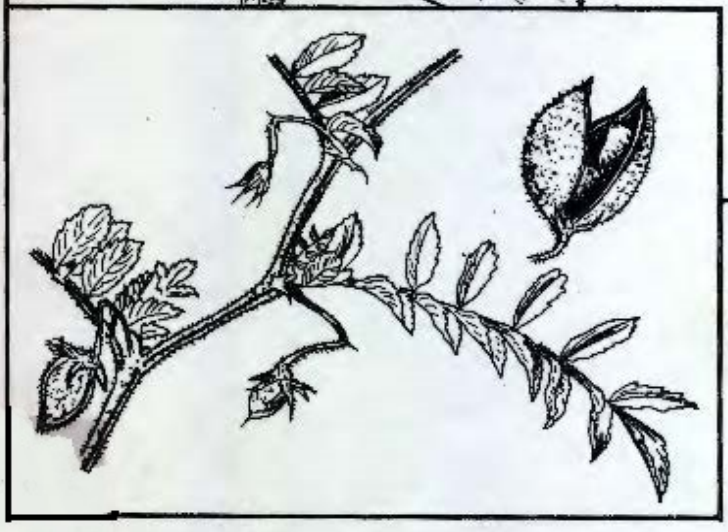
REPORT ON:

THE INTERNATIONAL COOPERATIVE PROGRAM ON FOOD LEGUME IMPROVEMENT 1977-78



INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS

Report on

THE INTERNATIONAL COOPERATIVE PROGRAM

ON FOOD LEGUME IMPROVEMENT

1977/78

The International Centre for Agricultural Research in the Dry Areas

(I C A R D A)

Contents

Preface

This report summarizes the results of the 1977/78 international nurseries, which were prepared and distributed by the staff of the food legume improvement program of ICARDA. A list of all the cooperators from the national research programs is listed at the beginning of the report.

Our thanks are due to all the donors of ICARDA, and in particular the IDRC, for making this cooperative research effort possible.

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Introduction

The international nursery program on food legumes, is a cooperative research effort, coordinated by the International Centre 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 materials originating from both national and international programs. Through such multi-location testing it is hoped that it will prove possible to identify both superior genotypes adapted to specific environments, and genotypes which have a wide adaptability. Performance data from a number of widely differing environments helps the breeder in deciding which particular cultivar is best suited to any given location and reduces the number of seasons required for evaluation prior to cultivar release.

The multi-location testing of pest and disease resistant materials also provides valuable information in that there is a greater chance of exposure to a wide range of pathogenic biotypes. In addition to multi-location testing, the program aims at disseminating segregating populations elite lines or lines having specific characteristics, to interested scientists.

This report summarizes the data received from cooperators on the 1977/78 crop season on two types of trials:

a) unreplicated screening nurseries in which each entry comprised a single row for general observation.

b) replicated yield trials containing fewer numbers of entries than the screening nurseries but in which plot size was increased and each entry was replicated.

In the following sections information is given on the institutions who cooperated in the program, the locations at which trials were conducted, and the data received from each trial and location.

For each trial or nursery, observations were requested on plant stand (1-5; rating 1=perfect), days to 50% flowering, plant height (cm) and yield (kgs/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); 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); days to maturity, branching (1-5; 1=very few branches) and virus (1-5; 1=free of virus).

It was emphasized that the materials should be planted at the normal farmers planting date and that the locally recommended practices should be used with respect to fertilizer, pesticides, herbicides and irrigation.

In addition,cooperators were requested to send information on location, altitude, 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.

In all 86 yield trials and screening nurseries were distributed to 16 countries in the 1977/78 region. A breakdown of the distribution is given in Table 1. Data were returned on 56 of the nurseries, representing 65% of the nurseries distributed. A list of the individual sites from which data were returned to ICARDA is given in Table 2 and some details of these sites is given in Table 3. The map indicates the locations of the sites within the region.

We hope that both the materials distributed and the information and data contained in this report prove to be useful to all cooperators.

Table 1. Number of international nurseries distributed for the 1977/78 season.

Country	BRPYT-L	BRPYT-S	CRN	CRPYT	LRN	LRPYT
AFGHANISTAN	-	-	1	-	1	-
ALGERIA	2	-	2	2	2	2
BANGLADESH	-	-	1	-	1	-
CYPRUS	1	-	1	1	1	1
EGYPT	1	1	1	-	1	1
ETHIOPIA	1	1	1	1	1	1
IRAQ	-	-	1	-	1	-
JORDAN	1	1	2	1	2	1
LEBANON	-	-	1	1	1	1
NEPAL	-	-	2	-	2	-
PAKISTAN	-	-	-	-	1	-
SUDAN	1	-	1	-	1	-
SYRIA	4	3	2	3	3	3
THAILAND	-	-	1	-	1	-
TUNISIA	1	-	3	1	-	-
TURKEY	1	-	3	1	3	1
T O T A L	13	6	23	11	22	11

BRPYT-L = Broadbean Regional Preliminary Yield Trial - Large Seed
BRPYT-S = Broadbean Regional Preliminary Yield Trial - Small Seed
CRN = Chickpea Regional Nursery
CRPYT = Chickpea Regional Preliminary Yield Trial
LRN = Lentil Regional Nursery
LRPYT = Lentil Regional Preliminary Yield Trial.

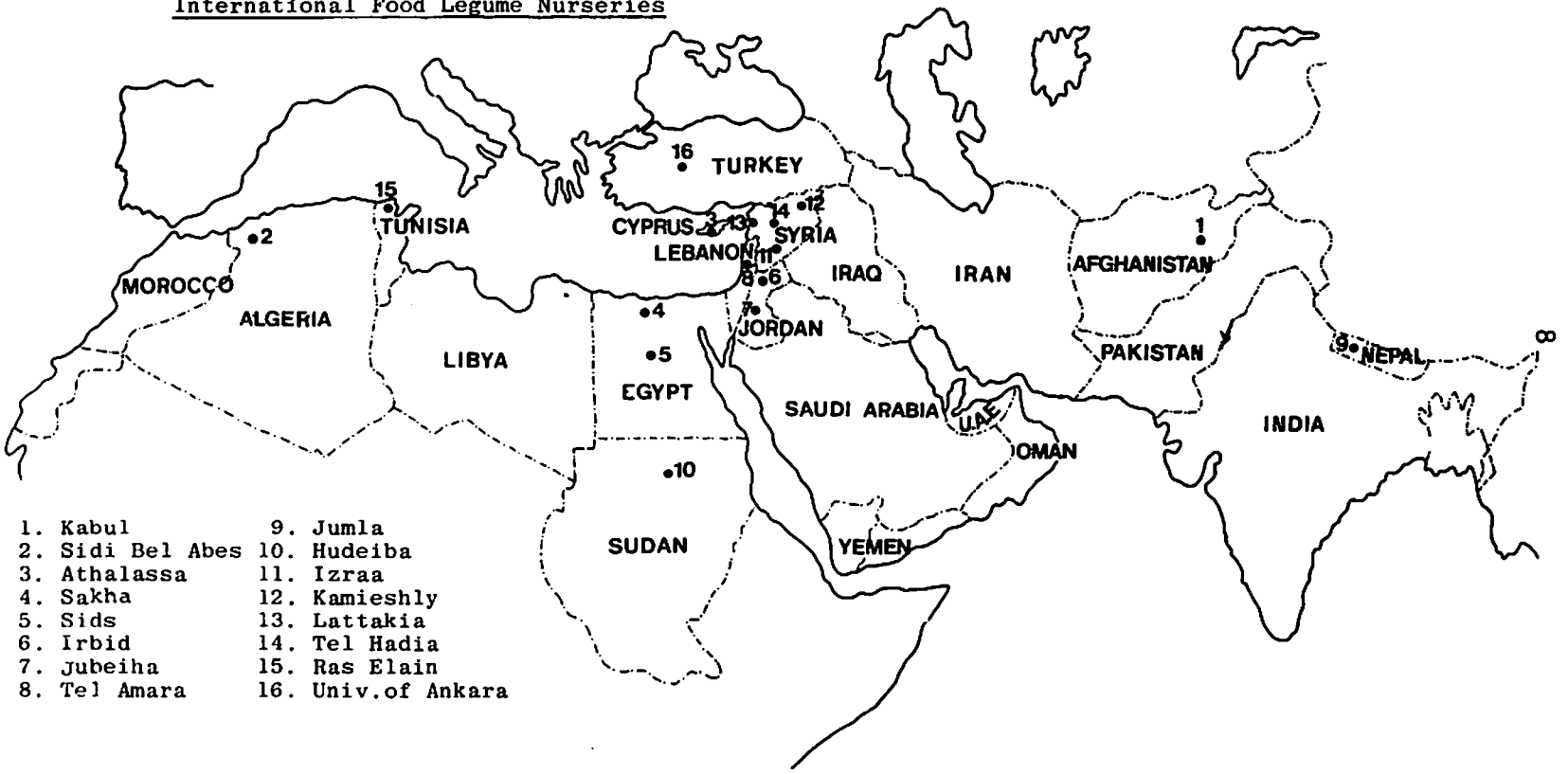
Table 2. Number of international nurseries on which data was sent to ICARDA for the 1977/78 season.

Country	BRPYT-L	BRPYT-S	CRN	CRPYT	LRN	LRPYT
AFGHANISTAN						
Kabul	-	-	1	-	-	-
ALGERIA						
Sidi bel Abess	1	-	1	1	1	-
CYPRUS						
Athalassa	1	-	1	1	1	1
EGYPT						
Sakha	1	-	-	-	-	-
Sids	-	-	1	-	1	1
JORDAN						
Irbid	-	-	1	-	1	-
Jubeiha	1	-	1	1	1	1
LEBANON						
Tel Amara	-	-	1	1	1	1
NEPAL						
Jumla	-	-	1	-	1	-
SUDAN						
Hudeiba	-	-	1	-	1	-
SYRIA						
Izra'a	1	-	1	1	1	1
Kameshly	-	-	-	-	1	1
Lattakia	1	1	1	-	1	-
Tal Hadia	2	2	-	2	2	1
TUNISIA						
Ras Elain	1	-	3	1	-	-
TURKEY						
Univ. of Ankara	-	-	1	-	1	-
T O T A L	9	3	15	8	14	7

Table 3. Latitude, longitude, altitude and rainfall for some of the stations from which data was received for 1977/78 season.

Country	Latitude	Longitude	Altitude	Rainfall
AFGHANISTAN				
Kabul	34°N	69°E	1800	NA
ALGERIA				
Sidi bel Abess	35°N	1°E	450	NA
CYPRUS				
Athalassa	35°N	34°E	142	249
EGYPT				
Sakha	31°N	30°E	6	NA
Sids	29°N	29°E	NA	NA
JORDAN				
Irbid	33°N	36°E	555	429
Jubeiha	32°N	36°E	980	432
LEBANON				
Tal Amara	34°N	35°E	950	NA
NEPAL				
Jumla	29°N	82°E	2220	710
SUDAN				
Hudeiba	18°N	34°E	350	NA
SYRIA				
Izra'a	32°N	36°E	575	NA
Kameshly	37°N	42°E	480	380
Lattakia	36°N	36°E	NA	NA
Tal Hadia	37°N	37°E	392	336
TUNISIA				
Ras Elain	37°N	10°E	NA	NA
TURKEY				
Univ. of Ankara	40°N	33°E	800	191

Figure 1. Map Showing Sites from which Data was Returned on 1977/78, International Food Legume Nurseries



Broadbean Regional Preliminary Large-Seeded Yield Trial (BRPYT-L)

The Broadbean Regional Preliminary Large-Seeded Yield Trial (BRPYT-L) was composed of 21 large-seeded broadbean entries, 19 of which were selections originating from 7 different countries. The remaining 2 were local checks for each respective location. The introduced selections were chosen based on their outstanding performance in ICARDA screening nurseries and yield trials. BRPYT-L was sent upon request to 13 locations (Table 1) and data were returned from 8 locations (Table 2).

Management:

The experimental design used for the BRPYT-L was a randomized complete block design with 4 replicates. Recommended plot size was three 3-meter rows, 50 cm apart. Ninety seeds were recommended for planting per plot. Seeds were treated with Benlate and Captan.

Information returned on management and cultural practices applied at each location were incomplete. Planting was done in November at Tel Hadia (ICARDA site), Egypt and Lebanon; in December in Cyprus; and in January in Algeria, Izra'a (Syria) and Tunisia. Fertilizer (N = Nkg/ha, P = P_2O_5kg/ha) was applied as follows: Algeria 90P; Cyprus 70P; Egypt 18.5N and 75P; Lebanon 30N and 60P; Syria: at Tel Hadia 30N and 60P, and at Izra'a 50P. The BRPYT-L was rainfed in all locations except for Egypt and Tel Hadia where irrigation was applied. The amoung of rainfall during the growing season at most of the locations is presented in Table 3. In Egypt two irrigations were applied; on 18/1 and 28/2/78. At Tel Hadia two supplementary irrigations were given during the second half of the growing season to compensate for low rainfall. Weed control was done by hand in Lebanon, Tel Hadia and Lattakia. Treflan was used as an effective herbicide in Algeria. Other locations gave no information on weed control. Malatox and Primor were used to control aphids and bruchids in Algeria. Harvesting was done during the last week of April in Egypt and second week of June in Tunisia.

Results:

Data reported on days to 50% flowering, maturity, plant height and grain yield are summarized in Tables 4, 5, 6 and 7 respectively. From these tables one may see that data received from some locations were incomplete. While 8 locations reported data on grain yield, only five of these reported data on flowering and maturity. The mean performance of the entries in the BRPYT-L, across locations, for various characters, is presented in Table 8.

Results on flowering indicated that on average entries took the least time to achieve 50% flowering at Izra'a (41 days) and the longest time at Tel Hadia (130 days). At all locations except in Egypt there were no substantial differences in days to 50% flowering between local cultivars and the introduced entries. In Egypt the earliest selection (75TA 26062) flowered 6 days later than the earliest local check. However, variation in flowering was generally low in all locations. The minimum range for differences in flowering was 4 days at Izra'a and the maximum range was 12 days in Egypt. Data on maturity were in line with those for flowering.

Data on plant height (Table 6) indicated that plants, on an average, were tallest in Cyprus (80cm) and shortest in Algeria (47cm). Local checks were generally shorter than most of the introduced entries. Selections 74TA 85,74TA 95, 75TA 26083 and 75TA 26054 gave relatively taller plants across locations while the shortest selections, across locations were Aquadulce, 75TA 26511 and 74TA 374.

Average dry seed yield was the highest in Tunisia (3300 kg/ha) and the lowest at Izra'a (1136 kg/ha). Excluding Cyprus, the number of entries exceeding the best local check ranged from 3 at Izra'a, Egypt and Algeria to 16 at Lattakia. In Cyprus one local check ranked 1st while the second one ranked 14th. At five locations (Lebanon, Izra'a, Lattakia, Tel Hadia and Tunisia) substantial differences in grain yield existed between local checks and some of the better yielding introductions. At Lattakia 9 entries outyielded local checks by more than 35%. However, these differences were not of the same extent at Algeria and Egypt. The 3 highest yielding entries across locations (74TA 22, 74TA 51 and 74TA 59) ranked in the top five entries

at three locations. Selection 74TA 59 ranked top at both the lowest yielding environment (Izra'a) and at the second highest yielding environment (Lebanon). Selection 74TA 59 seemed to have relatively wide range of adaptability. It ranked second in Lebanon and 5th in Algeria, Egypt and Izra'a.

Coefficients of variability (C.V.) were high at Tunisia, Lattakia and Izra'a and fairly low at Lebanon, Tel Hadia and Algeria.

Certain entries at several locations were significantly higher yielding than the local cultivars. However, these results are based on one year's data and further studies are needed to confirm them.

Table 4. Days to 50% flowering of entries in the BRPYT-L at different locations during 1977/78.

Ent. No.	ILB	Pedigree	Origin	SYRIA			EGYPT	ALGERIA	Mean
				Izra'a	Lattakia	T.Hadia	Sakha		
1	5	74TA 12	Jordan	42	101	131	65	103	88
2	9	74TA 22	"	41	101	131	68	103	88
3	19	74TA 51	Syria	41	104	134	70	104	90
4	22	74TA 59	"	43	102	133	67	105	90
5	24	74TA 63	Iraq	42	101	131	68	102	88
6	24	75TA 26062	"	42	102	130	64	103	88
7	29	75TA 26054	"	43	92	131	69	105	88
8	30	74TA 84	"	43	104	134	70	102	90
9	31	74TA 85	"	41	104	131	68	101	89
10	31	74TA 87	"	44	105	133	72	101	91
11	32	74TA 91	"	42	99	131	69	100	88
12	32	75TA 26083	"	42	101	130	69	100	88
13	33	74TA 95	"	43	102	131	67	104	89
14	37	74TA109	"	42	99	131	68	103	88
15	39	74TA 114	"	41	102	130	67	102	88
16	49	74TA 133	U.K.	43	105	129	69	100	89
17	274	74TA 374	Leb.	42	101	129	68	101	88
18	324	75TA 26511	USA	44	97	129	66	103	87
19	-	Aquadulce	Spain	40	99	126	69	104	87
20	-	Local check	CV.	40	99	129	58	102	85
21	-	Local check	CV.	40	104	131	60	102	87
Grand Mean				41	101	130	67	102	88
Local Check Mean				40	102	130	59	102	86

Table 5. Days to maturity of entries in the BRPYT-L at different locations during 1977/78.

Ent. No.	LEBANON	S Y R I A		ALGERIA	TUNISIA	Mean
		Izra'a	T.Hadia			
1	195	90	195	154	159	158
2	198	92	198	149	158	159
3	199	94	199	154	158	160
4	196	92	196	151	158	158
5	201	92	201	155	156	161
6	201	90	200	154	157	160
7	198	88	199	148	162	159
8	198	92	198	152	159	159
9	200	93	200	155	159	161
10	200	91	200	148	158	159
11	196	92	196	155	166	161
12	194	92	194	148	159	157
13	199	93	199	151	159	160
14	195	93	195	155	159	159
15	204	94	204	151	159	162
16	195	89	195	153	161	158
17	195	90	195	151	162	158
18	198	91	198	151	160	159
19	199	90	199	153	156	159
20	199	91	199	151	160	160
21	190	90	190	149	159	155
Grand Mean	197	91	197	151	159	159
Local Check Mean	195	91	195	150	160	158

Table 6. Plant height (cm) of entries in the BRPYT-L at different locations during 1977/78.

Ent. No.	CYPRUS	LEBANON	S Y R I A		ALGERIA	TUNISIA	Mean
			Izra'a	T.Hadia			
1	78	61	50	61	46	80	62
2	78	60	52	60	45	78	62
3	81	65	46	65	45	73	62
4	79	60	49	60	41	75	61
5	80	65	44	65	46	80	63
6	82	61	47	61	46	75	62
7	85	66	53	66	48	75	65
8	83	59	49	59	45	83	63
9	79	64	50	64	56	88	66
10	81	61	51	61	51	73	63
11	81	64	50	64	50	78	64
12	83	66	51	68	63	78	68
13	83	69	49	69	48	85	67
14	83	65	55	65	46	75	64
15	84	66	46	66	47	73	63
16	82	61	49	61	50	68	61
17	82	60	49	60	46	68	60
18	77	55	46	55	46	80	59
19	77	56	46	56	41	68	57
20	78	60	41	60	40	68	57
21	72	60	51	60	43	68	59
Grand Mean	80	62	48	62	47	75	62
Local Check Mean	75	60	46	60	42	68	58

Table 7. Grain yield (Y, Kg/ha) and rank (R) of entries in the BRPYT-L at different locations during 1977/78.

Ent. No.	CYPRUS		LEBANON		SYRIA						EGYPT		ALGERIA		TUNISIA		Mean	
					Izra'a		Lattakia		T. Hadia									
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	2068	5	2792	14	1228	9	1913	10	1363	10	1861	19	1931	13	3270	13	2053	17
2	1542	18	2917	8	1068	15	2593	1	1624	2	2378	10	1900	17	4413	2	2304	1
3	1690	16	3125	3	1233	8	2467	3	1254	18	3072	2	1992	10	3340	11	2271	2
4	1813	12	3258	1	1543	1	2133	5	1307	15	2439	9	2012	8	3526	7	2211	3
5	1672	17	3000	6	863	20	2067	7	1388	7	2011	15	1906	16	3796	4	2087	12
6	1299	20	3000	6	1215	10	2560	2	1457	4	3122	1	1975	11	2173	20	2079	14
7	1943	9	2817	13	1242	7	1713	16	1850	1	2328	11	1818	20	3168	14	2131	6
8	2238	4	2425	19	1067	16	2407	4	1232	19	2044	14	2025	7	3507	8	2118	8
9	1967	7	2842	11	1290	3	2007	9	1268	17	2211	12	2125	2	3479	10	2148	5
10	1845	10	2550	18	1412	2	1780	12	1193	20	1939	18	1856	18	4279	3	2106	10
11	1984	6	2867	10	1122	13	1740	14	1313	14	1967	16	1968	12	2751	17	1964	19
12	1524	19	2825	12	1060	17	2020	8	1471	3	2139	13	1925	14	3712	5	2093	11
13	1729	15	2775	16	1205	11	1733	15	1365	9	1833	20	1787	21	4963	1	2173	4
14	1056	21	3175	2	983	19	1793	11	1446	5	2700	5	2050	5	3307	12	2063	15
15	1841	11	3017	5	1117	14	1400	18	1444	6	1944	17	1912	15	1934	21	1827	21
16	1952	8	2900	9	1252	5	1773	13	1388	7	2678	6	1850	19	2862	16	2081	13
17	2281	3	3025	4	1182	12	2073	6	1330	12	2522	8	2068	3	2434	18	2114	9
18	2758	2	2275	21	1058	18	1067	21	1127	21	1361	21	2043	6	3535	6	1903	20
19	1780	13	2292	20	1248	6	1360	19	1355	11	3039	3	2243	1	3144	15	2057	16
20	1758	14	2567	17	1253	4	1680	17	1318	13	2967	4	2012	8	3490	9	2122	7
21	2809	1	2792	14	783	21	1293	20	1280	16	2606	7	2062	4	2245	19	1991	18
Grand Mean	1883		2821		1136		1884		1370		2341		1975		3300		2090	
Local Check Mean	2284		2680		1018		1487		1299		2787		2037		2868		2056	
C.V.	25.5%		9.9%		31.0%		33.5%		14.4%		20.3%		17.6%		48.5%		25.8%	
L.S.D. 5%	678		396.1		509.3		893		287.6		672.2		491.7		3340.7		908.57	
No.of entries exceeding best local check	0		13		3		16		12		3		3		8		6	

Table 8. Mean performance of entries in the BRPYT-L for various characters during 1977/78

Ent. No.	Yield		Flowering days	Maturity days	Plant height
	Kg/ha	rank			
1	2053	17	88	158	62
2	2304	1	88	159	62
3	2271	2	90	160	62
4	2211	3	90	158	61
5	2087	12	88	161	63
6	2079	14	88	160	62
7	2131	6	88	159	65
8	2118	8	90	159	63
9	2148	5	89	161	66
10	2106	10	91	159	63
11	1964	19	88	161	64
12	2093	11	88	157	68
13	2173	4	89	160	67
14	2063	15	88	159	64
15	1827	21	88	162	63
16	2081	13	89	158	61
17	2114	9	88	158	60
18	1903	20	87	159	59
19	2057	16	87	159	57
20	2122	7	85	160	57
21	1991	18	87	155	59

Broadbean Regional Preliminary Small-Seeded Yield Trial (BRPYT-S)

The Broadbean Regional Preliminary Small-Seeded Yield Trial (BRPYT-S) included 25 entries of which 23 were selections from germplasm accessions originating in 13 different countries. The remaining two were local checks. Twenty one of the selections were furnished by ICARDA and two, (Giza 3 and Giza 4) by the grain legume program in Egypt. The BRPYT-S was distributed to six locations (Table 1) and data were received from four locations (Table 2).

Management:

The experimental design used for the BRPYT-S was a fully randomized 5x5 lattice design with 4 replicates. However, the option was also given to handle this design as a randomized complete block design. The recommended plot size was three 3-meter rows, 50cm apart. Ninety seeds were supplied for planting per plot. Seeds were treated with Benlate and Captan fungicides.

The BRPYT-S was planted during the first week of November at the ICARDA sites in Tel Hadia and Lattakia; the last week of November in Lebanon and the last week of January at Izra'a. The amount of fertilizer (N=kgN/ha and P=kgP_2O_5/ha) applied was as follows: Lebanon 30N and 60P; Izra'a 50P and Tel Hadia 30N and 60P. Hand weeding was done late May at Izra'a.

Results:

The data on days to flowering, days to maturity, plant height and dry seed yield are presented in tables 9, 10, 11 and 12 respectively. Table 13 summarizes the data for these characters across all locations.

The data in table 9 indicates that on average the plants flowered earliest at Izra'a (mean of all entries was 48 days) and longest at Tel Hadia (mean 157 days). At each location the range in days to flowering between entries was very small, from 3 days in Lebanon to 14 days at Lattakia and Tel Hadia. Over all locations entry 19 (74TA 490) originating in Egypt

was the earliest flowering and entries 3 (75TA 26160 from UK) and 10 (75TA 26298 from Greece) were the latest. Although data on maturity were only received from Lebanon and Izra'a, a similar trend occured as for flowering;entries 3 and 10 were the latest maturing.

Data on plant height were returned from three locations: Lebanon, Izra'a and Tel Hadia in Syria. Plants were on average tallest in Lebanon and shortest at Tel Hadia. The late maturing entry, number 3 was also the tallest at all locations. Entry number 17 from Japan was the shortest at all locations with a mean plant height of only 39 cms.

The data on yield, (Table 12) indicated that reasonably uniform trial conditions were obtained in Lebanon and at Lattakia and Tel Hadia in Syria. At these sites the coefficients of variation were 14.3%, 17.0% and 17.2% respectively. At Izra'a the coefficient of variation was rather high, (31.6%) and of the 22 entries which exceeded the local check mean yield, only 5 did so by a margin of greater than the 5% LSD value.

The best entry across locations was entry number 6 (75TA 26270 from Morocco) which was ranked 3rd in Lebanon, 2nd at Izra'a and top at both Lattakia and Tel Hadia. Entry number 14 also exhibited a high degree of wide adaptation, with an overall mean yield of 2298 kg/ha (rank 2nd) and ranked top in Lebanon, 10th at Izra'a, 4th at Lattakia and 2nd at Tel Hadia.

Table 9. Days to 50% flowering of entries in the BRPYT-S at different locations during 1977/78.

Ent. No.	ILB	Pedigree	Origin	LEBANON	S Y R I A			Mean
					Izra'a	Latt.	T.Hadia	
1	3	75TA 26003	Jordan	134	48	98	158	110
2	9	75TA 26022	"	133	48	98	158	109
3	54	75TA 26160	U.K.	134	47	110	163	114
4	83	74TA 197	Jordan	131	49	96	158	109
5	96	75TA 26224	Iran	134	49	107	153	111
6	136	75TA 26270	Morocco	131	48	95	158	108
7	142	74TA 253	"	134	47	104	159	111
8	Local	-	-	133	47	100	157	109
9	156	75TA 26291	France	131	49	104	163	112
10	159	75TA 26298	Greece	133	51	110	163	114
11	159	75TA 26301	"	134	49	104	149	109
12	201	74TA 311	Turkey	133	46	104	150	108
13	207	75TA 26333	"	134	47	104	160	111
14	269	74TA 367	Spain	134	46	100	157	109
15	295	75TA 26467	Uraguay	133	49	104	159	111
16	Local	-	-	134	49	104	154	110
17	322	75TA 26501	Japan	130	48	96	158	108
18	353	74TA 471	Egypt	134	50	95	157	109
19	359	74TA 490	"	134	49	94	154	107
20	360	74TA 498	"	131	47	95	157	108
21	369	75TA 26639	Algeria	134	49	104	161	112
22	373	75TA 26651	"	131	48	104	159	111
23	391	75TA 26668	Tunisia	131	49	104	160	111
24	Giza 3		Egypt	134	50	93	155	108
25	Giza 4		"	131	50	93	156	108
Grand Mean				132	48	101	157	110
Local Check Mean				134	48	102	156	110

Table 10. Days to maturity of entries in the BRPYT-S at different locations during 1977/78.

Ent. No.	LEBANON	SYRIA Izra'a	Mean
1	194	94	144
2	194	96	145
3	209	98	153
4	195	96	145
5	201	97	149
6	194	94	144
7	194	95	144
8	193	95	144
9	198	96	147
10	203	97	150
11	199	97	148
12	196	95	145
13	196	97	146
14	199	96	147
15	195	93	144
16	193	95	144
17	195	94	144
18	196	95	145
19	195	95	145
20	195	95	145
21	201	96	148
22	199	96	147
23	200	98	149
24	196	96	146
25	200	96	148
Grand Mean	197	95	146
Local Check Mean	193	95	144

Table 11. Plant height (cms) of entries in the BRPYT-S at different locations during 1977/78.

Ent. No.	LEBANON	S Y R I A		Mean
		Izra'a	T. Hadía	
1	56	41	44	47
2	60	43	41	48
3	70	54	56	60
4	59	45	45	50
5	56	42	39	45
6	59	46	48	51
7	55	44	53	51
8	58	44	35	45
9	55	48	46	49
10	58	46	43	49
11	66	48	46	53
12	54	45	40	46
13	61	54	48	54
14	68	47	48	54
15	65	49	51	55
16	55	43	34	44
17	54	36	28	39
18	61	51	44	52
19	60	49	45	51
20	61	46	39	48
21	60	44	45	50
22	55	50	44	49
23	58	42	45	48
24	58	46	44	49
25	55	48	46	49
Grand Mean	59	46	43	49
Local Check Mean	57	44	35	45

Table 12. Yield (Y=kg/ha) and rank (R) of entries in the BRPYT-S at different locations during 1977/78.

Ent. No.	LEBANON		SYRIA						Mean	
			Izra'a		Lattakia		T. Hadia			
	Y	R	Y	R	Y	R	Y	R	Y	R
1	2317	12	1643	22	2498	11	1513	6	1993	11
2	2633	2	1982	11	2505	10	1338	16	2115	7
3	2242	14	1258	24	2480	12	1221	22	1800	21
4	198	21	2057	9	2283	17	1413	14	1935	15
5	2200	15	1812	18	2368	15	1238	18	1905	16
6	2550	3	2535	2	2992	1	1754	1	2458	1
7	2383	8	2113	7	2878	3	1241	17	2154	6
8	2292	13	1173	25	2633	7	1026	24	1782	22
9	2375	11	1848	15	2685	5	1501	8	2103	8
10	1633	25	1707	20	2378	14	1051	23	1693	24
11	2383	8	2065	8	2137	19	1235	19	1956	14
12	2458	5	2345	4	2518	9	1368	15	2173	4
13	2392	7	2195	6	2883	2	1588	4	2266	3
14	2808	1	2002	10	2753	4	1626	2	2298	2
15	2425	6	1878	13	2443	13	1529	5	2070	9
16	2533	4	1575	23	2648	6	874	25	1857	18
17	2067	20	2603	1	2062	21	1446	11	2044	10
18	2383	8	2455	3	2358	16	1466	10	2166	5
19	2117	18	2327	5	1900	23	1499	9	1961	13
20	2133	16	1812	18	2130	20	1507	7	1896	17
21	2125	17	1847	16	2553	8	1443	12	1993	11
22	1767	24	1933	12	2178	18	1429	13	1827	19
23	2108	19	1878	13	2050	22	1235	19	1819	20
24	1833	23	1647	21	1395	25	1227	21	1525	25
25	1917	22	1813	17	1505	24	1621	3	1714	23
Mean	2242		1940		2369		1375		1980	
Local check mean	2412		1374		2641		950		1820	
LSD 5%	452.3		863.4		585		332.7			
C.V.	14.3%		31.6%		17.0%		17.2%			
No. of entries exceeding best local check	3		22		5		23		17	

Table 13. Mean performance of entries in the BRPYT-S for various characters during 1977/78.

Ent. No.	Yield		Flowering days	Maturity days	Plant height
	Kg/ha	rank			
1	1993	11	110	144	47
2	2115	7	109	145	48
3	1800	21	114	153	60
4	1935	15	109	145	50
5	1905	16	111	149	45
6	2458	1	108	144	51
7	2154	6	111	144	51
8	1782	22	109	144	45
9	2103	8	112	147	49
10	1693	24	114	150	49
11	1956	14	109	148	53
12	2173	4	108	145	46
13	2266	3	111	146	54
14	2298	2	109	147	54
15	2070	9	111	144	55
16	1857	18	110	144	44
17	2044	10	108	144	39
18	2166	5	109	145	52
19	1961	13	107	145	51
20	1896	17	108	145	48
21	1993	11	112	148	50
22	1827	19	111	147	49
23	1819	20	111	149	48
24	1525	25	108	146	49
25	1714	23	108	148	49

Chickpea Regional Nursery (CRN)

Elite chickpea germplasm lines and advanced breeding lines were furnished to cooperators. This nursery was unreplicated and provided a wide range of genetic diversity. Cooperators were invited to select material for wider adaptation, yield, disease resistance and other characters useful for their programs.

The CRN was sent to 23 cooperators in 15 countries for the 1977/78 season. Complete results were returned from 9 locations and partial results, without yield estimates, from 6 more cooperators.

Management:

The CRN had 84 test entries including 55 kabuli and 29 desi. A local check was planted after every 14 entries, thus making a total of 91 entries in the nursery. These entries originated from 11 countries. Recommended plot size was one row 3-4 m long placed at 40-60 cm apart with a plant to plant distance of 10 cm within the row. The seed was treated with Benlate and Captan fungicides before dispatch.

The nursery was planted in October at the ICARDA site at Tel Hadia, Syria (Tel Hadia - W); in November at Nepal; in December in Cyprus and Egypt; in January in Algeria and February thru early April at other sites including a second planting at Tel Hadia, Syria (Tel Hadia - S). Every station had applied phosphate and nitrogenous fertilizer in varying quantity except Algeria and Tunisia where only phosphate was applied. Algeria and Tunisia were the only two locations where Treflan herbicide was used. The crop received 1 irrigation in Lebanon, 2 in ICARDA (Tel Hadia S) and 3 in Egypt. Almost every station received some rainfall during the growing season. The crop was harvested from April to July. No information on pest management was communicated from any centre.

Results:

The observations on days to 50% flower and maturity and plant height are summarized in tables 14, 15 and 16 respectively. The crop took longest (113 days) to flower in Cyprus and least (55 days) in Lebanon on an overall basis. A similar pattern was observed for days to maturity. As expected the winter planted trial at Tel Hadia took longest to flower and mature. Plants attained a maximum height in Cyprus and minimum in Lebanon. There appeared to be some association between days to flower and plant height.

The data on grain yield shown in table 17 indicated that the local check mean was not the highest yielding at any location although several individual check rows, in many of the nurseries, did give the highest yield. Amongst the test entries ILC 1126 produced the highest yield followed by NEC 1813, ILC 32, ILC 263 and ILC 1022. The highest overall yield was reported from Tunisia and the lowest from Izra'a in Syria.

Several entries out-yielded respective local checks at different locations. The number of entries exceeding local checks varied from 3 in Turkey to 81 in Cyprus. The superiority of the best test entry over the local check ranged from 19 per cent in Turkey to 305 per cent in Egypt. Local breeders thus had an opportunity to select promising materials at all locations for further testing.

ILC lines 1126, 32 and 263 were the three best kabuli entries and showed promise at one or more locations and also on overall locations mean.

Table 14. Number of days to flowering of entries in the CRN in different locations during 1977/78.

Ent. No.	ILC	Pedigree	Origin	CYPRUS	JORDAN		LEB.	SYRIA			EGYP	SUD	ALG	TUN	TURK	AFGH	NEPAL	Mean
					Irbid	Jub.		Latt.	T.H. W	T.H. S	Sids							
1	-	Local	-	117	76	75	55	-	150	60	85	42	112	72	85	66	74	82
2	12	74TA 13 (NEC 11)	Jordan	110	76	75	55	-	150	60	90	77	105	72	90	69	67	84
3	13	74TA 14 (NEC 11)	"	111	74	75	55	152	150	65	90	77	108	72	90	67	65	89
4	14	74TA 22 (NEC 14)	"	109	74	75	55	152	150	60	85	70	100	72	83	70	58	86
5	24	16014 (NEC 16)	"	107	73	75	55	147	150	60	100	77	100	72	85	72	67	88
6	32	16022 (NEC 21)	Syria	114	79	75	-	-	150	65	-	70	121	72	85	73	68	88
7	41	16026 (NEC 26)	"	107	71	75	60	134	150	60	85	63	94	72	83	67	54	83
8	46	16029 (NEC 28)	Iraq	106	72	80	60	142	150	60	85	78	100	72	85	69	59	87
9	52	- (NEC 30)	"	107	71	75	60	134	150	60	80	65	100	72	85	69	59	84
10	103	16082 (NEC 64)	Spain	122	81	80	60	155	165	65	100	86	110	72	90	76	71	95
11	-	- (NEC 138)	USSR	124	90	85	-	160	150	80	105	87	113	72	92	75	79	100
12	-	16104 (NEC 138)	"	124	90	85	-	155	150	85	105	88	113	74	92	75	79	101
13	193	- (NEC 139)	"	122	85	85	55	152	150	65	-	61	109	72	90	76	69	91
14	192	16105 (NEC 139)	"	122	85	85	-	-	150	75	105	61	111	72	90	76	69	91
15	202	- (NEC 142)	"	122	85	85	-	160	160	80	-	87	113	72	90	76	55	98
16	-	Local	-	120	76	75	55	145	150	60	80	41	112	72	85	76	50	85
17	238	16167 (NEC 216)	Spain	112	80	80	55	140	150	65	90	78	106	72	90	71	67	90
18	263	- (NEC 293)	Turkey	120	84	78	-	154	160	65	105	85	106	82	90	71	71	98
19	-	16203 (NEC 311)	Iran	120	87	78	60	150	150	75	100	83	109	80	91	74	74	95
20	-	16204 (NEC 324)	Iran	112	79	78	55	148	150	70	90	76	111	72	90	71	72	91
21	-	16298 (NEC 754)	India	112	74	75	60	150	150	65	90	63	109	72	90	70	68	89
22	-	16381 (NEC 961)	"	112	73	75	60	-	150	65	90	65	111	72	90	69	69	85
23	-	16440 (NEC 1071)	Iran	106	76	75	55	-	165	65	90	65	111	72	90	69	68	85
24	-	16554 (NEC 1078)	"	113	79	78	60	-	150	70	90	68	120	72	90	77	73	88
25	-	1929 (NEC 1256)	"	104	74	78	55	143	150	60	80	69	109	72	90	69	58	87
26	291	16621 (NEC 1332)	"	111	79	78	55	149	170	70	90	78	105	72	90	71	62	91
27	508	2217 (NEC 1554)	"	112	77	80	55	150	150	65	90	79	109	72	90	71	50	89
28	493	- (NEC 1540)	"	112	72	80	55	137	150	60	-	62	95	72	85	71	58	85
29	603	16820 (NEC 1644)	Algeria	107	72	70	55	143	150	60	-	66	101	72	85	76	50	85
30	615	16825 (NEC 1659)	Tunisia	112	72	70	55	148	165	60	90	69	106	72	85	76	59	89
31	-	Local	-	112	75	75	55	145	165	60	85	43	106	72	85	76	67	87
32	617	16825 (NEC 1660)	Tunisia	111	73	70	55	144	150	60	90	84	101	72	85	-	68	89
33	659	16858 (NEC 1699)	Iran	106	73	78	45	150	150	60	80	52	93	72	83	-	58	85
34	728	16878 (NEC 1770)	"	118	84	78	55	152	165	65	95	43	126	73	85	71	70	91
35	-	16880 (NEC 1784)	"	111	80	78	55	146	165	65	85	44	126	74	85	69	71	90
36	750	16890 (NEC 1808)	"	108	76	78	55	140	150	65	90	79	105	72	85	-	71	90
37	-	16992 (NEC 1813)	"	112	75	78	60	135	150	65	90	71	109	72	90	73	72	89
38	-	16901 (NEC 1835)	"	112	84	78	60	140	150	75	90	71	124	72	90	71	72	92
39	-	16907 (NEC 1844)	"	113	84	80	60	152	150	75	90	72	124	72	90	72	74	93
40	-	16915 (NEC 1891)	"	108	81	78	60	142	150	70	90	75	111	72	90	71	73	91
41	-	16916 (NEC 1891)	"	106	89	80	55	125	165	65	95	75	109	-	90	69	73	92
42	803	16917 (NEC 1894)	"	119	85	78	-	150	170	75	100	66	126	74	90	76	74	98
43	812	- (NEC 1906)	"	114	81	78	60	152	150	70	95	87	111	73	90	76	78	93
44	-	16946 (NEC 1962)	"	114	83	78	60	143	150	70	90	78	121	74	90	70	79	93
45	-	16949 (NEC 1964)	"	113	83	78	60	125	150	65	90	77	112	72	95	70	74	90
46	-	Local	-	114	75	75	55	130	165	55	85	43	108	74	85	65	67	85

Contd...

Ent. No.	ILC	Pedigree	Origin	CYPRUS	JORDAN		LEB.	SYRIA			EGYP	SUD	ALG	TUN	TURK	AFGH	NEPAL	Mean
					Irbid	Jub.		Latt.	T.H. W'	T.H. S	Sids							
47	-	16952 (NEC 1971)	Iran	112	79	80	60	128	165	70	90	70	110	80	90	65	72	91
48	898	16970 (NEC 1994)	"	115	79	78	55	154	170	75	95	78	110	71	90	69	68	93
49	918	16988 (NEC 2011)	"	115	79	80	45	156	170	70	95	88	111	70	90	70	68	93
50	926	16991 (NEC 2017)	"	113	78	80	55	155	165	70	105	78	113	73	90	69	69	94
51	953	17006 (NEC 2040)	"	114	78	80	55	160	170	70	100	79	113	72	90	69	71	94
52	963	17012 (NEC 2049)	"	121	80	80	55	160	165	70	105	91	121	73	90	70	69	96
53	1022	17041 (NEC 2101)	"	114	82	80	55	154	165	70	100	83	109	70	90	69	68	94
54	-	17045 (NEC 2103)	"	119	79	85	55	150	165	75	90	87	126	73	90	68	68	95
55	1028	17047 (NEC 2105)	"	107	79	75	50	154	150	60	90	53	106	70	85	68	54	86
56	1038	17052 (NEC 2114)	"	110	78	80	60	141	150	75	95	82	109	72	85	70	67	91
57	1043	17055 (NEC 2116)	"	112	82	78	55	154	150	65	90	83	119	72	90	67	64	92
58	1045	16059 (NEC 2117)	"	113	79	80	55	148	150	70	90	82	109	74	90	66	62	91
59	-	17061 (NEC 2122)	"	108	79	78	60	147	150	70	90	74	110	74	90	65	73	91
60	1052	17062 (NEC 2123)	"	114	81	78	60	150	165	75	95	85	109	70	90	70	68	94
61	Local	-	-	114	75	75	45	143	165	65	85	45	111	72	85	71	55	86
62	1061	17070 (NEC 2132)	Iran	113	80	80	55	150	150	70	100	81	109	73	90	68	68	92
63	1091	17077 (NEC 2170)	"	118	83	80	60	156	165	75	95	88	121	73	90	69	71	96
64	1096	17080 (NEC 217)	"	112	79	80	60	142	150	75	90	88	107	73	85	65	67	91
65	-	17081 (NEC 2177)	"	120	79	80	55	156	165	75	90	83	121	79	90	69	69	95
66	-	17184 (NEC 2195)	"	118	83	80	55	154	150	75	95	-	109	70	85	55	69	92
67	1123	17085 (NEC 2195)	"	114	78	80	60	148	165	75	100	84	111	69	90	65	69	93
68	1126	17187 (NEC 2198)	"	111	75	78	55	148	165	60	80	81	95	69	85	76	65	89
69	1133	17089 (NEC 2203)	"	118	83	80	60	154	165	75	100	-	121	70	90	70	71	97
70	-	17091 (NEC 2214)	"	119	79	80	60	148	150	75	100	72	113	72	90	69	70	93
71	1145	17101 (NEC 2214)	"	119	82	80	60	155	150	86	105	74	121	72	90	71	73	96
72	1154	17103 (NEC 2219)	"	124	85	80	55	155	150	75	105	85	123	69	90	65	69	95
73	1214	17120 (NEC 2263)	"	114	77	78	55	149	165	75	90	89	101	73	90	71	69	93
74	1218	17121 (NEC 2271)	"	124	87	80	55	154	165	80	95	89	121	74	92	71	78	98
75	1245	17133 (NEC 2293)	"	114	79	80	55	149	150	70	100	89	105	70	90	71	73	93
76	Local	-	-	112	75	75	45	148	150	60	85	46	106	72	85	71	69	86
77	-	(NEC 2304)	USA	110	80	78	50	150	150	88	90	80	113	70	90	71	71	92
78	1255	(NEC 2305)	"	114	85	80	45	152	150	88	90	83	113	71	90	71	70	93
79	-	17144 (NEC 2313)	"	115	87	80	55	160	150	75	90	92	114	71	90	74	78	95
80	-	17146 (NEC 2313)	"	121	87	85	60	160	150	80	105	94	113	71	90	72	78	98
81	-	17148 (NEC 2315)	"	120	78	85	60	160	165	75	95	81	117	67	90	71	77	96
82	-	17157 (NEC 2332)	"	112	79	85	45	147	150	70	90	81	107	67	90	65	74	90
83	-	17158 (NEC 2335)	"	113	79	85	45	152	165	70	95	85	113	66	90	65	71	92
84	1263	17160 (NEC 2345)	"	107	74	85	45	130	150	70	90	86	102	70	85	71	71	88
85	1268	17163 (NEC 2351)	"	114	79	85	50	156	150	70	105	-	120	70	85	71	67	94
86	1282	17185 (NEC 2380)	"	112	78	85	45	139	150	70	95	-	103	70	85	65	64	89
87	1284	17188 (NEC 2388)	"	112	80	85	-	144	165	75	105	83	124	70	85	71	69	98
88	1290	17196 (NEC 2423)	"	111	79	82	45	144	150	70	90	98	108	70	85	65	69	90
89	1298	17200 (NEC 2429)	"	108	79	82	45	144	150	70	90	69	102	70	85	65	68	88
90	1308	17207 (NEC 2449)	"	108	78	82	55	130	150	70	100	76	109	72	85	65	69	89
91	Local	-	-	112	75	75	45	140	150	60	85	42	111	81	85	65	69	85
Mean				113	79	78	55	148	155	69	92	67	111	72	88	67	68	-

Table 15. Number of days to maturity of entries in the CRN in different locations in 1977/78.

Ent. No.	JORDAN Jubeiha	LEB.	SYRIA Izra'a	SYRIA T.H. W	SYRIA T.H. S	EGYP Sids	SUD	TURK	AFGH	NEPAL	Mean
1	105	85	73	208	115	140	95	126	136	112	119
2	105	-	75	208	110	140	108	130	136	112	124
3	105	85	75	208	110	140	106	130	136	112	120
4	105	-	75	208	110	140	105	130	136	112	124
5	105	-	76	208	112	140	106	130	136	115	125
6	105	-	-	208	110	-	115	127	133	115	130
7	105	-	-	208	110	140	110	126	133	115	130
8	105	-	76	208	110	140	120	126	133	115	125
9	105	-	77	208	110	140	105	126	136	115	124
10	125	-	-	208	114	145	118	130	137	115	136
11	125	-	-	208	112	155	125	130	139	122	139
12	125	-	-	208	114	145	-	130	139	122	140
13	125	-	85	208	110	-	110	130	140	122	128
14	125	-	-	208	112	145	-	130	136	122	129
15	125	-	-	208	114	-	122	130	140	122	137
16	105	85	-	208	110	140	97	126	143	122	126
17	110	-	85	208	105	145	113	126	143	121	128
18	110	-	77	208	108	140	117	126	143	121	127
19	110	-	77	208	112	140	-	130	136	122	129
20	110	-	77	208	110	150	-	130	136	122	130
21	110	-	76	208	108	150	-	127	136	122	129
22	110	-	76	208	110	150	-	130	136	122	130
23	110	-	79	208	114	150	-	130	136	122	131
24	110	-	76	208	116	160	-	130	146	135	135
25	110	85	78	208	110	140	-	126	147	114	124
26	120	85	69	208	110	150	-	130	140	114	125
27	125	85	69	208	105	140	118	130	140	114	123
28	125	90	69	208	110	-	106	130	140	115	121
29	120	-	69	208	108	-	111	130	140	115	125
30	118	-	70	208	110	140	113	130	140	115	127
31	118	90	68	208	110	140	118	126	136	115	122
32	120	-	68	208	110	145	123	126	-	115	126
33	120	85	75	208	110	140	123	126	-	115	122
34	120	-	74	208	114	140	114	130	140	115	128
35	120	-	74	208	110	140	-	130	140	115	130
36	120	85	70	208	108	145	-	126	-	122	123
37	120	-	71	208	112	145	-	130	138	122	130
38	120	-	75	208	114	145	-	126	136	135	133
39	120	-	75	208	116	145	-	130	136	122	131
40	120	-	75	208	116	145	-	130	136	122	131
41	120	-	77	208	113	150	-	127	138	122	131
42	118	-	76	208	115	155	109	130	143	122	130
43	118	-	77	208	110	150	-	130	138	122	131
44	118	-	77	208	110	145	-	130	138	122	131
45	118	-	79	208	110	145	-	130	136	122	131
46	118	-	75	208	110	140	115	126	136	122	127
47	125	-	75	208	110	145	-	126	136	122	130
48	125	85	76	208	110	150	118	130	136	122	126
49	125	85	76	208	108	150	124	126	136	122	126
50	125	85	76	208	108	155	117	126	133	122	125

Contd...

Table 15. Contd.

Ent. No.	JORDAN Jubeiha	LEB.	SYRIA Izra'a	SYRIA T.H. W	SYRIA T.H. S	EGYP Sids	SUD	TURK	AFGH	NEPAL	Mean
51	120	85	73	208	110	155	117	126	138	122	125
52	120	85	73	208	110	155	128	126	138	122	126
53	120	85	75	208	110	150	122	126	136	115	125
54	120	85	68	208	115	145	-	130	138	115	125
55	118	80	71	208	110	145	108	126	136	115	122
56	120	85	76	208	112	145	121	126	136	122	124
57	120	85	76	208	110	140	123	126	136	115	124
58	128	85	76	208	110	145	123	126	136	115	125
59	125	-	75	208	112	145	-	126	136	135	133
60	120	90	71	208	110	150	126	126	136	122	126
61	115	85	75	208	110	140	99	126	140	122	122
62	120	85	77	208	110	150	122	126	136	122	126
63	120	-	77	208	115	150	-	130	136	122	132
64	125	-	77	208	114	145	-	130	136	135	134
65	118	-	76	208	114	140	-	130	136	135	132
66	118	-	75	208	110	145	-	126	136	115	129
67	118	-	69	208	116	150	-	130	136	122	131
68	118	-	75	208	113	140	-	126	136	122	130
69	120	-	75	208	115	150	-	130	140	122	133
70	120	-	76	208	114	150	-	126	136	122	132
71	120	-	78	208	116	155	-	130	136	122	133
72	120	-	74	208	110	150	-	130	136	122	131
73	118	-	75	208	110	140	-	126	136	122	129
74	118	-	71	208	110	145	-	130	136	135	132
75	118	90	71	208	110	145	-	126	136	135	127
76	120	85	75	208	110	145	98	126	136	122	123
77	120	85	75	208	113	145	-	126	136	122	126
78	125	90	77	208	113	140	-	126	136	122	126
79	125	90	78	208	110	145	-	130	136	135	129
80	125	90	75	208	110	155	-	130	136	135	129
81	125	-	70	208	114	145	-	130	136	135	133
82	125	85	71	208	110	140	-	126	133	135	126
83	120	85	69	208	110	145	-	126	133	122	124
84	120	85	74	208	110	140	125	126	136	122	125
85	120	85	74	208	108	150	-	126	136	122	125
86	118	85	72	208	110	145	-	126	136	122	125
87	118	-	70	208	110	150	120	130	138	122	130
88	120	85	70	208	110	140	129	130	136	122	125
89	120	90	75	208	110	140	110	126	138	122	124
90	120	85	75	208	105	150	115	126	136	122	124
91	115	85	75	208	105	145	88	126	136	115	120
Mean	118	85	67	208	110	145	113	127	127	121	-

Table 16. Plant height (cm) of entries in the CRN in different locations in 1977/78.

Ent. No.	CYPRUS	JORDAN Jubeiha	LEB	SYRIA Izra'a	SYRIA T.H. W	SYRIA T.H. S	EGYP Sids	SUD	ALG	TUR	AFGH	NEPAL	Mean
1	35	25	30	34	45	19	35	55	35	35	25	35	34
2	48	25	25	34	35	23	45	48	35	32	30	35	35
3	45	30	30	36	40	23	50	46	30	30	25	35	35
4	40	30	25	30	35	20	25	55	30	30	25	30	31
5	47	30	30	28	45	25	40	56	30	27	20	40	35
6	42	28	30	-	25	22	-	42	25	26	20	40	30
7	44	28	25	-	30	20	30	47	22	28	20	35	29
8	48	28	25	26	35	22	30	42	28	25	25	35	31
9	47	25	-	25	30	22	25	56	28	27	20	35	31
10	46	25	30	-	40	26	40	57	35	32	25	50	37
11	54	35	30	-	45	33	40	54	35	32	40	50	41
12	60	35	35	-	45	35	60	60	42	37	35	50	45
13	60	35	40	41	50	35	-	76	42	34	30	50	44
14	60	35	-	-	40	41	45	62	42	33	40	45	44
15	60	35	40	-	45	36	-	80	50	41	50	60	50
16	-	25	30	-	55	23	45	47	35	38	30	30	36
17	54	25	30	32	25	21	50	69	35	32	30	45	37
18	45	30	-	30	30	24	35	45	30	35	20	40	33
19	48	30	30	31	30	27	45	50	32	31	30	35	35
20	47	30	30	28	35	28	50	70	40	35	30	40	38
21	47	30	35	30	35	26	35	70	35	34	30	45	38
22	53	20	30	29	35	28	40	70	30	31	20	45	35
23	52	30	30	33	35	29	50	67	35	34	30	40	39
24	45	30	30	33	30	31	65	82	40	31	30	40	41
25	45	30	25	35	40	20	50	69	38	31	20	35	37
26	47	30	30	32	30	18	50	80	38	29	20	40	37
27	47	30	30	38	25	21	45	65	32	28	20	30	34
28	50	30	30	27	30	20	-	62	32	30	25	30	33
29	47	25	30	30	30	21	-	68	30	30	30	30	33
30	47	25	30	33	30	23	45	80	30	30	20	25	35
31	42	25	30	30	25	22	50	82	32	36	30	35	37
32	43	25	30	27	30	23	45	85	30	33	-	35	37
33	44	30	25	26	25	16	40	60	25	25	-	25	31
34	45	30	30	35	35	24	45	70	32	30	30	30	36
35	46	28	35	29	30	30	40	82	30	35	30	35	38
36	48	28	25	27	30	22	35	61	30	28	-	30	33
37	44	30	30	28	30	22	45	60	25	28	20	30	33
38	50	30	30	29	30	26	40	65	38	28	30	35	36
39	47	30	30	33	30	31	50	72	32	30	30	35	38
40	53	30	30	39	35	29	50	79	35	30	35	40	40
41	54	28	35	32	30	31	40	75	32	33	30	40	38
42	47	30	-	30	40	26	40	65	30	28	30	40	37
43	47	28	35	38	40	34	55	68	40	35	25	38	40
44	46	30	30	34	35	29	40	58	35	31	35	40	37
45	52	30	35	34	40	28	50	54	40	33	35	40	39
46	47	25	30	30	35	23	50	48	35	33	20	25	33

Contd...

Table 16. Contd.

Ent. No.	CYPRUS	JORDAN Jubeiha	LEB	SYRIA Izra'a	SYRIA T.H. W	SYRIA T.H. S	EGYP Sids	SUD	ALG	TURK	AFGH	NEPAL	Mean
47	48	30	35	40	40	35	50	75	38	34	30	35	41
48	49	30	25	35	35	28	45	70	30	31	20	30	36
49	49	30	30	37	30	25	35	67	28	28	20	35	35
50	50	28	30	40	35	28	35	59	30	31	25	35	36
51	45	30	35	34	40	28	40	46	30	31	30	40	36
52	52	30	30	38	35	27	40	58	28	31	30	35	36
53	50	30	30	34	35	29	50	50	30	32	25	30	35
54	47	25	35	35	40	26	45	54	38	31	30	35	37
55	47	25	35	28	25	19	45	53	25	27	20	35	32
56	48	25	25	29	30	25	40	65	32	31	25	40	35
57	45	25	25	26	30	28	35	58	30	30	30	25	32
58	44	25	30	25	35	24	50	71	32	29	25	25	35
59	45	25	35	31	40	31	45	61	40	36	35	40	39
60	47	25	30	30	30	24	45	59	30	30	30	35	35
61	39	25	25	32	30	24	45	52	35	32	30	25	33
62	49	30	30	31	35	27	55	63	30	32	20	30	36
63	50	30	35	35	40	30	60	50	30	30	20	40	38
64	49	30	30	35	35	22	35	45	30	31	25	30	33
65	44	30	25	26	30	23	55	50	30	28	20	30	33
66	46	30	25	33	40	23	50	38	32	33	20	25	33
67	47	30	35	36	40	30	55	44	32	31	30	30	37
68	50	30	35	37	35	23	50	63	32	31	20	30	36
69	52	25	30	34	40	24	50	40	30	30	35	35	35
70	49	30	30	30	40	24	50	47	30	31	25	35	35
71	54	30	35	36	35	27	40	65	35	32	30	35	38
72	54	30	30	33	35	24	50	40	35	27	20	35	34
73	49	30	30	30	40	23	50	32	32	31	20	40	34
74	46	30	30	27	35	21	40	44	35	27	20	35	33
75	54	30	30	39	40	26	50	50	35	34	20	40	37
76	40	25	25	37	35	23	65	42	32	36	30	25	35
77	40	30	25	32	30	21	66	45	30	28	25	25	32
78	42	30	30	30	35	24	50	50	30	30	30	40	35
79	44	30	30	35	35	24	45	45	30	34	30	40	35
80	44	32	30	38	40	26	55	58	35	33	30	40	38
81	43	30	35	36	40	25	50	45	32	28	25	35	35
82	45	30	30	42	35	26	40	50	38	32	20	30	35
83	42	32	30	33	35	23	40	52	40	33	20	35	35
84	45	28	30	36	40	26	45	32	40	36	20	35	34
85	50	28	25	30	35	23	40	38	30	33	20	35	32
86	50	30	30	37	40	25	50	33	30	33	15	30	34
87	47	30	-	32	40	28	45	47	35	33	30	30	36
88	50	28	30	37	40	24	50	49	32	33	20	30	35
89	50	28	30	36	35	25	45	58	30	33	20	25	35
90	51	30	30	35	40	29	40	77	40	38	30	40	40
91	46	25	30	32	35	25	45	46	40	34	30	-	32
Mean	48	29	30	33	35	26	45	58	33	31	26	35	35

Table 17. Yield (Y-kg/ha) and rank (R) of the CRN entries at different locations during 1977/78.

Ent. No.	CYPRUS		LEBANON		SYRIA						EGYPT		TUNISIA		TURKEY		NEPAL		Mean	
					Izra'a		T.H.-W		T.H.-S		Sids									
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	-	-	163	75	146	63	867	40	842	58	139	40	750	22	-	-	-	-	485	68
2	333	86	138	77	108	69	592	84	996	36	111	44	1350	8	-	-	733	4	545	47
3	583	53	283	68	71	75	1050	15	938	46	83	64	900	20	-	-	542	19	556	42
4	771	15	346	61	133	65	967	26	908	50	111	45	1225	10	-	-	433	36	612	16
5	875	6	54	87	17	83	579	86	1154	14	56	66	1100	11	-	-	775	2	576	26
6	521	63	79	84	-	-	750	72	1299	4	-	-	825	21	-	-	692	6	694	4
7	729	25	63	86	-	-	1000	22	1221	6	56	67	950	18	533	24	654	11	651	8
8	750	19	88	82	67	76	800	57	1217	7	56	68	-	-	511	25	675	8	521	57
9	583	54	-	-	17	82	775	64	1017	35	28	80	1800	1	267	61	-	-	641	12
10	417	74	100	81	-	-	892	35	1488	1	28	81	1600	3	222	69	429	37	647	9
11	542	59	179	74	-	-	646	80	792	65	28	82	1050	14	155	79	388	46	473	72
12	825	11	354	59	-	-	863	41	838	59	-	-	1100	12	400	48	183	69	652	7
13	458	67	267	71	21	80	583	85	604	83	-	-	1550	5	178	75	383	47	506	64
14	667	36	-	-	-	-	754	71	667	77	361	9	1250	9	222	70	483	30	629	13
15	375	81	83	83	-	-	633	82	433	89	-	-	1600	4	200	74	204	65	504	65
16	-	-	458	42	-	-	808	54	950	44	83	60	1450	7	822	3	508	28	726	1
17	667	37	475	40	46	78	708	76	808	64	333	11	1100	13	511	26	471	31	569	33
18	625	43	-	-	296	30	721	75	983	37	139	41	1800	2	445	45	429	38	68a	5
19	542	60	608	14	21	81	675	78	1079	25	611	1	950	19	489	30	154	74	570	32
20	750	20	625	11	108	70	1058	12	788	66	28	83	1050	15	489	31	279	56	575	28
21	417	75	383	54	163	59	983	25	825	62	56	69	1050	16	489	32	471	32	537	50
22	583	55	338	62	267	36	1071	11	1058	28	83	62	1500	6	467	38	196	67	618	15
23	521	64	517	28	208	49	1142	2	979	38	111	46	1050	17	400	49	183	70	568	34
24	313	87	-	-	129	67	813	53	838	60	194	29	600	23	422	46	238	61	443	79
25	396	78	604	16	104	72	771	65	-	-	305	15	1150	10	355	53	517	23	525	56
26	708	27	238	72	263	38	563	88	729	69	56	70	-	-	489	33	396	45	430	85
27	396	79	496	33	396	17	563	89	671	75	250	24	-	-	289	59	463	34	441	81
28	633	41	375	56	304	28	921	33	575	85	-	-	-	-	511	28	550	18	553	43
29	604	47	333	63	238	45	771	66	708	71	-	-	-	-	578	18	617	12	550	45
30	542	61	396	51	250	40	575	87	604	84	56	71	-	-	489	34	596	15	439	83
31	258	89	596	17	108	71	817	51	679	74	56	72	-	-	733	5	508	27	469	75
32	438	72	358	58	246	41	504	90	638	80	83	63	-	-	511	27	800	1	447	78
33	438	73	438	47	133	66	800	58	625	81	111	47	-	-	245	67	517	24	413	87
34	363	83	275	70	163	60	808	55	775	67	56	73	-	-	178	78	400	44	377	90
35	458	68	442	45	171	57	1013	20	854	55	250	25	-	-	267	62	529	20	498	66
36	604	48	292	67	183	55	646	81	821	63	56	74	-	-	555	19	383	48	443	80
37	771	16	771	3	446	6	1167	1	1238	5	278	16	-	-	422	47	467	33	695	3
38	396	80	371	57	329	24	846	44	888	52	111	48	-	-	222	71	417	39	448	77
39	500	66	479	38	408	15	800	59	925	48	139	42	-	-	267	63	263	60	473	71
40	633	42	421	49	417	11	675	79	1113	21	111	49	-	-	111	81	275	57	470	74
41	696	31	508	30	308	27	1125	3	1217	8	111	50	-	-	578	16	221	62	596	20
42	333	85	108	80	171	58	704	77	1104	24	111	51	-	-	245	68	113	75	361	91
43	625	44	121	78	283	32	496	91	963	43	111	52	-	-	378	52	188	68	396	89
44	354	84	388	53	363	19	800	60	1021	33	167	35	-	-	178	77	54	78	416	86
45	688	32	608	15	400	16	863	42	1208	10	278	17	-	-	222	72	33	80	538	49
46	404	77	333	64	267	37	1042	16	1208	11	194	30	-	-	667	11	-	-	588	24
47	688	33	454	43	417	12	938	29	975	42	167	36	-	-	222	73	-	-	552	44
48	771	17	425	48	450	5	1100	8	1117	19	56	75	-	-	22	85	-	-	563	39
49	604	49	492	34	363	20	992	23	1354	3	194	31	-	-	267	64	746	3	627	14
50	833	8	442	46	242	43	804	56	1208	12	56	76	-	-	467	39	667	10	590	21

Contd...

Table 17. Contd.

Ent. No.	CYPRUS		LEBANON		SYRIA						EGYPT		TUNISIA		TURKEY		NEPAL		Mean	
					Izra'a		T.H.-W		T.H.-S		Sids									
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
51	646	39	379	55	313	26	988	24	1213	9	56	77	-	-	489	35	525	22	576	27
52	792	12	163	76	158	61	1017	19	1154	15	28	84	-	-	311	55	583	17	526	55
53	854	7	275	69	429	8	1071	10	1367	2	111	53	-	-	489	36	675	9	659	6
54	738	24	350	60	179	56	1088	9	1025	32	111	54	-	-	45	84	700	5	530	54
55	779	14	400	50	279	33	883	36	1108	22	56	78	-	-	511	29	688	7	588	22
56	917	5	329	65	188	54	800	61	450	88	167	37	-	-	445	44	313	55	451	76
57	750	21	575	18	121	68	958	27	1167	13	556	3	-	-	489	37	529	21	643	11
58	625	45	517	29	150	62	758	68	850	57	222	27	-	-	533	22	608	13	533	52
59	729	26	552	21	146	64	1125	4	1042	29	250	26	-	-	155	80	517	25	565	38
60	521	65	538	25	217	48	733	74	646	79	194	32	-	-	445	42	-	-	471	73
61	458	69	546	23	475	4	858	43	1138	18	139	43	-	-	711	6	208	64	567	36
62	688	34	542	24	363	21	817	52	863	53	194	33	-	-	533	23	-	-	571	31
63	604	50	463	41	196	51	1100	7	979	39	194	34	-	-	289	60	417	40	530	53
64	1042	2	554	19	279	35	879	37	1021	34	167	38	-	-	333	54	404	42	585	25
65	604	51	529	27	54	77	833	49	896	51	278	18	-	-	311	56	404	43	489	67
66	750	22	608	12	508	3	758	69	979	40	278	19	-	-	578	17	379	49	605	18
67	979	4	183	73	304	29	1054	13	938	47	389	7	-	-	267	65	588	16	588	23
68	1125	1	488	35	658	1	929	31	1154	16	417	6	-	-	555	20	417	41	718	2
69	604	52	296	66	221	47	846	45	946	45	389	8	-	-	311	57	513	26	516	60
70	708	28	767	4	246	42	1021	18	1038	31	333	12	-	-	445	43	25	82	573	30
71	833	9	117	79	417	13	758	70	854	56	83	65	-	-	267	66	458	35	473	70
72	646	40	850	1	283	31	771	67	975	41	111	55	-	-	89	82	350	53	509	61
73	667	38	392	52	408	14	958	28	863	54	167	39	-	-	600	13	217	63	534	51
74	417	76	500	32	358	22	829	50	771	68	111	56	-	-	89	83	183	71	407	88
75	833	10	754	5	638	2	1013	21	917	49	28	85	-	-	400	50	200	66	598	19
76	375	82	663	7	325	25	933	30	1146	17	333	13	-	-	667	8	83	77	566	37
77	385	56	629	8	429	7	633	83	646	78	333	14	-	-	533	21	-	-	541	48
78	563	57	608	13	421	9	917	34	667	76	444	5	-	-	578	15	175	72	547	46
79	458	70	679	6	83	74	875	38	575	86	361	10	-	-	445	40	42	79	440	82
80	563	58	483	36	42	79	871	39	621	82	278	21	-	-	445	41	171	73	434	84
81	708	29	483	37	258	39	1113	5	729	70	222	28	-	-	178	76	104	76	474	69
82	771	18	454	44	192	53	842	47	688	73	583	2	-	-	667	9	346	52	568	35
83	458	71	554	20	242	44	846	46	1075	26	556	4	-	-	600	12	271	58	575	29
84	792	13	533	26	342	23	838	48	829	61	278	20	-	-	822	2	29	81	558	41
85	542	62	500	31	196	52	800	62	1117	20	278	22	-	-	667	10	371	51	559	40
86	688	35	479	39	208	50	1029	17	408	90	83	61	-	-	755	4	492	29	518	59
87	708	30	79	85	88	73	1108	6	1042	30	111	57	-	-	311	58	600	14	506	63
88	625	46	629	9	233	46	929	32	708	72	278	23	-	-	400	51	271	59	509	62
89	750	23	550	22	421	10	796	63	500	87	111	58	-	-	711	7	317	54	520	58
90	1042	3	625	10	375	18	738	73	1063	27	56	79	-	-	600	14	375	50	609	17
91	292	88	797	2	279	34	1054	14	1108	23	111	59	-	-	889	1	-	-	647	10
Mean	620		422		253		857		925		182		1197		419		399		-	
Local Check Mean	357		508		267		911		1010		151		1100		748		327		-	
C.V. (for local check)			22.9		41.7		49.4		11.2		19.2		60.9		5.0		2.0		6.0	

Chickpea Regional Preliminary Yield Trial (CRPYT)

This trial comprised lines and cultivars which have shown the greatest promise regionally or internationally, in ICARDA nurseries. Superior performing entries can be released as commercial cultivars or used in a breeding program by the cooperators. The CRPYT was furnished to 11 cooperators and results were returned from 8.

Management:

The CRPYT comprised 36 entries, 34 of them test, one Syrian Local cultivar and one local check supplied by the cooperator. Twenty eight entries were Kabuli and 8 Desi types. The entries originated from six countries. The experimental design suggested was a 6x6 fully randomized duplicate simple lattice (4 reps). However the results have been analysed only as a randomized complete block design. The plot size was 4 rows, 3m long spaced at 30 cm apart. Only the middle 2-rows 2.5m long were to be considered for recording data.

The trial was planted in October by ICARDA (Tel Hadia-W) in early spring in Jordan and Algeria and during spring in Lebanon, ICARDA (Tel Hadia-S) Syria (ACSAD) and Tunisia. The crop was fertilized in Lebanon and Tel Hadia (N and P_2O_5) and Algeria and Tunisia (P_2O_5 only). Treflan herbicide was used by Algerian and Tunisian cooperators. Each location received some rainfall during the growing season (Table 3). The crop was harvested earliest in Nepal in April and latest in July in Lebanon.

Results:

A summary of data on days to 50% flowering, maturity and plant height are shown in tables 18, 19 and 20 respectively. The mean days to flowering were earliest (49 days) in Lebanon and latest (104 days) in Cyprus in spring planted trials. There was, however, little difference in days to flower amongst the cultivars across the locations. Cultivars in Algeria took 160 days to mature as against 83 at Lebanon. The winter planted trial at ICARDA took longest to flower and mature. The mean plant height was shortest (25cm)

at Tel Hadia spring planted trial and tallest in Cyprus (43cm). The plants of L-550 and NEC 2410 remained consistantly dwarf across the locations, whereas the opposite was true for NEC 1963 and ILC 1167.

The mean yield, rank, C.V. and L.S.D. (5%) are given in Table 21. F-tests indicated that cultivar differences were significant at all locations. The coefficient of variations, however, were generally large. The cultivar NEC 1813 produced the highest yield. This was followed by NEC 1096, ILC 1039, NEC 2410, NEC 1405 and ILC 405. Three cultivars, (NEC 1813, NEC 1096 and ILC 13) appeared 3 times in the top five ranks at different locations.

ICARDA winter planted trial gave the highest yield, followed by the ICARDA spring planted trial and Algeria. Yields were low in both Lebanon and at the ACSAD site at Izra'a.

A large number of entries, (from 10 to 35) exceeded the local check by a margin of between 14 and 218 per cent, indicating the usefulness of the nursery in providing superior yielding cultivars to the national programs.

Mean data across locations, on yield, days to flower, days to maturity, plant height and seed type are presented in Table 22. Days to flower and maturity and plant height appear to bear little relationship to yield. Amongst the top five yielders overall, however, 4 were desis and on average desis produced 6 per cent higher yield than the kabulis in the trial. The opposite was true in the winter planted trial at ICARDA site.

The highest overall yielding kabuli entry was ILC 1039 (NEC 2114). There was no kabuli entry which performed consistently well across all locations. Different entries were amongst the first 5 rankers at different locations. The large shifts in rank of test entries across locations do indicate considerable location x entry interactions and the search for widely adapted cultivars in chickpeas may be difficult.

Table 18. Days to flowering of entries in the CRPTT at different locations during 1977/78.

Ent. No.	ILC	Pedigree	Origin	CYPRUS	JORD	LEB	SYRIA			ALG	TUN	Mean
							Izra'a	T.H.-W	T.H.-S			
1	1929	Syrian Local	Syria	104	75	50	69	153	65	104	71	86
2	13	74TA 14 (NEC 11)	India	102	75	49	68	155	66	100	71	86
3	19	" 22 (NEC 14)	"	104	75	48	68	155	65	92	70	85
4	-	" 1629 (NEC 1096)	"	104	75	53	70	153	73	105	72	88
5	-	" 1740 (NEC 1163)	Iran	104	78	54	69	155	73	107	72	89
6	-	" 2162 (NEC 1405)	"	105	78	55	71	155	75	111	73	90
7	405	" 2181 (NEC 1426)	"	98	80	44	67	155	68	95	70	85
8	480	" 2364 (NEC 1531)	Turkey	105	77	51	68	154	73	103	70	88
9	493	- (NEC 1540)	"	101	78	46	67	145	65	92	69	83
10	523	74TA 2436 (NEC 1570)	Egypt	101	76	51	68	151	68	89	70	84
11	567	- (NEC 1607)	Leb.	100	75	49	72	148	64	93	70	84
12	576	74TA 2540 (NEC 1614)	"	106	75	50	66	155	68	93	68	85
13	750	75TA 16890 (NEC 1808)	Iran	102	75	53	70	148	74	107	71	88
14	-	" 16892 (NEC 1813)	"	106	78	58	71	153	70	107	71	89
15	812	- (NEC 1906)	-	106	78	59	71	156	80	109	71	91
16	-	75TA 16947 (NEC 1963)	Iran	107	75	53	70	155	71	113	72	90
17	888	" 16966 (NEC 1989)	"	108	80	49	69	155	70	107	73	89
18	896	74TA 2972 (NEC 1994)	"	105	80	49	69	156	68	103	73	88
19	918	75TA 16988 (NEC 2011)	"	104	80	49	71	155	71	109	71	89
20	926	" 16991 (NEC 2017)	"	104	80	49	71	156	69	100	71	88
21	933	75TA 16994 (NEC 2022)	Iran	104	80	48	67	155	68	102	71	87
22	935	" 16995 (NEC 2023)	"	101	80	50	68	155	65	98	72	86
23	961	" 17011 (NEC 2047)	"	102	78	49	69	153	68	95	72	86
24	1039	" 17053 (NEC 2114)	"	99	80	45	66	148	65	94	71	84
25	-	" 17072 (NEC 2136)	"	107	78	61	72	159	78	111	75	93
26	-	" 17073 (NEC 2136)	"	107	78	59	73	156	79	109	72	92
27	1164	74TA 3272 (NEC.2226)	"	100	80	44	67	153	63	97	70	84
28	1167	" 3278 (NEC 2229)	"	108	80	56	76	165	76	111	74	93
29	1255	- (NEC 2305)	USA	111	80	51	73	163	80	105	73	92
30	-	75TA 17192 (NEC 2410)	India	98	75	43	67	153	65	89	72	83
31	1298	" 17200 (NEC 2429)	Turkey	102	78	50	70	153	66	99	71	86
32	1309	" 17208 (NEC 2449)	USA	103	79	49	68	155	66	95	70	86
33	1920	K 4	India	106	75	51	70	155	70	103	70	88
34	1919	L 550	"	95	76	48	67	145	65	93	70	82
35	1921	P 2264	"	103	75	44	66	155	66	89	69	83
36	-	Local check	-	106	75	50	69	155	65	105	71	87
Mean				104	76	49	69	154	69	101	73	87

Table 19. Days to maturity of entries in the CRPYT at different locations during 1977/78.

Ent. No.	JORDAN	LEBANON	SYRIA			ALGERIA	TUNISIA	Mean
			Izra'a	T.H.-W	T.H.-S			
1	116	85	101	198	115	156	129	129
2	115	84	102	198	115	159	126	128
3	118	85	101	198	117	162	126	130
4	118	85	87	199	112	156	126	126
5	122	-	103	201	114	155	125	137
6	122	-	103	198	116	159	125	137
7	121	80	95	197	112	155	125	126
8	118	85	103	199	112	159	125	129
9	120	82	100	197	115	158	125	128
10	88	85	104	198	115	161	130	126
11	115	85	97	198	115	156	126	127
12	115	82	98	197	117	159	125	128
13	115	83	104	197	112	159	126	128
14	119	-	102	198	115	161	126	137
15	118	-	106	200	122	163	130	140
16	115	85	105	197	112	164	127	129
17	124	83	99	197	113	161	125	129
18	122	84	101	197	114	163	125	129
19	125	85	105	196	115	161	126	130
20	125	83	102	198	111	162	125	129
21	124	81	100	196	111	155	123	127
22	124	80	100	196	115	160	125	129
23	119	80	101	197	113	162	125	128
24	125	83	98	197	110	162	125	129
25	121	-	106	199	121	164	133	141
26	121	-	105	199	117	166	126	139
27	123	81	100	196	113	162	125	129
28	125	85	107	203	123	162	134	134
29	126	83	105	198	116	158	125	130
30	115	81	97	201	117	156	126	128
31	120	85	103	198	112	163	125	129
32	119	85	102	197	113	155	125	128
33	120	83	100	197	111	160	125	128
34	118	83	96	199	112	157	125	127
35	116	80	98	197	113	156	125	126
36	118	-	105	198	116	166	131	139
Mean	119	83	101	198	112	160	126	130

Table 20. Plant height (cm) of entries in the CRPYT at different locations during 1977/78.

Ent. No.	CYPRUS	JORDAN	LEBANON	SYRIA			ALGERIA	Mean
				Izra'a	T.H.-W	T.H.-S		
1	37	25	29	31	42	25	41	33
2	41	27	35	37	42	25	35	35
3	43	30	33	31	40	24	33	33
4	49	30	34	32	40	26	36	35
5	44	30	31	32	41	29	40	35
6	40	30	31	30	37	26	37	33
7	41	30	30	33	37	24	35	33
8	44	30	30	33	41	27	38	35
9	42	30	29	33	40	25	36	34
10	46	30	31	34	40	31	40	36
11	43	26	29	32	41	25	37	33
12	45	27	28	31	45	26	33	34
13	42	28	31	33	40	25	37	34
14	42	30	33	34	37	29	37	35
15	49	30	35	38	45	30	43	39
16	45	30	34	38	43	28	43	37
17	45	30	30	33	39	23	39	34
18	43	30	29	34	43	28	36	35
19	40	30	33	36	42	26	34	34
20	44	30	31	37	46	25	36	36
21	44	30	29	27	38	23	37	33
22	43	30	29	31	39	23	36	33
23	46	30	30	31	39	21	37	33
24	49	30	30	29	45	24	36	35
25	45	30	34	35	41	27	40	36
26	40	30	34	34	43	30	39	36
27	41	30	29	32	43	26	37	34
28	46	30	34	36	43	30	38	37
29	37	30	28	30	35	22	36	31
30	37	25	26	27	39	20	32	29
31	44	30	31	35	43	25	36	35
32	42	30	30	33	44	26	25	33
33	43	30	34	29	35	21	35	32
34	36	30	25	26	36	19	29	29
35	48	30	30	30	39	20	32	33
36	38	25	29	28	42	26	37	32
Mean	43	29	31	32	40	25	36	33

Table 21. Yield (Y=kg/ha) and rank (R) of entries in the CRPYT at different locations during 1977/78.

Ent. No.	CYPRUS		JORDAN		LEBANON		SYRIA						ALGERIA		TUNISIA		Mean	
							Izra'a		T.H.-W		T.H.-S							
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	615	30	1073	3	223	8	319	7	1138	24	820	36	581	35	1044	11	727	32
2	1163	5	1000	7	202	22	330	4	1111	25	992	27	1127	19	1233	4	895	9
3	953	15	896	16	196	24	239	31	1348	8	822	35	1019	27	1322	2	849	14
4	1414	2	1073	2	214	14	289	16	1383	6	1197	13	1373	3	1122	7	1008	2
5	826	22	938	12	168	29	262	27	1268	14	1423	5	1506	4	717	29	867	13
6	826	21	854	19	211	15	234	34	1215	18	1837	1	1338	6	900	20	927	5
7	615	31	979	10	253	1	267	22	1148	23	1077	21	1152	17	1067	10	820	22
8	935	17	833	20	192	25	236	32	1247	16	1680	2	1271	9	1017	14	926	6
9	936	16	906	13	242	2	264	26	1480	3	1000	26	1269	10	1106	8	900	8
10	1163	6	688	27	202	23	262	27	1252	15	1433	4	1052	24	1078	9	891	10
11	992	12	667	30	219	12	264	25	1452	4	1278	10	994	30	1161	5	878	12
12	823	23	875	18	167	30	284	20	1373	7	1115	19	1138	18	1011	15	848	16
13	701	28	792	24	104	35	198	36	1093	28	1405	6	1523	1	910	19	841	18
14	987	13	1302	1	167	31	267	22	1552	2	1568	3	1367	5	967	16	1022	1
15	844	10	563	35	87	36	343	1	1278	13	1352	8	808	34	844	23	765	26
16	800	24	594	32	229	7	286	19	1337	11	1297	9	1304	8	950	18	849	15
17	572	35	677	28	206	17	287	18	1105	27	1258	11	1033	26	728	27	733	29
18	771	27	635	31	210	16	339	3	1607	1	1175	17	996	29	889	21	828	19
19	693	29	500	36	203	21	289	16	1193	20	1173	18	1208	13	734	26	749	28
20	1008	11	563	34	206	18	218	35	1158	22	880	34	1069	22	1283	3	798	23
21	955	14	823	22	174	28	267	22	1055	30	1360	7	1227	12	722	28	823	21
22	607	33	698	26	182	26	308	9	990	34	940	30	904	32	617	30	656	36
23	1034	10	885	17	222	9	343	2	928	35	1255	12	1233	11	1156	6	882	11
24	1177	4	1000	8	236	5	307	10	1325	12	987	28	1171	15	1428	1	954	3
25	609	32	823	21	122	34	293	14	1107	26	1000	25	1006	28	317	36	660	35
26	771	26	573	33	134	33	294	13	903	36	932	33	1127	20	800	24	692	33
27	839	20	802	23	205	20	327	5	1338	10	1080	20	1069	23	589	31	781	25
28	797	25	708	25	138	32	281	21	1045	31	1190	14	939	33	867	22	733	30
29	573	34	1021	4	219	13	384	6	1013	33	1185	15	1383	2	589	32	796	24
30	1794	1	1010	6	220	11	331	8	1165	21	1038	23	1317	7	756	25	954	3
31	1060	9	667	29	206	19	247	30	1340	9	958	29	963	31	394	35	729	31
32	1110	7	906	15	238	3	235	33	1395	5	1177	16	1115	21	433	34	827	20
33	1322	3	1021	5	178	27	306	11	1213	19	1050	22	1200	14	1017	13	913	7
34	474	36	906	14	232	6	297	12	1067	29	933	31	1152	16	956	17	752	27
35	1094	8	1000	9	236	4	290	15	1028	32	1037	24	1046	25	1044	12	847	17
36	867	18	958	11	229	10	251	29	1235	16	932	32	479	36	494	33	680	34
Mean	909		839		196		284		1219		1162		1121		896		828	
C.V.%	37.7		22.9		26.6		21.6		22.2		27.6		14.9		27.8			
LSD 5%	633		269		73		87		379		449		236		506			
No. of entries significantly greater than check	1		1		0		4		0		5		34		15			

Table 22. Mean values over locations of entries in the CRPYT in 1977/78.

Ent. No.	Yield kg/ha	Yield rank	Flowering days	Maturity days	Plant height	Seed type
1	727	32	86	129	33	K
2	895	9	86	128	35	K
3	849	14	85	130	33	K
4	1008	2	88	126	35	D
5	867	13	89	137	35	D
6	927	5	90	137	33	D
7	820	22	85	126	33	K
8	926	6	88	129	35	K
9	900	8	83	128	34	K
10	891	10	84	126	36	K
11	878	12	84	127	33	K
12	848	16	85	128	34	K
13	841	18	88	128	34	K
14	1022	1	89	137	35	D
15	765	26	91	140	39	K
16	849	15	90	129	37	D
17	733	29	89	129	34	K
18	828	19	88	129	35	K
19	749	28	89	130	34	K
20	798	23	88	129	36	K
21	823	20	87	127	33	K
22	656	36	86	129	33	K
23	882	11	86	128	33	K
24	954	3	84	129	35	K
25	660	35	93	141	36	D
26	692	33	92	139	36	D
27	781	25	84	129	34	K
28	733	30	93	134	37	K
29	796	24	92	130	31	K
30	954	3	83	128	29	D
31	729	31	86	129	35	K
32	827	20	86	128	33	K
33	913	7	88	128	32	K
34	752	27	82	127	29	K
35	847	17	83	126	33	K
36	680	34	87	139	32	K
Mean of all enries	828		87	130	33	-
Range	656		82	126	29	
	1022		93	141	39	

K = Kabuli

D = Desi

Lentil Regional Nursery (LRN)

The Lentil Regional Nursery (LRN) was an unreplicated screening nursery composed of 83 entries from 12 different countries. These entries represented a wide range of genetic diversity. In addition they showed a good overall performance in ICARDA nurseries evaluated in several locations. A local check was included after every 14 entries to evaluate the relative performance of the introduced accessions in a particular locations. The LRN was sent to 22 locations (Table 1) but data were received from only 13 of these (Table 2).

Management:

Each entry in the LRN was planted in a single row. The recommended row length was 3-4 meters and row width 50-60 cms with 160 seeds/row. Seeds were treated with Benlate and Captan.

Data available on latitude, longitude, altitude and rainfall during 1977/78 season at various testing locations are presented in Table 3. Information on management and cultural practices were not completed for all locations. Such information, however, is essential for data interpretation. The nursery was planted in October in Turkey; in November in Lebanon and Sudan and at the ICARDA site at Tel Hadia (Tel Hadia-W); in December in Cyprus, Egypt and Jordan; in January (1978) in Algeria and at Izra'a and Kameshly locations in Syria; in February at Tel Hadia as a spring crop (Tel Hadia-S) and in April in Nepal.

Fertilizer (P = P_2O_5kg/ha and N = Nkg/ha) was added at various locations as follows: Algeria 90P; Cyprus 70P; Egypt 18.5N and 75P; Jordan Irbid 20N and 30P, Jubeiha 10N and 30P; Sudan 40N; Syria Izra'a 50P, Kameshly 100P and Tel Hadia 30N and 60P; Turkey 40N and 60P; and Nepal 40P. Except for Egypt and Sudan the nursery was rainfed. In Egypt 3 irrigations were given on 31/1,5/3 and 6/4. In Sudan 9 irrigations were given at approximately 12 days intervals. Weed control was done by hand twice at Tel Hadia and many times at Kameshly. Treflan was used as a herbicide in Algeria. No information on weed control was available from other locations. Malatox and Primor were used to control aphids and bruchids. Harvesting was done around mid May in Egypt and mid June at Tel Hadia, Syria. Other locations did not report their harvesting dates.

Results:

In most locations from which data were received observations were collected on days to 50% flowering (Table 23), plant height (Table 24), days to maturity (Table 25) and grain yield (Table 26). Mean performance of the various entries across locations are presented in Table 27. In some locations (Algeria, Jordan, Sudan, Syria-Lattakia) no yield data were recorded but instead selection notes were made in certain cases. In Afghanistan no data were taken because there was no seed set, for unknown reasons. Other characters were scored in several locations.

Observations on flowering show that in all locations, except for Egypt and Nepal, several entries were earlier than the local check. In Egypt the earliest introduction was 10 days later than the local check. In Nepal six entries were as early as the earliest local checks (46-51 days). These originated from Egypt (ILL 784, 791 and 826) and Ethiopia (ILL 1695, 1738 and 1747). On an average, the crop took least time to flower in Nepal (66 days) and the longest time in Lebanon (156 days). Results for maturity were similar to those for flowering. In Egypt only two entries, originating from Ethiopia (ILL 1695 and 1747) matured earlier than the local check.

Under rainfed conditions plants were tallest in Kameshly, Syria and shortest in Tel Hadia (spring). In Jordan, Lebanon, Izra'a and Tel Hadia-W locations at least one entry was substantially taller than the local check. ILL 149, 618 and 1415 gave relatively tall plants across locations.

Data on grain yield (Table 26) show that highest average yields were reported from Turkey (1790 kg/ha) and lowest from spring planting at Tel Hadia (163 kg/ha). As expected in such screening nurseries, a wide range of variation in grain yield is shown at each location. Comparing the introduced entries with the adjacent local checks reveals a number of entries which out-yielded the local cultivars substantially in all locations except for spring planting at Tel Hadia. In Cyprus about 25 entries out-yielded the local cultivar by more than 100%. At each of the three testing locations in Syria at least 2 entries were superior to local checks by more than 34%. Both in winter and spring plantings in Turkey a minimum of 3 entries were superior to

local cultivars by over 40%. A few introductions seemed to have relatively wider range of adaptability (74TA 249, 74TA 260, 75Kf 36241 and 75Kf 36627). Selection 249 ranked 2nd at Tel Hadia-winter, 4th at Tel Hadia-spring, 6th in Nepal, 7th in Egypt and 8th in Kameshly.

Coefficients of variability (C.V.) for local checks were generally high except for Lebanon and Turkey. Particularly high coefficients were recorded from Izra'a, Cyprus and Egypt. The comparison of introduced entries only with the mean of the adjacent local checks can however, resolve some of the implications of such heterogenous conditions.

The results observed are based on unreplicated single row plots, however a number of promising lines were identified at most locations and it is hoped that cooperators will follow these up with further more critical testing.

Table 23. Days to 50% flowering of entries in the LRH at different locations during 1977/78.

Ent. No.	ILL	Pedigree	Origin	CYPRUS	JORDAN		LEB	SYRIA				EGYP	ALG	TURK	NEP	Mean
					Jubeiha	Irbid		Izra'a	Kameshly	T.H.-W	T.H.-S	Sids				
1	Local		-	121	115	78	150	69	109	120	80	75	109	91	50	97
2	30	74TA 20	Syria	114	115	81	145	73	101	125	75	95	107	91	68	99
3	33	75Kf 36009	"	120	115	81	145	75	101	125	75	100	108	91	69	100
4	46	74TA 42	"	121	115	97	165	83	115	130	80	105	113	98	77	108
5	118	75Kf 36083	Turk	122	115	79	150	81	101	130	80	100	105	91	69	101
6	119	74TA 152	"	124	120	89	160	82	109	130	80	100	113	91	75	106
7	149	74TA 158	"	125	120	77	165	86	98	135	85	115	113	98	63	106
8	176	74TA 178	"	127	120	97	165	86	115	135	85	105	115	98	79	110
9	179	74TA 181	"	128	120	98	165	86	115	135	90	110	118	98	81	112
10	185	74TA 184	"	124	120	90	165	85	101	130	80	110	113	98	78	107
11	207	75Kf 36107	Eth	124	112	89	150	78	115	125	80	100	107	91	70	103
12	211	74TA 210	Greece	128	120	89	165	76	115	135	90	110	120	98	78	110
13	211	74TA 212	"	128	120	89	165	87	115	135	90	110	120	98	77	111
14	214	74TA 222	Afgh	128	112	90	170	87	115	145	85	120	119	98	75	112
15	232	74TA 249	Iran	123	120	89	150	83	109	130	80	90	107	98	68	103
16	Local		-	121	110	78	160	69	109	120	80	75	113	91	45	97
17	253	74TA 260	Aust	108	120	82	145	74	99	120	75	95	105	91	63	98
18	253	74TA 263	"	108	120	82	145	74	99	120	75	95	105	91	63	98
19	254	74TA 264	"	120	120	-	145	74	101	125	75	95	108	91	63	101
20	262	74TA 276	Hung	108	120	81	145	74	98	120	75	100	108	91	62	98
21	272	74TA 290	Greece	126	120	96	165	88	115	135	85	115	120	98	76	111
22	289	74TA 309	"	-	120	98	170	96	118	130	90	120	113	98	77	111
23	321	74TA 374	Hung	121	115	89	160	76	109	130	80	105	111	91	66	104
24	331	74TA 387	Turk	125	115	97	170	88	115	140	90	110	118	98	75	111
25	348	75Kf 36209	Mexico	120	117	90	145	86	115	125	85	100	109	91	64	103
26	350	74TA 434	"	120	117	89	150	83	110	125	80	95	108	91	64	102
27	351	75Kf 36211	"	113	117	87	145	78	101	120	75	90	105	91	64	98
28	351	75Kf 36212	"	112	117	89	145	77	101	120	75	90	105	91	63	98
29	351	75Kf 36213	"	112	117	97	145	78	101	120	75	90	105	91	66	99
30	363	74TA 452	Chile	124	120	90	165	85	115	130	85	105	118	91	73	108
31	Local			122	115	78	160	69	99	120	80	75	113	91	72	99
32	470	74TA 548	Syria	112	115	79	145	73	96	120	75	90	105	91	59	96
33	470	74TA 549	"	126	115	80	145	73	98	120	75	95	103	91	61	98
34	492	74TA 559	"	124	117	90	150	81	106	125	75	105	109	91	68	103
35	495	74TA 565	Mexico	121	120	81	145	86	110	125	80	95	109	91	69	102
36	495	75Kf 36237	"	121	120	83	150	86	109	120	80	100	109	91	63	102
37	496	74TA 567	"	122	120	90	150	86	115	135	85	110	109	91	69	106
38	497	74TA 569	"	122	120	89	160	86	110	125	80	100	109	91	67	104
39	499	74TA 575	"	124	120	89	165	86	115	130	80	110	115	91	71	108
40	499	74TA 577	"	114	115	77	145	77	96	120	70	90	103	91	58	96
41	501	75Kf 36241	Mexico	124	115	78	145	69	98	120	70	90	103	91	55	96
42	502	74TA 583	"	125	115	97	165	73	110	120	80	100	109	91	61	103
43	504	74TA 587	USSR	110	125	79	145	75	98	115	75	90	105	91	72	98
44	540	74TA 618	Turk	124	125	97	160	75	110	130	80	115	115	91	75	108
45	553	75Kf 36261	"	126	125	90	145	84	98	130	80	110	111	91	71	105
46	Local		-	122	115	78	155	69	104	120	80	75	113	91	76	99

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Table 23. Contd.

Ent. No.	ILL	Pedigree	Origin	CYPRUS	JORDAN		LEB	SYRIA				EGYP	ALG	TURK	NEP	Mean
					Jubetha	Irbid		Izra'a	Kameshly	T.H.-W	T.H.-S	Sids				
47	598	75Kf 36268	USSR	123	125	89	165	87	110	130	80	105	109	91	70	107
48	618	74TA 657	"	123	125	90	160	87	110	135	80	90	111	91	72	106
49	704	75Kf 37350	Hung	124	120	90	150	89	109	125	80	90	111	91	67	103
50	752	75Kf 37356	Iran	125	125	89	160	75	101	130	75	90	106	91	64	102
51	784	-	Egypt	108	115	75	145	69	90	110	65	90	93	91	46	91
52	791	-	"	110	115	74	145	69	90	110	65	75	93	91	46	90
53	826	-	"	110	115	75	145	73	90	105	65	75	93	91	51	90
54	882	75Kf 36323	Iran	124	120	80	160	86	101	130	75	90	111	91	56	102
55	883	74TA 849	"	124	120	87	160	88	115	130	80	115	119	91	67	108
56	935	75Kf 36370	"	125	125	92	170	93	115	140	85	115	120	91	76	112
57	936	75Kf 36371	"	110	118	79	145	82	98	125	70	90	105	91	84	99
58	947	75Kf 36384	"	111	118	79	145	82	101	125	75	90	109	91	63	99
59	983	75Kf 36421	"	112	118	79	145	82	110	130	80	90	113	91	62	101
60	1027	75Kf 36468	"	119	120	79	155	83	115	130	80	95	115	91	62	103
61	Local		-	121	115	78	155	69	109	120	80	75	113	91	46	97
62	1036	75Kf 36483	Iran	123	118	87	150	83	110	130	80	90	115	91	63	103
63	1110	75Kf 36567	"	123	118	96	165	86	115	130	85	110	118	91	70	108
64	1147	75Kf 36600	"	124	118	92	165	87	98	130	80	95	113	91	65	104
65	1169	75Kf 36627	"	124	118	82	150	85	101	125	75	90	111	91	63	101
66	1253	75Kf 36710	"	124	118	89	160	86	109	130	75	90	109	91	62	103
67	1255	75Kf 36712	"	127	118	90	165	89	115	130	80	105	120	91	64	107
68	1316	75Kf 36757	"	127	120	90	170	93	115	140	90	115	120	91	76	112
69	1318	75Kf 36759	"	128	120	100	165	93	115	135	90	120	120	91	75	112
70	1364	75Kf 36799	"	128	118	100	170	93	115	135	85	105	120	91	75	111
71	1384	75Kf 36811	"	124	118	88	165	86	112	130	80	90	113	91	65	105
72	1415	75Kf 36844	"	120	118	87	160	86	110	130	75	90	113	91	65	103
73	1424	75Kf 36852	"	119	120	90	165	86	88	125	80	105	111	91	68	104
74	1486	75Kf 36904	"	124	120	97	165	86	112	135	80	115	120	91	69	109
75	1504	75Kf 36921	"	120	120	91	160	86	112	125	85	105	109	91	78	106
76	Local	-	-	121	115	78	165	69	109	120	75	75	113	91	71	100
77	1518	75Kf 36926	Iran	124	118	90	165	91	115	135	80	105	118	91	69	108
78	1522	75Kf 36931	"	125	118	89	160	86	115	130	75	90	109	91	65	104
79	1526	75Kf 36933	"	130	118	92	165	86	115	135	80	115	120	91	71	109
80	1695	-	Eth.	128	115	74	145	69	90	110	65	80	87	91	46	91
81	1701	-	Eth	129	115	73	145	69	90	110	65	80	87	91	54	92
82	1738	-	"	128	115	73	145	69	90	110	65	80	85	91	51	91
83	1747	-	"	128	115	76	145	71	90	110	65	80	85	91	51	92
84	1753	-	Afgh	117	115	97	165	89	115	130	80	95	113	91	71	106
85	1756	-	"	126	115	100	170	95	115	140	90	120	120	91	77	113
86	1808	-	"	127	115	100	175	91	118	150	100	125	120	91	83	116
87	-	Giza 9	Egypt	117	115	78	145	69	90	110	65	75	89	91	51	91
88	-	75Kf 36082	L.L.	126	115	90	160	87	106	130	80	115	111	91	78	107
89	-	75Kf 36205	L.L.	118	115	92	160	83	101	130	80	110	113	91	77	105
90	Local	-	-	121	115	78	160	69	101	125	80	75	113	91	46	97
Mean				121	117	85	156	80	106	126	78	97	109	91	66	102

Table 24. Days to maturity in entries in the LRU at different locations during 1977/78.

Ent. No.	JORDAN Jubeiha	LEBANON	SYRIA Izra a	SYRIA Kameshly	SYRIA T.H.-W	SYRIA T.H.-S	EGYPT Sids	ALGERIA	TURKEY	Mean
1	151	210	99	142	175	120	135	149	119	144
2	145	210	106	132	165	120	145	147	119	143
3	145	210	119	132	180	120	145	146	119	146
4	145	210	117	139	180	120	155	149	116	148
5	150	210	117	136	180	120	155	140	119	147
6	155	210	117	140	180	120	150	148	119	149
7	155	210	118	130	180	120	155	148	123	149
8	155	215	120	154	180	120	155	149	123	152
9	150	215	124	154	180	120	155	150	123	152
10	150	215	120	132	180	120	150	148	119	148
11	145	215	120	136	165	120	155	145	123	147
12	150	210	120	154	180	120	150	140	123	150
13	150	210	120	154	180	120	155	140	123	150
14	145	205	120	154	180	120	160	150	119	150
15	145	205	120	135	175	120	155	144	119	146
16	145	210	105	132	175	120	135	149	119	143
17	150	210	112	130	175	120	145	140	116	144
18	150	210	111	130	175	120	145	140	116	144
19	150	215	108	132	180	120	145	143	123	146
20	150	210	111	136	180	120	150	143	123	147
21	150	210	124	154	180	120	155	152	123	152
22	155	205	124	147	175	120	155	149	123	150
23	150	210	109	136	175	120	150	147	119	146
24	145	210	124	154	180	120	155	150	123	151
25	140	210	115	136	175	120	145	147	123	146
26	147	205	114	135	175	120	145	146	119	145
27	147	205	111	132	175	120	145	144	116	144
28	147	205	109	132	175	120	145	144	116	144
29	147	210	109	135	175	120	150	144	119	145
30	150	215	120	154	180	125	155	150	119	152
31	147	215	99	139	175	120	135	148	119	144
32	145	210	108	130	165	120	150	144	116	143
33	145	210	106	129	165	120	145	144	116	142
34	145	215	120	130	175	120	150	147	116	146
35	150	215	119	135	175	120	150	147	116	147
36	150	205	119	135	175	120	150	147	116	146
37	150	205	119	135	175	120	150	147	116	146
38	150	205	119	135	175	120	155	147	116	147
39	150	210	119	139	175	120	150	150	119	148
40	150	205	114	130	175	120	145	144	116	144
41	150	210	111	130	175	120	150	144	116	145
42	150	210	111	132	175	120	155	146	119	146
43	155	210	108	134	175	120	150	144	119	146
44	150	210	108	138	175	120	155	148	119	147
45	150	210	112	136	175	120	155	148	119	147
46	145	210	99	130	175	120	150	148	119	144

Contd...

Table 24. Contd.

Ent. No.	JORDAN Jubeiha	LEBANON	SYRIA Izra'a	SYRIA Kameshly	SYRIA T.H.-W	SYRIA T.H.-S	EGYPT Sids	ALGERIA	TURKEY	Mean
47	150	210	120	134	175	120	155	146	119	148
48	150	210	120	134	175	120	150	146	119	147
49	148	205	120	136	175	120	145	146	119	146
50	150	200	108	132	165	120	140	141	119	142
51	145	210	113	129	175	120	140	136	116	143
52	145	215	115	129	175	120	145	136	116	144
53	145	215	111	129	175	120	140	136	116	143
54	145	210	120	132	175	125	150	147	123	147
55	145	200	124	139	175	120	155	151	123	148
56	145	210	124	142	180	125	155	151	123	150
57	145	215	120	130	175	120	145	144	116	145
58	145	215	114	136	175	120	145	149	116	146
59	145	215	114	142	175	120	150	149	119	147
60	150	210	114	139	175	120	150	150	119	147
61	145	215	99	132	175	125	135	150	119	160
62	148	215	120	154	180	125	145	150	123	151
63	148	200	120	140	175	120	145	152	123	147
64	148	210	119	136	175	120	150	150	119	147
65	148	210	119	136	175	120	145	149	116	146
66	148	210	120	140	175	120	145	149	119	147
67	150	195	119	139	175	120	150	152	119	147
68	150	200	124	142	175	120	150	154	119	148
69	150	200	124	142	175	120	150	154	119	148
70	150	195	124	154	175	120	150	154	119	149
71	150	205	120	154	175	120	150	149	119	149
72	150	215	120	154	175	120	140	149	119	149
73	150	195	119	139	175	120	145	147	119	145
74	150	205	124	142	175	120	150	154	119	149
75	150	215	118	154	180	125	155	147	119	151
76	150	215	100	135	175	120	140	147	119	145
77	150	205	120	142	175	120	150	150	119	148
78	150	200	120	154	180	125	145	148	119	149
79	140	210	117	139	175	120	150	154	119	147
80	140	210	102	129	175	120	130	134	116	140
81	140	210	102	128	175	120	135	134	116	140
82	140	210	107	129	175	120	135	135	116	141
83	140	210	102	129	175	120	130	135	116	140
84	140	205	118	136	175	120	140	148	116	144
85	145	205	118	140	180	125	160	154	119	150
86	145	210	118	154	180	125	160	154	123	152
87	145	210	114	132	175	122	135	136	116	142
88	145	215	114	132	175	125	155	148	119	148
89	145	215	118	132	175	125	155	148	119	148
90	145	215	106	132	175	125	135	148	119	144
Mean	148	209	115	138	176	121	148	147	119	147

Table 25. Plant height (cm) of entries in the LRN at different locations during 1977/78.

Ent. No.	JORDAN Jubeiha	LEBANON	SYRIA Izra'a	SYRIA Kamashly	SYRIA T.H.-W	SYRIA T.H.-S	EGYPT Sids	SUDAN	ALGERIA	TURKEY	Mean
1	25	40	25	45	30	25	55	40	35	26	35
2	25	35	30	35	30	30	40	24	32	25	31
3	25	35	32	35	35	25	35	22	30	25	30
4	28	40	26	40	40	25	50	34	32	27	34
5	28	35	27	38	35	30	50	28	29	23	32
6	30	45	29	40	35	25	50	25	25	25	33
7	30	50	34	30	35	30	50	55	35	24	37
8	30	45	25	44	30	25	50	43	35	24	35
9	30	40	36	46	40	20	50	36	30	25	35
10	25	30	30	35	30	25	40	21	30	25	29
11	25	35	30	35	30	25	55	40	35	23	33
12	28	30	29	38	35	30	40	24	30	25	31
13	30	30	28	37	30	25	50	30	31	28	32
14	30	30	20	37	25	20	40	20	25	22	27
15	30	30	30	38	30	25	50	36	30	25	32
16	28	35	24	40	30	25	50	45	32	27	34
17	25	30	25	40	30	25	40	40	30	29	31
18	25	30	29	42	35	25	50	38	39	28	34
19	25	25	27	38	30	25	40	28	30	25	29
20	30	25	28	30	30	30	30	36	28	23	29
21	30	30	29	37	30	20	30	28	30	24	29
22	30	35	20	38	30	25	40	38	32	27	32
23	30	25	24	30	30	20	45	26	30	25	29
24	30	30	29	35	35	30	50	33	30	27	33
25	28	30	23	35	30	20	35	37	32	25	29
26	28	30	24	37	30	20	35	33	34	24	30
27	28	30	30	35	30	20	35	38	30	24	30
28	30	30	24	37	25	15	40	37	30	25	29
29	30	30	23	37	30	25	55	37	35	23	33
30	30	30	30	36	30	25	45	30	30	27	31
31	30	35	29	42	35	30	30	41	32	25	33
32	25	25	21	32	30	20	35	22	28	20	26
33	28	25	23	31	25	20	45	22	30	20	27
34	28	30	26	34	30	15	35	18	30	21	27
35	28	30	30	35	35	20	50	38	32	26	32
36	28	30	25	37	35	20	45	36	30	20	31
37	25	30	24	38	30	20	45	36	30	18	30
38	25	30	21	36	30	20	35	40	30	22	29
39	25	30	30	28	30	25	30	32	30	22	28
40	25	25	27	34	25	20	35	29	30	16	27
41	30	25	21	31	30	20	40	36	30	19	28
42	30	30	23	32	30	25	35	25	27	21	28
43	30	25	26	40	30	25	45	30	35	27	31
44	30	30	27	35	35	25	35	13	33	23	29
45	30	30	24	35	35	25	55	35	30	24	32
46	30	35	30	42	35	25	50	43	20	27	34

Contd...

Table 25. Contd.

Ent. No.	JORDAN Jubeiha	LEBANON	SYRIA Izra'a	SYRIA Kameshly	SYRIA T.H.-W	SYRIA T.H.-S	EGYPT Sids	SUDAN	ALGERIA	TURKEY	Mean
47	32	35	25	40	35	25	35	40	32	29	33
48	32	40	35	40	35	25	45	45	34	31	36
49	30	35	27	42	35	25	50	38	30	31	34
50	30	35	30	40	30	25	35	35	29	25	31
51	25	30	28	33	30	20	35	42	30	22	30
52	25	25	27	40	30	25	40	42	30	23	31
53	25	30	30	38	30	25	40	45	28	22	31
54	25	30	29	34	30	20	45	40	26	27	31
55	28	30	25	33	25	20	40	38	28	22	29
56	28	25	29	40	30	25	35	40	23	27	30
57	28	35	22	26	25	20	45	40	29	25	30
58	30	30	23	37	35	25	35	46	32	27	32
59	30	30	31	35	30	25	40	40	30	28	32
60	30	35	22	40	30	25	50	46	39	32	35
61	25	35	32	42	30	25	55	43	28	30	35
62	25	35	29	37	25	25	35	50	25	26	31
63	28	35	21	27	25	20	40	38	32	24	29
64	28	25	25	37	30	20	40	40	30	29	30
65	30	30	24	36	30	25	45	37	28	26	31
66	30	30	28	30	25	25	45	44	30	26	31
67	30	30	25	36	25	20	40	43	27	22	30
68	28	30	24	35	30	20	40	36	28	24	30
69	28	35	25	40	30	25	40	37	35	27	32
70	30	35	26	36	25	20	40	38	29	26	31
71	30	30	35	42	40	25	45	45	35	26	35
72	30	35	30	47	35	25	45	40	29	24	37
73	30	30	26	30	25	20	40	40	25	26	29
74	30	30	25	36	25	20	40	40	26	25	30
75	30	30	33	40	35	25	45	43	29	29	34
76	25	35	30	37	35	25	55	43	25	26	34
77	25	30	20	29	20	15	40	33	25	20	26
78	25	35	30	36	35	25	50	48	30	29	34
79	25	25	24	30	30	15	45	28	26	21	27
80	25	25	25	23	25	12	35	32	30	20	25
81	25	25	23	28	20	15	30	38	28	20	25
82	25	25	27	30	30	15	30	36	30	23	27
83	30	20	22	25	20	15	30	33	26	17	24
84	28	30	21	35	20	20	45	35	30	21	29
85	28	30	24	30	30	20	30	20	25	20	26
86	25	40	30	43	35	25	40	40	30	21	33
87	25	30	25	33	35	20	45	45	30	20	31
88	28	35	30	33	30	25	45	28	35	23	31
89	28	35	27	40	35	25	40	33	35	25	32
90	25	35	29	36	30	20	50	42	30	28	33
Mean	27	31	26	36	30	22	42	35	30	24	30

Table 26. Yield (Y=kg/ha) and rank (R) of entries in the LEN at different locations during 1977/78.

Ent. No.	CYPRUS		LEBANON		SYRIA								EGYPT		TURKEY				NEPAL	
					Izra'a		Kamashly		T.H.-W		T.H.-S		Sids		winter		spring			
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	250	40	1139	5	190	60	1275	2	900	5	225	17	750	21	3750	4	333	61	333	31
2	417	25	861	23	100	85	1125	4	975	4	200	25	333	56	2000	33	333	61	133	38
3	375	31	1056	10	465	17	1125	4	625	21	125	50	306	61	1500	43	400	43	1240	7
4	250	40	1361	1	225	58	650	38	550	32	100	62	722	23	2250	29	400	43	-	-
5	625	13	1194	4	330	37	875	20	650	19	75	72	778	17	2000	33	267	73	200	34
6	250	40	1083	9	285	50	625	43	450	51	50	77	389	51	4000	3	467	32	400	29
7	167	57	583	64	85	87	1300	1	525	39	175	36	333	56	250	79	133	86	853	16
8	333	34	667	50	85	87	400	62	500	43	100	62	1083	2	150	84	333	61	413	28
9	208	51	806	30	175	65	300	72	275	76	50	77	594	24	500	70	267	73	147	37
10	625	13	556	69	120	82	975	14	400	60	50	77	278	64	1250	49	267	73	173	35
11	958	4	778	35	300	45	750	29	675	16	125	50	1111	1	500	70	467	32	147	36
12	208	51	611	63	125	81	250	83	425	58	-	-	167	79	2250	29	333	61	-	-
13	250	40	667	50	515	13	275	75	325	70	50	77	222	70	2500	21	400	43	-	-
14	83	67	722	42	35	89	425	60	300	73	125	50	83	84	2750	15	200	81	-	-
15	500	19	750	39	115	83	1050	8	1000	2	300	4	944	7	250	79	400	43	1267	6
16	208	51	861	23	505	14	1125	4	1100	1	250	9	611	31	250	15	400	43	-	-
17	417	25	667	50	555	9	900	19	850	9	125	50	889	10	2250	29	533	21	1373	5
18	750	12	639	58	750	5	600	45	550	32	175	36	972	5	2750	15	533	21	1427	4
19	625	13	722	42	155	69	1275	2	550	32	200	25	556	38	1500	43	720	8	-	
20	458	22	528	75	450	20	850	21	575	27	225	17	389	51	2000	33	267	73		
21	250	40	639	58	385	30	275	75	575	27	-	-	222	70	1000	54	467	32	-	-
22	42	74	472	78	130	77	450	56	400	60	225	17	222	70	3000	9	533	21	-	-
23	333	34	722	42	290	47	750	29	450	51	300	4	611	31	1000	55	533	21	533	27
24	50	73	444	80	180	61	475	55	350	65	150	45	139	81	500	70	400	43	333	31
25	833	10	556	69	290	47	775	28	675	16	-	-	778	17	2500	21	467	32	-	-
26	875	7	639	58	245	54	750	29	350	65	-	-	500	43	2000	33	333	61	1707	1
27	583	16	667	50	255	53	725	33	550	32	225	17	583	36	1000	54	333	61	1227	8
28	583	16	1000	13	520	12	650	38	275	76	200	25	889	10	1500	43	400	43	760	17
29	292	38	861	23	425	23	650	38	450	51	75	72	889	10	1250	49	400	43	-	-
30	42	74	1139	5	155	69	275	75	650	19	100	62	556	38	3000	9	267	73	-	-
31	42	74	917	21	655	8	975	14	1000	2	250	9	667	26	3750	4	333	61	613	23
32	125	61	500	77	395	27	650	38	675	16	250	9	611	31	1500	43	533	21	-	-
33	42	74	917	21	680	6	825	24	725	12	225	17	750	21	3750	4	400	43	933	12
34	42	74	806	30	180	61	925	18	725	12	100	62	222	70	3000	9	333	61	720	18
35	250	40	972	18	180	61	675	36	600	24	150	45	583	36	750	64	533	21	1640	3
36	208	51	1000	13	180	61	825	24	375	64	125	50	944	7	1500	43	267	73	880	15
37	25	87	806	30	130	77	850	21	575	27	150	45	194	75	1250	49	400	43	1053	10
38	333	34	1000	13	130	77	850	21	450	51	175	36	639	30	2500	21	333	61	573	25
39	292	38	1000	13	315	41	275	75	575	27	-	-	611	31	2500	21	400	43	1133	9
40	917	6	389	82	315	41	1000	9	350	65	125	50	500	43	2500	21	533	21	707	20
41	1000	3	667	50	130	77	1000	9	725	12	200	25	1028	4	2000	33	467	32	347	30
42	1125	1	528	75	305	43	725	33	525	39	200	25	667	26	500	70	400	43	-	-
43	1125	19	778	35	470	16	650	38	500	43	200	25	889	10	750	64	533	21	-	-
44	500	51	694	46	445	21	375	65	450	51	225	17	361	53	1750	39	467	32	-	-
45	208	25	444	80	295	46	500	52	625	21	275	7	528	40	1000	54	533	21	907	14
46	417	25	1111	7	1285	3	600	45	875	8	275	7	833	14	3000	9	667	9	-	-
47	417	25	556	69	230	56	625	43	600	24	175	36	333	56	750	64	867	4	-	-
48	500	19	778	35	385	30	825	24	600	24	325	2	111	82	1000	54	667	9	-	-

Contd...

Table 26. Contd.

Ent. No.	CYPRUS		LEBANON		S Y R I A								EGYPT		T U R K E Y				NEPAL	
					Izra'a		Kamashly		T.H.-W		T.H.-S		Sida		winter		spring			
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
49	125	61	333	84	140	74	375	65	200	86	50	77	306	61	1750	39	467	32	-	-
50	333	34	1111	7	505	14	1000	9	900	5	300	4	611	31	250	79	400	43	600	24
51	542	18	278	86	165	66	50	90	350	65	75	72	83	84	1250	49	200	81	-	-
52	875	7	806	30	355	33	275	75	475	49	50	77	278	64	1000	54	262	80	1013	11
53	875	7	556	69	420	24	225	84	625	21	175	36	667	26	3000	9	33	90	933	12
54	250	40	694	46	370	32	600	45	550	32	250	9	944	7	-	-	667	9	640	22
55	42	74	972	18	290	47	500	52	500	43	250	9	500	43	2750	15	667	9	560	26
56	42	74	750	39	140	74	350	68	225	80	200	25	194	75	1000	54	467	32	-	-
57	458	22	778	35	140	74	300	72	500	43	175	36	972	5	1000	54	667	9	-	-
58	417	25	833	28	465	17	675	36	750	11	-	1	1083	2	1750	39	333	61	-	-
59	350	33	1056	10	540	10	500	52	700	15	200	25	361	53	2750	15	800	6	-	-
60	250	40	1028	12	265	51	950	17	500	43	175	36	500	43	2000	33	400	43	-	-
61	233	50	1000	13	1505	1	800	27	900	5	150	45	667	26	2500	21	533	21	-	-
62	250	40	667	50	330	37	400	62	500	43	125	50	333	56	750	64	1333	1	-	-
63	83	67	639	58	105	84	700	35	225	80	125	50	417	50	1250	49	667	9	-	-
64	375	31	694	46	350	35	525	51	150	89	125	50	778	17	2750	15	933	3	-	-
65	942	5	1361	1	395	27	975	14	575	27	325	2	806	16	500	70	667	9	-	-
66	42	74	583	64	660	7	550	50	400	60	100	62	833	16	500	70	867	4	-	-
67	42	74	861	23	160	67	600	45	325	70	225	17	694	24	5500	1	600	16	-	-
68	83	67	472	78	245	54	225	84	350	65	125	50	528	40	750	64	400	43	-	-
69	42	74	944	20	150	72	325	70	225	80	175	36	194	75	750	64	333	61	-	-
70	42	74	556	69	160	67	300	72	325	70	200	25	83	84	-	-	600	16	-	-
71	417	25	806	30	340	36	375	65	450	51	100	62	333	56	1000	54	600	16	720	18
72	125	61	583	64	400	26	600	45	850	9	225	17	306	61	3500	7	730	7	-	-
73	125	61	833	28	395	27	450	56	250	79	250	9	472	47	2250	29	600	16	-	-
74	-	-	722	42	355	33	450	56	275	76	250	9	250	69	1000	63	600	16	240	33
75	167	57	617	62	230	56	275	75	425	58	100	62	528	40	500	70	533	21	-	-
76	167	57	861	23	1290	2	1000	9	525	39	250	9	222	70	2500	21	400	43	-	-
77	42	74	583	64	5	90	275	75	175	87	25	83	278	64	1750	39	80	88	-	-
78	83	67	1250	3	305	43	325	70	550	32	200	25	444	48	250	79	1333	1	-	-
79	42	74	667	50	325	40	425	60	225	80	100	62	111	82	500	70	400	43	-	-
80	167	57	83	88	155	69	125	88	400	60	75	72	28	89	-	-	400	43	-	-
81	208	51	83	88	525	11	350	68	175	87	100	62	83	84	-	-	467	32	1693	2
82	250	40	194	87	150	72	225	84	-	-	75	72	194	75	-	-	467	32	-	-
83	458	22	28	90	420	24	100	89	300	73	25	83	56	88	500	70	200	81	-	-
84	83	67	583	64	445	21	400	62	225	80	100	62	278	64	-	-	200	81	-	-
85	17	88	333	84	200	59	275	75	300	73	125	50	167	79	4750	2	200	81	-	-
86	-	-	389	82	95	86	150	87	225	80	25	83	28	89	200	83	67	89	-	-
87	767	11	556	69	330	37	450	56	450	51	200	25	444	48	2500	21	133	86	680	21
88	125	61	694	46	775	4	1000	9	525	39	125	50	278	64	1500	43	267	73	-	-
89	83	67	750	39	260	52	750	29	475	49	150	45	361	53	3000	9	333	61	-	-
90	108	66	667	50	465	17	1100	7	550	32	175	36	778	17	3250	8	467	32	-	-
Mean	337		728		339		615		511		163		499		1790		456		771	
Mean of locals	204		937		649		982		836		225		647		3071		448		473	
C.V. for local	58		17.3		60		22		26		26		31		17.4		26.8			
check																				

Table 27. Mean performance of entries in the LRN for various characters during 1977/78.

Ent. No.	Yield kg/ha	Yield rank	Fl. days	Mat. days	Pl. Ht.
1	915	7	97	144	35
2.	648	38	99	143	31
3	722	25	100	146	30
4	723	24	108	148	34
5	779	19	101	147	32
6	800	17	106	149	33
7	440	72	106	149	37
8	406	75	110	152	35
9	342	81	112	152	35
10	469	69	107	148	29
11	581	51	103	147	33
12	546	58	110	150	31
13	578	52	111	150	32
14	525	63	112	150	27
15	658	35	103	146	32
16	868	9	97	143	34
17	856	11	98	144	31
18	915	7	98	144	34
19	700	29	101	146	29
20	638	39	98	147	29
21	477	68	111	152	29
22	608	45	111	150	32
23	552	56	104	146	29
24	302	84	111	151	33
25	859	10	103	146	29
26	822	13	102	145	30
27	615	44	98	144	30
28	678	33	98	144	29
29	588	47	99	145	33
30	687	31	108	152	31
31	920	6	99	144	33
32	582	50	96	143	26
33	925	4	98	142	27
34	705	27	103	146	27
35	633	41	102	147	32
36	630	42	102	146	31
37	543	59	106	146	30
38	698	30	104	147	29
39	789	18	108	148	28
40	734	23	96	144	27
41	756	20	96	145	28
42	553	55	103	146	28
43	655	36	98	146	31
44	585	49	108	147	29
45	532	61	105	147	32
46	1007	1	99	144	34
47	506	66	107	148	33
48	577	53 .	106	147	36
49	416	73	103	146	34
50	601	46	102	142	31
51	333	82	91	143	30
52	539	60	90	144	31
53	751	21	90	143	31
54	552	56	102	147	31
55	703	28	108	148	29
56	374	77	112	150	30
57	554	54	99	145	30
58	937	3	99	146	32
59	806	15	101	147	32
60	674	34	103	147	35
61	921	5	97	160	35
62	521	64	103	151	31
63	468	70	108	147	29
64	742	22	104	147	30
65	635	40	101	146	31
66	504	67	103	147	31
67	1001	2	107	147	30
68	353	79	112	148	30
69	349	80	112	148	32
70	283	86	111	149	31
71	514	65	105	149	35
72	813	14	103	149	37
73	625	43	104	145	29
74	460	71	109	149	30
75	375	76	106	151	34
76	802	16	100	145	34
77	357	78	108	148	26
78	527	62	104	149	34
79	311	83	109	147	27
80	179	89	91	140	25
81	409	74	92	140	25
82	222	88	91	141	27
83	232	87	92	140	24
84	289	85	106	144	29
85	707	26	113	150	26
86	147	90	116	152	33
87	651	37	91	142	31
88	588	47	107	148	31
89	685	32	105	148	32
90	840	12	97	144	33

Lentil Regional Preliminary Yield Trial (LRPYT)

The Lentil Regional Preliminary Yield Trial (LRPYT) was a replicated trial which included 36 entries originated from 10 different countries (Table 28). The remaining two entries were local checks. The entries were chosen based on their good overall performance in regional screening nurseries, evaluated in several locations and years. The LRPYT was requested by 11 locations (Table 1) and data were returned from 7 locations (Table 2).

Management:

The experimental design recommended was 6x6 fully randomized simple lattice with 4 replicates. However, the option was given to handle this design as a randomized complete block design both for planting and the analysis of the results. Recommended rows/plot were 4 and row length 3m with 20 cms between rows. General management and cultural practices at each particular location were the same as those described for LRN except for plot size. The recommended plot size was adopted by all locations with few exceptions; the row width used at Sids (Egypt) was 60 cms and in Kameshly (Syria) 50 cms instead of the recommended width.

Results:

A summary of the data on days to 50% flowering, maturity, plant height and grain yield are presented in tables 28, 29, 30 and 31. Mean performance respectively of the various entries over locations are presented in table 32.

Based on the mean performance of all entries, days to 50% flowering ranged from 78 days in Izra'a, southern Syria to 160 days in Tel Amara, Lebanon. The range of variation in flowering differed within locations; Egypt showed a range of 41 days while Jordan gave a range of 10 days. In all locations, except for Egypt, the number of days taken by the local check to achieve 50% flowering fell within the range of those for the introduced entries. In Egypt almost all entries achieved 50% flowering at least 10 days later than the local check. Selections 74TA 19, 276, 441, 577 and 580 were fairly early across locations. Selection 74TA577 is of particular interest since it flowered in 71 days in southern Syria and in 79 days in Egypt.

Results on maturity (Table 29) were generally in line with those for flowering. Again based on mean performance of all entries, Izra'a had the shortest growing season (110 days) and Tel Amara the longest growing season (210 days). Except for Egypt and southern Syria, days to maturity of the local checks fell with the range of those for the introduced entries. In Egypt the earliest maturing introduction was about one week later than the local check.

Under rainfed conditions, plants on average were tallest in northern Syria (range 28-43, mean 37 cm) and shortest in southern Syria at Izra'a (range 23-32, mean 29 cm, Table 30). Selection 74TA 30 gave relatively tall plants across locations (range 30-45, mean 38). In each of the locations there were no substantial difference in plant height between the local check and the tallest introduced entries.

The highest grain yields were reported in Lebanon (range 563-1594 kg/ha) and the lowest in Tel Hadia, Syria (range 221-1220 kg/ha, mean 684 kg/ha, Table 31). Yields were generally low under irrigated conditions in Egypt (range 229-1122 kg/ha, mean 717 kg/ha). Several entries gave substantially higher yields than the local checks in each location except for Tel Hadia, Syria. Yield advantage of the best introduced entry over best local check ranged from 15% at Sids, Egypt to 181% at Athalassa, Cyprus. Most entries showed a large shift in rank order across locations: selection 74TA 19 ranked 4th and 32nd in north Syria (Tel Hadia) and south Syria (Izra'a) respectively and ILL 379 ranked 30th and 3rd in the same locations. Such shifts became more prominent in comparing rank orders in Egypt with those in other locations eg. 74TA 374). A few entries seemed to have a relatively wide range of adaptability; eg. 74TA 138, 74TA 374, 74TA 580, 75Kf 36226, 75Kf 36267 and 75Kf 36851. Selection 74TA 138 was top in Egypt, 5th in Syria (Izra'a), 6th in Jordan and 8th in Cyprus. Selection 74TA 580 was top in Izra'a, 5th in Egypt and 8th in Jordan and Lebanon.

In all locations, except for Tel Hadia, there were several promising introductions which could be adopted by local breeder for further testing and utilization in their programs. Introduced entries which were top in each

location were either earlier or close in maturity to the local checks. The great shift in rank orders across locations indicates a very high genotype x environment interactions and thus narrow a range of adaptability for most genotypes. However, a few entries seemed to have a relatively wide range of adaptability and of particular interest are those which showed good yielding performance both under short days (Egypt) and under long days (Syria) eg. 74TA 580. The five top yielding entries based on mean performance (75Kf 36811, 74TA 374, 75Kf 36267, 74TA 138 and 74TA 580) were all relatively widely adapted.

Variation in mean yield performance among locations may generally be atributed to differences in rainfall and temperature particularly during flowering and pod set, length of growing season and soil fertility levels. For better interpretation of results cooperators in the future should provide, if possible, a complete set of information on management practices and meteorological data for the growing season in order that the data may be better interpreted. Coefficients of variability (C.V.) are generally high particularly in Sids (Egypt) and Izra'a (Syria).

Table 28. Days to 50% flowering of entries in the LRPYT at different locations during 1977/78.

Ent. No.	ILL	Pedigree	Origin	CYPRUS	JORDAN Jubeiha	LEBANON	S Y R I A Izra'a	S Y R I A Kamashly	S Y R I A T.Hadia	EGYPT Sids	Mean
1	-	Local L. (check)		119	117	163	69	108	119	75	110
2	28	74TA 19	Syria	109	120	149	74	99	120	86	108
3	35	74TA 30	"	124	120	170	90	115	134	108	123
4	46	74TA 42	"	117	120	164	87	110	128	100	118
5	97	75Kf 36075	Morocco	116	115	160	77	105	126	98	113
6	101	74TA 138	"	113	118	160	80	100	125	90	112
7	102	75Kf 36078	Greece	125	120	169	86	111	134	109	122
8	254	74TA 265	"	115	120	165	82	109	123	99	116
9	262	74TA 276	Hungary	106	120	146	73	95	118	96	107
10	289	74TA 308	Greece	126	120	170	93	115	140	116	125
11	321	74TA 374	Hungary	119	118	164	80	107	131	101	117
12	331	75Kf 36191	Turkey	121	115	170	86	114	134	105	120
13	346	-	Mexico	119	117	160	81	109	121	93	114
14	348	75Kf 36210	"	119	112	165	82	110	124	94	115
15	350	74TA 434	"	118	117	165	78	108	124	95	115
16	351	75Kf 36214	"	114	117	149	75	110	120	90	110
17	353	74TA 441	"	110	113	149	69	106	121	90	106
18	379	75Kf 36226	Chile	122	120	164	80	110	121	104	117
19	495	74TA 565	Mexico	115	120	165	82	107	123	91	114
20	498	74TA 572	"	111	115	150	73	100	120	90	108
21	500	74TA 577	Mexico	110	115	148	71	95	118	79	105
22	501	74TA 580	"	111	115	149	71	97	120	90	107
23	540	74TA 619	Turkey	122	120	166	84	109	129	115	120
24	598	75Kf 36267	USSR	116	120	169	87	108	131	95	118
25	618	75Kf 36275	"	117	120	165	84	102	129	91	115
26	882	75Kf 36322	Iran	115	117	164	77	115	124	91	114
27	936	75Kf 36371	"	109	120	160	70	97	121	89	109
28	-	L. Local	Syria	109	110	163	74	98	118	91	109
29	1155	75Kf 36612	Iran	117	117	163	77	100	125	90	112
30	1169	75Kf 36627	"	114	120	163	76	100	121	90	112
31	1205	75Kf 36665	"	118	118	161	84	108	126	93	115
32	1384	75Kf 36811	"	115	110	164	84	108	126	91	114
33	1423	75Kf 36851	"	121	115	164	85	110	129	101	117
34	1440	75Kf 36869	"	121	115	166	83	110	128	104	118
35	-	Giza 9	Egypt	111	110	150	69	91	114	75	102
36	-	L. Small (check)		119	110	150	70	108	119	75	107
Mean				116	116	160	78	105	124	94	113
Local mean				119	114	157	70	108	119	75	109

Table 29. Days to maturity of entries in the LRPYT at different locations during 1977/78.

Ent. No.	JORDAN Jubeiha	LEBANON	S Y R I A Izra'a	Kameshly	T. Hadia	EGYPT Sids	Mean
1	145	211	100	134	165	134	148
2	155	209	112	134	165	140	152
3	150	208	120	154	175	149	159
4	148	209	115	135	174	148	154
5	148	210	111	134	169	143	152
6	150	211	110	132	170	141	152
7	155	209	117	136	175	155	157
8	151	208	108	133	174	143	152
9	151	206	108	129	164	140	149
10	155	206	119	142	171	155	158
11	153	206	110	134	175	148	154
12	151	211	120	140	183	158	160
13	147	205	108	133	168	144	150
14	150	209	111	134	169	143	152
15	147	206	109	134	170	145	151
16	142	205	107	133	168	144	149
17	145	209	106	128	169	143	150
18	150	205	117	137	175	154	156
19	151	209	108	134	170	143	152
20	145	209	107	129	166	141	149
21	147	208	108	129	169	141	150
22	145	209	106	129	165	140	149
23	151	208	111	135	173	150	154
24	151	209	116	134	175	151	156
25	151	210	114	134	175	145	154
26	145	210	112	139	170	151	154
27	150	211	105	128	171	140	150
28	145	211	113	131	166	143	151
29	151	209	107	133	170	143	152
30	151	210	108	132	168	145	152
31	140	206	113	134	170	145	151
32	150	211	117	136	174	153	156
33	155	208	116	135	174	145	155
34	143	205	114	134	169	151	152
35	145	213	106	130	173	135	150
36	143	209	99	134	166	133	147
Mean	148	208	110	134	170	145	152
Local Mean	144	210	100	134	166	134	148

Table 30. Plant height (cm) of entries in the LRPYT at different locations during 1977/78.

Ent. No.	JORDAN Jubeiha	LEBANON	S Y R I A Izra'a	S Y R I A Kameshly	S Y R I A T. Hadia	EGYPT Sids	Mean
1	30	38	29	36	31	49	35
2	28	33	24	33	33	36	31
3	35	41	30	43	34	45	38
4	30	38	27	40	35	45	35
5	30	31	24	31	25	35	29
6	30	33	27	33	29	43	32
7	28	33	27	34	28	39	31
8	30	33	27	40	30	44	34
9	25	26	24	31	29	38	28
10	33	39	28	40	30	46	36
11	25	31	23	29	25	34	27
12	30	34	29	34	33	44	34
13	20	31	26	32	25	35	28
14	25	34	25	37	26	38	30
15	20	31	24	34	26	56	31
16	25	33	25	34	25	41	30
17	25	28	25	33	23	38	28
18	20	31	25	31	26	39	28
19	30	33	27	34	30	36	31
20	35	30	28	36	25	35	31
21	28	30	24	32	29	38	30
22	33	29	26	31	24	33	29
23	30	30	32	35	31	34	32
24	33	36	29	36	30	43	34
25	35	36	31	38	30	39	34
26	35	33	30	39	30	43	35
27	28	26	26	28	24	31	27
28	35	36	30	35	31	36	33
29	35	31	29	33	28	34	31
30	30	34	29	31	30	34	31
31	25	28	26	31	34	39	30
32	30	39	31	39	30	40	34
33	35	30	27	31	25	38	31
34	30	28	26	30	24	39	29
35	30	34	29	37	31	44	34
36	35	34	29	37	31	36	33
Mean	29	32	27	34	28	39	31
Local mean	33	36	29	37	31	43	34

Table 31. Yield (Y=kg/ha) and rank (R) of entries in the LRPYT at different locations during 1977/78.

Ent. No.	CYPRUS		JORDAN Jubeiha		LEBANON		SYRIA Izra'a		SYRIA Kameshly		SYRIA T. Hadia		EGYPT Sids		Mean	
	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R	Y	R
1	792	18	422	36	875	24	1038	13	871	8	1220	1	976	4	884	19
2	417	30	797	28	854	29	590	32	413	35	1024	4	590	27	669	32
3	1240	8	891	20	1208	11	1063	12	821	11	658	18	566	28	921	14
4	1542	4	891	20	865	26	1005	17	908	7	691	15	806	13	958	9
5	844	15	750	30	1156	13	975	20	650	23	670	17	667	22	816	23
6	1240	8	1266	6	875	24	1181	5	817	12	745	11	1122	1	1035	4
7	719	21	594	34	1083	17	796	26	629	24	571	27	750	16	734	26
8	1792	2	1109	11	740	33	871	24	675	22	625	20	663	23	925	13
9	667	24	1325	4	865	26	719	28	621	26	995	5	604	25	828	22
10	*604*	*27*	594	34	1000	21	685	31	504	30	575	26	781	15	677	30
11	750	19	1578	1	1594	1	1504	2	918	5	587	23	559	30	1070	2
12	687	23	813	26	1177	12	754	27	446	34	321	36	694	20	698	28
13	719	21	953	16	1135	15	983	19	763	15	820	8	854	9	889	17
14	375	32	906	19	1240	9	931	22	692	19	675	16	750	16	795	25
15	1125	10	1016	15	1365	5	1148	8	1071	1	583	25	639	24	992	6
16	646	25	1141	9	844	30	1090	11	692	19	654	19	1010	3	868	20
17	213	35	750	30	1115	16	338	36	188	36	625	20	417	35	520	36
18	842	17	1344	2	1385	4	1356	3	690	21	546	30	524	31	955	11
19	875	13	1125	10	1073	18	1117	10	454	33	941	6	802	14	912	15
20	385	31	1328	3	729	35	975	20	725	18	703	14	844	10	812	24
21	740	20	781	29	563	36	715	29	500	31	716	12	438	34	636	34
22	625	26	1219	8	1281	8	1529	1	804	14	770	9	972	5	1019	5
23	844	15	953	16	740	33	1172	6	625	25	716	12	1014	2	866	21
24	1323	7	1313	5	1479	2	1150	7	913	6	367	35	889	7	1062	3
25	323	33	891	20	927	22	485	33	571	27	421	33	594	26	601	35
26	994	12	828	25	1417	3	835	25	558	28	754	10	816	12	886	18
27	1490	6	953	16	1010	19	1036	14	933	3	475	32	837	11	962	8
28	113	36	734	32	1365	5	429	34	467	32	1037	3	566	28	673	31
29	427	29	813	26	1313	7	710	30	538	29	587	23	458	33	692	29
30	1042	11	1109	11	1010	19	917	23	833	10	841	7	500	32	893	16
31	1510	5	1031	13	771	32	985	18	925	4	608	22	878	8	958	9
32	2229	1	1250	7	979	22	1029	15	1021	2	549	29	670	21	1103	1
33	1615	3	859	23	865	26	1271	4	842	9	416	34	948	6	973	7
34	254	34	609	33	1219	10	1008	16	738	17	550	28	229	36	658	33
35	850	14	859	23	844	30	408	35	742	16	525	31	747	18	710	27
36	552	28	1031	13	1156	13	1144	9	808	13	1086	2	726	19	929	12
Mean	878		965		1059		970		705		684		717			
Local mean	672		727		1016		1091		840		1153		851		907	
C.V.	22		37.9		20.8		31.1		18.0		28.7		38.8			
LSD 5%	272		511.9		308.8		422.9		178.4		275.5		390.1			
No.of entries exceeding best local check	17		13		13		8		7		0		3			

Table 32. Mean performance of entries in the LRPYT for various characters during 1977/78.

Ent. No.	Yield* kg/ha	Yield* rank	Flowering** days	Maturity** days	Plant** height
1	884	19	110	148	35
2	669	32	108	152	31
3	921	14	123	159	38
4	958	9	118	154	35
5	816	23	113	152	29
6	1035	4	112	152	32
7	734	26	122	157	31
8	925	13	116	152	34
9	828	22	107	149	28
10	677	30	125	158	36
11	1070	2	117	154	27
12	698	28	120	160	34
13	889	17	114	150	28
14	795	25	115	152	30
15	992	6	115	151	31
16	868	20	110	149	30
17	520	36	106	150	28
18	955	11	117	156	28
19	912	15	114	152	31
20	812	24	108	149	31
21	636	34	105	150	30
22	1019	5	107	149	29
23	866	21	120	154	32
24	1062	3	118	156	34
25	601	35	115	154	34
26	886	18	114	154	35
27	962	8	109	150	27
28	673	31	109	151	33
29	692	29	112	152	31
30	893	16	112	152	31
31	958	9	115	151	30
32	1103	1	114	156	34
33	973	7	117	155	31
34	658	33	118	152	29
35	710	27	102	150	34
36	929	12	107	147	33

* Average of 7 locations

** Average of 6 locations.

Table 33. Summary of performance of the best introduced entries in the Regional Preliminary Yield Trials (RPYT) compared to the local check cultivars, 1977/78.

	BROADBEAN - Large seed				BROADBEAN - Small seed			
	No. of entries exceeding local check	Yield of best introduced entry (kg/ha)	Yield of best local check (kg/ha)	% increase over check	No. of entries exceeding local check	Yield of best introduced entry (kg/ha)	Yield of best local check (kg/ha)	% increase over check
ALGERIA								
Sidi bel Abess	3	2243	2062	9	-	-	-	-
CYPRUS								
Athalassa	0	2758	2809	-2	-	-	-	-
EGYPT								
Sakha	3	3122	2967	5	-	-	-	-
LEBANON								
Tel Amara	13	3258	2792	17	3	2808	2533	11
SYRIA								
Izra'a	-	-	-	-	22	2603	1575	65
Lattakia	16	2593	1680	54	-	-	-	-
Tel Hadia - W	12	1850	1318	40	23	1754	1026	71
TUNISIA								
Ras El-Ain	8	4963	1490	42	-	-	-	-

	CHICKPEAS				LENTILS			
	No. of entries exceeding local check	Yield of best introduced entry (kg/ha)	Yield of best local check (kg/ha)	% increase over check	No. of entries exceeding local check	Yield of best introduced entry (kg/ha)	Yield of best local check (kg/ha)	% increase over check
ALGERIA								
Sidi bel Abess	16	1523	479	218	-	-	-	-
CYPRUS								
Athalassa	17	1794	867	107	19	2229	792	181
EGYPT								
Mata'ana	-	-	-	-	5	1896	1270	49
Sids	-	-	-	-	3	1122	976	15
JORDAN								
Jubeiha	11	1302	958	36	13	1578	1031	53
LEBANON								
Tal Amara	10	253	222	14	13	1594	1156	38
SYRIA								
Izra'a	29	343	251	37	8	1529	1144	34
Kamashly	-	-	-	-	7	1071	871	23
Tel Hadia - W	16	1407	1235	30	0	1037	1220	15
Tel Hadia - S	32	1837	932	97	-	-	-	-
TUNISIA								
Ras El-Ain	33	1428	494	189	-	-	-	-

Conclusions

As can be seen from the data presented in this report (summarized in Table 33), materials were identified at almost all locations which outperformed the local check cultivars. Several locations failed to return data to ICARDA, however, and are thus not included in this report. Incomplete data were also received from several locations. It is hoped that in future years it may be possible to include data from a greater proportion of cooperators.

Nearly all the entries in the nurseries were selected by ICARDA scientists. One main aim of the international program, however, is to provide a multi-location testing systems for all breeders. To make maximum use of the facilities offered all cooperators are urged to contribute materials for inclusion in future trials.

The information on many of the locations is inadequate to allow a detailed analysis of environmental efforts. In future cooperators are urged to supply full details on environmental and management factors.

Following suggestions made at the 1978 Regional Food Legume Workshop held in Aleppo, future trials will be designated "International" rather than "Regional". In addition it was proposed that several new types of nurseries be considered;

1) adaptability trials: replicated trials of local cultivars allowing the legume growing environments to be classified into majro zones;
2) internationally coordinated agronomy trials;
3) pest and disease resistance nurseries.

In the 1977/78 season chickpea nurseries were distributed to food legume scientists in the West Asia and North Africa region by both ICARDA and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India. Following an agreement reached between the two institutes in May 1978, the respective chickpea programs were integrated. In future

international cooperative work on the improvement of Kabuli (white-seeded) types will be coordinated by ICARDA while ICRISAT will focus the major part of its attention on the improvement of Desi types.

It is strongly believed that international cooperation is essential for the efficient utilization of the talents of the few and scattered food legume scientists throughout the world. It is hoped that the program discussed in this report will have helped, in some measure, to improve this cooperation. Comments and suggestions from all concerned scientists as to how the program can be made more effective will be gratefully received.