	48	47	88	114	83	96	116	89	150	102	162	130	100
2578	L830	India	111	63	75	47	47	75	107	71	71	69	86	99	76	170	111	85
2580	L1278	India	111	63	83	49	47	89	107	71	103	92	88	134	96	170	123	95
2581	L1282	India	111	63	83	48	48	81	114	71	103	116	87	134	94	170	123	96
2582	LL1	India	111	63	86	48	50	89	116	76	93	83	88	134	98	172	125	95
2590	LWS3	India	113	92	80	49	68	80	114	71	76	60	88	150	85	175	123	95
3416	EP3	Ethiopia	113	88	82	51	49	79	114	80	93	114	93	150	109	162	123	100
3493	B77	India	113	63	95	49	48	91	116	80	100	116	91	134	105	175	130	100
3516	LG41	India	113	63	86	49	47	89	116	79	123	107	92	150	104	175	130	102
3517	LG46	India	113	63	88	48	47	100	116	81	123	116	90	150	101	175	127	103
3601	LL37	India	111	63	88	49	50	100	114	82	84	107	91	134	101	175	130	99
3614	LL57	India	117	79	98	51	50	106	116	81	116	116	102	150	121	175	137	108
4062	-	India	118	96	102	72	66	104	116	-	78	140	103	150	128	160	139	112
4236	-	India	117	79	102	53	68	96	132	80	116	128	103	150	120	170	139	110
4374	-	India	117	65	95	50	48	92	114	78	123	114	89	167	102	160	127	103
4377	Pant.L.286	India	117	63	80	48	47	88	114	78	103	85	100	134	98	175	130	97
4401	81S 38084	Syria	117	92	95	68	67	94	107	76	93	139	103	150	118	160	127	107
4403	162	Pakistan	112	63	88	49	48	88	114	76	93	104	87	134	98	170	123	96
5071	EL-142	Ethiopia	110	63	86	53	50	80	107	-	95	59	89	134	100	180	116	94
5425	R186	Mexico	126	80	102	80	74	95	114	80	117	114	101	150	111	185	137	111
39x983	FLIP 84-108L	ICARDA	111	79	93	50	74	98	114	80	93	116	97	150	108	160	125	103
20x1LWL1	FLIP 84-67L	ICARDA	110	79	98	64	67	104	107	79	116	130	102	150	116	170	127	108
20x1LWL1	FLIP 84-29L	ICARDA	113	78	100	53	76	99	114	80	116	130	102	150	119	180	125	109
883x470	FLIP 84-109L	ICARDA	110	-	102	70	67	100	107	-	117	142	101	150	128	180	130	116
774x1LWL1	FLIP 84-110L	ICARDA	110	85	98	71	73	95	107	-	109	128	100	134	116	180	127	110
253x470	FLIP 84-111L	ICARDA	112	92	112	70	65	106	114	76	117	144	102	150	131	170	130	113
883x470	FLIP 84-112L	ICARDA	117	89	94	52	48	78	107	76	76	69	88	134	83	185	113	94
39x35	FLIP 84-113L	ICARDA	112	-	102	71	67	108	107	81	120	135	102	150	120	180	130	113
39x479	FLIP 84-114L	ICARDA	110	-	102	93	67	89	114	76	120	142	102	150	128	170	130	106
39x479	FLIP 84-115L	ICARDA	110	95	100	93	41	100	107	-	117	140	101	150	120	170	130	112
449x212	FLIP 84-116L	ICARDA	117	-	102	91	67	88	124	-	117	137	100	150	131	160	132	117
500x35	FLIP 84-117L	ICARDA	110	76	90	62	76	98	114	-	107	130	103	150	111	162	123	108
500x1719	FLIP 84-118L	ICARDA	110	88	98	57	74	97	114	-	112	130	100	150	124	165	130	111
500x35	FLIP 84-119L	ICARDA	110	78	98	63	66	104	107	-	96	113	92	134	108	160	123	104
500x35	FLIP 84-120L	ICARDA	110	85	98	52	67	76	107	75	117	116	102	134	116	160	127	103
-	FLIP 84-56L	ICARDA	110	49	102	80	81	104	107	-	112	138	102	150	123	160	123	110
883x470	FLIP 84-121L	ICARDA	110	66	92	51	74	79	107	-	76	135	88	134	74	170	112	98
883x516	FLIP 84-122L	ICARDA	112	-	98	80	74	102	125	-	112	142	102	150	131	162	134	117
30x866	FLIP 84-123L	ICARDA	117	88	102	65	67	92	116	-	112	138	95	134	128	170	130	111
883x470	FLIP 84-78L	ICARDA	117	65	98	52	67	105	114	-	82	93	89	134	89	170	116	99
4354	Jordan Local	Jordan	113	63	98	65	70	96	114	81	104	116	102	150	117	172	125	106
4605	Precoz	Argentina	111	51	71	56	66	79	107	71	82	74	87	134	87	170	110	90
	Local check	-	117	47	77	55	70	72	130	71	71	92	86	134	100	163	130	-
Location mean			113	74	93	59	60	92	114	78	101	110	95	143	108	170	126	

Table 5.5.3. Time to maturity of entries at different locations in the LISN-E during 1983/84.

ENTRY NAME		CHILE	COSTA RICA	EGYPT	ETHIOPIA		INDIA	MOROCCO	NEPAL	PAKISTAN					SYRIA	
ILL/ CROSS	PEDIGREE	Chillan	Heredia	Bahteem	Debre Zeit-1	Debre Zeit-2	New Delhi	Marchouch	Parwanipur	Bahawalpur	Chakwal	Dokri	Islamabad	Quette	Tel Hadya	MEAN
1	76TA 66005	180	125	152	122	105	130	158	135	148	180	132	189	200	167	152
358	-	178	134	150	122	104	137	158	135	155	182	131	189	200	173	153
784	Giza 9	180	134	150	135	106	118	161	132	137	182	132	189	200	173	152
813	F130	184	118	150	123	105	140	175	132	155	185	132	189	220	177	156
1693	-	176	113	150	106	100	124	134	-	144	179	137	182	200	167	147
1701	EL31	176	118	150	100	103	122	134	-	148	180	137	189	200	167	148
1712	-	176	103	150	100	104	116	152	132	148	182	131	182	200	167	146
1713	EL43	178	125	150	108	105	111	152	-	151	180	133	189	200	167	150
1861	Selaim	180	134	152	122	105	140	161	132	153	181	131	189	200	172	154
1866	-	180	134	150	122	106	136	161	-	151	179	131	189	200	172	155
1983	L528(75)	178	103	150	102	100	116	134	132	148	183	130	182	200	167	145
2022	L1057	178	103	150	98	107	116	158	132	148	180	129	182	200	167	146
2069	L1327	180	118	150	100	106	126	161	132	155	185	132	182	200	172	150
2149	-	174	125	157	132	105	136	161	-	151	184	132	189	200	173	155
2439	-	180	103	150	101	105	116	134	133	148	182	133	189	200	167	146
2500	Pant.L.538	176	103	150	96	105	134	134	132	148	185	130	182	200	167	146
2501	Pant.L.406	176	103	150	100	107	125	134	132	148	184	130	182	195	167	145
2526	T36	176	103	153	106	106	130	158	-	151	182	132	189	195	172	150
2532	-	180	125	151	130	102	140	161	132	148	181	132	189	200	172	153
2573	Pant.L.639	176	113	153	97	107	125	134	132	148	183	127	182	195	167	146
2578	L830	174	85	150	96	104	123	134	132	148	184	131	182	200	167	144
2580	L1278	174	103	150	100	103	130	134	132	148	184	130	182	200	167	146
2581	L1282	174	103	150	100	101	120	134	132	148	182	130	182	200	167	145
2582	LL1	176	103	150	96	107	125	134	124	148	185	130	182	200	167	145
2590	LWS3	176	85	153	130	103	125	161	136	151	190	133	189	200	173	150
3416	EP3	176	125	150	130	105	110	158	133	148	180	133	189	200	172	151
3493	B77	178	113	153	96	104	105	158	132	148	180	139	182	200	172	147
3516	LG41	178	113	155	96	103	127	158	132	148	190	130	189	200	172	149
3517	LG46	178	113	153	96	103	132	158	132	148	180	137	182	200	167	149
3601	LL37	176	103	150	100	106	132	158	132	151	184	127	182	200	167	148
3614	LL57	180	118	155	96	104	137	158	130	151	185	137	189	200	173	151
4062	-	180	125	155	135	104	138	166	-	155	185	132	189	195	176	157
4236	-	180	118	153	106	104	127	158	140	151	187	137	189	200	176	152
4374	-	180	125	150	118	105	132	158	134	148	187	134	182	195	172	151
4377	Pant.L.286	180	113	153	100	103	125	158	132	148	180	130	182	200	167	148
4401	BIS 38084	178	118	150	115	105	125	158	132	148	182	136	182	195	172	150
4403	162	178	103	150	100	105	127	158	132	137	182	130	182	200	167	147
5071	EL142	176	113	151	100	101	122	134	-	132	179	130	182	210	165	146
5425	R186	182	118	157	124	105	127	164	134	151	180	139	182	210	173	153
39x983	FLIP 84-108L	176	125	150	112	102	132	158	135	151	182	134	182	190	172	150
20x1LWL1	FLIP 84-67L	176	134	151	122	102	135	158	134	151	184	140	194	200	172	154
20x1LWL1	FLIP 84-29L	178	118	150	120	101	132	158	135	151	180	133	182	220	172	152
883x470	FLIP 84-109L	176	134	153	112	103	131	158	-	151	190	134	194	210	172	155
774x1LWL1	FLIP 84-110L	176	125	150	135	103	131	161	-	151	180	140	194	210	173	156
253x470	FLIP 84-111L	176	134	150	135	100	135	158	135	157	184	133	194	200	172	155*
883x470	FLIP 84-112L	180	113	153	106	105	112	158	138	153	182	138	182	210	167	150
39x35	FLIP 84-113L	176	134	153	145	102	137	158	135	151	187	135	194	210	176	157
39x479	FLIP 84-114L	176	125	155	145	103	110	161	135	157	180	134	194	200	173	153
39x479	FLIP 84-115L	176	134	155	134	110	130	158	-	155	184	135	189	200	173	156
449x212	FLIP 84-116L	176	134	150	120	105	104	158	-	151	185	137	194	190	172	152
500x35	FLIP 84-117L	176	118	153	135	105	130	158	-	151	187	137	189	190	167	154
500x1719	FLIP 84-118L	176	125	153	101	104	129	158	-	137	182	139	189	200	172	151
500x35	FLIP 84-119L	176	125	153	124	110	120	158	-	151	184	138	189	190	172	153
500x35	FLIP 84-120L	176	118	150	99	102	114	158	135	151	180	138	182	190	172	148
-	FLIP 84-56L	176	134	150	135	115	135	158	-	155	185	135	194	190	167	156
883x470	FLIP 84-121L	176	125	151	135	105	112	158	-	151	190	134	194	190	167	153
883x516	FLIP 84-122L	176	134	153	124	107	131	158	-	151	180	134	189	200	172	155
30x866	FLIP 84-123L	180	125	151	106	104	122	158	-	150	180	135	194	200	170	152
883x470	FLIP 84-78L	180	118	150	120	103	135	161	-	150	182	136	194	200	178	154
4354	Jordan Local	179	99	152	130	105	132	160	130	151	174	134	188	202	173	151
4605	Precoz	176	85	152	102	104	107	138	132	139	161	130	182	200	160	141
	Local check	182	83	154	122	104	116	174	131	143	168	129	182	191	172	-
Location mean		178	117	152	114	104	126	154	133	149	182	133	187	200	170	

Table 5.5.4. Plant height (cm) of entries at different locations in the LISN-E during 1983/84.

ENTRY NAME		CHILE	COSTA RICA	EGYPT	ETHIOPIA		INDIA	NEPAL	PAKISTAN						SYRIA	
ILL/ CROSS	PEDIGREE	Chillan	Heredia	Bahteem	Debre Zeit-1	Debre Zeit-2	New Delhi	Parwanipur	Bahawalpur	Chakwal	Dokri	Islamabad	Lahore	Quette	Tel Hadya	MEAN
1	76TA 66005	45	18	60	39	40	42	15	26	31	39	36	30	17	28	33
358	-	45	16	50	45	40	43	15	27	32	30	37	33	21	20	32
784	Giza 9	40	14	40	32	25	35	15	25	30	33	39	32	18	19	28
813	F130	87	19	60	57	45	50	13	40	31	41	47	47	20	25	42
1693	-	40	17	50	47	30	34	-	23	34	32	26	34	25	27	32
1701	EL31	40	18	40	44	35	32	-	26	31	37	34	31	22	22	32
1712	-	35	19	50	36	35	38	17	24	30	28	36	30	17	24	30
1713	EL-43	45	18	50	45	30	30	-	30	31	34	47	32	21	27	34
1861	Selaim	40	15	40	26	25	32	13	30	34	30	36	20	17	23	27
1866	-	40	11	40	33	35	38	-	27	34	28	35	28	15	22	30
1983	L528(75)	45	18	45	38	35	41	17	27	30	32	30	45	21	20	32
2022	L1057	35	19	42	31	20	39	13	32	31	33	34	39	21	17	29
2069	L1327	50	19	30	41	35	27	13	28	31	30	28	35	21	22	29
2149	-	50	18	50	49	25	33	-	26	31	36	41	39	21	27	34
2439	-	40	20	45	45	30	30	11	28	31	38	28	29	20	23	30
2500	Pant.L.538	35	18	40	28	25	35	16	26	31	38	39	37	20	20	29
2501	Pant.L.406	35	18	40	38	30	35	15	30	32	33	29	34	21	15	29
2526	T36	50	20	60	40	30	44	-	30	35	42	31	46	21	22	36
2532	-	36	11	50	35	30	34	16	22	33	32	34	35	21	25	30
2573	Pant.L.639	40	19	45	37	30	34	17	22	34	30	29	37	21	16	29
2578	L830	40	15	45	35	30	35	16	30	30	32	29	38	22	18	30
2580	L1278	40	16	40	36	30	36	14	25	35	36	34	33	21	20	30
2581	L1282	35	16	40	40	35	40	16	30	34	34	30	37	21	21	31
2582	LL1	40	19	30	35	35	29	14	26	35	35	32	36	20	16	29
2590	LWS3	65	14	35	29	25	28	11	22	34	25	31	31	22	20	28
3416	EP3	55	15	30	35	25	27	13	23	30	30	30	27	25	23	28
3493	B77	44	22	40	34	35	28	16	30	34	37	38	42	21	16	31
3516	LG41	35	21	48	33	30	29	15	30	32	33	33	44	21	13	30
3517	LG46	38	21	40	33	30	27	14	22	35	32	35	43	20	18	29
3601	LL37	43	16	45	34	40	28	15	25	32	39	36	36	19	16	30
3614	LL57	35	15	62	33	30	35	12	27	30	28	35	38	21	16	30
4062	-	50	16	40	31	25	34	-	22	35	30	31	31	22	18	30
4236	-	55	20	45	31	35	43	11	33	31	31	33	39	24	22	32
4374	-	43	15	45	34	25	26	15	24	33	28	32	35	19	17	28
4377	Pant.L.286	35	20	30	32	30	42	15	25	30	28	38	34	21	17	28
4401	81S 38084	40	13	45	35	30	25	13	17	34	28	31	28	20	22	27
4403	162	35	18	30	34	35	28	16	30	35	37	35	37	21	16	29
5071	EL142	35	19	35	40	20	27	-	23	30	28	33	32	21	18	28
5425	R186	65	22	60	40	30	40	13	25	34	36	44	38	20	25	35
39x983	FLIP 84-108L	45	22	40	39	30	28	13	23	34	29	38	31	22	22	30
20x1LWL1	FLIP 84-67L	45	20	60	37	25	38	12	30	34	36	34	36	20	25	32
20x1LWL1	FLIP 84-29L	45	23	50	43	40	41	14	30	35	34	36	32	21	30	34
883x470	FLIP 84-109L	35	20	40	32	25	31	-	24	35	35	32	31	21	23	30
774x1LWL1	FLIP 84-110L	51	20	40	37	35	34	-	29	35	43	34	45	18	25	34
253x470	FLIP 84-111L	42	15	35	32	25	27	13	25	32	29	30	31	19	21	27
883x470	FLIP 84-112L	40	22	50	39	35	34	12	28	32	31	36	34	21	24	31
39x35	FLIP 84-113L	47	19	30	39	25	39	11	26	36	47	35	39	20	24	31
39x479	FLIP 84-114L	35	19	40	32	25	37	13	29	30	38	33	35	18	21	29
39x479	FLIP 84-115L	40	16	40	32	25	45	-	31	34	34	36	42	21	22	32
449x212	FLIP 84-116L	45	19	35	30	35	28	-	24	32	42	31	33	19	25	31
500x35	FLIP 84-117L	35	21	50	34	20	25	-	23	37	25	31	36	20	20	29
500x1719	FLIP 84-118L	32	18	30	28	25	35	-	19	30	41	25	30	21	19	27
500x35	FLIP 84-119L	40	15	45	31	30	29	-	25	29	33	34	35	20	20	30
500x35	FLIP 84-120L	30	19	35	25	25	29	12	20	30	35	27	28	18	25	26
-	FLIP 84-56L	45	19	40	34	35	34	-	33	35	40	36	41	19	25	34
883x470	FLIP 84-121L	40	15	30	36	30	33	-	36	39	40	25	43	19	23	31
883x516	FLIP 84-122L	33	17	35	32	25	30	-	23	35	41	31	30	21	18	29
30x866	FLIP 84-123L	33	20	55	24	20	43	-	23	32	30	27	35	21	27	30
883x470	FLIP 84-78L	60	24	65	40	25	32	-	38	30	30	43	50	20	30	37
4354	Jordan Local	45	17	48	39	32	33	12	29	30	35	42	35	19	25	32
4605	Precoz	41	21	36	35	26	31	12	25	28	30	27	30	20	25	28
	Local check	59	22	52	36	33	34	14	26	31	33	33	39	20	22	-
Location mean		43	18	43	36	30	34	14	27	33	34	34	35	20	22	

Table 5.5.5. Adjusted seed yield (Y=kg/ha) and rank (R) of entries at different locations in the LISN-E during 1983/84.

ENTRY NAME		CHILE		COSTA RICA		EGYPT		ETHIOPIA				INDIA		MOROCCO				NEPAL	
ILL/ CROSS	PEDIGREE	Chillan		Heredia		Bahteem		Debre Zeit-1		Debre Zeit-2		New Delhi		Marchouch		Sidi Laidi		Khumaltar	
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	76TA 66005	846	40	210	23	206	25	739	39	135	36	917	6	1147	22	239	14	199	40
358	-	846	40	63	56	581	1	779	37	482	4	667	21	980	33	-	-	149	49
784	Giza 9	846	40	116	44	81	47	0	59	0	50	0	60	1180	21	379	3	0	54
813	F-130	2279	4	143	36	81	47	799	36	1228	1	0	60	913	37	-	-	599	8
1693	-	1176	25	236	20	81	47	1459	14	202	22	217	53	1613	6	-	-	0	54
1701	EL-31	699	51	63	56	81	47	1079	26	375	9	67	59	1647	5	192	23	0	54
1712	-	735	50	330	14	81	47	1019	27	295	12	367	43	1580	7	412	2	0	54
1713	EL-43	551	55	143	37	206	25	559	42	2	48	667	21	1047	29	-	-	49	53
1861	Selaim	1507	18	170	27	122	39	0	59	0	50	0	60	547	57	-	-	99	52
1866	-	809	43	130	39	81	47	0	59	0	50	167	56	580	54	365	5	199	40
1983	L 528(75)	1176	25	410	12	81	47	509	45	42	46	767	12	980	34	185	27	849	2
2022	L 1057	331	59	556	5	189	29	449	47	2	48	767	12	580	54	345	7	499	12
2069	L 1327	1814	11	193	25	0	56	863	33	135	36	917	6	247	62	-	-	583	9
2149	-	1777	13	73	54	0	56	113	57	122	39	117	57	880	39	-	-	233	38
2439	-	1520	17	219	22	0	56	943	30	762	2	217	53	847	42	305	9	283	31
2500	Pant.L.538	490	57	419	11	0	56	333	55	95	41	217	53	513	58	339	8	633	6
2501	Pant.L.406	895	38	246	18	494	2	923	31	215	16	717	18	447	59	285	11	483	13
2526	T-36	931	37	499	7	11	54	1393	17	148	34	367	43	347	60	185	28	0	54
2532	-	1336	20	59	58	0	56	373	52	95	41	117	57	313	61	305	9	483	13
2573	Pant.L.639	1152	27	166	29	361	6	1513	9	122	39	567	32	680	49	-	-	483	13
2578	L 830	748	49	113	45	261	16	833	35	82	45	367	43	847	42	192	23	733	3
2580	L 1278	784	47	86	50	0	56	1223	22	135	36	367	43	680	50	232	15	883	1
2581	L 1282	637	53	153	33	0	56	1463	13	295	12	1067	3	613	52	-	-	733	3
2582	LL 1	3027	1	379	13	0	56	993	28	95	41	567	32	647	51	379	3	633	6
2590	LWS-3	797	46	164	30	108	42	39	58	0	50	483	38	713	47	106	30	206	39
3416	EP-3	944	36	230	21	275	15	399	51	0	50	733	17	1147	23	207	20	156	45
3493	B-77	131	61	484	8	300	12	1269	21	0	50	683	20	880	40	207	20	406	21
3516	LG-41	502	56	470	9	458	3	1369	18	0	50	583	29	1080	26	-	-	456	17
3517	LG-46	319	60	764	1	108	42	1519	8	0	50	583	29	580	54	-	-	306	27
3601	LL-37	429	58	270	16	150	37	1409	15	0	50	883	9	947	35	213	17	356	23
3614	LL-57	613	54	164	31	233	19	1639	6	0	50	633	26	1213	20	-	-	456	17
4062	-	1054	31	137	38	150	37	0	59	11	47	483	38	1413	14	-	-	406	21
4236	-	1973	10	430	10	108	42	1409	15	384	7	1383	1	1546	10	-	-	156	45
4374	-	1054	31	177	26	108	42	349	54	0	50	333	49	1313	16	113	29	256	34
4377	Pant.L.286	25	62	630	2	108	42	1499	10	0	50	483	38	913	38	207	20	356	23
4401	81S 38084	1238	23	150	34	192	28	309	56	0	50	583	29	1047	29	280	12	156	45
4403	162	772	48	250	17	153	32	2169	3	224	15	817	11	591	53	190	25	473	16
5071	EL-142	809	43	290	15	294	13	1689	5	411	6	717	18	1558	9	190	25	271	33
5425	R-186	1801	12	237	19	153	32	1179	24	331	11	317	50	1391	15	-	-	293	29
39x983	FLIP 84-108L	1213	24	197	24	111	40	1579	7	211	18	467	41	1124	24	-	-	273	32
20x1LWL1	FLIP 84-67L	1985	8	144	35	178	30	609	40	424	5	767	12	1024	31	-	-	173	43
20x1LWL1	FLIP 84-29L	1544	16	170	28	111	40	879	32	211	18	667	21	1658	4	-	-	423	19
883x470	FLIP 84-109L	956	35	37	60	244	18	439	48	197	23	367	43	758	45	70	31	523	11
774x1LWL1	FLIP 84-110L	1029	33	64	55	153	32	1219	23	211	18	1117	2	1024	31	-	-	423	19
253x470	FLIP 84-111L	1029	33	50	59	319	11	769	38	211	18	317	50	858	41	-	-	173	43
883x470	FLIP 84-112L	2684	2	610	3	153	32	2269	1	251	14	517	35	1791	3	616	1	323	25
39x35	FLIP 84-113L	2684	2	37	60	194	27	419	50	197	23	267	52	824	44	-	-	573	10
39x479	FLIP 84-114L	2096	6	37	60	153	32	359	53	384	7	367	43	1058	28	-	-	323	25
39x479	FLIP 84-115L	1985	8	77	51	356	7	459	46	215	16	967	4	1102	25	-	-	239	35
449x212	FLIP 84-116L	1287	21	77	51	231	20	429	49	175	26	967	4	702	48	-	-	0	54
500x35	FLIP 84-117L	1140	28	117	41	339	9	1109	25	175	26	617	27	1536	11	-	-	139	50
500x1719	FLIP 84-118L	882	39	77	51	256	17	949	29	175	26	417	42	1069	27	-	-	289	30
500x35	FLIP 84-119L	1287	21	117	41	397	5	2109	4	175	26	767	12	736	46	-	-	139	50
500x35	FLIP 84-120L	809	43	157	32	289	14	1319	19	175	26	617	27	936	36	-	-	0	54
-	FLIP 84-56L	1765	14	117	41	231	20	839	34	175	26	667	21	1536	11	-	-	239	35
883x470	FLIP 84-121L	1471	19	130	40	331	10	1489	12	188	25	917	6	2136	2	213	19	239	35
883x516	FLIP 84-122L	1103	30	90	48	231	20	609	40	175	26	517	35	1269	18	-	-	189	42
30x866	FLIP 84-123L	662	52	104	47	356	7	529	43	375	9	517	35	1569	8	-	-	0	54
883x470	FLIP 84-78L	2059	7	90	48	231	20	2249	2	175	26	667	21	1469	13	353	6	0	54
4354	Jordan Local	2250	5	524	6	453	4	1306	20	683	3	860	10	1253	19	229	16	668	5
4605	Precoz	1640	15	109	46	158	31	520	44	93	44	750	16	1287	17	213	17	300	28
Local check		1110	29	571	4	213	24	1492	11	136	35	540	34	2433	1	253	13	150	48
Location mean		1194		221		187		944		190		557		1054		258		311	
C.V.%		22.7		37.0		175.8		28.6		181.2		57.7		30.8		27.3		46.2	
L.S.D. at 5% for:																			
Checks		420		135		465		403		460		486		519		57		212	
Checks vs. test entries		841		271		930		806		921		971		1038		115		425	
Test entries in the same block		940		303		1039		901		1030		1086		1161		128		475	
Test entries in different blocks		1086		349		1200		1041		1189		1254		1340		148		549	
S.E. for:																			
Checks		182		59		202		175		200		211		225		25		92	
Checks vs. test entries		365		117		403		350		399		421		450		50		184	
Test entries in the same block		408		131		451		391		447		471		503		56		206	
Test entries in different blocks		471		152		520		451		516		544		581		64		238	
The number of lines significantly exceeding the local check.		10		0		0		0		1		0		0		4		9	

Cont'd 2/...

Table 5.5.5. Cont'd 2.

ENTRY NAME ILL/ CROSS	PEDIGREE	PAKISTAN Bahawalpur Y	Bahawalpur R	Chakwal Y	Chakwal R	Dokri Y	Dokri R	Islamabad Y	Islamabad R	Lahore Y	Lahore R	Quette Y	Quette R	SYRIA Tel Hadya Y	Tel Hadya R	TUNISIA Beja Y	Beja R	MEAN Y	MEAN R
1	76TA 66005	266	32	360	43	404	34	302	44	51	50	844	27	1055	11	1543	8	557	37
358	-	643	19	760	14	674	15	652	11	221	35	44	58	802	27	1293	24	602	28
784	Giza 9	0	57	627	18	254	51	402	35	51	50	511	47	895	15	1343	21	393	59
813	F-130	255	34	0	61	654	16	227	51	51	50	711	29	775	28	893	44	601	29
1693	-	0	57	160	59	624	18	40	62	522	23	178	57	1295	6	843	46	540	41
1701	EL-31	92	49	227	57	454	31	165	59	484	27	0	60	748	30	1043	37	436	55
1712	-	87	51	493	33	294	44	240	50	241	34	511	47	642	36	743	50	475	49
1713	EL-43	319	28	427	37	264	48	190	57	103	42	0	60	828	22	843	46	387	60
1861	Selaim	0	57	627	18	164	59	421	32	51	50	511	47	842	19	1243	27	394	58
1866	-	0	57	760	14	354	37	215	54	51	50	578	35	882	17	1143	30	371	61
1983	L 528(75)	884	10	493	33	944	7	440	27	1810	4	44	58	695	34	793	48	653	19
2022	L 1057	775	15	360	43	414	33	621	14	1169	15	711	29	295	49	193	62	486	47
2069	L 1327	854	14	413	38	1014	6	515	19	548	22	267	52	344	48	727	51	590	32
2149	-	184	42	280	49	394	35	371	38	0	55	667	31	1051	12	1377	18	477	48
2439	-	206	40	413	38	294	44	96	61	296	32	533	37	171	53	727	51	461	52
2500	Pant.L.538	1043	4	547	23	594	19	246	49	1631	6	533	37	0	56	227	60	462	51
2501	Pant.L.406	919	7	547	23	544	25	302	44	1215	12	400	51	0	56	327	58	527	43
2526	T-36	504	22	280	49	1314	1	202	56	567	21	200	55	0	56	727	51	451	53
2532	-	264	33	280	49	314	41	565	18	399	28	533	37	837	21	1327	22	447	54
2573	Pant.L.639	856	12	413	38	1174	3	321	43	1571	7	533	37	0	56	227	61	634	21
2578	L 830	302	29	280	49	744	11	340	42	754	20	267	52	0	56	427	57	429	56
2580	L 1278	646	18	547	23	1174	3	377	36	1035	16	600	33	0	56	577	54	550	39
2581	L 1282	1484	1	547	23	724	12	471	22	1510	8	533	37	117	54	527	56	680	14
2582	LL-1	542	21	413	38	584	20	465	23	1443	9	200	55	0	56	327	58	629	23
2590	LWS-3	233	38	267	53	257	49	510	20	125	37	956	21	535	40	1427	14	407	57
3416	EP-3	118	48	133	60	267	47	360	39	125	37	956	21	735	31	1527	10	489	46
3493	B-77	1009	5	533	28	687	13	779	4	1407	10	1556	3	348	46	877	45	680	15
3516	LG-41	1300	2	800	7	687	13	442	26	2084	1	1222	10	268	50	1077	34	800	5
3517	LG-46	976	6	800	7	647	17	717	8	1724	5	956	21	375	45	1077	34	716	8
3601	LL-37	856	12	267	53	1077	5	785	3	1860	3	1222	10	228	51	777	49	690	13
3614	LL-57	892	9	800	7	447	32	910	2	1350	11	1222	10	402	43	977	41	747	6
4062	-	142	47	533	28	257	49	435	28	125	37	1356	7	815	25	1627	4	559	36
4236	-	913	8	267	53	477	28	635	12	125	37	1556	3	402	43	1277	26	815	4
4374	-	753	16	400	42	367	36	435	28	125	37	1356	7	842	19	1727	2	571	34
4377	Pant.L.286	884	10	533	28	477	28	410	33	1205	14	889	25	348	46	1177	29	597	30
4401	81S 38084	153	44	800	7	547	24	623	13	386	29	1222	10	1122	10	1577	7	611	26
4403	162	1090	3	636	17	801	9	713	9	2040	2	533	37	28	55	543	55	707	9
5071	EL-142	422	25	502	32	201	56	219	52	486	25	0	60	175	52	1093	33	549	40
5425	R-186	413	26	1036	1	1211	2	738	6	72	43	533	37	548	38	1043	37	706	10
39x983	FLIP 84-108L	636	20	902	3	491	26	406	34	385	40	267	52	815	25	993	39	629	24
20x1LWL1	FLIP 84-67L	300	30	902	3	221	54	219	52	72	43	1000	17	1522	5	993	39	658	17
20x1LWL1	FLIP 84-29L	323	27	1036	1	491	26	738	6	486	25	1533	5	1575	3	1493	11	834	3
883x470	FLIP 84-109L	252	35	902	3	171	57	619	15	72	43	533	37	548	38	1293	24	470	50
774x1LWL1	FLIP 84-110L	503	23	236	56	581	21	488	21	72	43	533	37	508	42	1643	3	613	25
253x470	FLIP 84-111L	240	36	769	11	171	57	431	30	72	43	933	24	682	35	1193	28	514	45
883x470	FLIP 84-112L	451	24	902	3	761	10	356	41	856	19	1600	2	522	41	1543	8	953	1
39x35	FLIP 84-113L	220	39	769	11	221	54	294	46	72	43	1200	14	775	28	1393	17	634	22
39x479	FLIP 84-114L	271	31	769	11	291	46	263	47	72	43	533	37	868	18	1443	12	580	33
39x479	FLIP 84-115L	18	56	524	31	554	23	360	39	0	55	1533	5	824	23	1310	23	658	17
449x212	FLIP 84-116L	0	57	324	45	0	61	1023	1	0	55	1200	14	1144	9	1060	36	539	42
500x35	FLIP 84-117L	186	41	591	20	234	52	429	31	1008	17	733	28	597	37	1410	15	648	20
500x1719	FLIP 84-118L	153	44	324	45	474	30	185	58	522	23	1000	17	1037	13	1110	31	557	38
500x35	FLIP 84-119L	90	50	324	45	564	22	460	24	353	31	1000	17	717	32	1410	15	665	16
500x35	FLIP 84-120L	26	55	324	45	314	41	373	37	209	36	467	50	1157	8	1110	31	518	44
	FLIP 84-56L	54	54	0	61	0	61	567	17	0	55	1667	1	1531	4	1910	1	706	11
883x470	FLIP 84-121L	236	37	191	58	324	39	260	48	0	55	1200	14	824	23	1610	5	692	12
883x516	FLIP 84-122L	59	52	724	16	234	52	679	10	0	55	867	26	891	16	1360	19	562	35
30x866	FLIP 84-123L	59	52	591	20	314	41	773	5	0	55	600	33	1757	1	1360	19	595	31
883x470	FLIP 84-78L	0	57	458	35	334	38	110	60	915	18	667	31	1691	2	910	43	728	7
4354	Jordan Local	697	17	547	23	824	8	573	16	1209	13	1347	9	1027	14	1430	13	934	2
4605	Precoz	152	46	587	22	322	40	459	25	0	55	973	20	1232	7	1580	6	610	27
Local check		172	43	440	36	106	60	206	55	275	33	547	36	707	33	920	42	-	-

Location mean	425	511	496	438	575	764	684	1092
C.V.%	43.1	55.2	19.1	23.7	29.0	63.6	33.1	23.3
L.S.D. at 5% for:								
Checks	256	411	135	150	236	736	349	384
Checks vs. test entries	513	822	270	301	472	1472	698	768
Test entries in the same block	573	919	301	336	528	1645	780	859
Test entries in different blocks	662	1061	348	388	609	1899	901	991
S.E. for:								
Checks	111	178	58	65	102	319	151	167
Checks vs. test entries	222	357	117	130	205	638	303	333
Test entries in the same block	249	399	131	146	229	713	338	372
Test entries in different blocks	287	460	151	168	264	824	391	430
The number of lines significantly exceeding the local check.	17	0	35	20	19	0	5	2

Table 5.5.6. The five heaviest seed yielding entries at the individual locations in the LISN-E during 1983/84.

RANK	CHILE Chillan		COSTA RICA Heredia		EGYPT Bahteem		ETHIOPIA Debre Zeit-1		ETHIOPIA Debre Zeit-2		INDIA New Delhi	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	2582	LL1	3517	LG 46	358	-	883x470	FLIP 84-112L	813	F-130	4236	-
2	883x470	FLIP 84-112L 1)	4377	Pant.L.286	2501	Pant.L.406	883x470	FLIP 84-78L	2439	-	774x1LWL1	FLIP 84-110L
3	39x35	FLIP 84-113L	883x470	FLIP 84-112L	3516	LG 41	4403	162	4354	Jordan Local	2581	L 1282
4	813	F-130	-	Local check	4354	Jordan Local	500x35	FLIP 84-119L	358	-	39x479	FLIP 84-115L
5	4354	Jordan Local	2022	L 1057	500x35	FLIP 84-119L	5071	EL 142	20x1LWL1	FLIP 84-67L	449x212	FLIP 84-116L

Cont'd. ...

RANK	MOROCCO Marchouch		MOROCCO Sidi Laidi		NEPAL Khumaltar		PAKISTAN Bahawalpur		PAKISTAN Chakwal		PAKISTAN Dokri	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	-	Local check	883x470	FLIP 84-112L	2580	L 1278	2581	L 1282	5425	R-186	2526	T-36
2	883x470	FLIP 84-121L	1712	-	1983	L 528(75)	3516	LG 41	20x1LWL1	FLIP 84-29L	5425	R-186
3	883x470	FLIP 84-112L	784	Giza 9	2578	L 830	4403	162	39x983	FLIP 84-108L	2573	Pant.L.639
4	20x1LWL1	FLIP 84-29L	2582	LL 1	2581	L 1282	2500	Pant.L.538	20x1LWL1	FLIP 84-67L	2580	L 1278
5	1701	EL-31	1866	-	4354	Jordan Local	3493	B 77	883x470	FLIP 84-109L	3601	LL 37
									883x470	FLIP 84-112L		

Cont'd ...

RANK	PAKISTAN Islamabad		PAKISTAN Lahore		PAKISTAN Quette		SYRIA Tel Hadya		TUNISIA Beja	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	449x212	FLIP 84-116L	3516	LG 41	-	FLIP 84-56L	30x866	FLIP 84-123L	-	FLIP 84-56L
2	3614	LL 57	4403	162	883x470	FLIP 84-112L	883x470	FLIP 84-78L	4374	-
3	3601	LL 37	3601	LL 37	4236	-	20x1LWL1	FLIP 84-29L	774x1LWL1	FLIP 84-110L
4	3493	B 77	1983	L 528(75)	3493	B 77	-	FLIP 84-56L	4062	-
5	30x866	FLIP 84-123L	3517	LG 46	20x1LWL1	FLIP 84-29L	20x1LWL1	FLIP 84-67L	883x470	FLIP 84-121L
					39x479	FLIP 84-115L				

1) The brackets indicate entries having the same rank.

Methods and Management

The material comprising 48 test entries and 3 checks was suggested to be planted in Augmented Block Design. In each block 12 test entries alongwith 3 check entries were sown in single row plots of 4 m length accomodating 200 plants per plot. The spacings between the rows were suggested to be 25 cm.

Forty one sets of screening nursery were supplied to cooperators in 23 countries and the data were received for 23 sets from 16 countries. The data on agronomic characters received from the cooperators are presented in Table 5.6.1.

Results and Discussion

The location mean for time to flowering (Table 5.6.2) ranged from 47 days at Toshevo in Bulgaria to 182 days at Ankara in Turkey. However, across locations, the range for time to flowering for different entries was 99 days for FLIP 84-133L to 118 days for Laird (ILL 4399). The data on time to maturity (Table 5.6.3) showed that at Toshevo in Bulgaria the entries matured earliest in 81 days and latest at Ankara in Turkey in 216 days. Among the entries, Precoz (ILL 4605) was the earliest to mature in 149 days and was followed by FLIP 84-13L which matured in 152 days. The entries, ILL 813 and Laird (ILL 4399), were, however, the latest lines maturing in 161 days.

The Table 5.6.4 showed that plant height was the maximum at Izmir in Turkey (58 cm) and minimum at Salta in Argentina (19 cm). The range in plant height was from 29 cm for Precoz and FLIP 84-13L to 40 cm for ILL 813 and Laird. At most of the locations some of entries exceeded the local check in plant height.

The adjusted seed yield for different entries at differet locations is given in Table 5.6.5. The mean yield over entries for each location was lowest at Bahteem in Egypt (199 kg/ha) and highest at Casilla in Chile (2034 kg/ha). The CV was highest at Gelline in Syria (71.4%) and was followed by Bahteem in Egypt (58.7%), New Delhi in India and Pulawy in Poland (55.5%), Islamabad in Pakistan (52.2%), Ankara in Turkey (47.1%) and Khulamtar in Nepal (44.8%). At other locations the CV varied from 8.0 to 37.2%. The LSD estimates revealed that at Salta (Argentina), Terbol (Lebanon), Marchouch (Morocco), Khumaltar (Nepal), Islamabad (Pakistan), Heimo and Tel Hadya (Syria), Beja and El-Kef (Tunisia) and Izmir (Turkey), 1, 1, 5, 1, 6, 3, 2, 2, 3 and 10 entries, respectively, exceeded the local check by a significant margin. The five heaviest yielding entries at each location are given in Table 5.6.6. It is evident that the entries ILL 813, ILL 1939, ILL 112 (78S 26052), FLIP 84-49L, and FLIP 84-141L occured more frequently among the top five entries at different locations and were thus more adaptable. On the basis of average over all locations the top five entries included 78S 26052 (ILL 112), FLIP 84-48L, FLIP 84-51L, FLIP 84-44L and ILL 1939.

Table 5.6.1. Agronomic data for different locations in the LISN-T-E during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
ARGENTINA	Salta	12.6.1984	178				1	Sencorex
BULGARIA	Toshevo	23.4.1984	94	30	60			Aphalon,Benlate, Calixin M,Actellic
CHILE	Casilla	20.7.1984	189		150	150		
CHILE	Chillan	18.6.1984	184		90			Linuron
ECUADOR	Pichincha	1.12.1983	160					
EGYPT	Bahteem	23.11.1983	163	25	75		3	
ETHIOPIA	Debre Zeit	16.7.1984	145					Bravo
INDIA	New Delhi	24.11.1983	145	20	40		2	Basalin,Metasystox
JORDAN	Jubeiha	5.12.1983	186	20	25			
LEBANON	Terbol	11.11.1983	206		50			
MOROCCO	Marchouch	4.12.1983	166					
NEPAL	Khumaltar	10.11.1983	157	20	40			
PAKISTAN	Islamabad	26.10.1983	194				1	Nogas
POLAND	Pulawy	30.3.1984	134		100	160		Azogand,Benlate+Calixin M+ Actellic
SYRIA	Gelline	10.1.1984	145					
SYRIA	Heimo	10.1.1984	127					
SYRIA	Izra'a	10.1.1984	144					
SYRIA	Tel Hadya	16.11.1983	178		50			
TUNISIA	Beja							
TUNISIA	El-Kef							
TURKEY	Ankara	15.11.1983	217	20	50			
TURKEY	Izmir	29.12.1983	162	3	8			

Table 5.6.2. Time to flowering (days) of entries at different locations in the LISN-T-E during 1983/84.

ENTRY NAME		ORIGIN	ARGENTINA	BULGARIA	CHILE		ECUADOR	EGYPT	ETHIOPIA	INDIA	JORDAN	LEBANON	MOROCCO	PAKISTAN	POLAND	SYRIA				TURKEY		MEAN
ILL CROSS	PEDIGREE		Salta	Toshevo	Casilla	Chillan	Pichincha	Bahteem	Debre Zeit	New Delhi	Jubeiha	Terbol	Marchouch	Islamabad	Pulway	Gelline	Homo	Izra'a	Tel-Hadya	Ankara	Izmir	
8	78S 26002	Jordan	100	47	105	117	69	92	65	89	124	146	114	150	69	95	77	91	130	179	116	104
8	78S 26003	Jordan	79	45	105	117	70	95	64	96	127	143	107	150	69	96	77	91	127	179	116	103
9	78S 26004	Jordan	100	45	107	117	71	95	65	91	126	146	107	150	69	104	77	93	127	179	119	105
20	-	Jordan	79	45	105	112	80	95	63	91	127	145	107	150	69	96	75	92	123	179	113	102
99	76TA 66054	Morocco	91	45	105	117	80	95	68	99	127	146	107	150	69	97	75	91	134	179	120	105
101	74TA 138	Morocco	109	47	116	122	84	102	90	105	142	154	114	150	72	107	90	99	137	181	123	113
112	78S 26052	Turkey	102	47	107	117	82	102	70	96	127	146	116	150	69	101	86	94	132	181	120	108
468	-	Chile	79	50	118	140	90	102	96	112	147	154	132	167	73	105	90	100	139	187	122	116
784	Giza 9	Egypt	100	45	111	117	56	95	55	108	131	146	114	150	68	100	75	94	123	181	118	105
813	-	Egypt	102	49	126	140	84	94	90	102	135	152	132	150	73	105	90	100	141	187	125	115
1939	-	Morocco	100	47	109	117	82	102	71	100	128	146	107	150	71	101	86	92	134	181	122	108
4399	Laird	Canada	100	54	124	140	-	102	94	104	148	154	132	169	73	100	90	99	137	187	125	118
4354	Jordan Local	Jordan	100	45	107	112	70	97	57	91	127	145	107	150	70	95	75	91	127	179	122	104
4400	81S 31368	Syria	100	47	109	117	80	102	66	76	129	146	116	150	71	97	77	91	132	181	123	106
4605	Precoz	Argentina	100	47	107	110	56	70	50	83	125	143	107	134	69	104	100	92	110	181	109	100
4711	Chilean 78	U.S.A.	109	47	120	125	84	102	70	111	147	152	127	150	73	108	75	96	132	187	126	113
101x212	FLIP 84-13	ICARDA	100	45	107	117	80	102	60	106	129	143	114	150	68	99	86	91	130	179	122	107
345x35	FLIP 84-42L	ICARDA	100	47	109	120	82	98	71	98	129	145	114	150	70	98	77	93	130	181	123	107
500x1719	FLIP 84-43L	ICARDA	100	47	109	117	84	102	92	103	135	152	114	150	71	101	86	92	137	181	130	111
500x1719	FLIP 84-44L	ICARDA	100	47	108	120	90	112	71	102	137	152	114	150	70	99	86	93	134	187	120	110
39x784	FLIP 84-47L	ICARDA	109	47	107	117	82	102	90	108	130	146	114	150	71	98	86	93	130	185	124	110
262x35	FLIP 84-48L	ICARDA	109	45	107	117	92	98	90	103	134	145	114	150	70	96	86	91	132	179	122	109
262x35	FLIP 84-49L	ICARDA	100	45	108	112	80	92	54	100	127	145	107	150	69	94	75	91	127	179	121	104
262x784	FLIP 84-50L	ICARDA	104	47	110	117	92	112	90	106	135	150	116	150	69	97	86	92	137	185	123	111
883x470	FLIP 84-51L	ICARDA	100	45	110	120	56	88	51	89	132	146	107	99	69	99	75	91	123	182	123	100
39x479	FLIP 84-58L	ICARDA	109	47	106	110	84	102	93	108	129	143	107	150	69	96	75	91	123	182	122	108
883x470	FLIP 84-78L	ICARDA	102	45	110	117	50	94	51	75	137	146	107	134	72	107	75	92	115	181	122	102
449x212	FLIP 84-116L	ICARDA	109	46	109	112	83	102	93	100	136	146	122	150	68	104	86	92	134	179	129	111
(176x226) X (345x217)	FLIP 84-124L	ICARDA	102	47	114	120	92	82	96	109	145	152	119	134	68	106	90	100	139	187	120	112
176x555	FLIP 84-125L	ICARDA	100	48	114	120	85	115	94	110	148	152	127	150	72	107	90	100	137	187	130	115
345x199	FLIP 84-126L	ICARDA	109	47	108	117	82	102	85	100	137	146	116	150	69	105	86	92	132	187	130	111
101x212	FLIP 84-127L	ICARDA	102	47	108	117	82	97	90	108	131	146	116	150	70	99	86	93	134	179	122	103
101x350	FLIP 84-128L	ICARDA	109	47	116	117	83	102	90	108	137	152	114	150	69	105	86	92	137	182	124	112
262x445	FLIP 84-129L	ICARDA	102	47	107	117	80	97	61	94	131	146	107	150	70	97	86	91	134	181	125	106
262x445	FLIP 84-130L	ICARDA	100	47	110	117	92	97	94	107	137	150	116	150	71	102	86	93	134	181	123	111
500x35	FLIP 84-131L	ICARDA	100	47	107	112	80	102	65	104	136	146	124	150	70	98	86	95	134	181	120	108
500x35	FLIP 84-132L	ICARDA	102	47	110	118	82	108	90	99	131	146	114	150	72	99	40	94	134	179	125	107
883x470	FLIP 84-133L	ICARDA	109	45	107	117	50	83	48	76	129	143	104	99	60	100	100	91	119	179	130	99
101x199	FLIP 84-134L	ICARDA	109	47	110	121	82	115	86	104	137	150	114	150	70	111	86	92	137	187	130	113
500x2	FLIP 84-135L	ICARDA	100	47	107	117	92	89	93	109	131	152	114	150	70	99	86	93	130	187	122	110
500x2	FLIP 84-136L	ICARDA	100	45	107	112	71	90	57	96	127	143	107	134	70	-	73	91	123	179	113	102
500x1719	FLIP 84-137L	ICARDA	102	47	110	117	90	98	93	110	131	152	114	150	69	102	86	98	134	187	130	112
500x1719	FLIP 84-138L	ICARDA	102	47	109	117	93	83	93	107	131	152	116	150	69	100	86	93	134	179	128	110
500x1719	FLIP 84-139L	ICARDA	100	47	110	117	94	97	92	109	134	150	116	150	70	103	86	94	134	181	125	111
345x35	FLIP 84-140L	ICARDA	100	47	112	117	92	102	92	102	131	146	116	150	71	101	86	97	137	181	130	111
345x321	FLIP 84-141	ICARDA	100	47	107	120	80	102	86	102	136	146	107	150	70	101	86	91	130	187	126	109
500x254	FLIP 84-142L	ICARDA	109	45	109	117	82	97	72	108	131	146	116	150	69	97	86	94	132	179	122	108
-	FLIP 84-143L	ICARDA	100	47	107	117	82	91	67	95	130	143	107	134	70	102	75	91	130	179	116	104
4401	Syrian Local	Syria	102	46	109	117	82	102	90	107	132	149	115	150	69	101	86	94	132	181	123	110
2130	Hurani 1	Syria	102	47	109	115	87	98	92	105	130	146	116	150	71	100	84	93	132	180	126	110
	Local check	-	100	47	116	120	88	78	58	75	128	153	123	138	74	101	84	92	132	182	124	-
Location mean			101	47	110	118	80	98	77	100	133	148	114	147	70	101	83	93	131	182	123	

Table 5.6.3. Time to maturity (days) of entries at different locations in the LISN-T-E during 1983/84.

ENTRY NAME		ARGENTINA	BULGARIA	CHILE		EGYPT	ETHIOPIA	INDIA	JORDAN	LEBANON	MOROCCO	PAKISTAN	POLAND	SYRIA				TURKEY		MEAN
ILL/ CROSS	PEDIGREE	Salta	Toshevo	Casilla	Chillan	Bahteem	Debre Zeit	New Delhi	Jubeiha	Terbol	Marchouch	Islamabad	Pulway	Gelline	Heimo	Izra'a	Tel-Hadya	Ankara	Izmir	
8	78S 26002	162	87	162	180	155	120	130	174	198	158	189	129	136	119	139	173	211	154	154
8	78S 26003	158	81	157	180	159	129	135	174	201	158	189	125	138	119	139	173	211	160	155
9	78S 26004	178	79	157	180	157	135	135	170	193	161	189	129	140	119	143	173	215	156	156
20	-	162	81	165	180	159	130	135	174	206	158	189	125	136	119	138	173	217	160	156
99	76TA 66054	162	79	172	180	155	135	137	174	203	158	189	125	135	116	136	172	212	154	155
101	74TA 138	162	82	172	180	158	135	140	178	203	161	189	125	143	127	139	176	217	161	158
112	78S 26052	178	79	179	180	157	135	135	170	193	161	189	122	137	119	139	173	217	157	157
468	-	158	79	179	182	163	145	145	178	201	166	189	138	141	127	141	179	217	160	160
784	Giza 9	158	83	165	180	156	135	140	174	201	163	189	122	135	119	138	173	212	154	155
813	-	162	89	189	184	156	122	136	186	206	167	189	138	144	127	144	176	217	162	161
1939	-	162	79	179	180	155	135	137	174	206	158	189	122	139	119	139	173	212	154	156
4399	Laird	162	94	189	180	160	139	137	186	206	166	189	129	142	127	144	178	217	154	161
4354	Jordan Local	162	79	162	178	155	135	130	174	198	158	189	125	136	119	133	173	217	158	155
4400	81S 31368	158	86	171	178	160	133	124	174	198	161	189	125	141	119	138	178	217	154	156
4605	Precoz	158	79	159	178	155	100	125	174	193	144	182	125	136	119	132	160	211	158	149
4711	Chilean 78	158	86	189	180	156	106	144	186	203	167	193	138	145	127	143	176	217	160	160
101x212	FLIP 84-13	158	79	160	178	157	106	137	174	193	158	189	116	131	116	135	172	211	157	152
345x35	FLIP 84-42L	158	79	162	178	159	122	135	178	198	158	189	125	136	116	135	172	212	154	154
500x1719	FLIP 84-43L	178	79	159	178	156	139	140	174	201	158	189	122	137	119	133	173	217	160	156
500x1719	FLIP 84-44L	158	79	161	178	161	139	135	178	195	158	189	116	138	116	133	174	217	154	154
39x784	FLIP 84-47L	178	79	164	178	155	135	140	174	201	158	189	122	137	119	132	173	217	156	156
262x35	FLIP 84-48L	178	79	162	178	161	135	138	174	195	158	189	122	137	119	135	173	217	154	156
262x35	FLIP 84-49L	178	79	162	178	157	120	135	170	201	158	182	122	132	119	133	173	217	158	154
262x784	FLIP 84-50L	162	79	162	178	157	139	138	178	201	158	189	116	133	119	133	173	217	154	155
883x470	FLIP 84-51L	178	85	173	182	155	108	127	180	198	158	189	125	140	119	136	174	217	154	155
39x479	FLIP 84-58L	178	82	171	178	159	135	140	178	193	158	189	129	134	116	136	167	217	156	156
883x470	FLIP 84-78L	162	81	176	180	160	111	122	180	198	163	194	138	143	119	141	173	217	161	157
449x212	FLIP 84-116L	158	79	157	180	155	135	137	174	195	158	194	116	138	119	132	172	217	158	154
(176x226) X (345x217)	FLIP 84-124L	162	81	174	182	157	135	140	180	198	166	194	125	143	119	140	178	217	154	158
176x555	FLIP 84-125L	178	84	173	184	160	145	142	181	201	166	194	125	141	119	138	178	217	160	160
345x199	FLIP 84-126L	178	79	160	180	158	124	137	174	201	158	194	125	140	119	135	172	217	157	156
101x212	FLIP 84-127L	178	85	165	178	156	135	138	174	198	158	189	125	139	119	138	176	217	156	157
101x350	FLIP 84-128L	178	85	171	182	159	135	140	180	198	158	189	125	137	119	137	174	217	157	158
262x445	FLIP 84-129L	158	84	163	178	157	115	135	174	195	158	189	125	140	119	138	176	217	158	154
262x445	FLIP 84-130L	162	81	174	182	157	135	140	180	203	163	194	125	139	119	139	178	217	158	158
500x35	FLIP 84-131L	162	79	165	182	156	116	137	178	198	158	189	125	137	119	135	173	217	160	155
500x35	FLIP 84-132L	178	79	172	180	158	135	132	174	201	158	194	125	137	119	136	172	217	157	157
883x470	FLIP 84-133L	178	79	165	178	156	106	123	174	203	158	194	122	139	119	138	167	212	160	154
101x199	FLIP 84-134L	178	79	172	182	155	135	135	178	201	158	194	116	139	119	135	174	217	161	157
500x2	FLIP 84-135L	158	79	172	182	155	145	135	174	195	158	194	122	135	119	136	173	217	154	156
500x2	FLIP 84-136L	178	79	172	178	159	123	130	174	203	158	194	125	-	119	137	174	217	161	158
500x1719	FLIP 84-137L	158	79	172	180	156	135	140	174	195	158	194	125	134	116	138	172	212	156	155
500x1719	FLIP 84-138L	178	79	163	180	155	145	140	174	198	158	194	125	138	119	136	172	211	157	157
500x1719	FLIP 84-139L	-	79	163	178	155	145	140	174	198	158	194	125	140	120	141	172	-	160	153
345x35	FLIP 84-140L	178	79	172	180	160	135	135	174	198	158	194	122	140	119	138	174	217	154	157
345x321	FLIP 84-141L	162	81	177	182	155	135	135	174	198	158	194	125	139	119	139	174	217	154	157
500x254	FLIP 84-142L	158	79	163	178	156	135	140	174	201	158	194	116	134	119	137	172	211	161	155
-	FLIP 84-143L	178	79	172	180	160	118	132	174	203	158	194	125	133	119	135	173	217	158	156
4401	Syrian Local	168	79	162	180	156	135	140	175	200	160	192	123	139	119	137	173	215	154	156
2130	Hurani 1	169	79	162	179	156	140	139	176	200	158	190	119	137	119	136	173	215	158	156
	Local check	159	80	175	181	157	120	123	177	202	165	182	134	134	123	138	178	217	159	-
Location mean		167	81	169	180	157	130	136	176	199	159	191	125	138	120	137	173	216	157	

Table 5.6.4. Plant height (cm) of entries at different locations in the LISN-T-E during 1983/84.

ENTRY NAME		ARGENTINA	BULGARIA	CHILE		EGYPT	ETHIOPIA	INDIA	JORDAN	LEBANON	NEPAL	PAKISTAN	POLAND	SYRIA				TURKEY		MEAN
ILL/ CROSS	PEDIGREE	Salta	Toshevo	Casilla	Chillan	Bahteem	Debre Zeit	New Delhi	Jubeiha	Terbol	Khumaltar	Islamabad	Pulway	Gelline	Heimo	Izra'a	Tel Hadya	Ankara	Izmir	
8	78S 26002	21	20	34	50	35	38	37	25	23	24	33	33	23	28	28	25	27	54	31
8	78S 26003	20	26	38	50	60	32	39	37	34	23	32	34	30	25	26	23	27	61	34
9	78S 26004	22	20	32	45	50	34	38	32	37	22	40	39	24	26	26	23	30	55	33
20	-	21	23	38	45	45	29	39	36	34	26	42	34	30	24	28	25	29	57	34
99	76TA 66054	19	20	39	50	40	30	37	34	50	19	37	36	28	27	27	28	30	54	34
101	74TA 138	25	22	40	45	60	32	35	37	35	24	33	39	27	22	25	25	27	68	35
112	78S 26052	24	23	33	36	50	38	38	37	30	21	43	34	30	27	30	27	32	75	35
468	-	33	27	45	65	60	32	42	38	43	27	43	38	27	28	25	23	32	59	38
784	Giza 9	17	16	35	45	45	28	32	33	28	24	35	32	22	26	23	22	29	62	31
813	-	34	30	41	65	50	52	32	38	28	26	48	64	30	27	31	24	31	66	40
1939	-	22	22	40	43	50	36	38	37	38	25	40	33	30	28	28	30	28	63	35
4399	Laird	34	29	41	51	60	36	42	44	42	29	47	58	28	27	31	30	28	64	40
4354	Jordan Local	15	23	36	60	37	41	39	35	40	22	40	37	28	24	24	30	36	50	34
4400	81S 31368	33	20	33	40	35	41	36	38	30	20	33	41	30	28	29	25	26	47	33
4605	Precoz	17	22	32	45	30	30	41	25	28	22	29	39	22	26	22	25	30	39	29
4711	Chilean 78	16	26	43	70	30	42	38	44	50	30	47	58	31	27	35	24	28	61	39
101x212	FLIP 84-13 L	17	15	30	40	35	29	38	35	28	21	28	32	22	25	22	22	27	60	29
345x35	FLIP 84-42L	20	21	34	50	30	35	32	40	38	19	25	37	25	26	23	22	28	59	31
500x1719	FLIP 84-43L	27	23	30	50	35	30	42	35	44	26	45	37	26	26	26	25	30	62	34
500x1719	FLIP 84-44L	12	23	37	57	40	39	43	35	40	26	40	37	29	23	28	30	32	63	35
39x784	FLIP 84-47L	22	22	33	45	30	36	38	37	23	22	34	28	28	26	27	25	31	51	31
262x35	FLIP 84-48L	18	21	31	40	40	37	44	35	28	19	29	27	27	22	26	24	30	53	31
262x35	FLIP 84-49L	22	19	33	43	40	36	42	35	36	19	36	56	28	26	25	20	30	54	33
262x784	FLIP 84-50L	11	25	36	45	50	42	37	37	38	22	29	33	32	24	28	20	31	56	33
883x470	FLIP 84-51L	18	24	41	45	40	34	36	37	32	23	38	45	26	24	28	25	31	58	34
39x479	FLIP 84-58L	20	23	35	45	30	32	39	33	35	21	36	39	28	28	30	25	29	61	33
883x470	FLIP 84-78L	22	30	43	60	60	45	37	42	38	30	40	64	25	25	30	34	31	63	40
449x212	FLIP 84-116L	22	15	29	43	60	35	29	38	30	33	31	29	24	25	27	22	35	58	33
(176x226) X (345x217)	FLIP 84-124L	20	30	40	70	50	44	37	46	50	24	43	45	31	27	29	26	31	60	39
176x555	FLIP 84-125L	16	24	41	65	40	29	37	32	34	18	41	39	26	26	37	26	29	53	34
345x199	FLIP 84-126L	13	20	31	40	40	33	33	40	29	19	29	29	25	24	24	26	30	45	29
101x212	FLIP 84-127L	17	22	34	45	45	35	40	39	27	24	36	36	28	26	25	25	36	66	34
101x350	FLIP 84-128L	22	20	36	43	35	31	34	31	25	20	29	36	24	27	27	21	28	58	30
262x445	FLIP 84-129L	18	25	32	46	40	38	37	37	30	23	35	37	27	27	29	26	32	59	33
262x445	FLIP 84-130L	13	26	40	50	40	36	40	40	40	26	40	43	30	27	27	25	30	67	36
500x35	FLIP 84-131L	16	17	35	48	40	34	40	30	38	22	29	30	23	28	24	22	32	57	31
500x35	FLIP 84-132L	15	15	34	55	45	31	32	37	25	24	32	37	27	22	22	17	31	58	31
883x470	FLIP 84-133L	18	23	34	44	40	35	31	40	37	16	39	32	30	22	23	24	31	61	32
101x199	FLIP 84-134L	16	18	32	40	50	36	39	35	30	15	32	33	28	20	29	23	30	52	31
500x2	FLIP 84-135L	15	18	33	48	45	37	42	40	42	17	40	41	28	28	25	27	36	62	35
500x2	FLIP 84-136L	17	23	36	45	35	25	34	36	34	17	36	35	-	23	23	23	39	55	32
500x1719	FLIP 84-137L	17	20	32	45	60	36	43	37	35	20	32	41	27	27	26	20	39	53	34
500x1719	FLIP 84-138L	16	18	45	50	50	28	42	35	32	23	34	41	26	23	29	20	31	56	33
500x1719	FLIP 84-139L	13	20	33	35	45	30	44	38	26	19	33	43	26	24	26	20	37	58	32
345x35	FLIP 84-140L	14	20	35	50	45	34	39	37	26	19	32	37	24	22	23	20	31	61	32
345x321	FLIP 84-141L	16	22	41	50	55	34	38	40	30	15	35	35	25	28	27	25	29	61	34
500x254	FLIP 84-142L	14	18	32	40	40	30	42	40	30	19	33	29	24	25	27	20	31	55	31
-	FLIP 84-143L	14	18	37	45	46	31	33	38	28	16	34	37	24	24	22	20	32	61	31
4401	Syrian Local	17	17	31	43	41	28	38	34	26	25	34	33	25	24	27	21	32	58	31
2130	Hurani 1	19	19	33	46	45	28	35	37	32	23	35	31	27	24	25	25	27	64	32
	Local check	18	28	43	56	53	37	38	35	39	24	31	60	28	28	28	25	37	55	-
Location mean		19	22	36	48	44	35	38	37	34	22	36	39	27	25	27	24	31	58	

Table 5.6.5. Adjusted seed yield (Y=kg/ha) and rank (R) of entries at different locations in the LISN-T-E during 1983/84.

ENTRY NAME		ARGENTINA		BULGARIA		CHILE				EGYPT		ETHIOPIA		INDIA		JORDAN		LEBANON		MOROCCO		NEPAL		PAKISTAN		POLAND	
ILL/	PEDIGREE	Salta		Toshevo		Casilla		Chillan		Bahteem		Debre Zeit		New Delhi		Jubeiha		Terbol		Marchouch		Khumaltar		Islamabad		Pulway	
CROSS		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
8	78S 26002	301	29	563	40	1739	36	1517	21	460	8	513	16	1096	3	1508	16	1160	25	1439	8	342	6	658	4	141	46
8	78S 26003	701	9	913	15	1851	27	1149	40	44	39	633	13	946	5	2218	2	994	39	772	39	292	12	615	6	381	30
9	78S 26004	34	43	963	13	2346	17	1186	38	519	5	403	28	946	5	1338	21	1660	12	1206	20	192	28	427	16	141	46
20	-	-	-	763	25	1544	41	1332	29	60	37	623	14	296	33	1798	8	827	44	1039	27	262	18	296	28	461	27
99	76TA 66054	301	29	813	22	1544	41	1259	32	0	46	333	31	246	39	1098	34	971	40	1206	20	162	34	808	2	361	34
101	74TA 138	-	-	1313	2	2678	6	2178	5	60	37	513	16	246	39	818	45	1160	25	939	33	242	20	515	11	521	23
112	78S 26052	301	29	1013	11	1750	34	781	50	310	12	463	25	746	10	2498	1	2271	4	1606	4	-	-	1083	1	531	20
468	-	1234	2	763	25	3264	3	1259	32	144	26	43	42	0	49	1048	37	1605	13	1039	27	262	18	240	38	371	33
784	Giza 9	1101	3	663	35	1634	37	1002	45	127	29	253	33	0	49	978	41	1049	35	539	49	142	36	590	7	381	30
813	-	968	5	963	13	3138	4	1811	15	35	41	1263	4	296	33	218	49	827	44	1372	10	382	2	796	3	1371	2
1939	-	568	14	1313	2	2518	13	818	49	0	46	513	16	646	13	1938	3	2549	2	1306	12	242	20	521	9	521	23
4399	Laird	-	-	1313	2	2407	15	267	51	85	32	33	44	0	49	158	50	494	51	706	43	342	6	471	13	101	48
4354	Jordan Local	363	26	663	35	1802	31	1210	35	185	19	789	11	863	8	1271	24	2175	5	1061	24	242	20	366	17	161	43
4400	81S 31368	630	11	863	19	2669	7	2570	2	185	19	839	10	513	18	1491	17	1286	21	1228	19	292	12	329	23	291	36
4605	Precoz	630	11	713	29	1442	46	1137	41	185	19	1019	8	363	31	311	46	1119	29	1761	1	162	34	0	51	71	49
4711	Chilean 78	1297	1	763	25	2349	16	1173	39	144	26	239	34	163	48	0	51	1564	14	894	34	362	5	61	49	531	20
101x212	FLIP 84-13L	1030	4	563	40	1869	25	953	48	244	15	529	15	413	27	1221	29	1397	18	1294	13	192	28	267	31	1751	1
345x35	FLIP 84-42L	97	42	713	29	2642	8	2203	4	435	9	509	19	463	22	1050	36	1064	32	1028	29	242	20	292	29	911	9
500x1719	FLIP 84-43L	363	27	463	48	1922	24	2093	9	169	23	199	36	613	15	1671	11	1731	9	1128	23	292	12	429	15	0	50
500x1719	FLIP 84-44L	230	37	913	15	2629	9	1982	11	494	7	469	24	713	11	1201	30	3008	1	1161	22	342	6	448	14	831	11
39x784	FLIP 84-47L	630	11	413	50	1402	47	1909	14	160	25	439	26	663	12	1151	32	1397	18	1261	16	342	6	504	12	1010	8
262x35	FLIP 84-48L	397	35	1113	7	2576	10	1578	20	327	11	409	27	863	8	1271	24	2119	7	1628	3	312	11	623	5	1311	3
262x35	FLIP 84-49L	230	37	913	15	1802	31	1945	12	435	9	1259	5	613	15	1931	4	1342	20	794	38	292	12	567	8	651	16
262x784	FLIP 84-50L	363	27	1113	7	1269	48	990	46	502	6	159	37	313	32	1231	28	1064	32	994	30	242	20	517	10	161	43
883x470	FLIP 84-51L	434	16	1063	10	2549	12	2117	7	538	3	1396	2	1146	2	1198	31	2138	6	750	40	175	32	321	24	828	12
39x479	FLIP 84-58L	434	16	713	29	2576	10	1382	24	0	46	0	47	246	39	1628	13	1694	10	1717	2	125	38	312	25	0	50
883x470	FLIP 84-78L	301	29	1113	7	2749	5	1713	17	205	17	1466	1	246	39	1148	33	1805	8	1483	6	125	38	332	22	818	13
449x212	FLIP 84-116L	568	14	513	46	936	51	1345	26	0	46	0	47	446	23	1248	26	1027	37	683	44	125	38	276	30	508	25
(176x226) X (345x217)	FLIP 84-124L	234	36	563	40	1549	40	1382	24	0	46	0	47	296	33	958	43	805	46	417	51	185	31	351	19	818	13
176x555	FLIP 84-125L	301	29	663	35	1856	26	2558	3	38	40	0	47	246	39	788	46	1194	23	717	41	275	17	343	20	1138	4
345x199	FLIP 84-126L	168	41	563	40	1829	28	2117	7	180	22	476	21	546	17	1738	9	1060	34	717	41	875	1	265	32	418	29
101x212	FLIP 84-127L	-	-	463	48	1536	44	1271	31	63	36	6	45	396	28	1658	12	605	50	683	44	105	41	308	27	338	35
101x350	FLIP 84-128L	368	20	713	29	2029	21	1198	36	288	13	336	30	446	23	338	47	971	40	1050	26	-	-	263	34	578	19
262x445	FLIP 84-129L	968	5	913	15	2189	20	1198	36	288	13	476	21	896	7	1618	14	1138	27	817	36	375	3	309	26	1038	7
262x445	FLIP 84-130L	-	-	863	19	1829	28	2852	1	0	46	0	47	396	28	968	42	749	48	983	31	225	27	336	21	228	40
500x35	FLIP 84-131L	434	16	313	51	1629	38	1308	30	163	24	636	12	496	20	908	44	749	48	517	50	325	10	264	33	208	41
500x35	FLIP 84-132L	-	-	513	46	1104	50	965	47	24	43	313	32	646	13	1344	20	971	40	617	47	172	33	212	44	261	38
883x470	FLIP 84-133L	368	20	813	22	1531	45	1333	27	816	1	1093	7	446	23	1854	6	1027	37	1283	14	92	44	250	36	1051	6
101x199	FLIP 84-134L	701	9	1013	11	2424	14	1406	22	24	43	223	35	396	28	1314	22	916	43	1250	17	242	20	211	45	1121	5
500x2	FLIP 84-135L	368	20	663	35	2211	19	1627	18	66	33	43	42	446	23	1474	18	1471	17	1383	9	192	28	259	35	191	42
500x2	FLIP 84-136L	208	39	763	25	2331	18	1737	16	233	16	943	9	196	46	1604	15	1038	36	1350	11	42	46	234	39	251	39
500x1719	FLIP 84-137L	368	20	1363	1	1758	33	1921	13	8	45	3	46	296	33	984	40	1505	16	1250	17	-	-	211	45	291	36
500x1719	FLIP 84-138L	368	20	563	40	2011	22	1590	19	108	30	143	38	196	46	1304	23	1171	24	950	32	142	36	222	41	581	18
500x1719	FLIP 84-139L	-	-	813	22	1971	23	1406	22	66	33	93	41	246	39	1014	39	1527	15	1283	14	92	44	215	43	481	26
345x35	FLIP 84-140L	368	20	713	29	1744	35	1075	43	191	18	353	29	296	33	1844	7	2305	3	617	47	242	20	206	48	531	20
345x321	FLIP 84-141L	434	16	1263	5	3278	2	2178	5	108	30	473	23	496	20	1384	19	1082	31	1550	5	292	12	225	40	591	17
500x254	FLIP 84-142L	-	-	663	35	1824	30	1333	27	66	33	493	20	246	39	1054	35	1138	27	650	46	-	-	210	47	661	15
-	FLIP 84-143L	301	29	713	29	1544	41	1222	34	524	4	1153	6	1096	3	1904	5	771	47	1450	7	-	-	221	42	381	30
4401	Syrian Local	710	8	838	21	1553	39	1066	44	35	41	100	39	250	38	1238	27	1108	30	800	37	100	42	243	37	453	28
2130	Hurani 1	193	40	525	45	1120	49	1121	42	135	28	100	39	500	19	1048	37	1278	22	825	35	100	42	385	18	160	45
Local check		737	7	1225	6	3307	1	2068	10	694	2	1328	3	1388	1	1678	10	1694	10	1058	25	375	3	48	50	880	10
Location mean		488		813		2034		1506		199		472		489		1268		1329		1064		243		362		544	
C.V.%		36.8		23.4		8.0		15.5		58.7		25.4		55.5		37.2		27.9		14.8		44.8		52.2		55.5	
L.S.D. at 5% for:																											
Checks		276		332		281		401		212		208		498		819		643		266		166		307		515	
Checks vs. test entries		504		607		513		733		388		379		909		1496		1174		486		302		560		940	
Test entries in the same block		552		664		562		803		425		415		995		1638		1286		532		331		613		1030	
Test entries different blocks		638		767		649		927		490		479		1149		1892		1485		615		383		708		1189	
S.E. for:																											
Checks		113		136		115		164		87		85		203		335		263		109		68		125		210	
Checks vs. test entries		206		248		210		299		158		155		371		611		480		199		124		229		384	
Test entries in the same block		226		272		230		328		174		170		407		670		526		218		135		251		421	
Test entries in different blocks		261		314		265		379		200		196		470		773		607		251		156		289		486	
The number of lines significantly exceeding the local check.		1		0		0		0		0		0		0		0		1		5		1		6		0	

Cont'd. 2.

Table 5.6.5. Cont'd. 2.

ENTRY NAME		SYRIA								TUNISIA				TURKEY				MEAN	
ILL/	PEDIGREE	Gelline		Heimo		Izra'a		Tel Hadya		Beja		El-Kef		Ankara		Izmir			
CROSS		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
8	78S 26002	571	16	575	3	1158	10	840	18	1104	26	913	38	1038	9	2413	6	955	10
8	78S 26003	901	5	408	9	1158	10	1053	9	1054	29	1163	25	971	18	2627	1	993	8
9	78S 26004	1021	2	379	12	958	19	627	33	1254	14	1063	27	731	29	2467	4	946	12
20	-	1001	3	367	13	1458	4	1093	8	954	40	846	41	984	16	1680	19	884	22
99	76TA 66054	751	10	341	15	1108	13	920	14	954	40	863	39	584	38	1053	43	746	37
101	74TA 138	801	8	137	45	858	23	587	38	804	45	1013	29	78	51	1107	40	828	28
112	78S 26052	601	14	679	1	758	28	1387	3	1054	29	946	35	464	43	2320	9	1078	1
468	-	451	23	123	46	708	33	627	33	1354	9	846	41	291	49	1440	28	815	31
784	Giza 9	471	22	275	28	758	28	1027	11	804	45	1563	6	744	28	1027	45	720	42
813	-	451	23	152	43	758	28	773	24	804	45	696	48	904	20	1013	46	904	17
1939	-	451	23	635	2	608	37	1627	1	1054	29	846	41	638	37	2627	1	1045	5
4399	Laird	231	45	85	49	358	44	307	51	754	49	579	51	384	46	427	50	475	50
4354	Jordan Local	624	13	441	7	825	24	1036	10	1171	19	1346	12	731	29	1209	36	884	22
4400	81S 31368	694	11	321	20	1375	6	676	29	1121	24	813	45	1344	3	1636	22	1008	6
4605	Precoz	394	36	517	4	625	35	876	17	471	51	1379	9	824	23	1609	23	743	41
4711	Chilean 78	544	17	67	51	275	47	609	35	521	50	1313	14	531	41	609	49	666	48
101x212	FLIP 84-13L	434	30	477	5	1575	1	662	31	1221	17	1363	10	1211	7	1116	39	942	14
345x35	FLIP 84-42L	594	15	333	18	725	31	916	15	971	38	663	49	1238	6	422	51	834	27
500x1719	FLIP 84-43L	514	18	200	37	925	20	1262	5	1621	3	1729	3	664	34	1849	17	945	13
500x1719	FLIP 84-44L	444	28	285	27	825	24	1449	2	1171	19	1063	27	1011	12	1502	25	1056	4
39x784	FLIP 84-47L	294	42	389	10	1525	2	609	35	921	42	863	39	398	45	1422	29	843	25
262x35	FLIP 84-48L	444	28	409	8	925	20	809	19	1121	24	1613	5	1038	9	1809	18	1076	2
262x35	FLIP 84-49L	1094	-	381	11	1475	3	582	39	1071	28	746	47	558	40	2436	6	1006	7
262x784	FLIP 84-50L	794	9	307	22	975	18	382	49	1421	8	646	50	691	33	1529	24	746	38
883x470	FLIP 84-51L	298	40	305	24	1075	14	969	12	1571	6	1346	12	656	35	1658	20	1073	3
39x479	FLIP 84-58L	498	19	355	14	1125	12	1249	6	1621	3	1879	1	1002	13	1871	16	973	9
883x470	FLIP 84-78L	18	49	169	41	75	51	809	19	821	44	1179	23	842	22	1378	32	895	19
449x212	FLIP 84-116L	348	39	261	29	1025	16	502	43	971	39	1013	29	642	36	1964	13	686	46
(176x226) X (345x217)	FLIP 84-124L	448	26	76	50	625	35	476	44	1171	21	1213	20	976	17	1471	27	667	47
176x555	FLIP 84-125L	298	40	121	47	1275	7	556	41	1171	21	1196	22	1029	11	1378	32	816	30
345x199	FLIP 84-126L	98	48	242	33	525	38	702	27	1271	12	946	35	1002	13	2284	10	858	24
101x212	FLIP 84-127L	398	35	288	26	725	31	462	45	1271	12	1529	7	1282	5	1498	26	744	40
101x350	FLIP 84-128L	418	32	207	36	875	22	342	50	1221	18	929	37	456	44	1898	15	746	39
262x445	FLIP 84-129L	498	19	457	6	825	24	796	21	1521	7	1013	29	762	27	1911	14	953	11
262x445	FLIP 84-130L	448	26	245	32	375	43	689	28	1021	36	1246	18	1362	2	1418	30	812	32
500x35	FLIP 84-131L	498	19	228	34	275	47	649	32	1621	3	1263	16	856	21	2471	3	753	36
500x35	FLIP 84-132L	258	43	336	16	692	34	529	42	1304	11	829	44	562	39	1120	38	639	49
883x470	FLIP 84-133L	258	43	335	17	492	39	902	16	1054	29	1363	10	296	48	2013	12	889	21
101x199	FLIP 84-134L	388	37	149	44	792	27	796	21	1254	14	1313	15	709	32	1000	47	840	26
500x2	FLIP 84-135L	658	12	193	38	392	41	1302	4	1704	2	979	33	1082	8	2400	7	910	16
500x2	FLIP 84-136L	0	50	306	23	292	45	462	45	1354	10	1179	23	216	50	1067	42	753	35
500x1719	FLIP 84-137L	178	47	331	19	392	41	742	26	1054	29	1513	8	989	15	1187	37	817	29
500x1719	FLIP 84-138L	808	7	214	35	992	17	609	35	1004	37	1263	16	922	19	1387	31	788	33
500x1719	FLIP 84-139L	378	38	93	48	292	45	676	29	804	45	1013	29	789	24	2173	11	771	34
345x35	FLIP 84-140L	198	46	158	42	92	49	436	48	1104	27	763	46	309	47	1080	41	696	44
345x321	FLIP 84-141L	0	50	253	31	92	49	796	21	1254	14	1779	2	776	26	1267	35	932	15
500x254	FLIP 84-142L	858	6	178	40	1392	5	942	13	904	43	1629	4	1402	1	2333	8	899	18
-	FLIP 84-143L	408	33	300	25	492	39	462	45	1754	1	963	34	522	42	1653	21	892	20
4401	Syrian Local	400	34	257	30	1038	15	760	25	1038	35	1213	20	723	31	1040	44	713	43
2130	Hurani 1	423	31	181	39	1163	9	1173	7	1050	34	1238	19	787	25	893	48	686	45
Local check		980	4	311	21	1175	8	573	40	1125	23	1088	26	1337	4	1333	34	-	-

Location mean	491	291	809	786	1133	1132	791	1578
C.V.%	71.4	27.9	42.3	32.9	14.8	15.6	47.1	19.3
L.S.D. at 5% for:								
Checks	621	138	627	452	287	307	664	501
Checks vs. test entries	1134	251	1144	826	525	560	1212	.915
Test entries in the same block	1242	275	1253	905	575	613	1327	1003
Test entries in different blocks	1434	318	1447	1045	663	708	1533	1158
S.E. for:								
Checks	254	56	256	185	117	125	271	205
Checks vs. test entries	463	103	468	338	214	229	495	374
Test entries in the same block	508	112	512	370	235	251	542	410
Test entries in different blocks	586	130	591	427	271	289	626	473
The number of lines significantly exceeding the local check.	0	3	0	2	2	3	0	10

Table 5.6.6. The five heaviest seed yielding entries at the individual locations in the LISN-T-E during 1983/84.

RANK	ARGENTINA Salta		BULGARIA Tosnevo		CHILE Casilla		CHILE Chillan		EGYPT Bahteem		ETHIOPIA Debre Zeit	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	4711	Chilean 78	500x1719	FLIP 84-137L	-	Local check	262x445	FLIP 84-130L	883x470	FLIP 84-133L	883x470	FLIP 84-78L
2	468	-	101	74TA 138	345x321	FLIP 84-141L	4400	81S 31368	-	Local check	883x470	FLIP 84-51L
3	784	Giza 9	1939	-	468	-	176x555	FLIP 84-125L	883x470	FLIP 84-51L	-	Local check
4	101x212	FLIP 84-13L	4399	Laird	813	-	345x35	FLIP 84-42L	-	FLIP 84-143L	813	-
5	813	-	1) 345x321	FLIP 84-141L	883x470	FLIP 84-78L	101	74TA 138	9	78S 26004	262x35	FLIP 84-49L
	262x445	FLIP 84-129L					345x321	FLIP 84-141L				

Cont'd ...

RANK	INDIA New Delhi		JORDAN Jubeiha		LEBANON Terbol		MOROCCO Marchouch		NEPAL Khumaltar		PAKISTAN Islamabad	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	-	Local check	112	78S 26052	500x1719	FLIP 84-44L	4605	Precoz	345x199	FLIP 84-126L	112	78S 26052
2	883x470	FLIP 84-51L	8	78S 26003	1939	-	39x479	FLIP 84-58L	813	-	99	76TA 66054
3	8	78S 26002	1939	-	345x35	FLIP 84-140L	262x35	FLIP 84-48L	262x445	FLIP 84-129L	813	-
4	-	FLIP 84-143L	262x35	FLIP 84-49L	112	78S 26052	112	78S 26052	-	Local check	8	78S 26002
5	8	78S 26003	-	FLIP 84-143L	4354	Jordan Local	345x321	FLIP 84-141L	4711	Chilean 78	262x35	FLIP 84-48L
	9	78S 26004										

Cont'd. ...

RANK	POLAND Pulway		SYRIA Gelline		SYRIA Heimo		SYRIA Izra'a		SYRIA Tel Hadya	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	101x212	FLIP 84-13L	262x35	FLIP 84-49L	112	78S 26052	101x212	FLIP 84-13L	1939	-
2	813	-	9	78S 26004	1939	-	39x784	FLIP 84-47L	500x1719	FLIP 84-44L
3	262x35	FLIP 84-48L	20	-	8	78S 26002	262x35	FLIP 84-49L	112	78S 26052
4	176x555	FLIP 84-125L	-	Local check	4605	Precoz	20	-	500x2	FLIP 84-135L
5	101x199	FLIP 84-134L	8	78S 26003	101x212	FLIP 84-13	500x254	FLIP 84-142L	500x1719	FLIP 84-43L

Cont'd. ...

RANK	TUNISIA Beja		TUNISIA El-Kef		TURKEY Ankara		TURKEY Izmir	
	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE	ILL/ CROSS	PEDIGREE
1	-	FLIP 84-143L	39x479	FLIP 84-58L	500x254	FLIP 84-142L	8	78S 26003
2	500x2	FLIP 84-135L	345x321	FLIP 84-141L	262x445	FLIP 84-130L	1939	-
3	500x1719	FLIP 84-43L	500x1719	FLIP 84-43L	4400	81S 31368	500x35	FLIP 84-131L
4	39x479	FLIP 84-58L	500x254	FLIP 84-142L		Local check	9	78S 26004
5	500x35	FLIP 84-131L	262x35	FLIP 84-48L	101x212	FLIP 84-127L	262x35	FLIP 84-49L

1) The brackets indicate entries having the same rank.

5.7. LENTIL INTERNATIONAL F_3 TRIAL (LIF_3T)

Material

The material for the Lentil International F_3 Trial comprised of 40 F_3 populations and one local check to be added by the cooperator. These populations were derived from the divergent crosses (Table 5.7.1) and were expected to release a wide genetic base upon which the selection can be practiced by the cooperators under their local environmental conditions.

Methods and Management

The material comprising 40 test entries and one check repeated 3 times in each replication was sown in a randomised complete block design with 2 replications. The suggested plot size was 4 rows, each 4 m long accomodating 640 seeds per plot. The between row spacing was suggested to be 25 cm.

Nineteen sets of trial were distributed to cooperators in 11 countries. However, the results were received back for 10 sets. The agronomic data received from the cooperators are presented in Table 5.7.2.

Results and Discussion

The data on time to flowering (Table 5.7.3) revealed that the populations flowered earliest at Toshevo in Bulgaria in 47 days and latest at Ankara in Turkey in 181 days. The range in time to flowering varied from 120 days for X82S 63 to 131 days for X82S 332. The crosses which flowered earlier were, not necessarily earlier in maturity (Table 5.7.4). The plant height data (Table 5.7.5) showed that the expression of plant height was least at Toshevo in Bulgaria (25 cm) and maximum at Izmir in Turkey (60 cm). The populations X82S 301, X82S 314 and X82S 20 were tallest with average height of 40 cm.

The seed yields and rank of different entries in CIF_3T are given in Table 5.7.6. The seed yield at Mallawi (Egypt) was highest (1502 kg/ha) and was followed by Terbol in Lebanon (1273 kg/ha). However, at Sakha the yields were lowest (338 kg/ha). The CV for the experiment was high at Sakha (56.3%), and Beja (45.9%) whereas at other locations it ranged from 11.4 to 32.3%. The ANOVA for the experimental design revealed that there were significant differences among the entries at all the locations except at Sakha in Egypt, and Beja and El-Kef in Tunisia. The LSD estimates revealed that at Setif (Algeria), Mallawi (Egypt), Terbol (Lebanon), Tel Hadya (Syria), Ankara and Izmir (Turkey) 4, 4, 2, 1, 1, and 7 entries, respectively, exceeded the check by a significant margin. These populations which gave as good yield as the local checks and didnot differ significantly from the local check should give some segregates which are better than the respective checks. The five heaviest yielding entries at different locations are

Table 5.7.1. Parents of crosses included in LIF_3T-84.

Entry No.	Cross No. X82S	Female Parent Selection	ILL	Origin	Male Parent Selection	ILL	Origin
1	8	W.H.2040	4965	GRC	74TA 19	28	SYR
2	14	W.H.2040	4965	GRC	S.L.L.	4400	SYR
3	20	-	468	CHL	78S 26066	193	SYR
4	30	Laird	4349	CAN	78S 26181	841	ESP
5	31	78S 26013	16	JOR	78S 26002	8	JOR
6	32	74TA 548	470	SYR	78S 26002	8	JOR
7	33	74TA 577	500	MEX	78S 26002	8	JOR
8	36	76TA 66088	223	IRN	78S 26066	193	SYR
9	40	78S 26013	16	JOR	74TA 276	262	HUN
10	41	76TA 66088	223	IRN	74TA 276	262	HUN
11	45	78S 26013	16	JOR	S.L.L.	4400	SYR
12	49	78S 26002	8	JOR	S.L.L.	4400	SYR
13	55	78S 26013	16	JOR	76TA 66088	223	IRN
14	57	78S 26003	8	JOR	Ham.white	2129	SYR
15	60	S.L.S.	4401	SYR	Red chief	4957	USA
16	61	76TA 66004	99	MAR	-	468	CHL
17	63	74TA 19	28	SYR	Precoz	4605	ARG
18	71	74TA 9	15	JOR	78S 26002	8	JOR
19	72	74TA 19	28	SYR	78S 26002	8	JOR
20	73	76TA 66043	59	IRQ	78S 26002	8	JOR
21	75	74TA 260	253	GRC	78S 26002	8	JOR
22	76	74TA 276	262	HUN	78S 26002	8	JOR
23	82	74TA 276	262	HUN	74TA 9	15	JOR
24	89	75KT 36627	1169	LBN	74TA 19	28	SYR
25	105	S.L.L.	4400	SYR	74TA 276	262	HUN
26	106	Precoz	2605	ARG	74TA 276	262	HUN
27	118	78S 26013	16	JOR	78S 26004	9	JOR
28	281	76TA 66043	59	IRQ	Red chief	4957	USA
29	286	S.L.L.	4400	SYR	Red chief	4957	USA
30	288	78S 26002	8	JOR	74TA 209	210	COS
31	289	78S 26013	16	JOR	74TA 209	210	COS
32	293	74TA 548	470	SYR	74TA 209	210	COS
33	301	76TA 66088	223	IRN	74TA 435	351	MEX
34	304	74TA 577	500	IRN	74TA 435	351	MEX
35	307	S.L.S.	4401	SYR	74TA 435	351	MEX
36	314	78S 26002	8	JOR	-	92	USSR
37	315	78S 26013	16	JOR	-	92	USSR
38	322	78S 26013	16	JOR	-	813	EGY
39	328	78S 26002	8	JOR	-	922	TUR
40	332	74TA 276	262	HUN	-	922	TUR
41	Local check						
42	Local check						
43	Local check						

Table 5.7.2. Agronomic data for different locations in the LIF_3T during 1983/84.

COUNTRY	LOCATION	Planting date	Crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
ALGERIA	Setif	10.1.1984	179		46			Treflan
BULGARIA	Toshevo	23.4.1984	89	30	60			Aphalon,Benlate, Calixin M,Actellic
EGYPT	Mallawi	11.12.1983	143	15	30		2	Prometrin
LEBANON	Terbol	11.11.1983	203		50			
SYRIA	Tel Hadya	17.11.1983	181		50			
TUNISIA	Beja							
TUNISIA	El-Kef							
TURKEY	Ankara	15.11.1983	217	20	50			
TURKEY	Izmir	29.12.1983	164	3	8			

Table 5.7.3. Time to flowering (days) of entries at different locations in the LIF_3T during 1983/84.

ENTRY / CROSS NO.	BULGARIA Toshevo	LEBANON Terbol	SYRIA Tel Hadya	TURKEY Ankara	TURKEY Izmir	MEAN
X82S 8	49	150	137	185	125	129
X82S 14	49	151	137	181	124	128
X82S 20	49	150	137	185	124	129
X82S 30	48	150	139	181	126	129
X82S 31	46	146	129	179	120	124
X82S 32	45	146	136	179	123	126
X82S 33	46	145	127	179	120	123
X82S 36	47	146	130	185	127	127
X82S 40	47	146	130	179	127	126
X82S 41	46	146	131	179	129	126
X82S 45	46	148	131	181	127	127
X82S 49	47	146	133	179	120	125
X82S 55	47	152	132	180	126	127
X82S 57	47	146	137	179	120	126
X82S 60	46	148	136	181	129	128
X82S 61	47	146	137	181	130	128
X82S 63	47	146	109	179	120	120
X82S 71	47	146	133	181	123	126
X82S 72	46	145	135	181	120	125
X82S 73	47	145	133	179	123	125
X82S 75	47	143	130	179	123	124
X82S 76	47	143	132	179	120	124
X82S 82	47	146	137	181	127	128
X82S 89	47	148	137	181	128	128
X82S 105	47	146	136	181	126	127
X82S 106	47	144	109	179	130	122
X82S 118	45	144	130	179	126	125
X82S 281	47	148	134	185	126	128
X82S 286	47	146	125	181	119	124
X82S 288	47	148	137	179	126	127
X82S 289	47	151	137	187	124	129
X82S 293	47	150	137	187	130	130
X82S 301	47	146	131	181	124	126
X82S 304	47	145	129	179	125	125
X82S 307	46	144	136	179	124	126
X82S 314	46	148	137	181	129	128
X82S 315	47	150	137	187	131	130
X82S 322	45	145	123	179	127	124
X82S 328	47	150	137	181	132	129
X82S 332	47	151	139	187	131	131
Local check	47	154	137	185	132	-
Location mean	47	147	133	181	125	

Table 5.7.4. Time to maturity (days) of entries at different locations in the LIF_3T during 1983/84.

ENTRY / CROSS NO.	BULGARIA Toshevo	EGYPT Mallawi	LEBANON Terbol	SYRIA Tel Hadya	TURKEY Ankara	TURKEY Izmir	MEAN
X82S 8	89	138	203	180	217	160	165
X82S 14	89	139	202	181	217	161	165
X82S 20	89	128	202	181	217	160	163
X82S 30	88	132	203	181	215	162	164
X82S 31	83	138	194	174	209	155	159
X82S 32	80	139	194	180	211	155	160
X82S 33	81	142	202	178	209	162	162
X82S 36	83	134	197	179	217	162	162
X82S 40	84	137	198	171	215	162	161
X82S 41	81	138	193	172	215	162	160
X82S 45	81	128	198	176	217	162	160
X82S 49	83	138	198	181	213	162	163
X82S 55	83	136	194	170	212	155	158
X82S 57	81	130	201	180	215	161	161
X82S 60	81	131	202	180	217	161	162
X82S 61	85	130	195	181	215	163	162
X82S 63	89	141	198	181	217	157	164
X82S 71	88	130	197	181	217	161	162
X82S 72	84	134	196	180	217	156	161
X82S 73	84	142	202	179	211	161	163
X82S 75	83	137	197	179	212	163	162
X82S 76	83	136	197	179	213	155	161
X82S 82	87	136	201	180	217	158	163
X82S 89	85	138	202	181	217	154	163
X82S 105	87	130	198	180	211	158	161
X82S 106	88	135	198	177	212	157	161
X82S 118	81	135	193	173	214	160	159
X82S 281	85	131	203	181	217	162	163
X82S 286	86	141	201	180	213	156	163
X82S 288	84	144	200	179	211	162	163
X82S 289	81	131	194	174	217	155	159
X82S 293	83	144	201	180	215	162	164
X82S 301	83	130	197	177	217	154	160
X82S 304	84	131	202	176	213	164	162
X82S 307	81	131	200	180	213	158	161
X82S 314	82	130	202	181	217	160	162
X82S 315	85	144	198	180	215	162	164
X82S 322	81	131	198	181	215	161	161
X82S 328	86	132	202	181	217	161	163
X82S 332	85	129	203	180	217	161	163
Local check	81	143	203	181	215	156	-
Location mean	84	135	199	179	215	159	

Table 5.7.5. Plant height (cm) of entries at different locations in the LIF_3T during 1983/84.

ENTRY / CROSS NO.	ALGERIA Setif	BULGARIA Toshevo	EGYPT Mallawi	LEBANON Terbol	SYRIA Tel Hadya	TURKEY Ankara	TURKEY Izmir	MEAN
X82S 8	27	28	42	44	31	35	63	39
X82S 14	31	26	44	43	28	33	67	39
X82S 20	32	25	44	49	32	32	65	40
X82S 30	31	25	41	38	29	35	67	38
X82S 31	27	23	39	38	26	34	56	35
X82S 32	29	20	47	30	26	36	57	35
X82S 33	31	24	42	33	26	34	58	35
X82S 36	28	25	45	42	29	34	64	38
X82S 40	24	26	42	39	30	33	65	37
X82S 41	27	26	42	45	29	33	56	37
X82S 45	27	26	42	38	29	37	52	36
X82S 49	30	26	43	39	28	33	64	38
X82S 55	25	23	46	46	28	34	56	37
X82S 57	27	23	41	40	28	33	62	36
X82S 60	24	24	42	43	24	34	53	35
X82S 61	29	26	45	40	30	38	58	38
X82S 63	27	23	42	53	30	36	61	39
X82S 71	28	25	43	40	28	34	62	37
X82S 72	27	24	42	35	28	32	58	35
X82S 73	28	23	47	37	28	34	67	38
X82S 75	30	25	40	37	29	36	63	37
X82S 76	23	20	41	38	29	37	65	36
X82S 82	29	22	40	45	26	40	62	38
X82S 89	29	23	42	42	27	34	58	36
X82S 105	28	25	40	37	26	35	57	35
X82S 106	30	25	41	48	29	34	58	38
X82S 118	26	24	41	44	32	35	61	38
X82S 281	25	24	44	41	28	31	61	36
X82S 286	30	25	44	44	31	37	63	39
X82S 288	27	23	44	33	28	36	55	35
X82S 289	29	26	45	40	29	34	53	37
X82S 293	26	23	40	37	27	37	56	35
X82S 301	33	26	43	46	29	36	70	40
X82S 304	28	24	44	43	27	35	63	38
X82S 307	28	20	41	37	25	35	54	34
X82S 314	30	30	42	47	31	38	64	40
X82S 315	32	28	44	36	29	34	60	38
X82S 322	33	24	46	39	28	35	62	38
X82S 328	29	28	40	45	30	34	68	39
X82S 332	27	26	42	46	28	33	63	38
Local check	23	28	47	47	26	34	56	-
Location mean	28	25	43	41	28	34	60	

Table 5.7.6. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in the LIF$_3$T during 1983/84.

ENTRY/ CROSS NO. X82S	ALGERIA Setif		BULGARIA Toshevo		EGYPT Mallawi		EGYPT Sakha		LEBANON Terbol		SYRIA Tel Hadya		TUNISIA Beja		TUNISIA El-Kef		TURKEY Ankara		TURKEY Izmir		MEAN	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
8	1479	4	463	20	1708	13	437	9	1215	22	843	20	850	32	1213	8	1050	25	507	38	977	17
14	1292	10	250	41	1688	14	237	33	1000	31	697	31	1075	21	675	38	1133	20	527	37	857	34
20	1380	5	263	40	896	35	390	14	938	36	799	23	775	34	1050	20	927	26	530	36	795	37
30	885	33	388	29	813	38	586	1	993	33	592	37	713	37	750	35	910	27	670	30	730	39
31	1052	22	488	17	938	34	480	5	1451	13	1012	6	1125	18	975	27	837	32	1313	2	967	19
32	1099	18	413	25	1271	29	420	10	1056	27	963	11	1063	23	988	25	1067	23	1033	12	937	24
33	958	27	488	17	2531	3	390	14	1056	27	770	27	1450	6	1213	9	413	41	800	25	1007	14
36	1203	13	375	31	583	41	333	24	1451	13	868	16	900	29	975	27	1460	3	943	20	909	27
40	1583	2	813	4	2458	4	480	5	1542	9	1016	4	1663	2	1675	1	1193	15	1020	14	1344	1
41	1083	19	463	20	1292	27	263	30	1903	1	973	8	1400	9	1013	23	1173	19	1313	2	1088	6
45	1026	23	413	25	2958	2	327	26	1736	3	971	9	1088	20	-	-	1110	21	1023	13	1184	2
49	1125	17	425	23	1083	32	343	23	1438	15	1066	2	1313	11	1488	3	1193	15	820	24	1029	12
55	1193	14	438	22	1417	23	567	3	1686	4	782	25	1475	4	1100	17	850	30	1387	1	1090	5
57	792	38	338	34	3063	1	240	32	1486	12	1014	5	1063	24	1163	12	1387	6	880	22	1143	3
60	1625	1	388	29	1729	11	143	40	868	40	449	40	1063	24	1125	16	757	37	627	33	877	31
61	932	29	500	15	1750	10	457	7	1493	11	830	22	1475	4	1463	4	843	31	773	27	1052	10
63	958	27	338	34	1917	5	573	2	1576	8	994	7	1013	27	888	31	1290	8	1277	5	1082	7
71	776	39	363	32	1333	24	413	12	1653	6	743	29	675	40	1150	14	1440	4	997	17	954	21
72	1068	20	525	12	1875	6	223	34	1674	5	967	10	1438	7	1063	19	1283	9	1100	9	1122	4
73	1005	25	575	10	1104	31	200	36	1000	31	921	12	1413	8	750	35	683	38	1013	16	866	33
75	1151	16	400	28	1729	11	383	17	1326	18	914	14	825	33	1175	11	1407	5	1080	10	1039	11
76	1016	24	675	7	1583	19	220	35	1278	21	1042	3	1213	14	1350	6	1093	22	1113	8	1058	8
82	1375	6	338	34	1771	7	197	37	1326	18	509	39	1063	24	1013	23	1197	14	747	28	954	21
89	1057	21	788	5	1771	7	353	21	1090	25	664	33	1113	19	1163	12	1190	17	603	34	979	16
105	870	34	413	25	1688	14	297	28	1625	7	838	21	875	30	1613	2	873	29	830	23	992	15
106	620	41	600	9	1542	20	247	31	1396	16	617	36	713	38	1200	10	1300	7	1043	11	928	26
118	1156	15	488	17	1292	27	357	20	1875	2	1147	1	650	41	1438	5	1183	18	947	19	1053	9
281	797	36	325	38	1250	30	80	41	892	39	347	41	1263	12	750	35	760	36	640	31	710	40
286	1292	11	675	7	792	39	163	38	1021	30	782	25	750	35	788	33	1203	13	470	39	794	38
288	859	35	338	34	1000	33	453	8	931	37	866	17	1525	3	775	34	907	28	1020	14	867	32
289	1297	9	513	14	625	40	533	4	1528	10	848	19	700	39	938	29	660	39	1233	7	888	30
293	917	30	325	38	833	37	417	11	849	41	862	18	1188	16	1300	7	573	40	727	29	799	36
301	1333	7	888	1	1604	18	383	17	1389	17	917	13	1388	10	925	30	787	34	580	35	1019	13
304	1323	8	838	3	1333	24	380	19	1101	24	797	24	1250	13	1038	22	1223	12	467	40	975	18
307	906	32	363	32	1667	16	347	22	1110	23	876	15	1200	15	550	40	1067	23	1287	4	937	25
314	1219	12	575	10	1479	21	330	25	958	35	573	38	750	35	1050	21	1253	11	893	21	908	28
315	703	40	425	23	1479	21	390	14	1028	29	648	34	863	31	1100	17	783	35	777	26	820	35
322	1526	3	525	12	1313	26	307	27	924	38	764	28	1075	22	988	26	800	33	1277	5	950	23
328	917	30	500	15	854	36	410	13	986	34	640	35	1825	1	825	32	1590	1	430	41	898	29
332	797	36	700	6	1771	7	277	29	1069	26	671	32	1163	17	625	39	1517	2	957	18	955	20
Local check	979	26	850	2	1608	17	162	39	1283	20	706	30	975	28	1150	14	1281	10	636	32	-	
Location mean	1088		510		1502		338		1273		807		1107		1035		1075		874			
C.V.%	22.6		29.9		15.5		56.3		18.1		23.1		45.9		32.3		11.4		27.3			
L.S.D. at 5%	494		308		469		NS		464		376		NS		NS		247		481			
S.E.	173.1		108.0		164.4		134.4		162.7		131.9		356.9		237.5		86.7		168.6			
No. of entries significantly exceeding the local check.	4		0		4		-		2		1		-		-		1		7			

Table 5.7.7. The five heaviest seed yielding entries at the individual locations in the LIF_3T during 1983/84.

RANK	ALGERIA	BULGARIA	EGYPT		LEBANON	SYRIA	TUNISIA		TURKEY	
	Setif	Toshevo	Mallawi	Sakha	Terbol	Tel Hadya	Beja	El-Kef	Ankara	Izmir
	Cross No.	Cross No.	Cross No.	Cross No.	Cross No.	Cross No.	Cross No.	Cross No.	Cross No.	Cross No.
1	X82S 60	X82S 301	X82S 57	X82S 30	X82S 41	X82S 118	X82S 328	X82S 40	X82S 328	X82S 55
2	X82S 40	Local check	X82S 45	X82S 63	X82S 118	X82S 49	X82S 40	X82S 105	X82S 332	X82S 31
3	X82S 322	X82S 304	X82S 33	X82S 55	X82S 45	X82S 76	X82S 288	X82S 49	X82S 36	X82S 41
4	X82S 8	X82S 40	X82S 40	X82S 289	X82S 55	X82S 40	X82S 55	X82S 61	X82S 71	X82S 307
5	X82S 20	X82S 89	X82S 63	X82S 31 (1)	X82S 72	X82S 57	X82S 61	X82S 118	X82S 75	X82S 63
				X82S 40						X82S 322

(1) The brackets indicate entries having the same rank.

given in Table 5.7.7.

5.8. LENTIL INTERNATIONAL F_3 TRIAL - EARLY (LIF_3T-E)

Material

The material for the Lentil International F_3 Trial Early comprised of 38 F_3 populations (test entries) and one local check. The test entries were supplied and local check was to be added by the cooperator. These F_3 populations originated from single crosses between diverse parents (Table 5.8.1).

Methods and Management

The randomised complete block design with two replications was suggested. The check was suggested to be repeated 3 times in each replication. The suggested plot size was four rows 4 m long, spaced 25 cm apart, accommodating 640 seeds/plot.

Twenty sets of LIF_3T-E were sent to cooperators in 9 countries and the results were received for 10 sets from 7 countries. At Hudeiba in Sudan the germination was eratic, and due to short winter season and hot weather in February most of the populations either died or did not flower or gave very poor yields. The agronomic data pertaining to different locations are presented in Table 5.8.2.

Results and Discussion

The mean time to flowering (Table 5.8.3) ranged from 58 days at Pichincha (Ecuador) to 124 days at Islamabad (Pakistan), and Tel Hadya (Syria). At all the locations a large number of entries were earlier than the respective local checks except at Gemmiza and Sids in Egypt where only 2 and 1 populations were earlier. The mean time taken to flower for each entry over locations revealed that the populations X82S 189 and X82S 176 took 83 days to flower and were earliest. These were followed by X82S 228, X82S 235, X82S 215, etc. The trend for time to maturity (Table 5.8.4) was almost similar to that of time to flowering. The two populations namely X82S 175 and X82S 226 which matured at the earliest were not among the earliest in flowering, however, the entry X82S 349 which was latest in flowering was also latest in maturity.

The mean plant height (Table 5.8.5) ranged from 24 cm at Tel Hadya in Syria to 45 cm at Pichincha in Ecuador. On the basis of average over locations the tall populations included X82S 228, X82S 230, X82S 231, and X82S 169, X82S 179, X82S 189, and X82S 207 etc.

The seed yield and rank of entries at different locations in the trial are given in Table 5.8.6. The highest mean yield was recorded at Gemmiza in Egypt (1441 kg/ha) and lowest at Chakwal in Pakistan (280 kg/ha). The CVs at all the locations were, in general, high, ranging from 30.3 to 53%. The ANOVA showed that the differences between the populations were statistically significant at Sids in

Table 5.8.1. Parents of crosses included in LIF3T-E-84.

Entry	Cross No.	Female parent				Male parent		
No.	X82S	Selection	ILL	Orig.		Selection	ILL	Orig.
1	165	78S 26004	9	JOR	X	Pant-L-406	2501	IND
2	167	74TA 441	353	MEX	X	Pant-L-406	2501	IND
3	168	Giza 9	784	EGY	X	Pant-L-406	2501	IND
4	169	-	813	EGY	X	Pant-L-406	2501	IND
5	172	-	1744	ETH	X	Pant-L-406	2501	IND
6	173	Jord.local	4354	JOR	X	Pant-L-406	2501	IND
7	174	340	4404	PAK	X	Pant-L-406	2501	IND
8	175	18-12	4407	PAK	X	Pant-L-406	2501	IND
9	176	Precoz	4605	CHL	X	Pant-L-406	2501	IND
10	177	76TA 66005	1	JOR	X	Pant-L-639	2573	IND
11	179	78S 26066	193	SYR	X	Pant-L-639	2573	IND
12	180	74TA 441	353	MEX	X	Pant-L-639	2573	IND
13	181	Giza 9	784	EGY	X	Pant-L-639	2573	IND
14	186	Jord.local	4354	JOR	X	Pant-L-639	2573	IND
15	189	Precoz	4605	CHL	X	Pant-L-639	2573	IND
16	190	76TA 66005	1	JOR	X	L-830	2578	IND
17	194	Giza 9	784	EGY	X	L-830	2578	IND
18	199	Jord.local	4354	JOR	X	L-830	2578	IND
19	206	74TA 441	353	MEX	X	LL-1	2582	IND
20	207	Giza 9	784	EGY	X	LL-1	2582	IND
21	215	Precoz	4605	CHL	X	LL-1	2582	IND
22	220	Giza 9	784	EGY	X	B 77	3493	IND
23	225	Jord.local	4354	JOR	X	B 77	3493	IND
24	226	340	4404	PAK	X	B 77	3493	IND
25	228	Precoz	4605	CHL	X	B 77	3493	IND
26	229	76TA 66005	1	JOR	X	Pant-L-286	4377	IND
27	230	78S 26004	9	JOR	X	Pant-L-286	4377	IND
28	231	78S 26066	193	SYR	X	Pant-L-286	4377	IND
29	233	Giza 9	784	EGY	X	Pant-L-286	4377	IND
30	234	-	813	EGY	X	Pant-L-286	4377	IND
31	235	-	1712	ETH	X	Pant-L-286	4377	IND
32	237	-	1744	ETH	X	Pant-L-286	4377	IND
33	238	Jord.local	4354	JOR	X	Pant-L-286	4377	IND
34	243	78S 26004	9	JOR	X	Pant-L-234	4380	IND
35	245	74TA 441	353	MEX	X	Pant-L-234	4380	IND
36	246	Giza 9	784	EGY	X	Pant-L-234	4380	IND
37	349	-	5425	MEX	X	Pant-L-406	2501	IND
38	355	-	5425	MEX	X	Pant-L-234	4380	IND
39	Local check							IND
40	Local check							IND
41	Local ckeck							IND

Table 5.8.2. Agronomic data for different locations in the LIF3T-E during 1983/84.

COUNTRY	LOCATION	Planting date	crop duration (days)	Fertilizer (kg/ha) N	P_2O_5	K_2O	Irrigation	Insecticide/ Fungicide/ Herbicide
ECUADOR	PICHINCHA	1-12-1983	160					
EGYPT	GEMMIZA	N.A.	141					
EGYPT	SIDS	22-11-1983	153	38	75		3	Promatrin
INDIA	New Delhi	24-11-1983	137	20	40		2	Basalin-Metasystox
PAKISTAN	CHAKWAL	18-10-1983	160	20	50			
PAKISTAN	ISLAMABAD	30-10-1983	201	20	50			
SUDAN	HUDEIBA	17-11-1983	106	43			8	
SYRIA	TEL HADYA	18-11-1983	180		50			
TUNISIA	BEJA	N.A.						
TUNISIA	EL-KEF	N.A.						

N.A. = Not Available.

Table 5.8.3. Time to flowering (days) of entries at different locations in the LIF3T-E during 1983/84

ENTRY CROSS NO.	ECUADOR Pichincha	EGYPT Gemmiza	EGYPT Sids	INDIA New Delhi	PAKISTAN Chakwal	PAKISTAN Islamabad	SYRIA Tel-Hadya	MEAN
X82S 165	61	92	91	92	61	123	126	92
X82S 167	58	94	95	95	69	119	130	94
X82S 168	53	85	91	87	61	121	120	88
X82S 169	50	79	82	87	77	124	113	87
X82S 172	50	84	83	89	68	120	120	88
X82S 173	56	89	88	92	81	125	126	94
X82S 174	50	87	83	98	76	126	125	92
X82S 175	50	90	86	87	61	122	127	89
X82S 176	47	84	83	70	71	119	107	83
X82S 177	56	88	94	90	94	127	127	97
X82S 179	64	83	96	91	68	127	133	95
X82S 180	56	93	94	91	75	123	130	95
X82S 181	56	90	77	93	58	123	129	89
X82S 186	57	94	91	93	60	130	130	94
X82S 189	49	70	83	86	62	123	108	83
X82S 190	56	84	83	83	78	119	120	89
X82S 194	48	83	81	79	87	120	113	87
X82S 199	50	82	88	81	78	121	120	89
X82S 206	57	96	93	94	94	125	130	98
X82S 207	56	95	90	95	71	130	130	95
X82S 215	51	84	83	72	74	122	108	85
X82S 220	56	95	85	94	74	125	130	94
X82S 225	57	96	85	94	63	123	127	92
X82S 226	56	98	90	94	58	126	128	93
X82S 228	48	72	82	91	60	125	107	84
X82S 229	56	87	83	92	74	127	120	91
X82S 230	62	93	98	90	92	130	127	99
X82S 231	62	98	96	100	84	125	133	100
X82S 233	52	82	90	79	81	124	116	89
X82S 234	53	85	80	83	68	120	117	87
X82S 235	52	83	83	80	57	118	116	84
X82S 237	49	83	81	89	72	121	119	88
X82S 238	61	96	91	93	86	130	130	98
X82S 243	53	93	89	91	74	127	128	94
X82S 245	56	89	85	91	59	122	127	90
X82S 246	53	86	89	92	82	127	121	93
X82S 349	86	100	101	100	90	130	141	107
X82S 355	84	102	104	106	71	130	141	105
Local check	85	77	79	85	66	121	136	
Location mean	58	87	87	89	72	124	124	

Table 5.8.4. Time to maturity (days) of entries at different locations in the LIF_3T-E during 1983/84.

ENTRY CROSS	NO.	ECUADOR Pichincha	EGYPT Gemmiza	EGYPT Sids	INDIA New Delhi	PAKISTAN Chakwal	SYRIA Tel-Hadya	MEAN
X82S	165	160	139	150	135	105	176	144
x82S	167	147	139	153	135	117	179	145
X82S	168	149	139	145	130	105	179	141
X82S	169	160	139	145	132	130	181	148
X82S	172	149	134	145	125	117	171	140
X82S	173	149	139	148	135	131	174	146
X82S	174	134	134	148	125	129	170	140
X82S	175	136	131	145	129	104	172	136
X82S	176	160	140	148	122	120	177	145
X82S	177	136	138	153	132	160	173	149
X82S	179	149	140	153	135	116	179	145
X82S	180	160	138	150	135	127	178	148
X82S	181	147	141	145	132	100	179	141
X82S	186	149	140	155	134	102	172	142
X82S	189	160	140	148	135	106	176	144
X82S	190	147	138	150	128	126	178	145
X82S	194	160	138	150	124	149	175	149
X82S	199	149	138	148	129	127	173	144
X82S	206	149	140	153	135	152	176	151
X82S	207	149	140	155	137	120	179	147
X82S	215	160	140	155	121	126	176	146
X82S	220	138	140	153	137	127	180	146
X82S	225	160	140	150	130	107	176	144
X82S	226	136	135	150	131	99	172	137
X82S	228	160	142	153	130	103	174	144
X82S	229	149	139	148	132	153	173	149
X82S	230	136	138	145	128	149	173	145
X82S	231	160	139	150	137	142	180	151
X82S	233	160	139	148	128	119	177	145
X82S	234	147	140	150	129	115	174	143
X82S	235	160	138	145	126	97	175	140
X82S	237	138	138	145	130	122	173	141
X82S	238	149	139	155	135	147	173	150
X82S	243	160	138	150	135		174	151
X82S	245	149	138	150	126	102	179	141
X82S	246	136	138	153	135	140	173	146
X82S	349	160	140	150	140	154	179	154
X82S	355	160	141	155	140	122	180	150
Local check		160	138	144	131	107	177	-
Location mean		151	138	149	131	123	176	

Table 5.8.5. Plant height (cm) of entries at different locations in the LIF_3T-E during 1983/84.

ENTRY CROSS	NO.	ECUADOR Pichincha	INDIA New Delhi	PAKISTAN Chakwal	SYRIA Tel-Hadya	MEAN
X82S	165	45	42	31	25	36
X82S	167	48	45	31	20	36
X82S	168	40	45	33	25	36
X82S	169	50	42	33	27	38
X82S	172	40	42	31	21	34
X82S	173	38	42	32	26	35
X82S	174	43	37	31	23	34
X82S	175	30	38	29	19	29
X82S	176	53	42	30	22	37
X82S	177	40	39	31	25	34
X82S	179	48	42	34	29	38
X82S	180	45	39	31	23	35
X82S	181	45	38	37	24	36
X82S	186	48	42	30	27	37
X82S	189	55	46	30	21	38
X82S	190	43	38	30	21	33
X82S	194	43	34	30	24	33
X82S	199	44	36	32	26	35
X82S	206	40	39	32	21	33
X82S	207	49	48	31	23	38
X82S	215	53	37	30	24	36
X82S	220	45	45	30	26	37
X82S	225	43	41	33	23	35
X82S	226	40	37	33	20	33
X82S	228	60	48	30	23	40
X82S	229	43	35	33	24	34
X82S	230	45	46	32	27	38
X82S	231	45	47	33	27	38
X82S	233	45	43	30	26	36
X82S	234	45	42	32	25	36
X82S	235	45	36	30	24	34
X82S	237	39	38	30	19	32
x82S	238	40	49	31	25	36
X82S	243	40	36		26	34
X82S	245	45	35	30	25	34
X82S	246	38	46	33	21	35
X82S	349	43	35	30	24	33
X82S	355	45	45	30	29	37
Local check		49	45	32	24	
Location mean		45	41	31	24	

Table 5.8.6. Seed yield (Y=kg/ha) and rank (R) of entries at different locations in the LIF_3T-E during 1983/84

ENTRY / CROSS NO.	EGYPT				INDIA		PAKISTAN				SYRIA		TUNISIA				Mean	
	Gemmiza		Sids		New Delhi		Chakwal		Islamabad		Tel Hadya		Beja		El-Kef			
X82S	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
165	1233	25	756	12	913	9	400	15	804	7	914	5	1075	11	338	34	804	11
167	1588	10	357	28	688	24	333	23	392	35	574	23	950	17	513	30	674	27
168	1517	13	398	25	719	22	433	12	691	16	690	18	738	26	713	16	737	20
169	1517	13	774	10	806	15	467	9	741	9	533	25	825	22	650	20	789	16
172	1350	20	350	29	575	34	367	20	825	5	530	26	813	23	288	38	637	31
173	1300	23	545	19	1006	5	417	13	532	25	944	3	900	18	888	10	817	10
174	1417	18	786	8	669	26	500	8	1249	2	296	37	413	36	438	32	721	21
175	1383	19	345	30	788	17	233	33	927	3	624	21	363	38	613	23	660	29
176	2167	3	202	36	638	29	333	23	388	36	381	33	850	20	763	14	715	24
177	1500	15	143	38	694	23	400	15	696	15	861	6	1038	13	1075	3	801	13
179	1533	12	756	12	588	31	467	9	664	19	861	6	713	27	675	18	782	18
180	2267	1	0	39	819	14	333	23	850	4	778	12	1325	2	800	12	897	4
181	967	35	483	23	850	12	767	2	452	34	499	27	650	30	400	33	633	33
186	1233	25	714	15	531	36	560	5	632	22	933	4	1450	1	1213	1	908	3
189	1200	27	310	32	501	37	233	33	341	37	256	39	638	31	725	15	526	37
190	573	39	757	11	1131	3	352	22	510	28	438	30	988	15	525	29	659	30
194	1833	7	1214	4	1288	1	533	6	757	8	464	29	588	33	1000	6	968	1
199	1050	33	512	20	1106	4	467	9	709	12	683	19	1250	6	588	25	796	15
206	1317	21	292	33	1281	2	400	15	453	32	730	14	688	29	475	31	705	26
207	1850	6	781	9	781	18	333	23	622	23	691	17	1225	7	550	27	854	6
215	1167	29	345	31	200	39	200	37	482	30	413	32	850	20	625	21	535	36
220	1617	9	946	7	856	11	216	36	527	27	841	9	1150	9	625	21	847	7
225	767	38	1065	5	556	35	533	6	578	24	631	20	988	15	600	24	715	24
226	1267	24	643	18	588	32	800	1	811	6	271	38	388	37	263	39	629	34
228	1467	16	750	14	394	38	283	29	531	26	374	35	513	34	775	13	636	32
229	1317	21	435	24	675	25	585	4	702	13	854	8	863	19	1138	2	821	9
230	1583	10	1624	1	744	20	333	23	132	39	802	11	1125	10	1075	3	927	2
231	1950	5	231	34	581	33	633	3	453	32	824	10	713	27	1038	5	803	12
233	1967	4	381	26	665	28	267	31	686	17	621	22	1013	14	663	19	783	17
234	1633	8	698	16	950	8	400	15	656	20	482	28	463	35	688	17	746	19
235	1067	32	375	27	975	6	52	38	741	9	376	34	763	25	588	26	617	35
237	933	36	207	35	875	10	233	33	506	29	352	36	363	29	313	35	473	38
238	1133	31	183	37	775	19	283	29	1366	1	724	15	1313	3	900	9	835	8
243	1450	17	1029	6	956	7	0	39	655	21	1043	1	1263	5	550	28	868	5
245	933	36	495	22	725	21	415	14	738	11	1002	2	1163	8	300	36	721	22
246	1017	34	506	21	825	13	300	28	683	18	418	31	1288	4	300	37	667	28
349	1150	30	1411	3	669	26	383	19	455	31	564	24	775	24	988	7	799	14
355	1183	28	698	17	625	30	267	31	327	38	693	16	1050	12	913	8	720	23
Local check	2233	2	1579	2	800	16	360	21	702	13	738	13	613	32	821	11		
Location mean	1441		664		766		380		643		639		875		677			
C.V.%	32.8		51.2		43.3		42.4		53.1		30.3		34.8		38.0			
L.S.D. at 5%	NS		687		NS		326		NS		390		606		525			
S.E	334.4		240.3		234.4		114.1		241.7		136.6		211.9		183.8			
No. of entries significantly exceeding the local check	0						2				0		7		0			

Table 5.8.7. The five heaviest seed yielding entries at the individual locations in the LIF_3T-E during 1983/84.

RANK	EGYPT		INDIA	PAKISTAN		SYRIA	TUNSISIA	
	Gemmiza	Sids	New Delhi	Chakwal	Islamabad	Tel Hadya	Beja	El-Kef
	Cross no.	Cross no.	Cross no.	Cross no.	Cross no.	Cross no.	Cross no	Cross no.
1	X82S 180	X82S 230	X82S 194	X82S 226	X82S 238	X82S 243	X82S 186	X82S 186
2	Local check	Local check	X82S 206	X82S 181	X82S 174	X82S 245	X82S 180	X82S 229
3	X82S 176	X82S 349	X82S 190	X82S 231	X82S 175	X82S 173	X82S 238	X82S 177 (1)
4	X82S 233	X82S 194	X82S 199	X82S 229	X82S 180	X82S 186	X82S 246	X82S 230
5	X82S 231	X82S 225	X82S 173	X82S 186	X82S 172	X82S 165	X82S 243	X82S 231

(1) The brackets indicate entries having the same rank.

Egypt, Chakwal in Pakistan, Tel Hadya in Syria, Beja and El-Kef in Tunisia, but the local check was excelled by a significant margin only at Chakwal and Bej . The five heaviest seed yielding entries at the individual locations are given in Table 5.8.7. It is evident that at all locations except Gemmiza and Sids where the local check ranked no. 2, the populations from ICARDA were among the five heaviest yielders.

5.9. LENTIL INTERNATIONAL OROBANCHE NURSERY (LION)

Lentil International Orobanche Nursery was distributed to the cooperators for the second time during 1983/84. The main objective of the nursery was to identify stable sources of resistance to Orobanche.

Material and Methods

The material comprised of eight test entries and two checks, one Syrian Local Large (ILL 4400) was supplied and the other local check to be added by the cooperator. The test entries were identified as resistant at Kafr Antoon research sub-station of ICARDA in Syria. This station has a very high natural infestation of Orobanche. The suggested experimental design was a randomised complete block with 3 replications and plot size was 4 rows, 1 m long with 200 plants/plot. It was suggested to plant the material in an area known to be heavily infested with Orobanche.

Results and Discussion

Ten sets of LION were sent to cooperators in Algeria, Morocco, Tunisia, and ICARDA managed research stations. The results were, however, received from five locations and the data are given in Table 5.9.1. The Orobanche infestation at Marchouch 1 and Marchouch 2 was almost negligible. At other locations the ANOVA revealed significant mean squares due to entries for Orobanche number, Orobanche weight and seed yield. The highest infestation was recorded at Tel Hadya in Syria.

At Douyet, all the entries except ILL 1558, ILL 1573, and ILL 2547 had less Orobanche number than the local check. In general, the lines having less Orobanche number also exhibited less Orobanche weight.

At Rabat in Morocco, all the entries possessed more Orobanche number than local check but Orobanche weight was more than the local check only in two lines namely, ILL 784 and ILL 1558.

At Tel Hadya, Syria the minimum infestation was recorded for ILL 2559 and ILL 3041 and maximum for ILL 1558 and ILL 155.

On the basis of overall locations, ILL 3047, ILL 2559 were the most resistant/tolerant entries.

Table 5.9.1 Number of orobanche per plot (No.), weight of orobanche per plot (WT) and seed yield (YLD) for the entries in LION during 1983/84

ENTRY	ORIGIN	MOROCCO												SYRIA		
		Douyet			Marchouch 1			Marchouch 2			Rabat			Tel-Hadya		
		No.	WT	YLD	No.	WT	YLD	No.	WT	YLD	No.	WT	YLD	No.	WT	YLD
ILL155	Turkey	0.8	0.7	1000	0	0	2400	0	-	1233	13.5	56	690	108.7	88.0	69
ILL784	Egypt	4	2.3	1000	0	0	1983	0	-	1158	10.6	95.7	230	110.3	68.7	195
ILL1558	Iran	13.3	14	833	0.3	0.3	2050	0	-	892	13.5	81.5	485	113.0	87.8	33
ILL1573	Iran	16	14.7	1000	0	0	1967	0	-	1083	10.5	65.5	515	83.7	39.3	36
ILL2547	India	5.7	3.6	500	0	0	1933	0	-	800	26.5	31.5	95	72.7	29.3	274
ILL2559	India	1.3	1.1	991	0	0	1667	0	-	617	10.6	9.3	15	44.7	12.7	41
ILL2917	India	2.7	2.3	667	0	0	1683	0	-	1042	23.5	8.0	30	69.0	18.7	27
ILL3047	India	1.5	4.1	1000	0	0	2367	0	-	950	10.5	3.0	75	45.3	13.7	70
ILL4400	Syria	2.0	1.0	667	0	0	2050	0	-	858	60.0	58.0	185	95.7	77.7	142
Local check		2.7	2.0	1000	0.7	0.7	1950	0	-	1525	7.0	71.0	240	98.0	51.0	47
Mean		5	4.6	866	0.1	0.1	2005	0	-	1016	18.6	47.9	256	84.1	48.7	93
C.V.%		51.5	98.6	18.9			40.9			33.9	60.4	75.9	69.7	28.4	66.6	50.3
L.S.D at 5%		4.4	7.8	280.9			N.S.			N.S	25.4	N.S,	403.7	41.0	55.6	80.4

6. AGRONOMY

6.1. DATE OF PLANTING AND PLANT-POPULATION TRIALS (DPPT)

Introduction

The objectives of the trial were: (i) to find out the optimum date of planting for chickpeas in different agro-ecological locations in the ICARDA region and to find out the consequence of deviating from this date on the crop performance, (ii) to determine the response of the chickpea crop to change in plant-population in relation to the date of planting and (iii) to determine the response of faba beans and lentils to charge in plant population.

Results of previous seasons have revealed that in most locations advancing date of planting early into the season increased growth and seed yields of faba beans and lentils. In case of chickpeas, delaying planting into spring reduced growth and seed yield substantially in all locations, however, varying the planting dates within winter did not lead to significant changes in the crop performance. The results revealed that seed yield increased with increasing population in wetter areas; however, under drier conditions, the existing genotypes of the three legumes have shown consistent high degree of plasticity.

Material and Methods

It was suggested that the cooperators use the locally adapted cultivar in all the three crops. In chickpeas two dates, namely D_1 and D_2 were suggested. D_1 should correspond to the normal winter planting and D_2 to the normal spring planting in the region. In case of faba beans and lentils, however, only one date has been proposed, between mid-October and early November for North Africa and West Asia for faba beans, and between mid-November and early December for lentils. Three row spacings and plant populations for chickpeas; four row spacings and 3 plant populations for faba beans; and four row spacings and four plant populations for lentils were suggested. The split-split-plot design keeping dates in the main plot, rows in the sub-plots and plant populations in sub-sub plots was suggested in chickpeas. In faba beans and lentils, however, split plot design with row spacings in the main plot and plant populations in the sub-plot were suggested. Each sub plot comprised 5 meter long rows eight each in faba beans and chickpeas and ten in lentils. At harvest the net plot data was to be reported from central rows, the outside 2 rows and 0.5 m at either end of the central rows were to be discarded.

6.1.1. CHICKPEA DATE OF PLANTING AND PLANT-POPULATION TRIAL (CDPPT)

Results and Discussion

Fifteen trials were sent to cooperators in 9 countries and the results were received from only two locations namely Terbol in Lebanon and Quette in Pakistan.

The ANOVA for the experimental design at Terbol in Lebanon (Table 6.1.1.a) indicated that the only mean squares due to row

Table 6.1.1.a. Seed yield of chickpeas at different dates of planting (D), row spacings (R), and plant populations (P) levels in CDPPT at Terbol in Lebanon during 1983/84.

PLANT POPULATION	Seed Yield (kg/ha) Date of Planting (D)								OVERALL MEAN
	D_1 (Early winter)				D_2 (Early spring)				
	R_1 (30cm)	R_2 (40cm)	R_3 (50cm)	MEAN	R_1 (30cm)	R_2 (40cm)	R_3 (50cm)	MEAN	
30 plants/msq (P_1)	2053	1675	1754	1827	1800	1522	1750	1690	1759
45 plants/msq (P_2)	1858	1929	1824	1870	2032	1856	1918	1935	1903
60 plants/msq (P_3)	1713	1625	1535	1624	2041	1849	1775	1888	1756
MEAN	1875	1743	1704		1958	1742	1814		

	L.S.D. 5%	C.V.%
Date of planting)D)	NS	7.9
Row spacing (R)	148.6	13.1
Plant population (P)	NS	13.2
DXR	NS	
D at the same level of P	186.7	
P at the same level of D	192.8	
RXP	NS	
DXRXP	NS	

Table 6.1.1.b. Seed yield of chickpeas at different dates of planting (D), row spacings (R) and plant population levels (P) in CDPPT at Quette in Pakistan during 1983/84.

PLANT POPULATION	Seed Yield (kg/ha) Date of Planting (D)								OVERALL MEAN
	D1 (Early winter)				D2 (Early spring)				
	R_1 (30cm)	R_2 (40cm)	R_3 (50cm)	MEAN	R_1 (30cm)	R_2 (40cm)	R_3 (50cm)	MEAN	
30 plants/msq (P_1)	651	732	539	641	677	386	309	457	549
45 plants/msq (P_2)	632	601	488	573	755	573	323	551	562
60 plants/msq (P_3)	488	542	398	476	768	688	300	586	531
MEAN	590	625	475		734	549	311		

	L.S.D. 5%	C.V.%
Date of planting (D)	NS	40.6
Row spacing (R)	115.6	33.6
Plant population (P)	NS	34.9
R at the same level of D	163.5	
D at the same level of R	209.7	
P at the same level of D	155.7	
D at the same level of P	203.8	
RXP	NS	
DXRXP	NS	

spacings (R) were significant. The row spacing of 30 cm was the best at Terbol in both the dates. Among the interactions however, date of planting at the same level of plant population and plant population at the same level of date, were significant. Further 45 plants per meter square gave high yields than other plant populations in both the dates.

The ANOVA for the experimental design for Quette in Pakistan (Table 6.1.1.b) also revealed that only mean squares due to row spacings were significant. For early winter planting 40 cm seems to be the optimum date whereas for early spring planting 30 cm gave the highest yield. Among the interactions, row spacing at the same level of date of planting, date of planting at the same level of row spacing, plant population at the same date of planting, and date of planting at the same level of plant population were significant. For early winter planting the plant population at 30 plants per meter square gave significantly higher yield than the plant population of 60 plants/m^2. For early spring planting, however, the plant populations did not have significant effect on seed yield.

6.1.2. FABA BEAN PLANT POPULATION TRIAL (FBPPT)

Results and Discussion

Eight trials were sent to cooperators in 6 countries but results were received for three trials. As at Menzel Temime and Mateur in Tunisia, totally different experiments were reported, the results were not included in this report. At Terbol (Lebanon) the ANOVA of the experimental design (Table 6.1.2) revealed the significance of mean squares due to plant populations only. The plant population levels with 30 plants and 45 plants per meter square gave significantly higher yields than that of 60 plants per meter square.

6.1.3. LENTIL PLANT POPULATION TRIAL (LPPT)

Results and Discussion

Eleven trials were sent to different cooperators in 7 countries and the results were received back for three and are presented here location wise:

India: At New Delhi in India, the ANOVA of the experimental design (Table 6.1.3) revealed significance of mean squares due to row spacings, plant populations and row spacings x plant population interaction. Row spacing of 20 cm gave the highest yields. Similarly highest yields were obtained from the treatment with 200 plants per meter square. The best treatment combination at New Delhi, was at a row spacing of 20 cm with 200 plants per meter square.

Table 6.1.2. Seed yield of faba beans at different row spacings (R) and plant populations (P) levels in FBPPT at Terbol (Lebanon) during 1983/84.

PLANT POPULATION	Seed yield (kg/ha) LEBANON (Terbol) Row spacing (R)				MEAN
	R_1	R_2	R_3	R_4	
30 plants /msq (P_1)	2549	2277	1924	1605	2089
45 plants/msq (P_2)	2576	2166	1811	1748	2075
60 plants/msq (P_3)	2285	1663	1671	1760	1845
MEAN	2470	2036	1802	1704	
C.V.%	R=33	P=13.1			
L.S.D. 5%	R=NS	P=191.3		RxP=NS	
Row spacing	30cm	40cm	50cm	60cm	

Table 6.1.3. Seed yield of lentils at different rows spacings (R) and plant populations (P) levels in LPPT at New Delhi (India), Terbol (Lebanon) and Quette (Pakistan) during 1983/84.

Plant Population (P)	Yield (kg/ha)									
	INDIA (New Delhi)					LEBANON (Terbol)				
	Row spacing (R)					Row spacing (R)				
	R_1	R_2	R_3	R_4	MEAN	R_1	R_2	R_3	R_4	MEAN
100 plants/msq (P_1)	1620	1201	663	469	988	1527	1401	1422	1456	1451
200 plants/msq (P_2)	1683	1255	767	523	1057	1601	1615	1517	1607	1585
300 plants/msq (P_3)	1543	1146	827	520	1009	1731	1599	1445	1519	1573
400 plants/msq (P_4)	1377	1122	703	520	931	1539	1547	1413	1402	1475
MEAN	1556	1181	740	508		1599	1540	1449	1496	
C.V.%	R=1.9	P=3.2				R=11.9	P=9.2			
L.S.D. 5%	R=18.5	P=26.8		RxP=53.6(1) =49.9(2)		R=NS	P=99.9		RxP=NS	
Row spacing	20cm	30cm	40cm	50cm		20cm	30cm	40cm	50cm	

(1) L.S.D. 5% for difference between two Pl. Pop. means at the same level of row spacing.

(2) L.S.D. 5% for difference between two Row Sp. means for the same Pl. Pop. mean or for different levels of Pl. Pop.

Cont'd. ...

Plant Population	Yield (kg/ha)				
	PAKISTAN (Quette)				
	Row spacing (R)				
	R_1	R_2	R_3	R_4	MEAN
100 plants/msq (P_1)	674	710	371	273	507
200 plants/msq (P_2)	723	521	498	387	532
300 plants/msq (P_3)	654	645	498	641	609
400 plants/msq (P_4)	596	625	479	348	512
MEAN	662	625	461	412	
C.V.%	R=60.6	P=35.4			
L.S.D. 5%	R=NS	P=NS		RxP=NS	
Row spacing	20cm	30cm	40cm	50cm	

Lebanon: At Terbol in Lebanon, only row spacings (Table 6.1.3) exhibited significant mean squares. Plant population of 200 plants per meter square gave the best yields and was very closely followed by 300 plants per meter square. The other plant populations gave significantly inferior yields.

Pakistan: At Quette in Pakistan, the ANOVA of the experimental design (Table 6.1.3) revealed that neither the row spacing nor the plant population had significant effect on the seed yield.

6.2. FERTILITY-CUM-INOCULATION TRIAL (FIT)

Introduction

The FIT was planned to study the response of faba beans, lentils and chickpeas to the application of fertilizer nutrients and to inoculation with Rhizobium culture under different agro-ecological conditions in the region. The objectives of this trial have been to investigate:

(i) whether there is need for application of phosphate and potash,
(ii) whether the naturalized Rhizobia present in the soil were effective or there was a need for artificial inoculation,
(iii) whether the symbiotic nitrogen fixation was adequate in meeting the nitrogen need of the crop,
(iv) whether the symbiotic nitrogen fixation as reflected in terms of crop performance can be improved with starter nitrogen dressing,
(v) whether the symbiotic nitrogen fixation is affected by the application of phosphorus and/or potassium.

Material and Methods

The basic set of fertility and inoculation treatments was the same for all the three crops. These consisted of: (i) an unfertilized uninoculated control, (ii) 50 kg P_2O_5/ha; (iii) 60 kg K_2O/ha, (iv) inoculation, (v) inoculation + 50 kg P_2O_5/ha, (vi) inoculation+ 60 kg K_2O/ha, (vii) inoculation + 50 kg P_2O_5/ha + 60 kg K_2O/ha and (viii) 100 kg N/ha + 50 kg P_2O_5/ha + 60 kg K_2O/ha.

The trial was designed as a randomized complete block with four replications. The cooperators could reduce the replications to three if land was limiting. The suggested plot size was: 13.5 m^2 (2.7m x 5.0m). The net plot for harvesting was suggested to be comprised of the central rows leaving one row at either side of the plot and 0.5 m at either end of row as borders.

6.2.1. CHICKPEA FERTILITY-CUM-INOCULATION TRIAL (CFIT)

Results and Discussion

Sixteen trials were sent to cooperators in 7 countries and the results were received back from only nine trials from four countries. The results are presented in Table 6.2.1. The location mean values revealed that the highest seed yield was recorded at Faisalabad in Pakistan (3165 kg/ha).

The ANOVA of seed yield for the experimental design showed that differences between treatments were significant only at Sids and Mallawi in Egypt, Islamabad and Tarnab in Pakistan, and Izra'a in Syria.

At Mallawi in Egypt three treatments significantly exceeded the control. The treatment T_4 (incoculation with rhizobium) gave the highest seed yield (661 kg/ha) and exceeded the local check by a margin of 144 per cent and was followed by T_3 (50 kg P_2O_5/ha), and T_6 (Inoculation + 50 kg P_2O_5/ha), respectively. At Sids, however, treatment T_7 (Inoculation + 50 kg P_2O_5/ha + 60 kg K_2O/ha) gave significantly higher yield than the control.

At Islamabad and Tarnab in Pakistan four treatments each exceeded the control by a significant margin. The best treatment among these was T_7 (Inoculation + 50 kg P_2O_5/ha + 60 kg K_2O/ha). At Islamabad it increased the seed yield over control by a margin of 34 per cent and at Tarnab by a margin of 196 per cent. The other treatments in order of merit at Islamabad included, T_3 (50 kg P_2O_5/ha), T_5 (Inoculation + 50 kg P_2O_5/ha) and T_4 (Inoculation). However, the other treatments in order of merit at Tarnab included, T_8 (100 kg N/ha + 50 kg P_2O_5/ha + 60 kg K_2O/ha), T_5 (Inoculation + 50 kg P_2O_5/ha) and T_2 (50 kg P_2O_5/ha).

At Izra'a, in Syria, none of treatments was significantly superior to the control in seed yield.

6.2.2. FABA BEAN FERTILITY-CUM-INOCULATION TRIAL (FBFIT)

Results and Discussion

Eleven trials were sent to 7 countries and the results were received from two trials. The ANOVA of yield data for these locations (Table 6.2.2.) indicated that the differences between the treatments were statistically non-significant at both locations indicating that the treatment differences were not significant.

6.2.3. LENTIL FERTILITY-CUM-INOCULATION TRIAL (LFIT)

Results and Discussion

Sixteen LFIT Trials were sent to cooperators in 8 countries and

Table 6.2.1. Seed yield (Y=kg/ha) and Rank (R) of different fertilizer-cum-inoculation treatments in CFIT at different locations during 1983/84.

	TREATMENTS	ARGENTINA		EGYPT				PAKISTAN								SYRIA				MEAN	
		Perico		Mallawi		Sids		Faisalabad		Islamabad		Lahore		Tarnab		Gelline		Izra'a			
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
T_1	Control	438	2	271	7	1234	6	3047	6	1533	8	1727	8	440	8	1477	2	933	1	1233	7
T_2	Phosphate at 50 kg P_2O_5/ha	320	5	237	8	1065	7	3590	1	1618	6	2038	4	1021	4	1463	3	815	5	1352	4
T_3	Potash at 60 kg K_2O/ha	488	1	539	2	979	8	2623	8	1860	2	1771	7	644	5	1217	6	892	2	1224	8
T_4	Inoculation with Rhizobium	335	4	661	1	1745	3	3095	5	1743	4	1932	6	479	7	1102	8	629	8	1302	6
T_5	Inoculation + Phosphate	271	7	302	6	1695	4	3163	4	1825	3	2118	2	1177	3	1210	7	647	7	1379	3
T_6	Inoculation + Potash	229	8	458	3	1784	2	3034	7	1575	7	1996	5	546	6	1219	5	888	3	1303	5
T_7	Inoculation+Phosphate+Potash	344	3	349	4	1914	1	3208	3	2058	1	2097	3	1304	1	1315	4	650	6	1471	1
T_8	100 kg N/ha+Phosphate+Potash	279	6	349	4	1482	5	3557	2	1620	5	2145	1	1302	2	1510	1	851	4	1455	2
Location mean		338		395		1487		3165		1729		1978		864		1314		788			
C.V.%		48.9		13.6		27.0		14.1		7.6		15.10		23.8		15.0		6.4			
L.S.D. at 5%		NS		79		591		NS		192		NS		302		NS		74			
No. of treatments significantly exceeding the control		-		3		1		-		4		-		4		-		0			

Table 6.2.2. Seed yield (Y=kg/ha) and Rank (R) of different fertilizer-cum-inoculation treatments in FBFIT at different locations during 1983/84.

	TREATMENTS	ARGENTINA Perico		TUNISIA Beja		MEAN	
		Y	R	Y	R	Y	R
T_1	Control	450	7	1743	8	1097	8
T_2	Phosphate at 50 kg P_2O_5/ha	488	6	2361	1	1425	2
T_3	Potash at 60 kg K_2O/ha	534	5	2170	3	1352	3
T_4	Inoculation with Rhizobium	603	3	1896	7	1250	6
T_5	Inoculation + Phosphate	616	2	2295	2	1456	1
T_6	Inoculation + Potash	659	1	1983	5	1321	5
T_7	Inoculation+Phosphate+Potash	413	8	1927	6	1170	7
T_8	100 kg N/ha+Phosphate+Potash	559	4	2094	4	1327	4
Location mean		540		2059			
C.V.%		48.0		23.0			
L.S.D. at 5%		NS		NS			
No. of treatments significantly exceeding the control		-		-			

Table 6.2.3. Seed yield (Y=kg/ha) and Rank (R) of different fertilizer-cum-inoculation treatments in LFIT at different locatons during 1983/84.

	TREATMENTS	ARGENTINA Perico		PAKISTAN Lahore		SUDAN(1) Wad Medani		SYRIA Izra'a		MEAN	
		Y	R	Y	R	Y	R	Y	R	Y	R
T_1	Control	354	6	1201	8	451	3	745	1	688	5
T_2	Phosphate at 50 kg P_2O_5/ha	408	2	1450	4	522	1	614	5	749	1
T_3	Potash at 60 kg K_2O/ha	372	4	1300	7	418	4	696	2	697	4
T_4	Inoculation with Rhizobium	453	1	1304	6	371	6	622	4	688	5
T_5	Inoculation + Phosphate	384	3	1509	3	319	7	535	8	687	7
T_6	Inoculation + Potash	269	8	1356	5	305	8	564	7	624	8
T_7	Inoculation+Phosphate+Potash	372	4	1556	1	394	5	570	6	723	3
T_8	100 kg N/ha+Phosphate+Potash	333	7	1513	2	466	2	666	3	745	2
Location mean		368		1399		-		626			
C.V.%		36.3		17.4		-		7.7			
L.S.D. at 5%		NS		NS		-		71			
No. of treatments significantly exceeding the control		-		-		-		0			

(1) Based on one replication only.

the results were received for 5 sets. The results from Pulawy (Poland) could not be included as the fertilizer treatments were totally changed. The results from Wad Medani were reported for only one replication and were not analysed. The ANOVA (Table 6.2.3) of seed yield revealed that only at Izra'a in Syria the mean squares due to treatments were significant. The LSD estimates at Izra'a, however, revealed that none of the treatments was significantly superior to control. It could, therefore, be concluded that application of Phosphate or Potash or Inoculation of materials with Rhizobia did not add much to seed yield.

6.3. WEED CONTROL TRIAL (WCT)

Introduction

The trial aimed at finding out the magnitude of yield loss that occurs in faba bean, lentil and chickpea crops due to the presence of weeds. It also aimed at assessing the relative merit of some selected weed control treatments under the different agro-ecological conditions in the three crops in the ICARDA region.

Material and Methods

The basic treatments involved weedy check, weed free by repeated hand weeding, hand weeding twice (30-40, 70-80 days after emergence) and herbicide application treatments. The details of these treatments are given in the appropriate tables.

The trials were designed as randomized complete blocks with four replications. The plot size was 18.0 m^2 (3.6 m x 5.0 m) for all the three crops. At harvest time the two outside rows and 0.5 m at either end of the central rows were discarded. Thus the seed yields described in this report came from the central rows of 4 m length.

6.3.1. CHICKPEA WEED CONTROL TRIAL (CWCT)

Thirty three trials were distributed to cooperators in 13 countries and the results were received from nine locations. The location mean data (Table 6.3.1) revealed that seed yield was highest at Douyet in Morocco (2483 kg/ha) and was followed by Islamabad in Pakistan (1923 kg/ha), and Gelline in Syria (1800 kg/ha). At Bahteem, the yield levels were extremely low (83 kg/ha). The coefficient of variation was very high at Bahteem in Egypt (185.8%), and Marchouch in Morocco (78.2%) and ranged from 16.0 to 55.8% at other locations.

The comparison of seed yields of weedy and weed free checks revealed that the loss due to weeds at different locations varied and the overall loss was 41 per cent. This showed the importance of weed control in chickpeas.

Table 6.3.1. Seed yield (Y=kg/ha) and rank (R) of chickpeas as affected by weed control treatments in CWCT at various locations during 1983/84.

	TREATMENTS	EGYPT				JORDAN		LEBANON		MOROCCO				NEPAL				PAKISTAN				SYRIA		MEAN	
		Bahteem		Sids		Jubeiha		Terbol		Douyet		Marchouch		Parwanipur		Janakpur		Faisalabad		Islamabad		Gelline			
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
T_1	Weedy check	3	11	821	3	400	10	1055	12	2313	8	83	12	1202	12	438	4	126	12	1918	6	1238	12	872	12
T_2	Weed free by repeated hand weeding	111	5	841	2	1122	1	2169	1	2648	6	760	5	1954	2	250	8	1996	2	2170	2	2210	1	1476	2
T_3	Hand weeding twice (30-40 & 70-80 DAE)	122	3	708	7	839	2	2169	1	2658	4	704	6	2054	1	396	5	2016	1	2863	1	2142	2	1516	1
T_4	Pre-emergence application of chlorbromuron (Maloran) at 1.5 kg a.i./ha	57	6	532	11	379	11	1664	9	2079	10	1178	1	1617	10	83	12	1789	3	1420	12	1661	9	1133	9
T_5	Pre-emergence application of methabenzthiazuron (Tribunil) at 3.0 kg a.i./ha	5	10	625	8	513	6	1761	6	2656	5	200	11	1857	6	750	1	1457	7	1928	5	2047	4	1254	4
T_6	Pre-emergence application of terbutryne (Igran) at 3.0 kg a.i./ha	175	2	869	1	426	9	1678	7	2542	7	1032	2	1668	9	167	9	1525	5	1838	8	1385	11	1210	7
T_7	Pre-emergence application of cyanazine (Bladex) at 0.5 kg a.i./ha	39	7	744	5	353	12	1286	11	2081	9	500	9	1519	11	167	9	216	11	1893	7	1840	6	967	11
T_8	Pre-emergence application of Cyanazine at 1.0 kg a.i./ha	3	11	597	9	493	7	1413	10	3238	1	441	10	1770	7	667	2	404	9	1700	10	1914	5	1149	8
T_9	Same as No. 4 above + 0.5 kg a.i./ha of pronamide (Kerb)	21	8	803	4	550	5	1866	4	2773	3	783	4	1892	4	333	6	1517	6	1725	9	1554	10	1256	3
T_{10}	Same as No. 5 above + pronamide as No. 9	113	4	489	12	439	8	1862	5	2888	2	1014	3	1757	8	167	9	1323	8	1673	11	2071	3	1254	4
T_{11}	Same as No. 6 above + pronamide as No. 9	344	1	742	6	576	4	1978	3	1846	12	615	7	1907	3	312	7	1527	4	1946	4	1749	8	1231	6
T_{12}	Same as No. 7 above + pronamide as No. 9	11	9	548	10	628	3	1675	8	2079	10	596	8	1888	5	458	3	221	10	2010	3	1799	7	1083	10
	Location mean	83		693		560		1715		2483		658		1757		349		1176		1923		1801			
	C.V.%	185.8		20.8		25.6		16.0		37.2		78.2		20.6		55.8		31.7		29.9		14.90			
	L.S.D. at 5%	NS		207		206		396		NS		NS		NS		NS		536		NS		386			
	No. of treatments significantly exceeding the weedy check.	-		0		3		9		-		-		-		-		8		-		9			

The ANOVA of the yield data showed that the differences between the treatment means were significant at Sids (Egypt), Jubeiha (Jordan), Terbol (Lebanon), Faisalabad (Pakistan) and Gelline (Syria).

At Jubeiha in Jordan, Terbol in Lebanon, Faisalabad in Pakistan and Gelline in Syria, 1, 7, 6 and 7 weedicide treatments significantly exceeded the weedy check. At Jubeiha treatment 12 gave significant better yield than the weedy check but in comparison to weed free check it gave 44% less yield.

At Terbol in Lebanon, the treatment T_{11} (Tribunil and Pronamide) was the best giving about 87 per cent higher yield than the weedy check, and the other treatments in order of merit included T_9, T_{10}, T_5, T_6, T_{12} and T_4 respectively.

At Faisalabad in Pakistan T_4 was the best treatment and was followed by T_{11}, T_6, T_9, T_5 and T_{10} respectively.

At Gelline in Syria, T_{10} was the best treatment and was followed by T_5, T_8, T_7, T_{12}, T_{11} and T_4 respectively.

On the basis of overall performance of weedicide treatments, across locations, T_9 was the best treatment and was closely followed by T_5 and T_{10}.

6.3.2. FABA BEAN WEED CONTROL TRIAL (FBWCT)

Results and Discussion

Fifteen Faba Bean Weed Control Trials were supplied to cooperators in 10 countries. The results were, however, received for 7 trials from 5 countries and are presented in Table 6.3.2. The comparison of the weedy check (treatment T_1) and weed free check (treatment T_2) showed that weeds caused heavy losses in yield in faba beans in almost all the locations. On an average across locations, the loss in seed yield was 6.9 per cent, however, the maximum loss was observed at Terbol in Lebanon (35.7%).

The location mean for seed yield was highest at Hama in Syria (4540 kg/ha) and was followed by Sakha (4154 kg/ha) and Sids (4022 kg/ha), however, the lowest seed yields were recorded at Debre Zeit in Ethiopia (1440 kg/ha) and Terbol in Lebanon (1606 kg/ha). The ANOVA of the yield data exhibited non-significant differences between treatments at all the locations.

6.3.3. LENTIL WEED CONTROL TRIAL (LWCT)

Results and Discussion

Thirty one trials of LWCT were distributed to cooperators in 13 countries. The results were, however, received for 9 trials. The data from Wroclaw (Poland) was reported only for weed count and it was observed that treatment T_4 (Maloran) was the best treatment in controlling weeds and was very closely followed by T_9. The ANOVA for

Table 6.3. 2. Seed yield (Y=kg/ha) and rank (R) of faba beans as affected by weed control treatments in FBWCT at various locations during 1983/84.

	TREATMENTS	EGYPT Sakha		EGYPT Sids		ETHIOPIA Debre Zeit		LEBANON Terbol		SPAIN Cordoba		SYRIA Hama		TUNISIA Beja		MEAN	
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
T_1	Weedy check	3414	12	3946	8	1146	12	1266	12	3743	4	4049	12	2190	8	2979	11
T_2	Weed free by repeated hand weeding	4336	7	4003	6	1354	9	1969	2	2661	12	4383	8	3700	4	3201	7
T_3	Hand weeding twice (30-40 & 70-80 DAE)	4350	5	4214	3	1248	11	2102	1	4375	1	4471	6	3263	9	3432	3
T_4	Pre-emergence application of chlorbromuron (maloran) at 1.5 kg a.i./ha	4079	8	4051	5	1317	10	1362	10	2908	11	4148	10	3507	7	3053	10
T_5	Pre-emergence application of methabenzthiazuron (Tribunil) at 3.0 kg a.i./ha	3731	10	3997	7	1520	5	1622	6	3233	8	4152	9	3837	3	3156	9
T_6	Pre-emergence application of terbutryne (Igran) at 2.0 kg a.i./ha	4611	1	4053	4	1677	1	1747	3	3913	3	4572	5	4666	1	3606	1
T_7	Pre-emergece application of cyanazine (Bladex) at 0.5 kg a.i./ha	3822	9	3892	9	1386	8	1557	7	3651	5	5072	3	3010	11	3199	8
T_8	Pre-emergence application of cyanazine (Bladex) at 1.0 kg a.i./ha	3692	11	4286	2	1504	6	1471	9	2933	10	4068	11	2407	12	2909	12
T_9	Same as No. 4 above + 0.5 kg a.i./ha of pronamide (Kerb)	4391	4	3847	11	1564	3	1638	5	3261	7	4678	4	3073	10	3207	6
T_{10}	Same as No. 5 above + pronamide as No. 9	4340	6	4300	1	1458	7	1493	8	3129	9	4420	2	4177	2	3331	5
T_{11}	Same as No. 6 above + pronamide as No. 9	4576	2	3794	12	1530	4	1711	4	3968	2	5356	1	3693	6	3518	2
T_{12}	Same as No. 7 above + pronamide as No. 9	4505	3	3885	10	1579	2	1337	11	3571	6	5115	2	3700	4	3385	4
	Location mean	4154		4022		1440		1606		3445		4540		3527			
	C.V.%	13.9		10.3		17.0		27.2		50.5		18.5		22.7			
	L.S.D. 5%	NS		NS		NS		NS		NS		NS		NS			
	No. of treatments significantly exceeding the check	-		-		-		-		-		-		-			

Table 6.3.3. Seed yield (Y=kg/ha) and rank (R) of lentils as affected by weed control treatments in LWCT at various locations during 1983/84.

	TREATMENTS	EGYPT				JORDAN		LEBANON		NEPAL				PAKISTAN		SYRIA				POLAND
		Bahteem		Sakha		Jubeiha		Terbol		Jankpur		Parwanipur		Chakwal		Izra'a		MEAN		Wroclaw
		Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Weed count
T_1	Weedy check	139	11	375	12	498	5	549	12	1075	11	1120	5	32	12	277	11	508	12	94
T_2	Weed free by repeated hand weeding	376	5	1121	6	1293	1	1303	1	1375	4	1140	3	447	1	698	3	969	1	-
T_3	Hand weeding twice (30-40 & 70-80 DAE)	483	2	975	7	521	4	989	7	1550	1	1024	7	265	2	563	5	796	5	-
T_4	Pre-emergence application of chlorbromuron (Maloran) at 1.5 kg a.i./ha	244	8	542	11	144	12	978	8	1075	11	1230	1	58	9	461	8	592	11	16
T_5	Pre-emergence application of prometryne (Gesagard) at 1.5 kg a.i./ha	448	4	1963	3	414	6	1014	6	1300	6	1126	4	124	4	323	10	839	3	71
T_6	Pre-emergence application of methabenzthiazuron (Tribunil) at 2.0 kg a.i./ha	195	10	583	10	355	7	1040	4	1400	3	1225	2	50	10	711	2	695	8	64
T_7	Pre-emergence application of cyanazine (Bladex) at 0.5 kg a.i./ha	234	9	671	9	565	3	820	11	1300	6	844	11	81	8	499	6	627	10	68
T_8	Pre-emergence application of cyanazine (Bladex) at 1.0 kg a.i./ha	320	6	779	8	343	9	904	10	1425	2	966	9	83	7	479	7	662	9	35
T_9	Same as No. 4 above + 0.5 kg a.i./ha of pronamide (Kerb)	281	7	1983	1	621	2	1258	2	1350	5	1090	6	47	11	374	9	876	2	20
T_{10}	Same as No. 5 above + pronamide as No. 9	563	1	1979	2	338	10	936	9	1275	8	1024	7	176	3	147	12	805	4	41
T_{11}	Same as No. 6 above + pronamide as No. 9	134	12	1588	4	281	11	1034	5	1225	9	679	12	97	5	761	1	725	7	29
T_{12}	Same as No. 7 above + pronamide as No. 9	463	3	1313	5	345	8	1083	3	1150	10	940	10	96	6	574	4	746	6	60
	Location mean	323		1156		476		992		1292		1034		130		489				
	C.V.%	50.8		28.8		45.7		26.9		18.8		26.4		11.8		11.7				
	L.S.D. at 5%	236		479		313		383		NS		NS		22		82				
	No. of treatments significantly exceeding the weedy check	5		7		1		9		-		-		9		9				

the experimental design for seed yield data (Table 6.3.3) revealed the significance of mean squares due to treatments at all the locations except Janakpur and Parwanipur in Nepal. At Bahteem, Sakha, Terbol, Chakwal and Izra'a, 3, 5, 7, 7 and 7 weedicide treatments exceeded the weedy check in seed yield by a significant margin. At Bahteem in Egypt the treatment T_{10} (Gesagard + Kerb) was the best treatment and was closely followed by T_{12} (Bladex + Kerb) and T_5 (Gesagard). At Sakha in Egypt the treatment T_9 (Maloran + Kerb), T_{10} (Gesagard + Kerb) and T_5 (Gesagard) were three most effective treatments.

At Terbol in Lebanon, T_9 (Maloran + Kerb) was the best weedicide treatment and was followed by T_{12} (Bladex + Kerb), T_6 (Tribunil), T_{11} (Tribunil + Kerb), and T_5 (Gesagard), etc. At Chakwal in Pakistan the yield levels were very low and the treatment T_{10} (Gesagard + Kerb) was the most effective in controlling weeds.

At Izra'a in Syria, the treatments T_{11} (Tribunil + Kerb) and T_6 (Tribunil) were the most effective in controlling weeds.

6.4. CHICKPEA IRON EFFICIENCY TRIAL (CIET)

This was the second year of conduct of trial on the efficiency of iron utilization in chickpea. The main objective of the trial is to seek the information on the possibility of removing the iron-deficiency-stress in susceptible entries by foliar spray of ferrous sulphate solution. It may also help in quantifying the magnitude of yield loss that might be occuring due to iron deficiency in the susceptible entries and in the identification of any latest deficiency in the efficient entry.

Material and Methods

Two entries, one which shows iron deficiency (V_1) and the other which does not show iron deficiency (V_2) under local conditions were suggested to be used in this trial. There were four treatments with spray of ferrous sulphate and other four with water. The randomised complete block design with four replications was suggested. The suggested plot size was six rows, 5 m long spaced at 30 cm with within row spacing of 10 cm. At harvest time the two outside rows and 0.5 m at either end of the central rows were discarded. Thus the seed yields described in this report came from the central rows of 4 m length.

Results and Discussion

Eleven sets of trial were sent to cooperators in 6 countries and the results were received from 3 locations namely Terbol in Lebanon, and Chakwal and Islamabad in Pakistan. The ANOVA for seed yield data revealed that the treatment differences were not significant at all the locations.

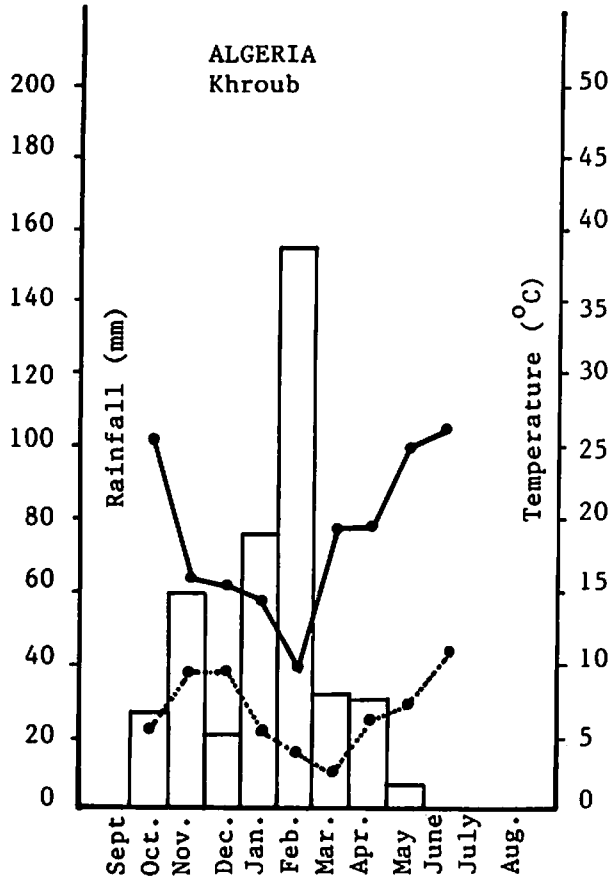
Table 6.4.1. Seed yield (kg/ha) of different treatments in CIET at various locations during 1983/84.

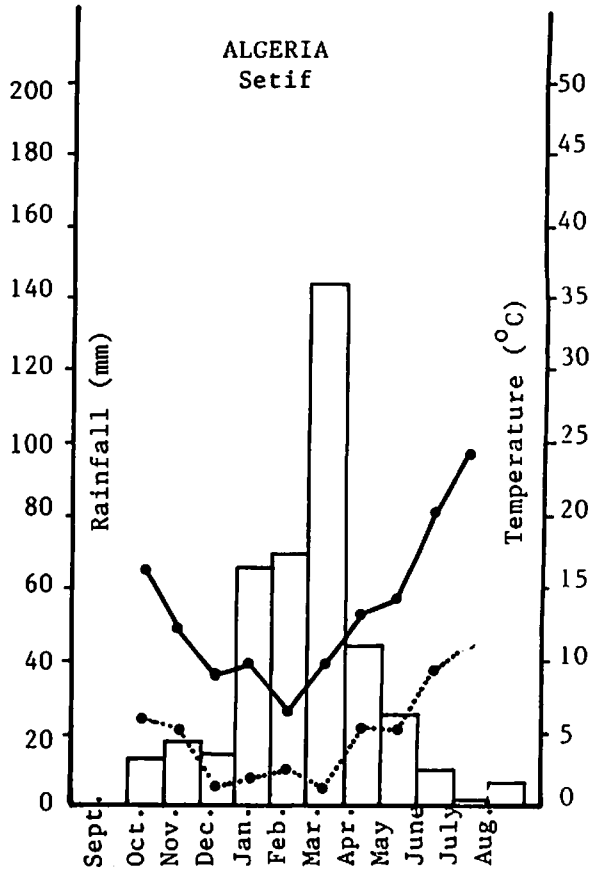
	TREATMENT	LEBANON		PAKISTAN				MEAN	
		Terbol		Chakwal		Islamabad			
		Y	R	Y	R	Y	R	Y	R
T_1	V_1 sprayed with water once	1961	7	1590	1	1748	1	1766	1
T_2	V_2 sprayed with water once	2135	4	1389	4	1420	7	1648	4
T_3	V_1 sprayed with water twice	2237	2	1299	6	1538	3	1691	2
T_4	V_2 sprayed with water twice	2008	6	1271	7	1649	2	1643	6
T_5	V_1 sprayed with 0.5% ferrous sulphate solution once	2198	3	1326	5	1333	8	1619	7
T_6	V_2 sprayed with 0.5% ferrous sulphate solution once	2253	1	1250	8	1483	5	1662	3
T_7	V_1 sprayed with 0.5% ferrous sulphate solution twice	1940	8	1417	2	1481	6	1613	8
T_8	V_2 sprayed with 0.5% ferrous sulphate solution twice	2013	5	1417	2	1503	4	1644	5
	Location Mean	2093		1370		1519			
	C.V.%	12.8		19.9		11.4			
	L.S.D. 5%	NS		NS		NS			

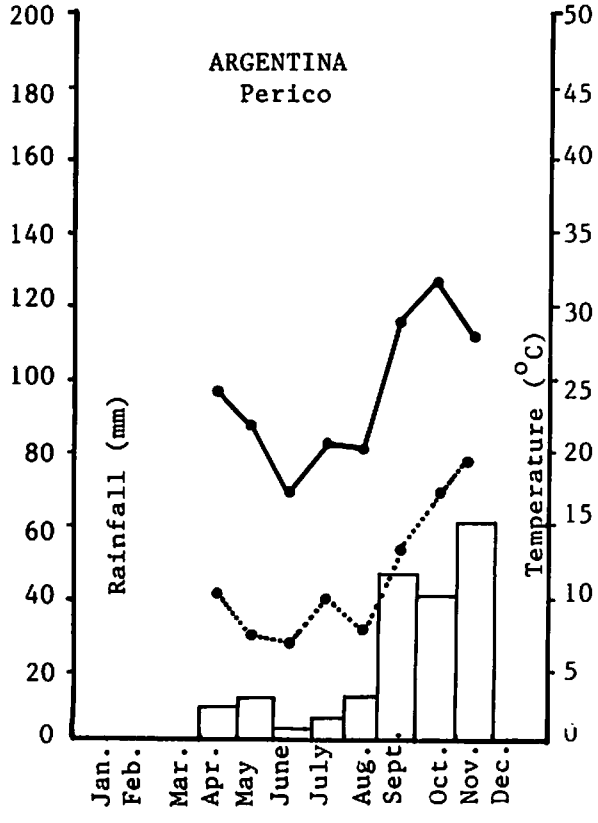
V_1 = Entry which shows iron deficiency, V_2 = Entry which does not show iron deficiency.

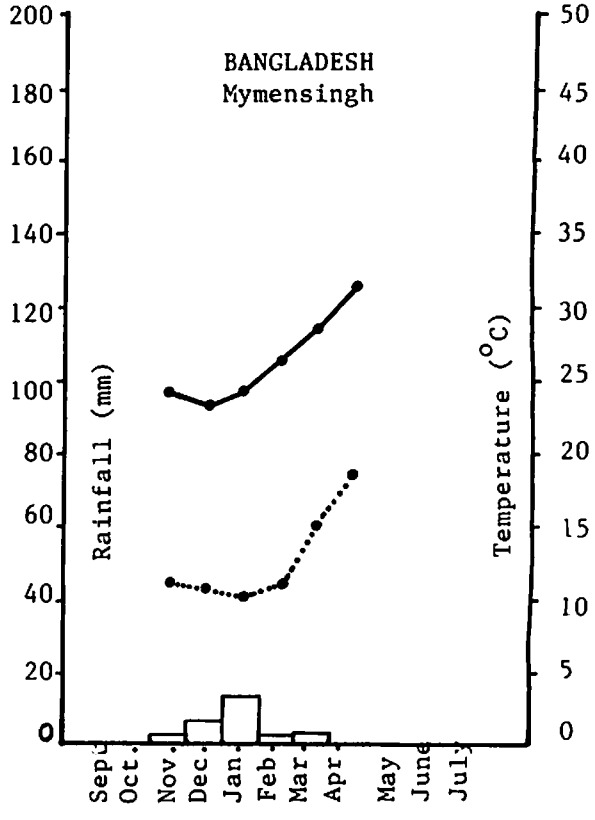
7. ACKNOWLEDGEMENTS

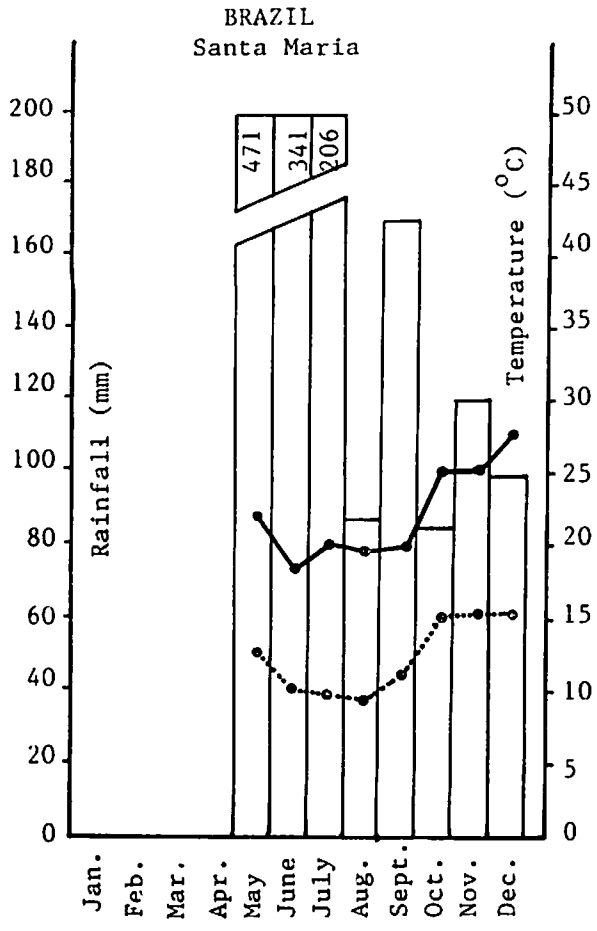
Our thanks are due to all the donors of ICARDA, and in particular the IDRC, for making this cooperative research effort possible.

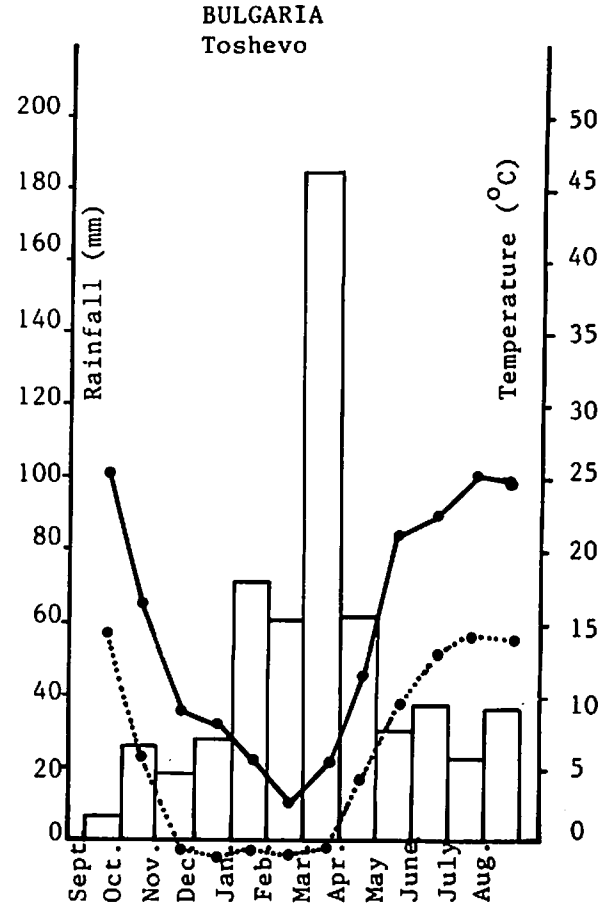

ALGERIA
Khroub
Rainfall (mm)
Temperature (°C)
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30
35
40
45
50
Sept
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

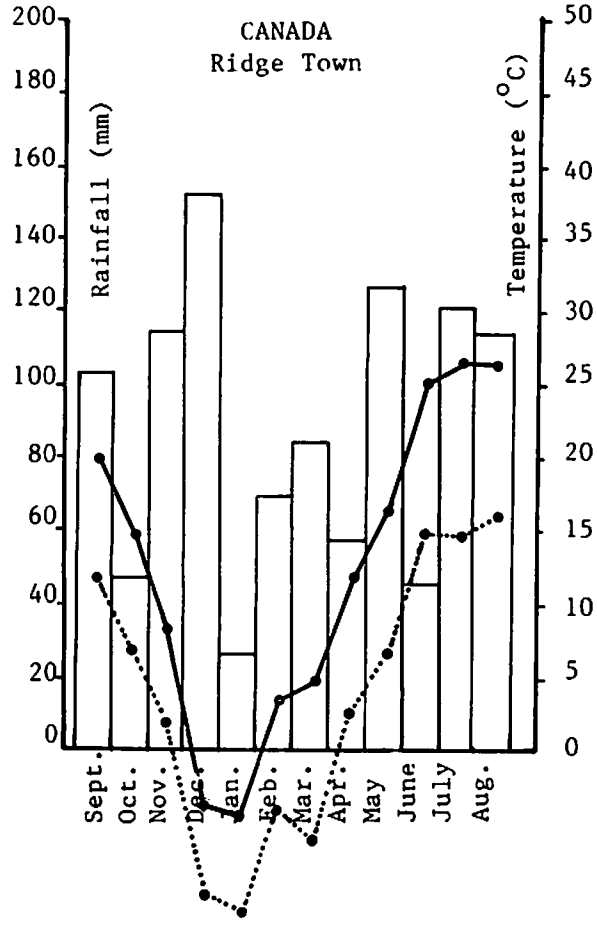

ALGERIA
Setif
Rainfall (mm)
Temperature (°C)
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30
35
40
45
50
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

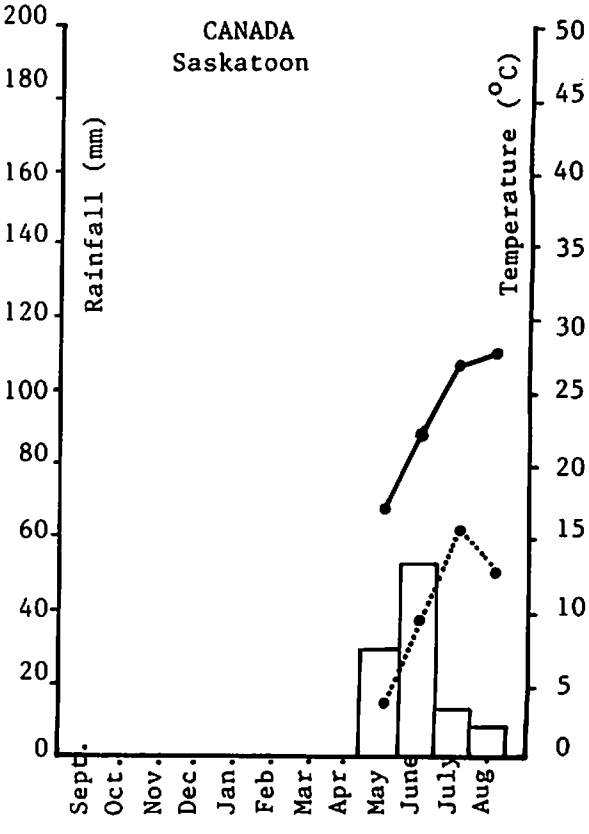

ARGENTINA
Perico
Rainfall (mm)
Temperature (°C)
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30
35
40
45
50
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

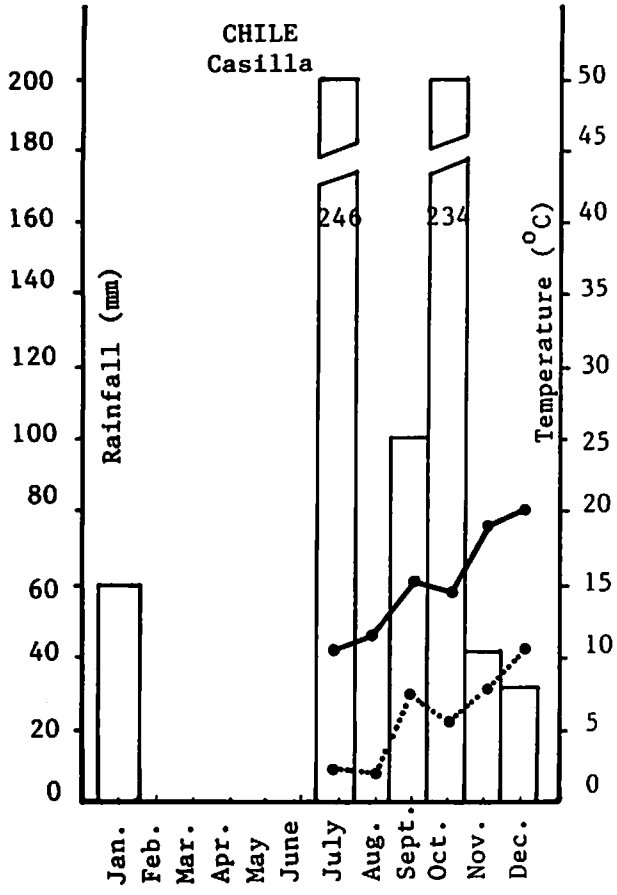

BANGLADESH
Mymensingh
Rainfall (mm)
Temperature (°C)
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30
35
40
45
50
Sept
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July

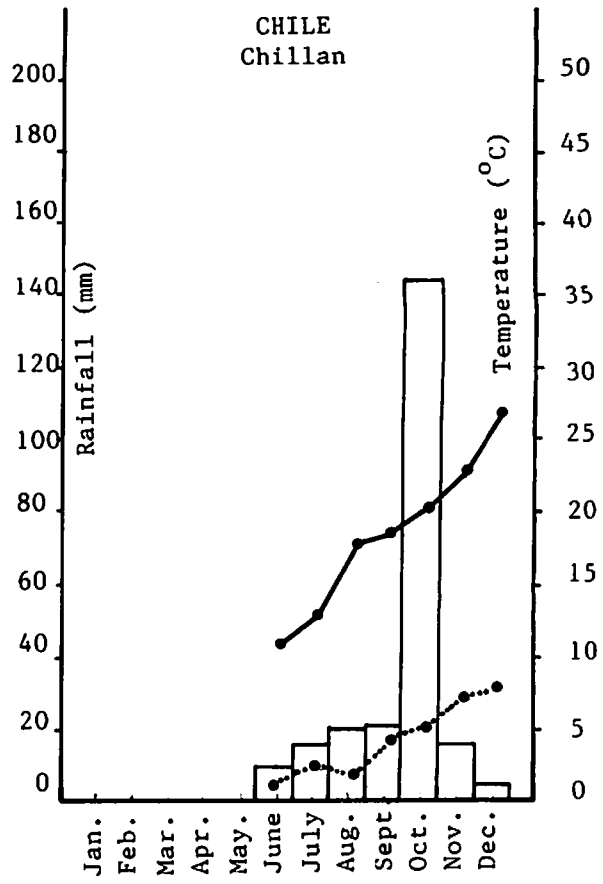

BRAZIL
Santa Maria
Rainfall (mm)
Temperature (°C)
471
341
206
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

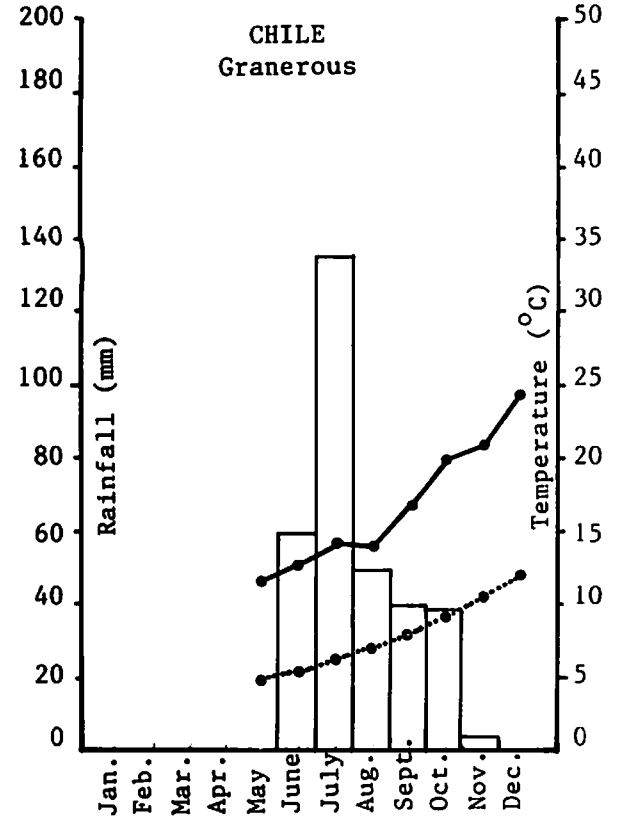

BULGARIA
Toshevo
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

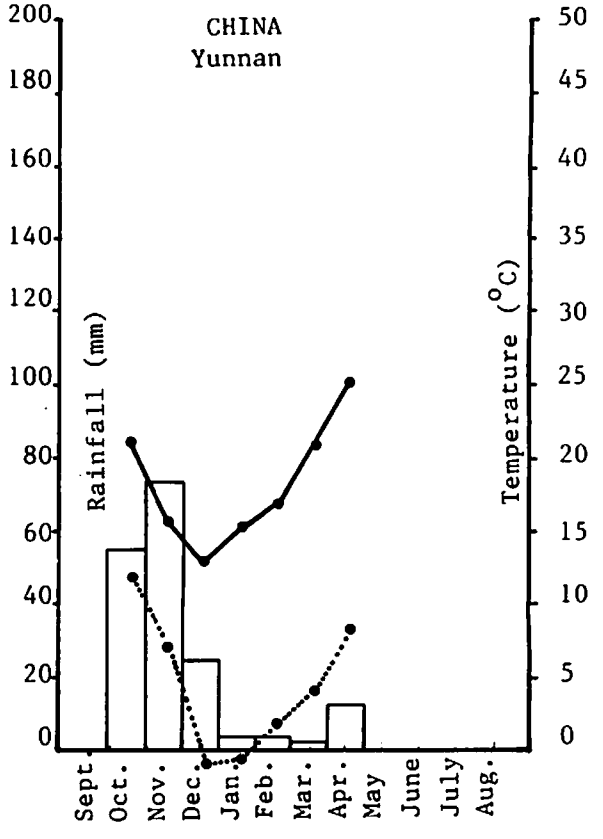

CANADA
Ridge Town
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

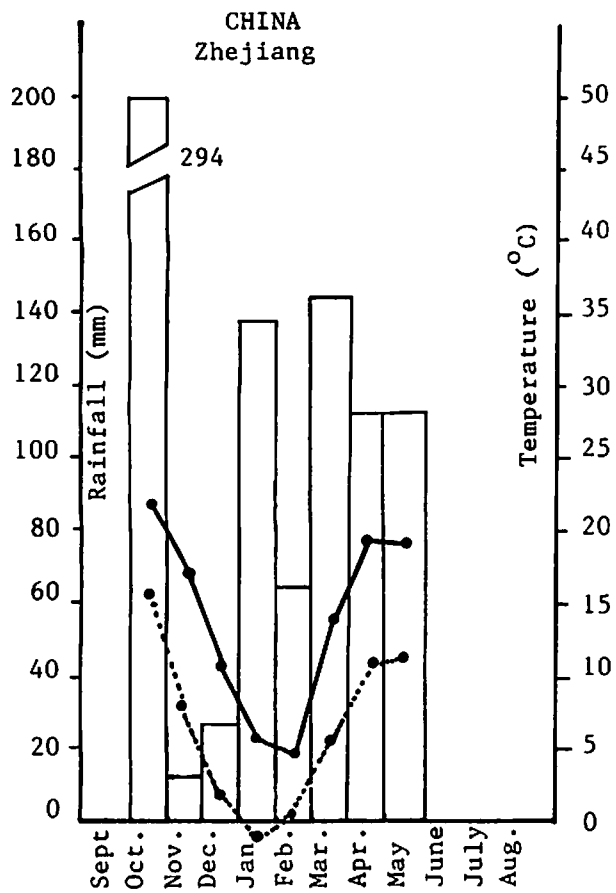

CANADA
Saskatoon
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

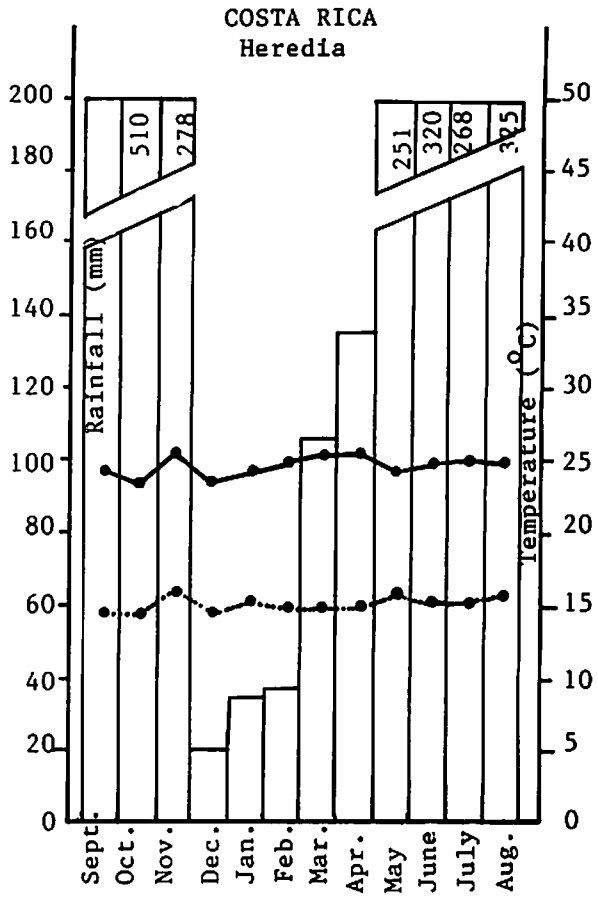

CHILE
Casilla
Rainfall (mm)
Temperature (°C)
246
234
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

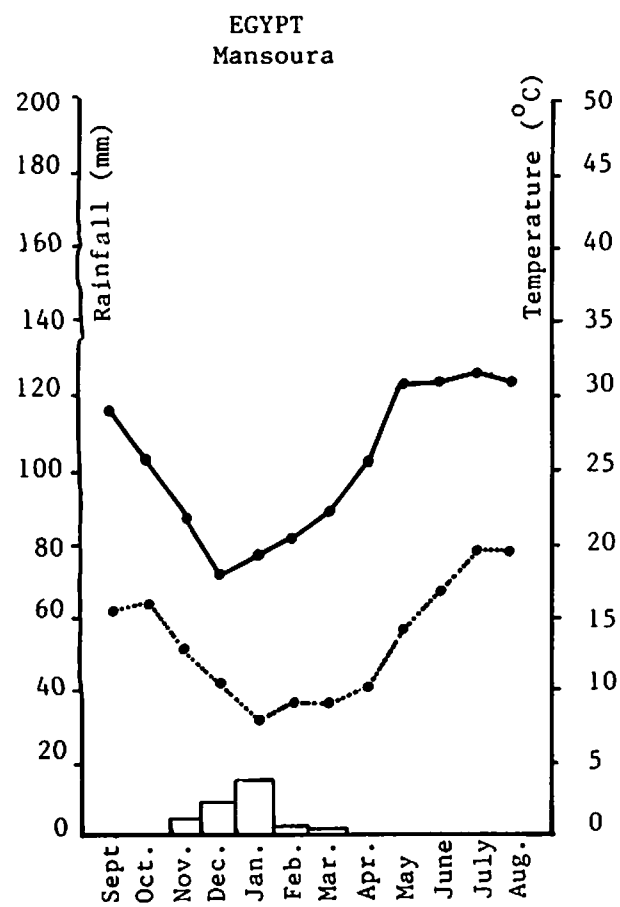

CHILE
Chillan
Rainfall (mm)
Temperature (°C)
Jan.
Feb.
Mar.
Apr.
May.
June
July
Aug.
Sept
Oct.
Nov.
Dec.

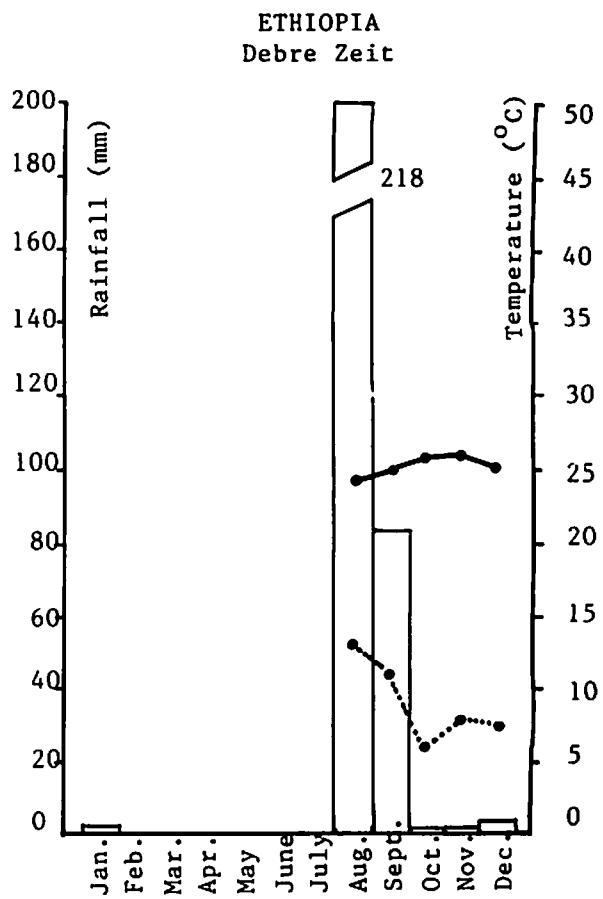

CHILE
Granerous
Rainfall (mm)
Temperature (°C)
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

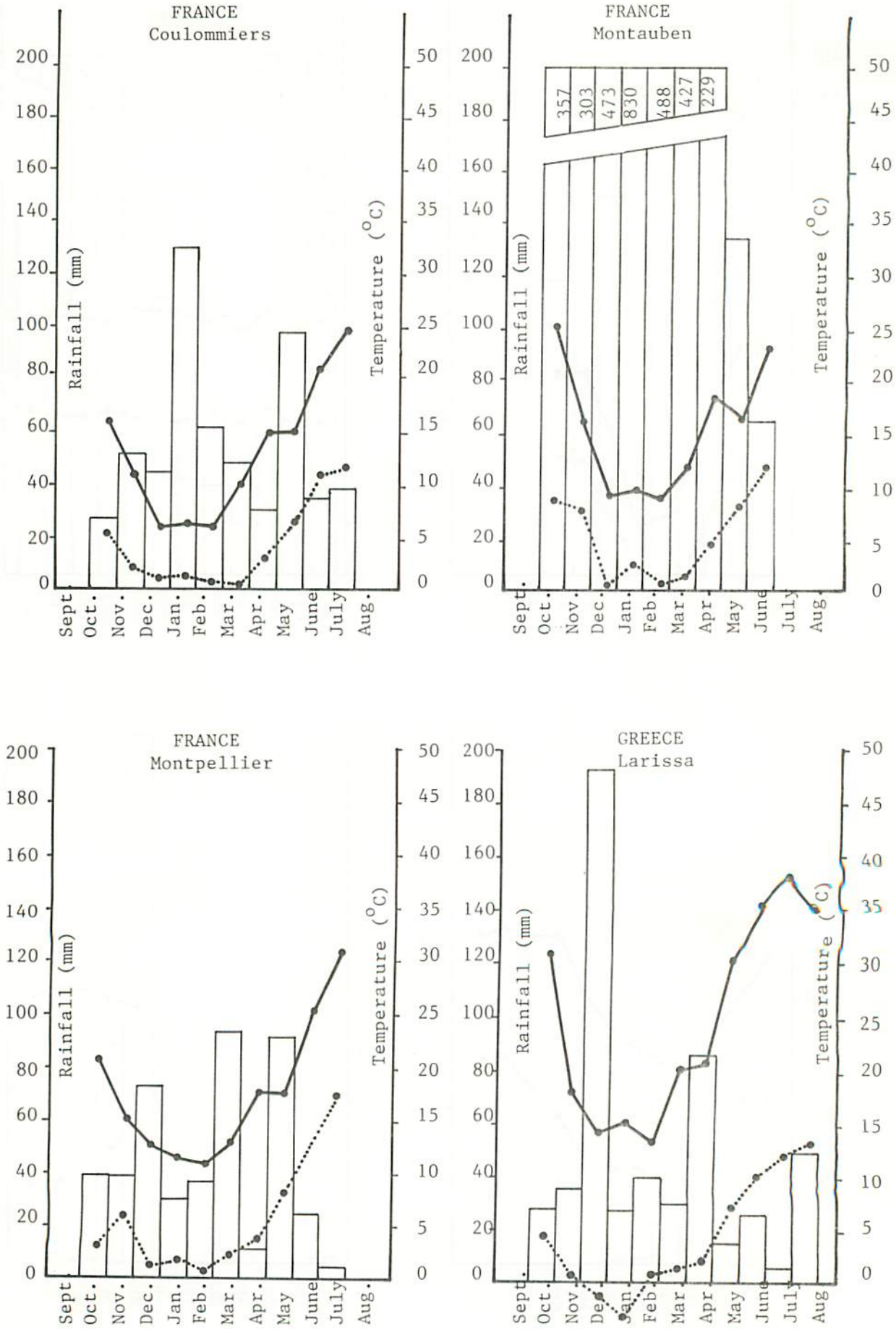

CHINA
Yunnan
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

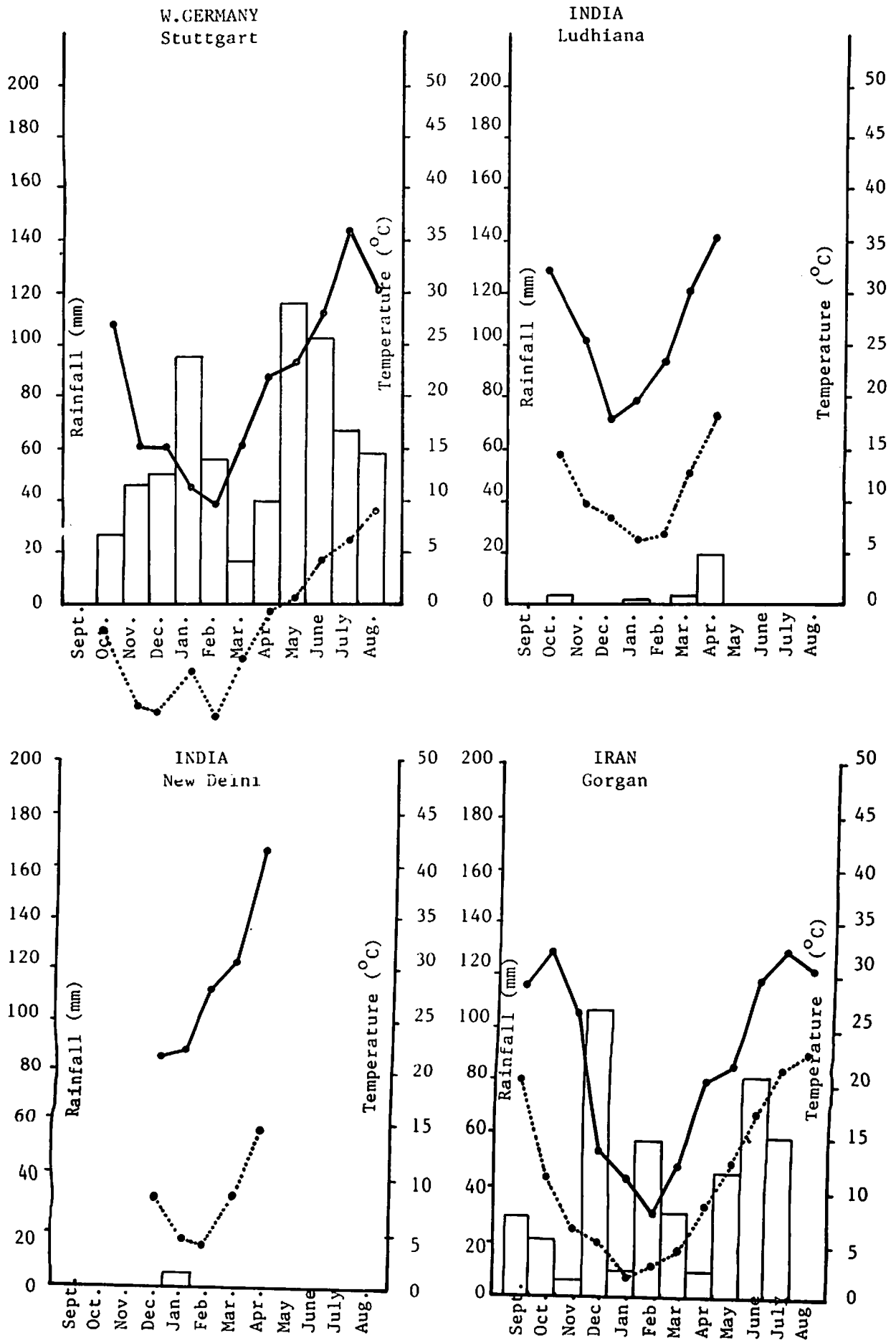

CHINA
Zhejiang
Rainfall (mm)
Temperature (°C)
294
Sept
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

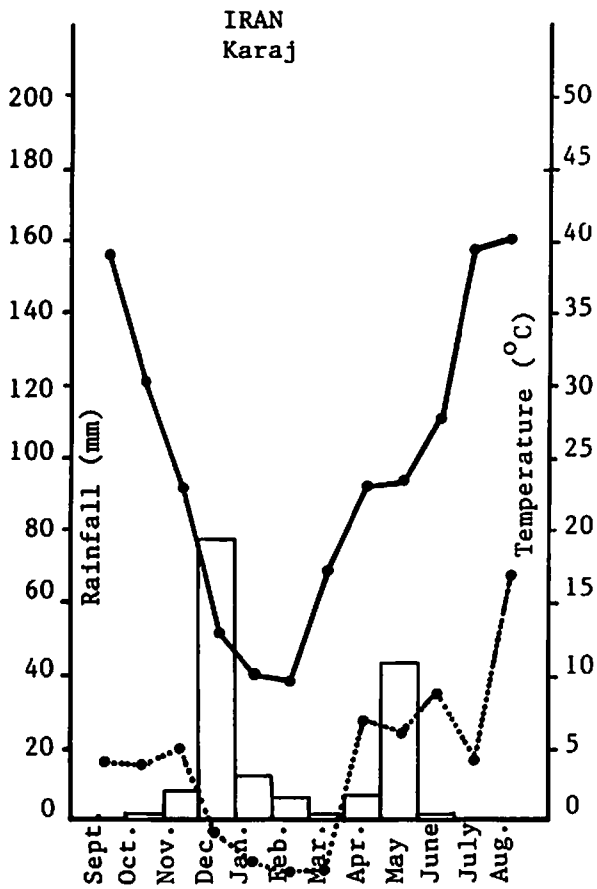

COSTA RICA
Heredia
Rainfall (mm)
Temperature (°C)
510
278
251
320
268
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

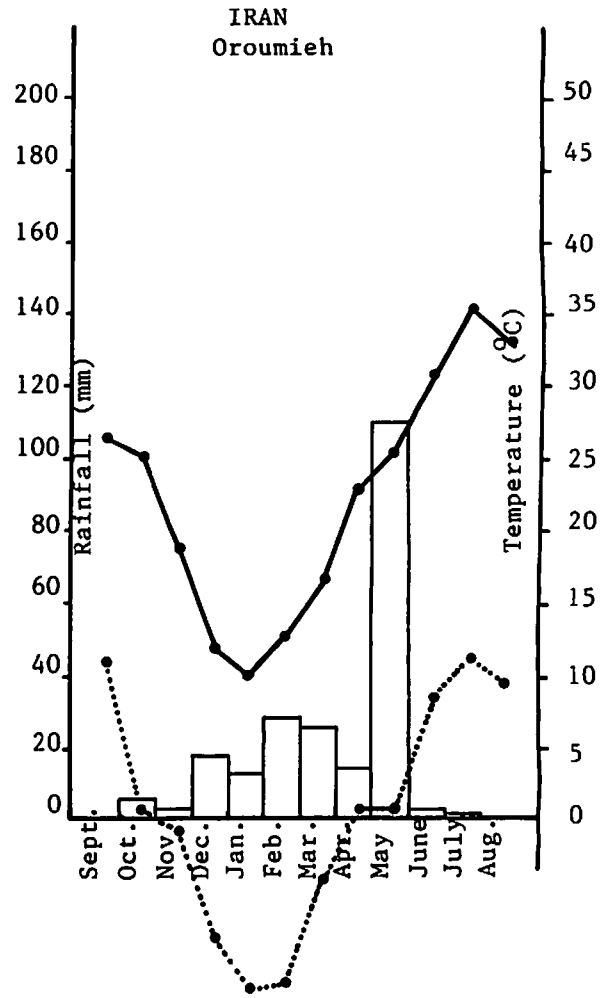

EGYPT
Mansoura
Rainfall (mm)
Temperature (°C)
Sept
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

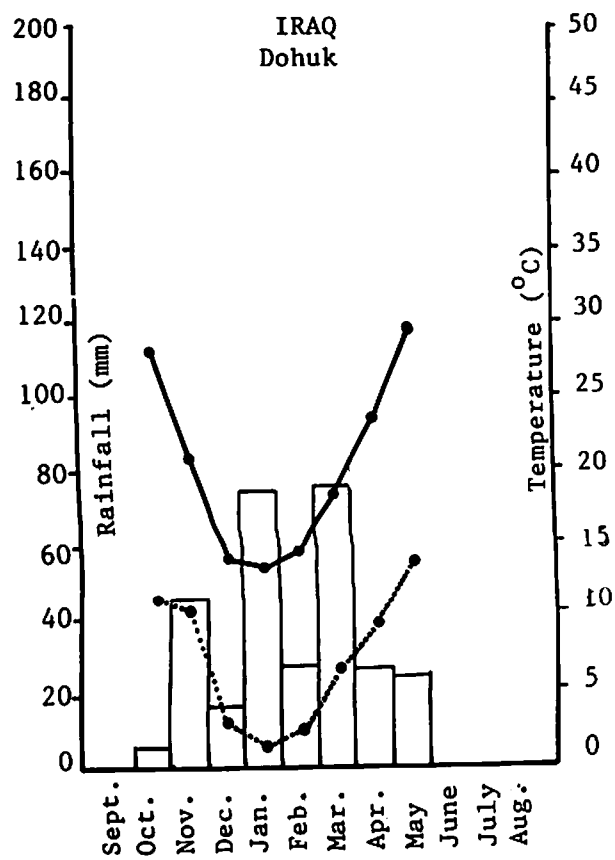

ETHIOPIA
Debre Zeit
Rainfall (mm)
Temperature (°C)
218
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

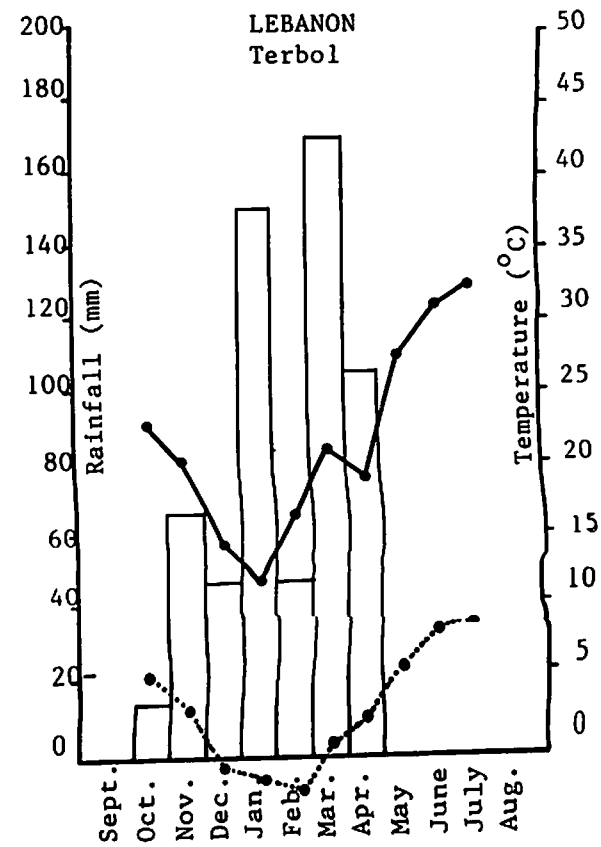

FRANCE
Coulommiers
FRANCE
Montauben
357
303
473
830
488
427
229
FRANCE
Montpellier
GREECE
Larissa
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

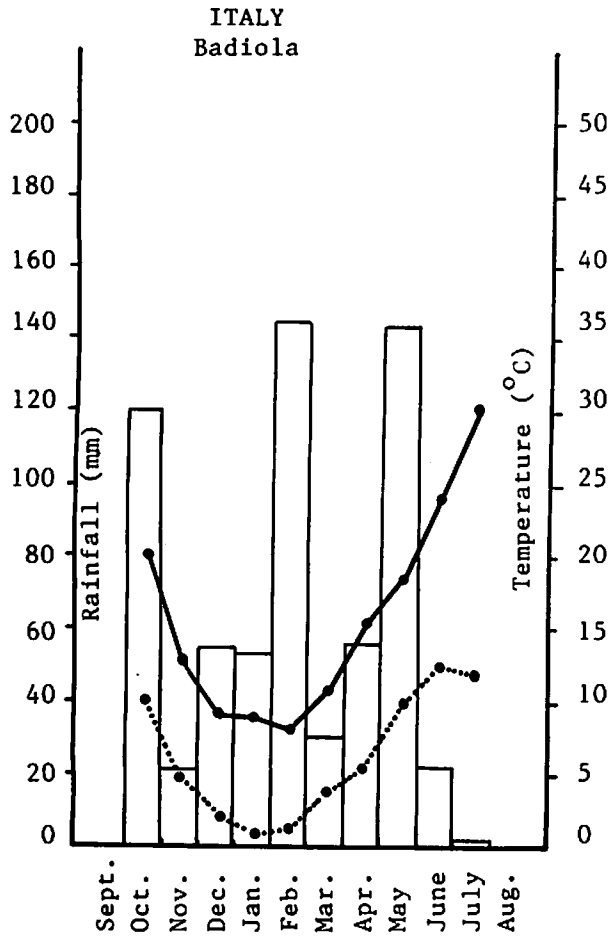

W.GERMANY
Stuttgart
INDIA
Ludhiana
INDIA
New Delhi
IRAN
Gorgan
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

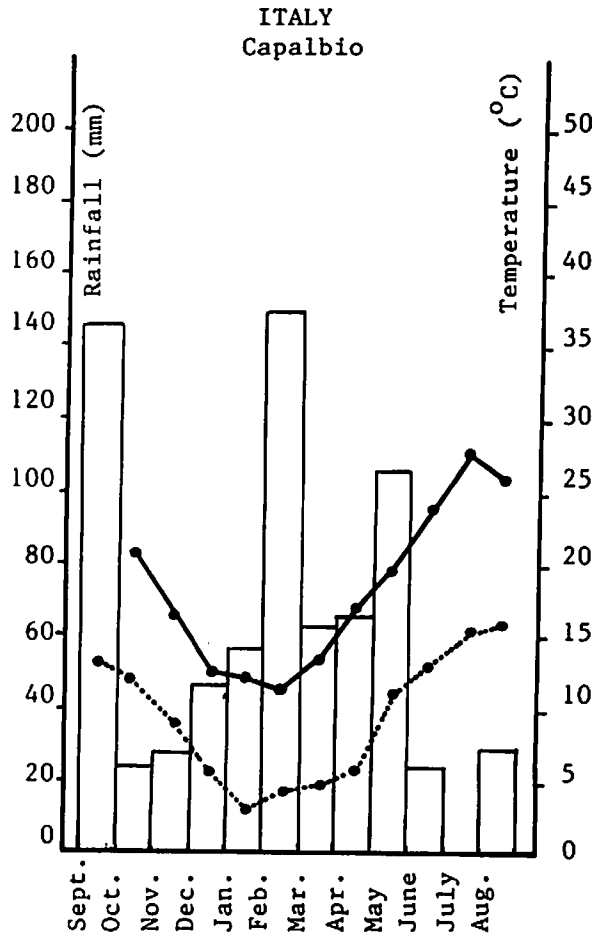

IRAN
Karaj
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

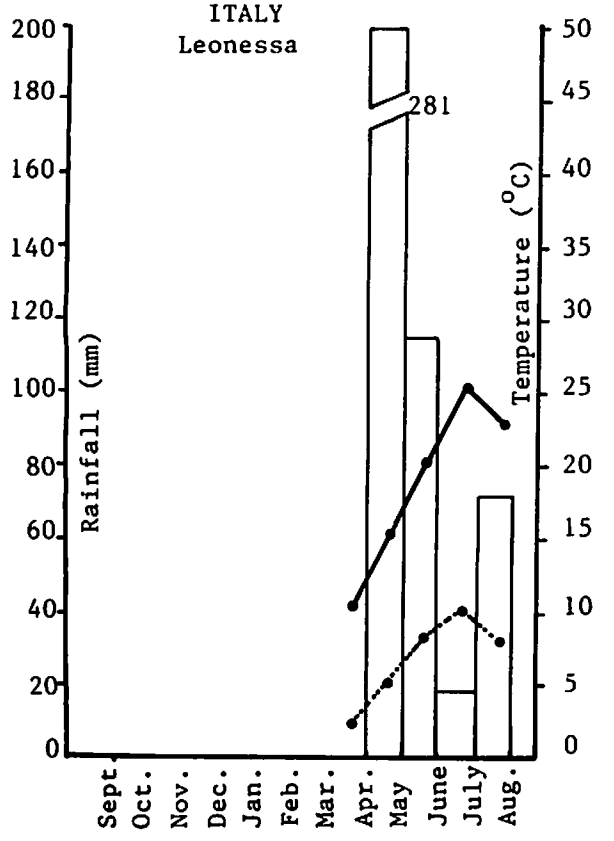

IRAN
Oroumieh
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

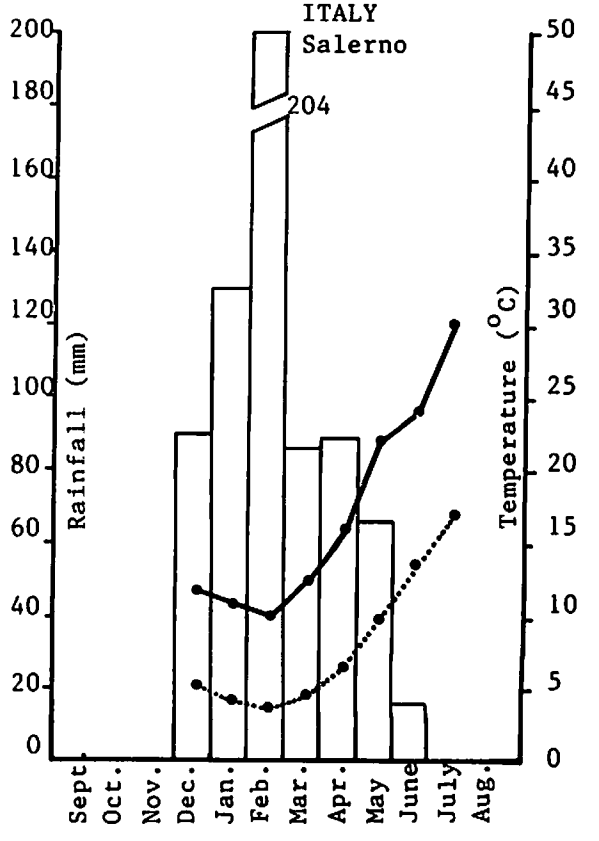

IRAQ
Dohuk
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

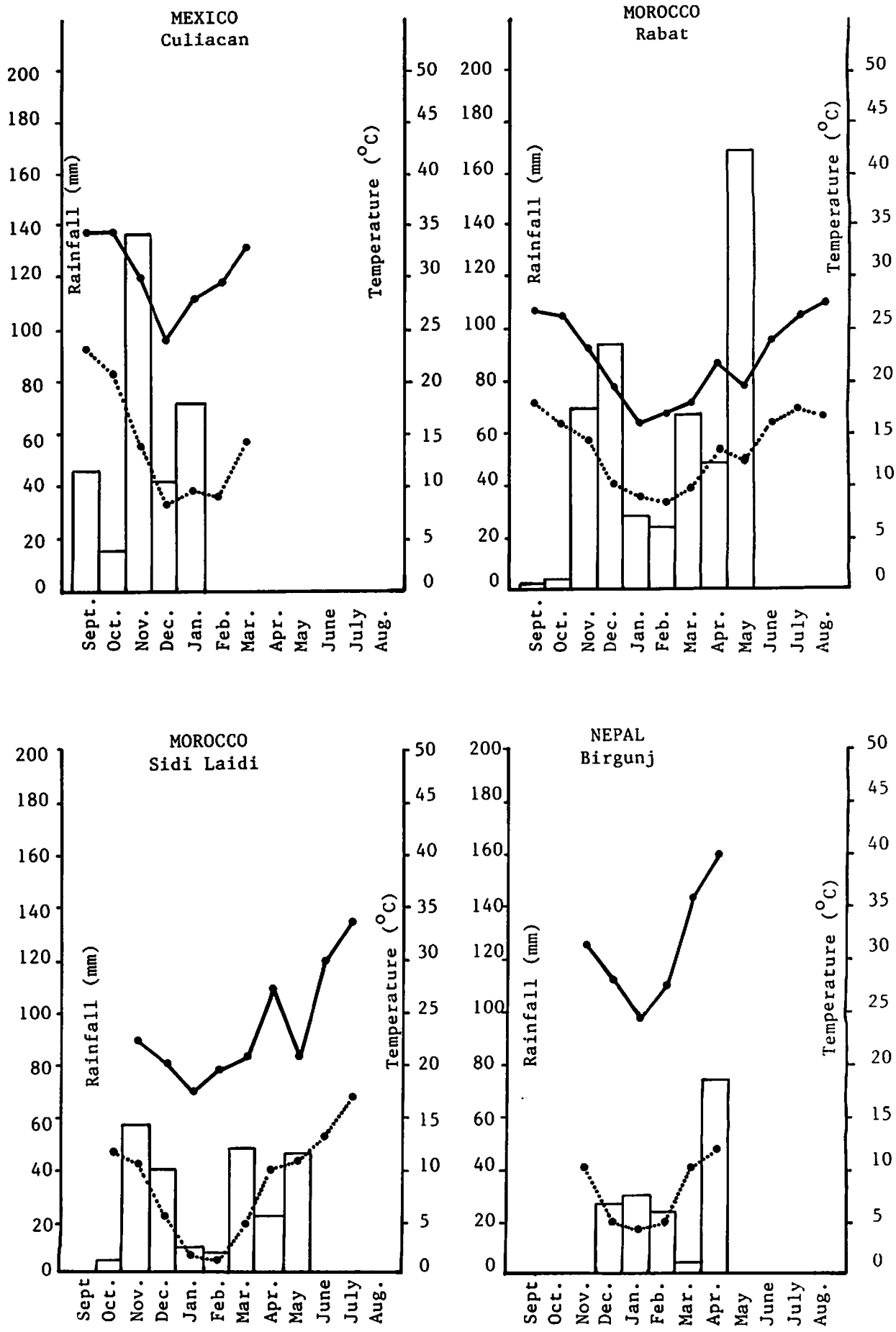

LEBANON
Terbol
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

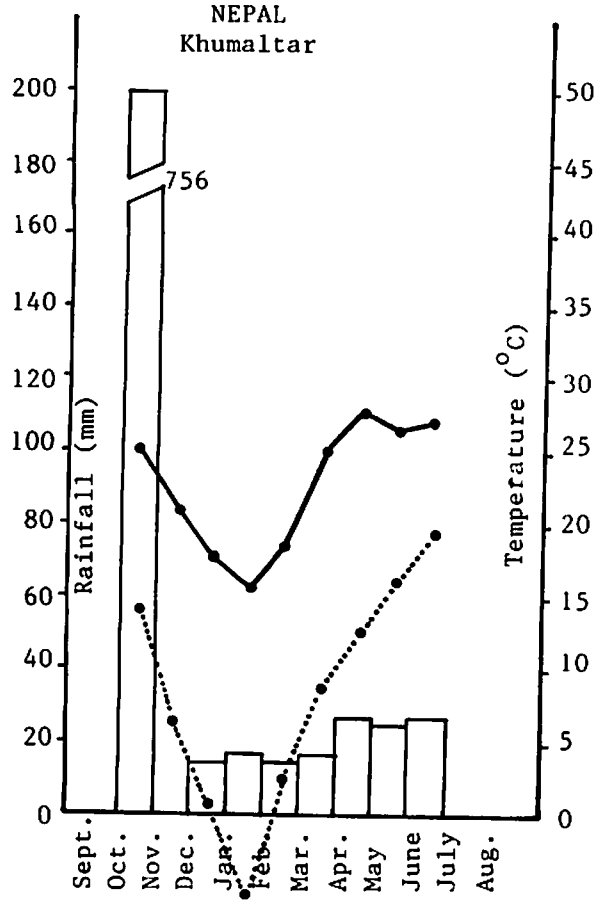

ITALY
Badiola
Rainfall (mm)
Temperature (°C)
0 20 40 60 80 100 120 140 160 180 200
0 5 10 15 20 25 30 35 40 45 50
Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.

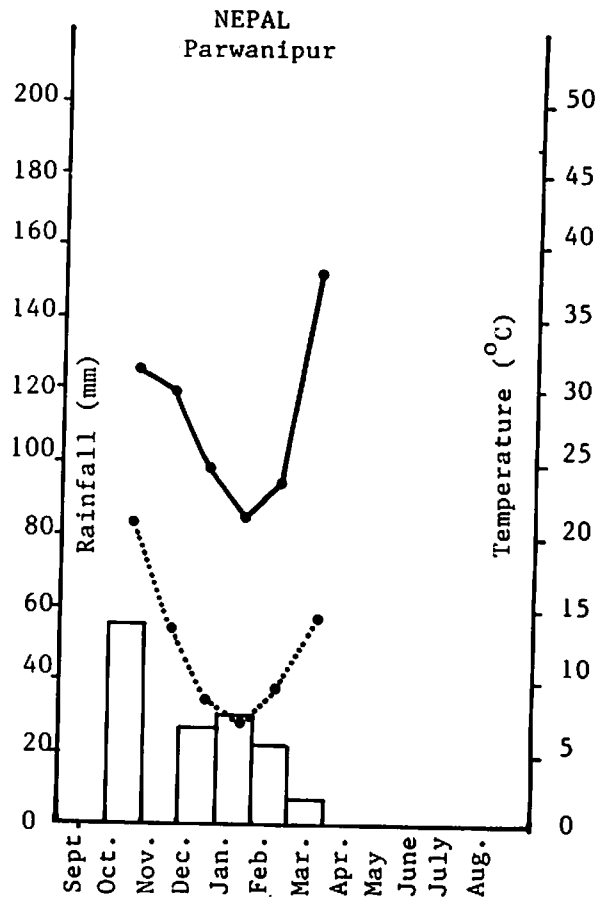

ITALY
Capalbio
Rainfall (mm)
Temperature (°C)
0 20 40 60 80 100 120 140 160 180 200
0 5 10 15 20 25 30 35 40 45 50
Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.

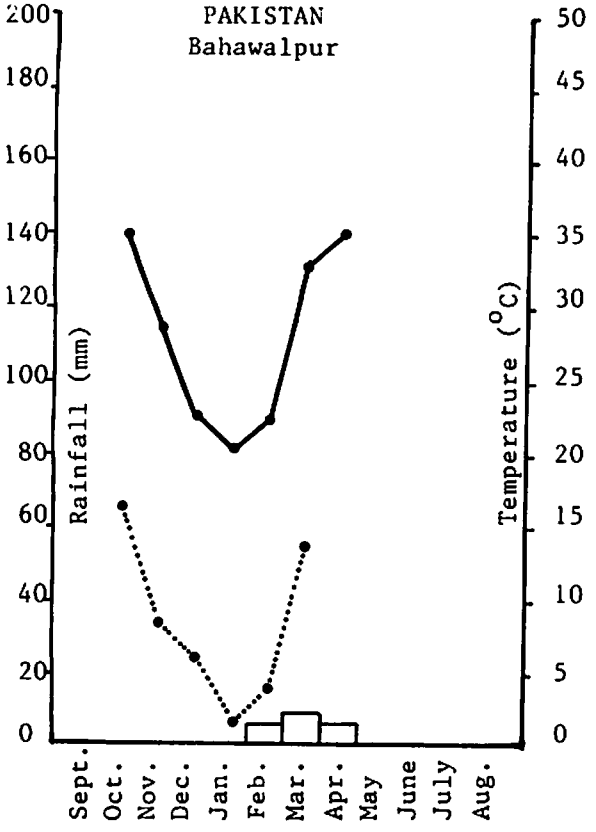

ITALY
Leonessa
281
Rainfall (mm)
Temperature (°C)
0 20 40 60 80 100 120 140 160 180 200
0 5 10 15 20 25 30 35 40 45 50
Sept Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.

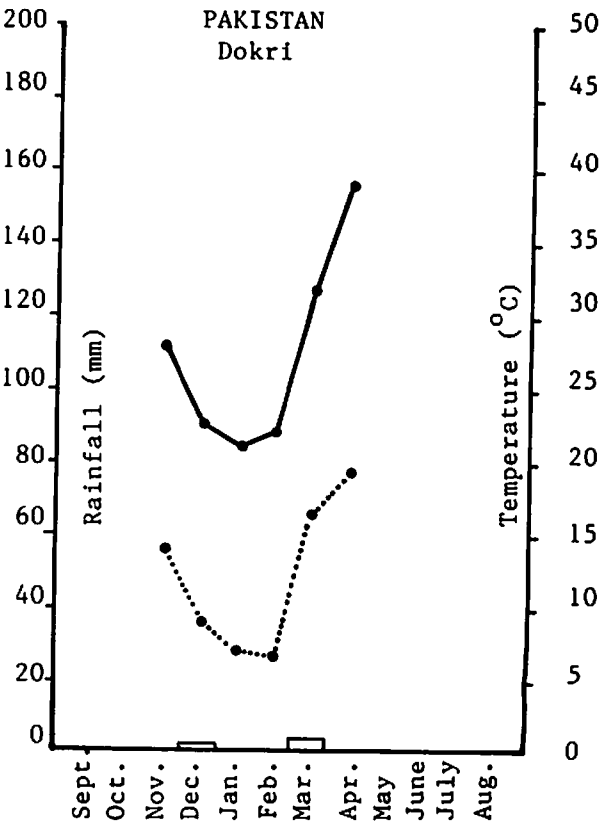

ITALY
Salerno
204
Rainfall (mm)
Temperature (°C)
0 20 40 60 80 100 120 140 160 180 200
0 5 10 15 20 25 30 35 40 45 50
Sept Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.

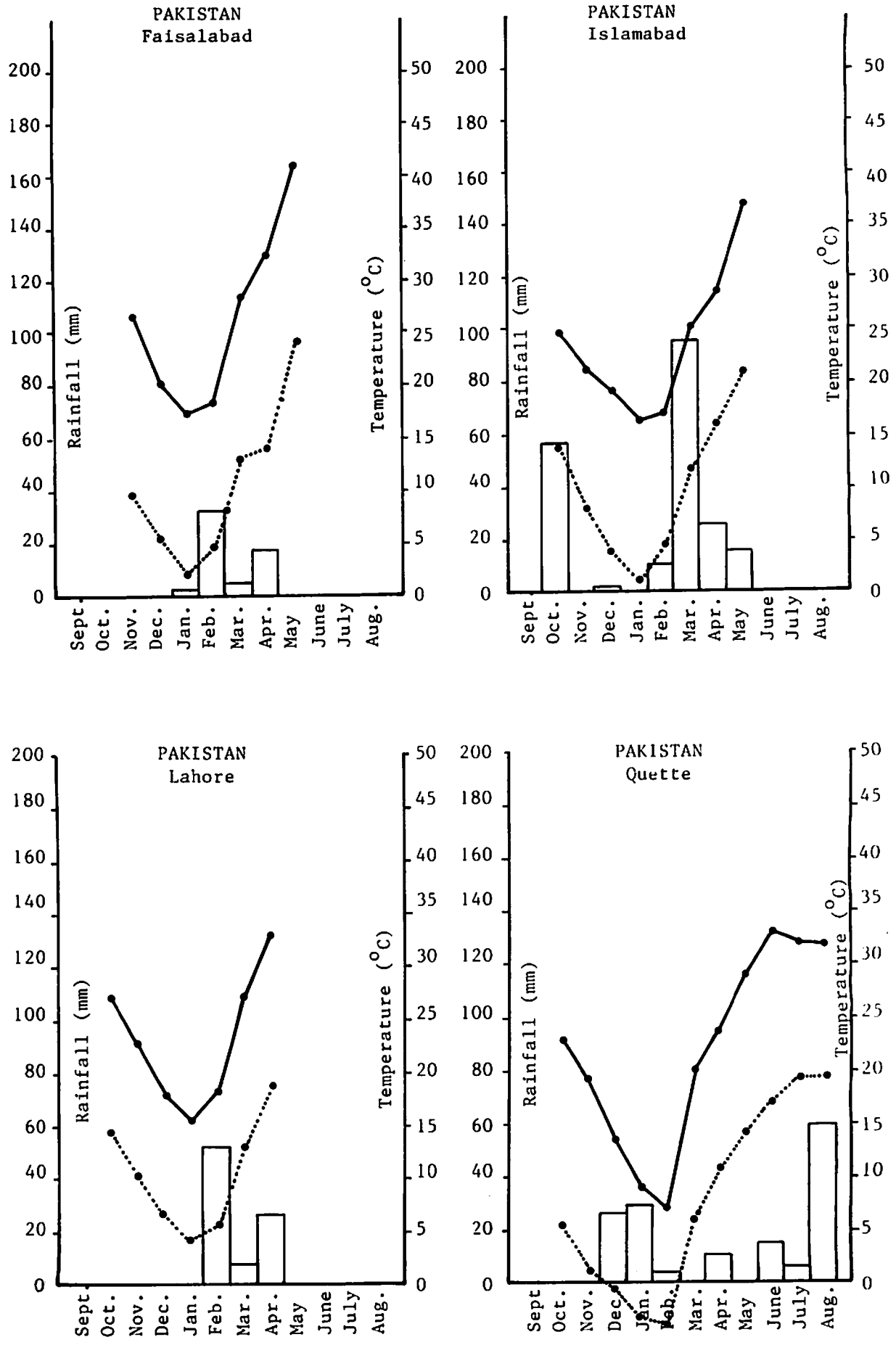

MEXICO
Culiacan
MOROCCO
Rabat
MOROCCO
Sidi Laidi
NEPAL
Birgunj
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

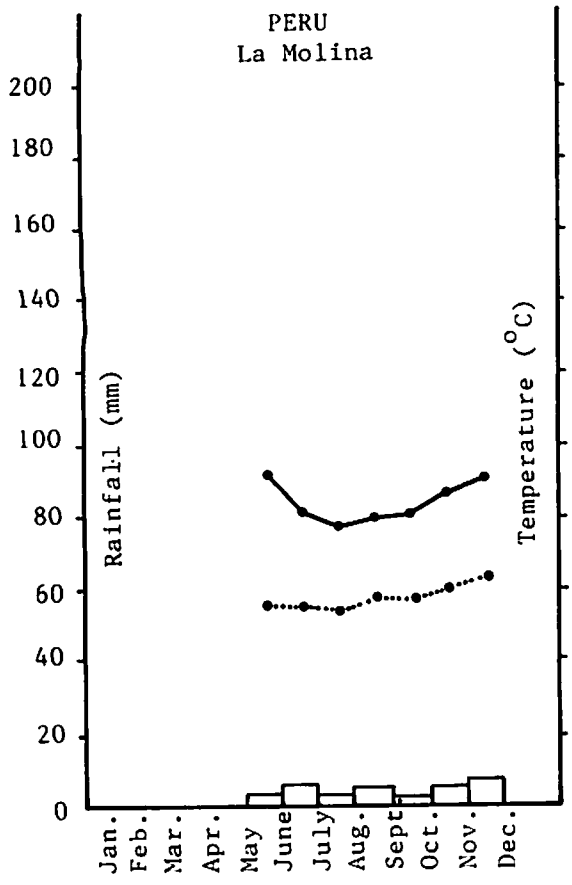

NEPAL
Khumaltar
Rainfall (mm)
Temperature (°C)
756
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

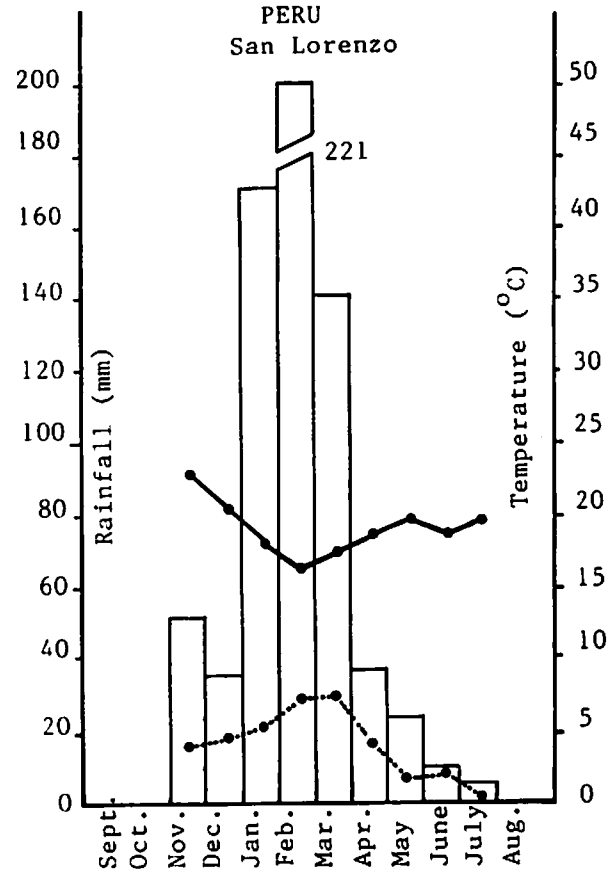

NEPAL
Parwanipur
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

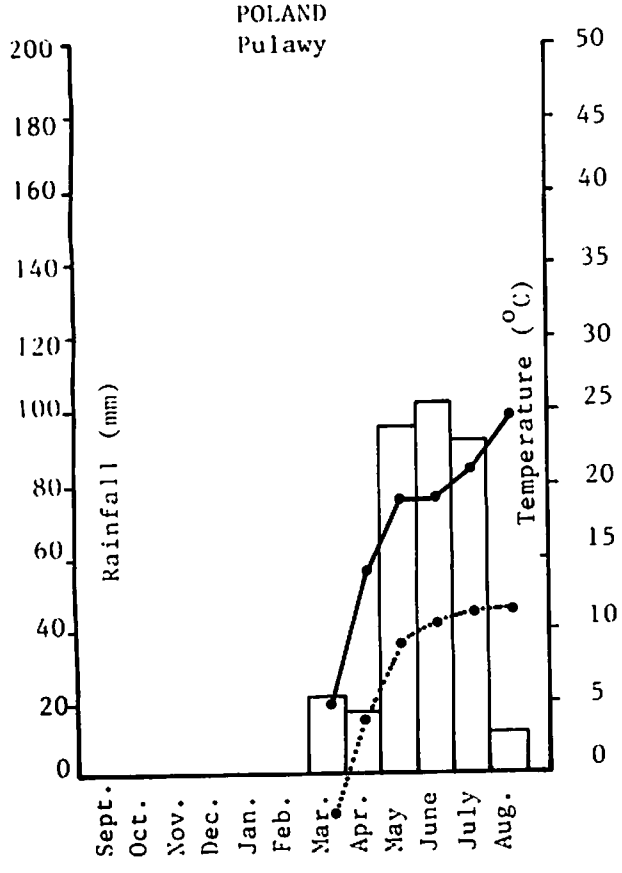

PAKISTAN
Bahawalpur
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

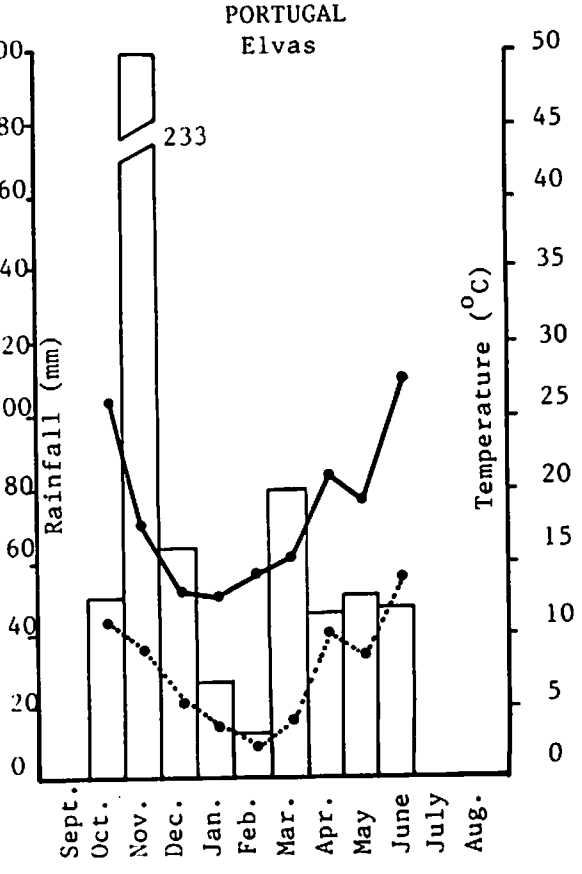

PAKISTAN
Dokri
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

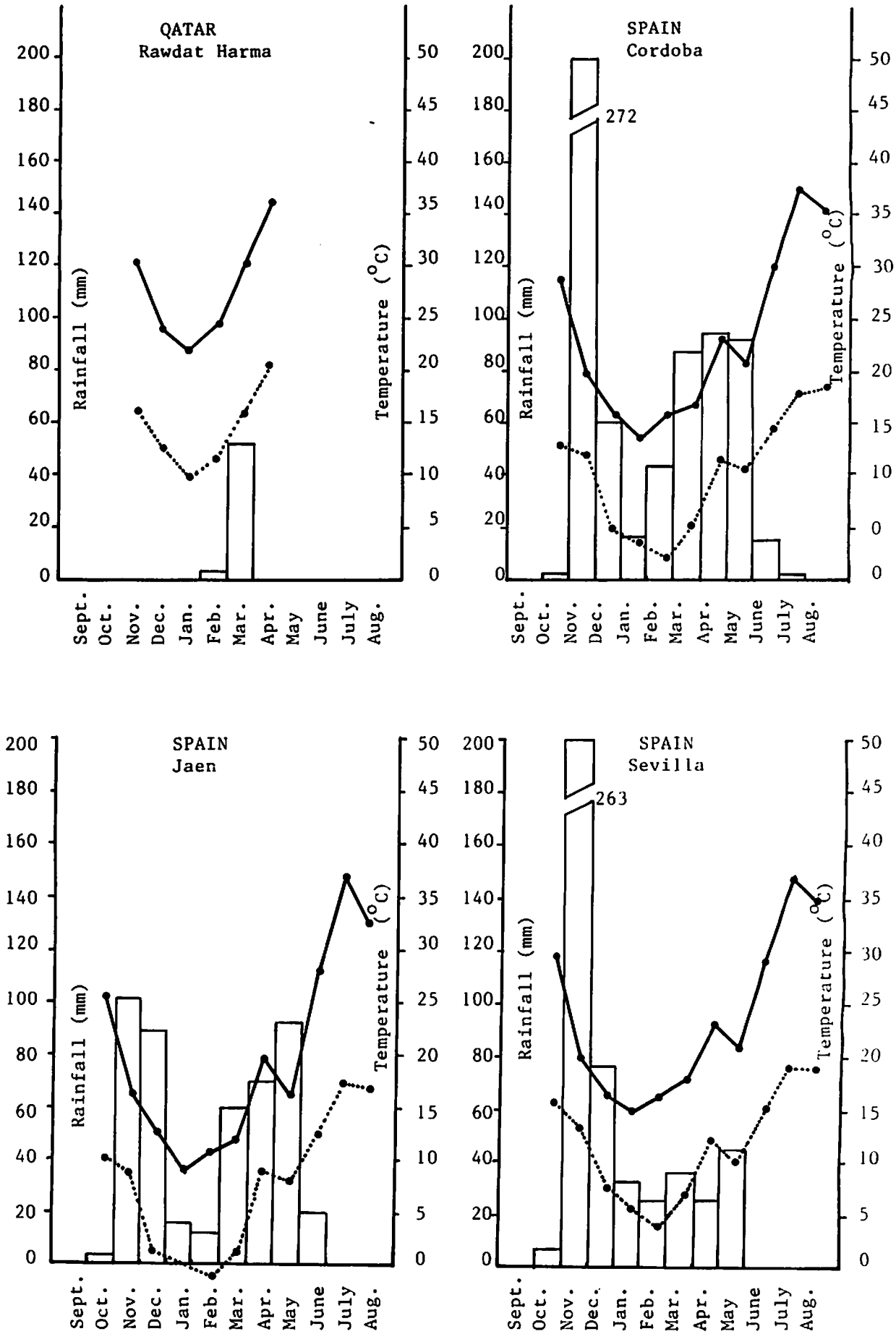

PAKISTAN
Faisalabad
PAKISTAN
Islamabad
PAKISTAN
Lahore
PAKISTAN
Quette
Rainfall (mm)
Temperature (°C)
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30
35
40
45
50
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

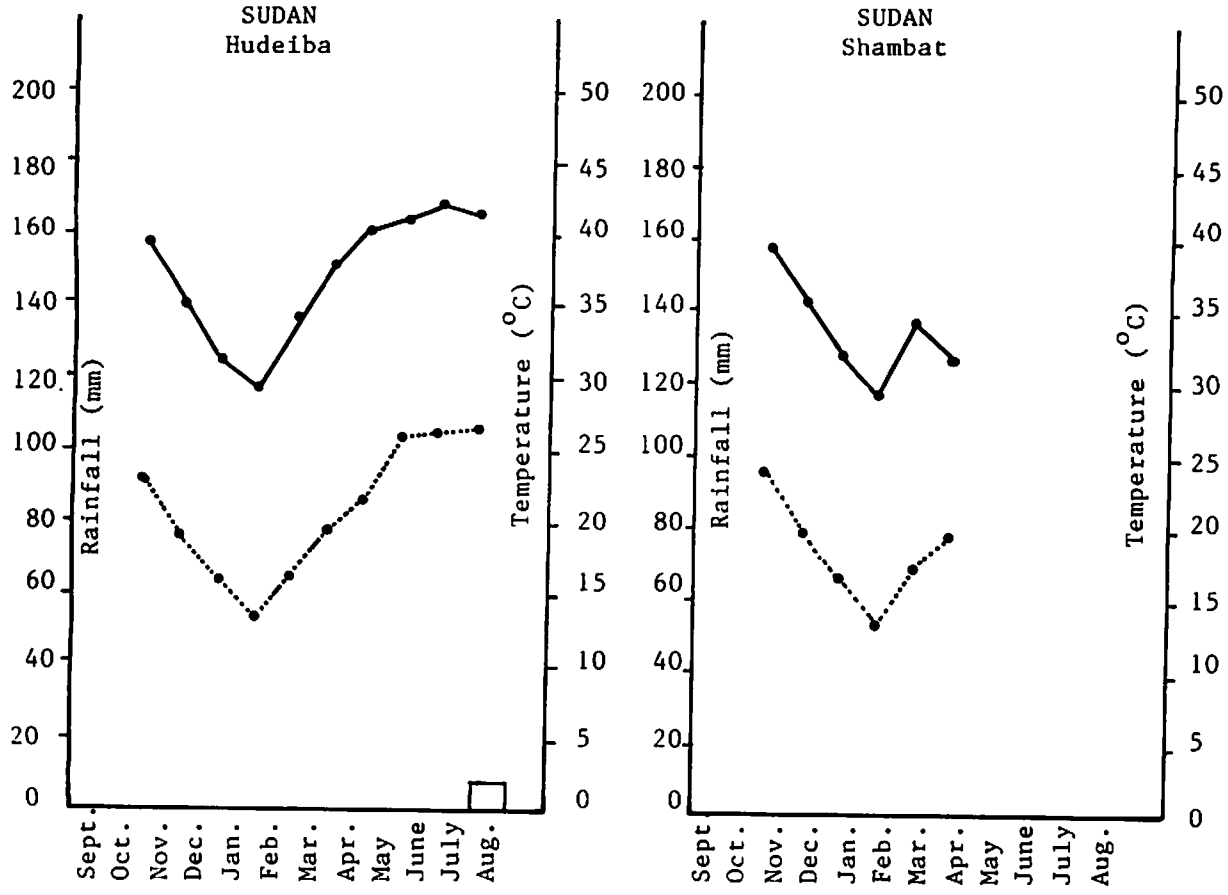

PERU
La Molina
Rainfall (mm)
Temperature (°C)
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept
Oct.
Nov.
Dec.

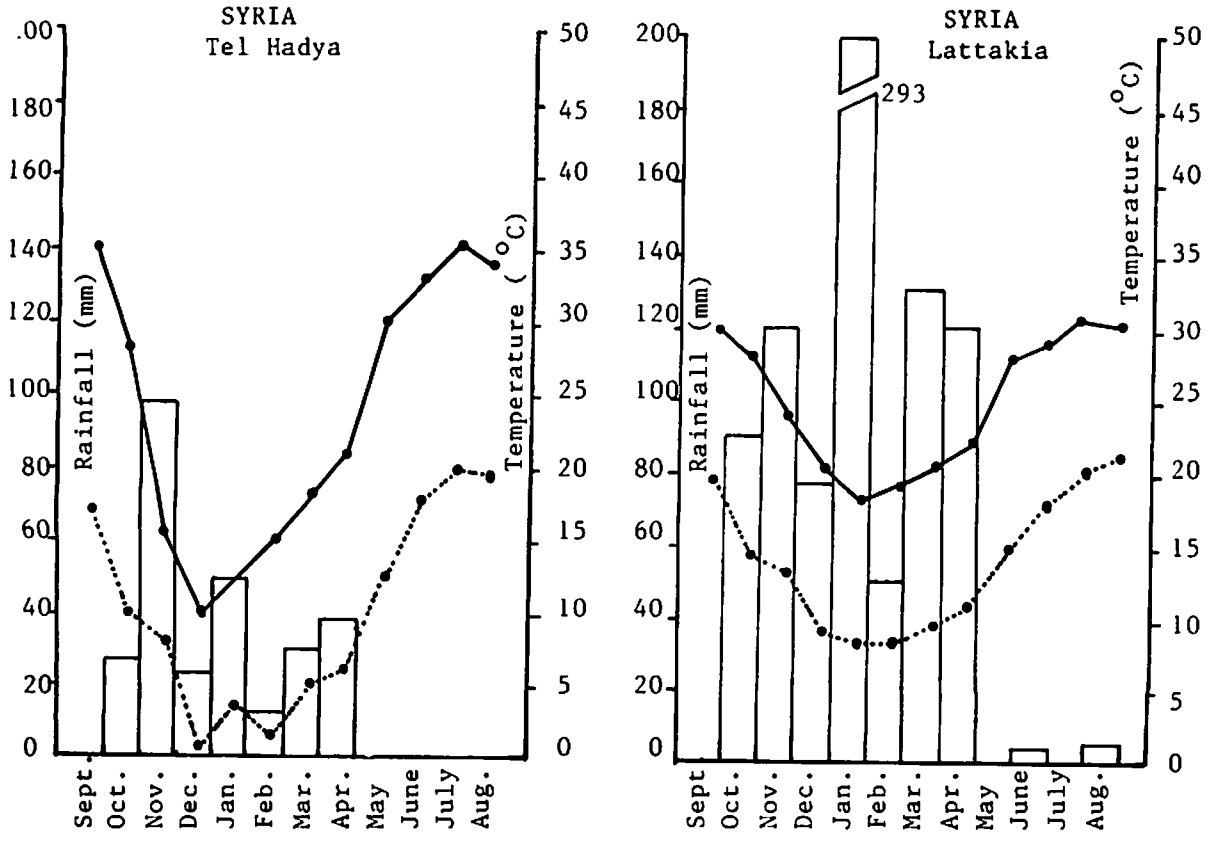

PERU
San Lorenzo
221
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

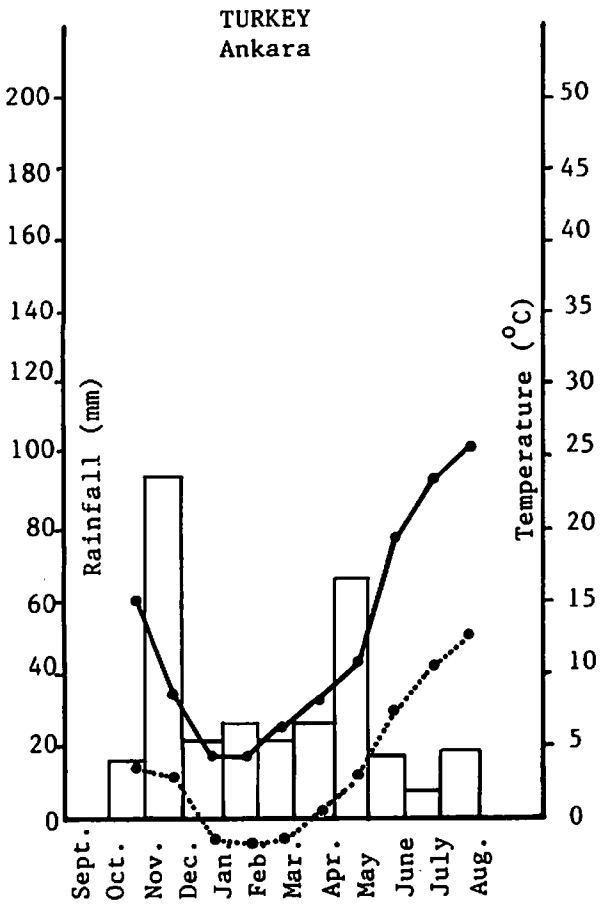

POLAND
Pulawy
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

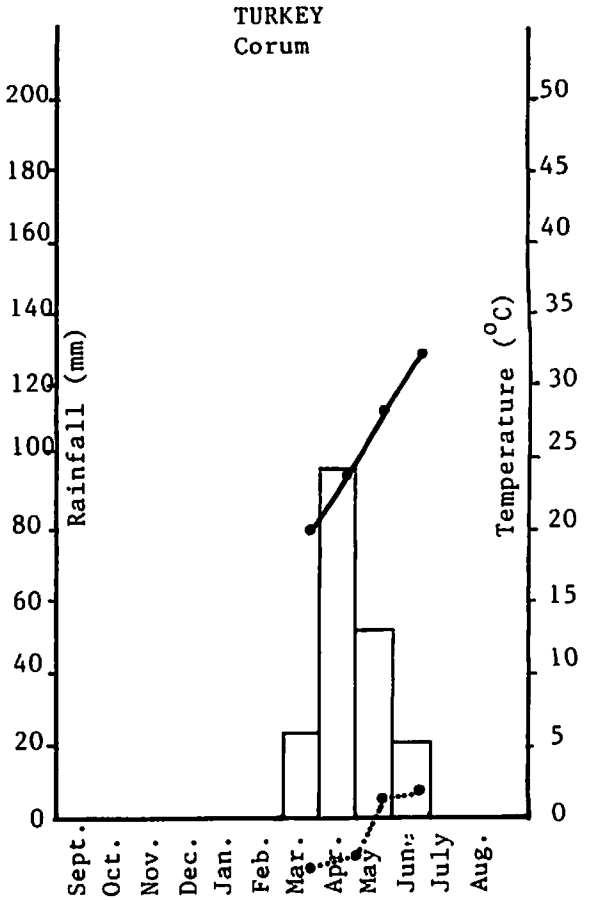

PORTUGAL
Elvas
233
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

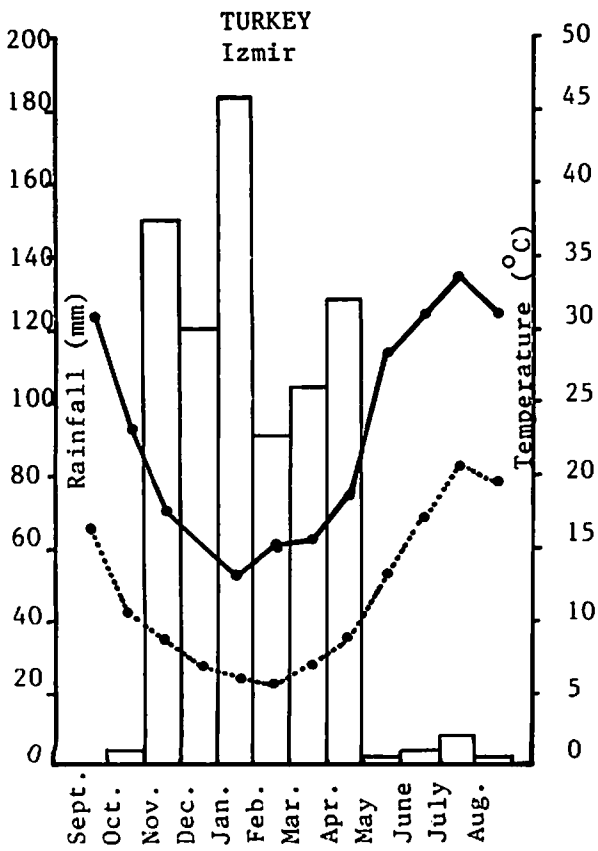

QATAR
Rawdat Harma
SPAIN
Cordoba
272
SPAIN
Jaen
SPAIN
Sevilla
263
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

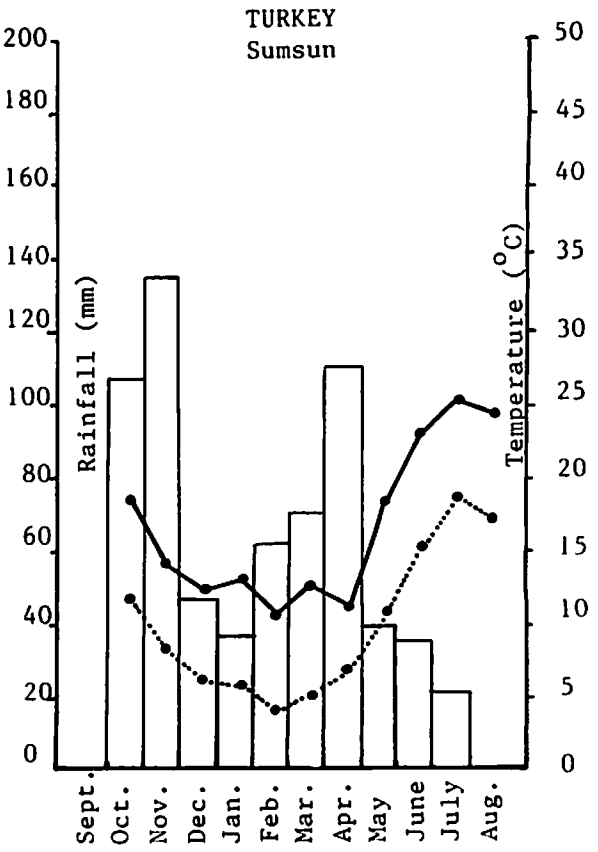

SUDAN
Hudeiba
Rainfall (mm)
Temperature (°C)
Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.
SUDAN
Shambat
Rainfall (mm)
Temperature (°C)
Sept Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.

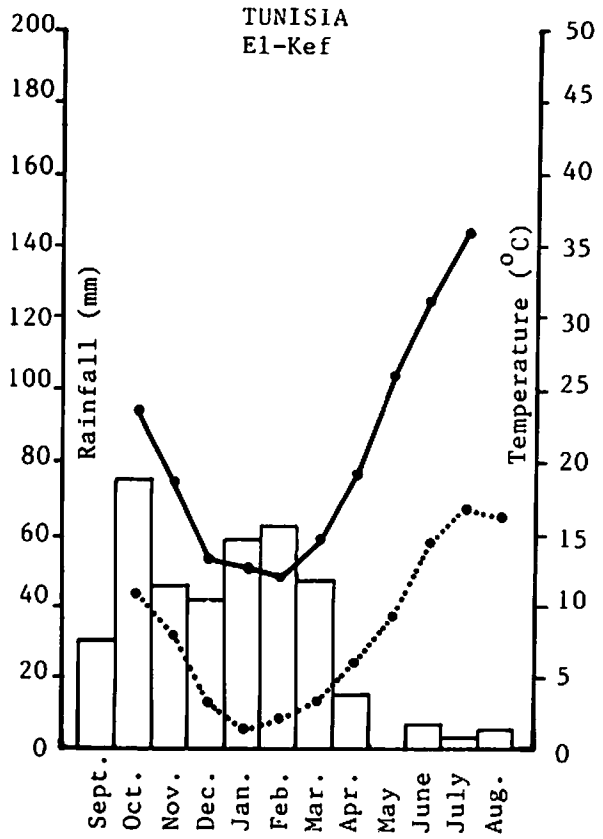

SYRIA
Tel Hadya
Rainfall (mm)
Temperature (°C)
Sept Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.
SYRIA
Lattakia
293
Rainfall (mm)
Temperature (°C)
Sept Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug.

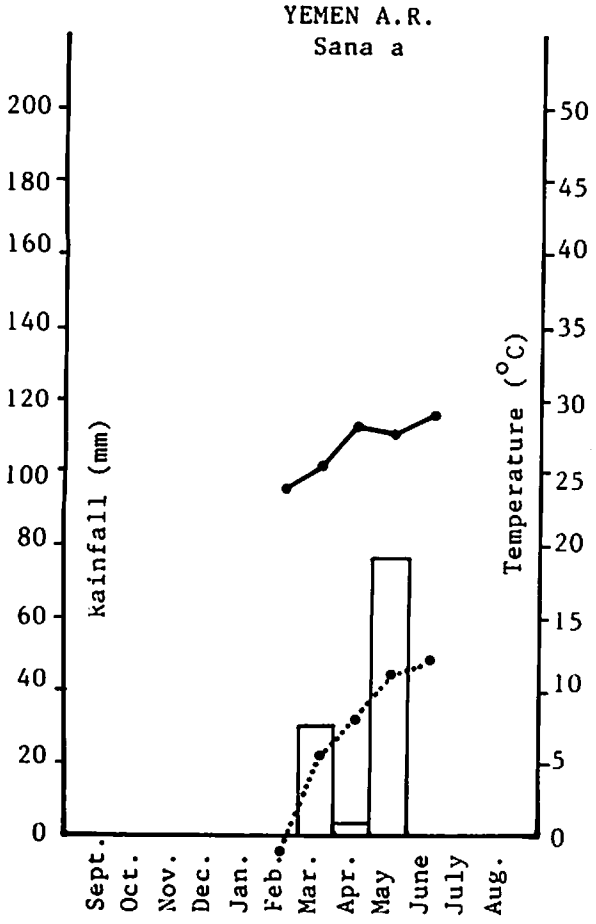

TURKEY
Ankara
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.

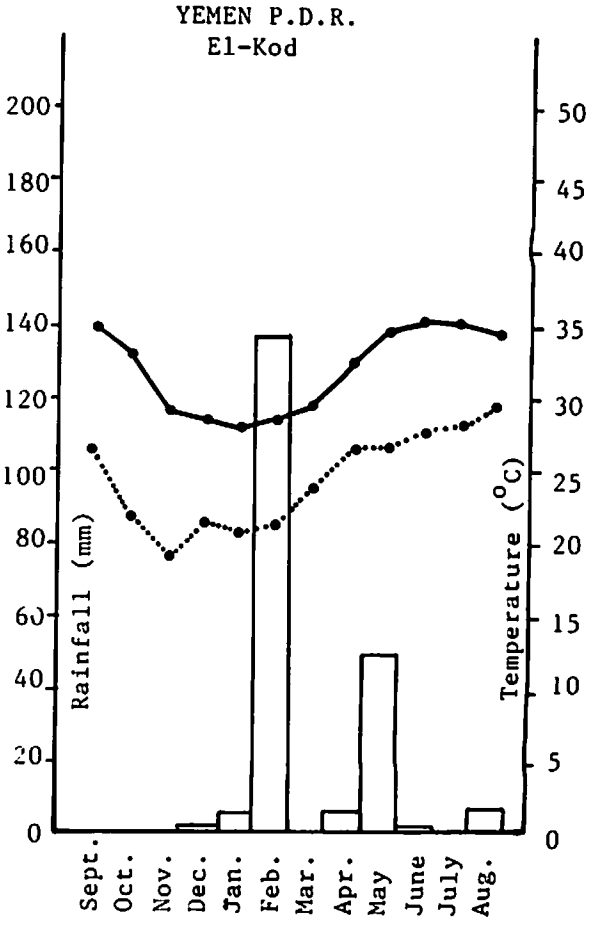

TURKEY
Corum
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.


TURKEY
Izmir
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.


TURKEY
Sumsun
Rainfall (mm)
Temperature (°C)
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.


TUNISIA
El-Kef
Rainfall (mm)
Temperature (°C)
200
180
160
140
120
100
80
60
40
20
0
50
45
40
35
30
25
20
15
10
5
0
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.


YEMEN A.R.
Sana a
Rainfall (mm)
Temperature (°C)
200
180
160
140
120
100
80
60
40
20
0
50
45
40
35
30
25
20
15
10
5
0
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.


YEMEN P.D.R.
El-Kod
Rainfall (mm)
Temperature (°C)
200
180
160
140
120
100
80
60
40
20
0
50
45
40
35
30
25
20
15
10
5
0
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.