

**SYRIAN ARAB REPUBLIC
MINISTRY OF AGRICULTURE
AND AGRARIAN REFORM**

**INTERNATIONAL CENTER FOR
AGRICULTURAL RESEARCH IN THE
DRY AREAS (ICARDA)**

Collaborative Research and Training Program

**Minutes of the Sixth Annual Coordination Meeting and the
Cooperative Plans for the 1987/88 Season**

Aleppo, Syria

**PROCEEDINGS OF THE SIXTH ANNUAL COORDINATION
MEETING FOR THE JOINT SCIENTIFIC COOPERATION PROGRAM
AND THE PLAN FOR THE 1987/88 SEASON
BETWEEN
THE MINISTRY OF AGRICULTURE AND AGRARIAN REFORM
AND
THE INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE
DRY AREAS
(ICARDA)**

3 - 6 October 1987

Under the auspices of His Excellency Mr Mahmud Kaddour, Vice-Prime Minister for the Public Services and the Acting Minister of Agriculture and Agrarian Reform, the Sixth Annual Coordination Meeting of the Joint Scientific Cooperation between the Ministry of Agriculture and Agrarian Reform and the International Center for the Agricultural Research in the Dry Areas (ICARDA) was held from 3-6 October 1987 at Tel Hadya, the main center of ICARDA in Aleppo.

His Excellency Mr Kaddour assigned Mr Hassan Sa'ud, Deputy Minister of Agriculture and Agrarian Reform, to represent him in attending the Conference in order to review and discuss the consequences of the joint agricultural research concerning the improvement of cereal crops (durum wheat - bread wheat - barley), food legumes (faba beans - lentils - chickpeas), forages, pastures, sheep, and the farming systems, which were carried out during the 1986/87 season as outlined in (Appendix I).

In the opening session, attended by many State and Party Officials responsible for the agricultural sector, and a good number of scholars who belong to various agricultural institutions (Appendix II), Mr Hassan Sa'ud, Deputy Ministry of Agriculture and Agrarian Reform, Representative of His Excellency Mr Kaddour, Vice-Prime Minister for the Public Services and the Acting Minister for Agriculture and Agrarian Reform, addressed the participants saying:

Ladies and Gentlemen,

It is a pleasure to me to represent His Excellency Mr Kaddour, Vice-Prime Minister for the Public Services and the Acting Minister of Agriculture and Agrarian Reform, in inaugurating the Sixth Annual Meeting for the Joint Scientific Cooperation between our Ministry and the International Center for Agricultural Research in the Dry Areas (ICARDA).

This conference has nowadays a special significance because food security occupies increasingly important position as a result of the growing gap between food-demand and food-production. Statistics available indicate that this gap will greatly expand if

concentrated and coordinated efforts are not made to put it right at the international level. The Syrian Arab Republic Government has given exceeding care to the development of the agricultural sector according to the decrees of Conferences of our great Party, the Arab Socialist Ba'ath Party, and to the guidelines of the Secretary General, the battling comrade Hafez Assad, President of the Syrian Arab Republic.

One of the most important things which those decrees and guidelines confirmed is that very great attention should be given to scientific agricultural research in order to establish a strong scientific base in Syria. Therefore, the following steps have been taken:

- Centers and stations for scientific agricultural research all over the country (Syria) have been established and provided with the necessary funds, facilities and requirements.
- Continual reinforcement of these centers and stations with scientific staff who are well qualified and able to continue the progress of research in Syria and to examine the results reached by other countries, particularly the advanced ones.
- Providing support and means of success for the Arabic and International Centers working in this country (Syria) by making available the required areas to establish their trials, the specialized technicians, labor, facilities ...
- Cooperation, organization, and supplement action between the national research programs and the programs set by those centers have been made for the purpose of the creation, renewal, and exchange of information, and for achieving results and avoiding duplication. For such reasons, the Joint Cooperation Program with ICARDA has been created, the program which has achieved, by virtue of the faithful efforts made by all the working staff of both Parties during the past few years, some good results which serve agricultural progress not only in our country (Syria), but also in all countries in the region by means of breeding high yielding varieties of wheat, barley, lentil, and winter chickpea. However, we still look forward to having better arrangements and guidance for our research programs in order to realize better results.

Within this framework we see that the Joint Cooperation Program must serve the requirements of our country (Syria) and the regional countries as well. This can be done by the expansion of research programs to include the breeding of new varieties of wheat suitable for the Zones B, C, and D together with breeding new varieties of lentil -tall with high yield- and developing the technique of mechanical harvesting of lentil and chickpeas in small and large fields and in stony areas. Breeding new and disease-resistant varieties of food legumes suitable for Zone B and Zone C, and elaboration of the recent program in order to include the medic and new varieties of forage, in Zone B and Zone C, are also appreciated.

It is also necessary that we should refer to the importance of the care which should be given to the management of agricultural research, to the supplementary irrigation studies of cereals in the rainfed areas, and to the economic suitability of such a process for these areas; besides the employment of modern techniques in plant breeding. For the purpose of realizing the above items we have decided to form a coordinating committee, headed by the Assistant Minister of Agriculture and Agrarian Reform with the membership of the Directors and the staff concerned in the Joint Program, hoping that the Joint Cooperation Program will be clearly defined, complying with the planned priorities of our country (Syria), a program in which the objectives of the work and the obligations of each party are confined according to limited timetables.

Ladies and Gentlemen,

We hope that an accurate evaluation of the benefit of the joint collaboration, a discussion of all the disadvantages from which the programs in the previous years suffered, and an illustration of the advantages will be made; future visions have also to be drawn.

As far as we are concerned, we confirm that the Ministry of Agriculture and Agrarian Reform is anxious to develop and deepen this cooperation and that our decision to supply all means for its success is certain.

Finally, we thank all kinds of efforts, those already made and those to be made in the future for the success of this program, hoping that this Meeting becomes a turning point and a bright symbol leading towards a flourishing agricultural future in our country and all other countries which the International Center for Agricultural Research in the Dry Areas (ICARDA) serves.

Afterwards, Dr G.J. Koopman, the Deputy Director General of ICARDA, delivered the following speech:

Mr Hassan Sa'ud, Assistant Minister of Agriculture and Agrarian Reform in the Syrian Arab Republic, Representative of His Excellency Mr Mahmud Kaddour, Vice-Prime Minister for Public Services and the Acting Minister of Agriculture and Agrarian Reform, and Mr Muhammad Nour Mawaldi, Governor of Aleppo, and Mr Hamid Mir'i, Assistant Minister of Planning, and our Dear Honourable Guests...

It is a pleasure to me to welcome you to this Sixth Annual Meeting for the Joint Scientific Cooperation Program between the Ministry of Agriculture and Agrarian Reform and the International Center for Agricultural Research in the Dry Areas (ICARDA), particularly the Directors and Representatives of the Directorates of Scientific Agricultural Research and Guidance: Soils, Irrigation and Water-Use, Steppe and Range, Pastures and Sheep, Teaching and Training, Statistics and Planning, and the General Organization for Seed-Multiplication.

In addition, I would like to thank and welcome the Deans and Representatives of Agricultural Faculties at the Universities of Damascus, Aleppo, and Lattakia; the Arab Center for Studies of the Arid Zones and Dry Lands; the Chairman and Representatives of the Syrian-Libyan Company for Industrial and Agricultural Investments (SYLICO); the Director of the Arab Company for Livestock; the Representatives of Agencies of Journalism, News, Broadcasting, Television, and Information in Syria, whether from Damascus, Aleppo, or abroad. It also pleases me to welcome and thank my colleagues in ICARDA, who participated in this Meeting and this Joint Program.

In accordance with the great and continuous reinforcement given by the Syrian Government to this International Center (ICARDA), the Center, since its establishment in this generous country (Syria), has done its best to support and develop scientific and agricultural research in Syria. And this is why this Joint Scientific Cooperation Program was established early in the 1981/82 season and became a cornerstone, first with the Directorate of Scientific Agricultural Research, and afterwards, it developed and expanded to include a good number of directorates and institutions for agricultural research in this country (Syria). The following joined the Program:

- Directorate of Steppe and Range
- Directorate of Soils
- Directorate of Teaching and Training
- Directorate of Irrigation and Water-Use
- Directorate of Agricultural Guidance
- General Organization for Seed Multiplication
- Universities of the Country (Syria)
- Peasants Union and other Arab or International organizations and some agricultural companies in this country, such as the Syrian-Libyan Company for Industrial and Agricultural Investments (SYLICO).

As you know, agricultural research requires long periods of time, but through tedious and continuous work, together with the scientists of the Syrian Program and through the Joint Scientific Cooperation Program, we proudly say that we can breed eleven new varieties of durum wheat, bread wheat, barley, chickpeas, lentils; they are:

- 1- Durum wheat Sham 1 Variety
- 2- Bread wheat Sham 2
- 3- Durum wheat Sham 3
- 4- Bread wheat Sham 4
- 5- Bread wheat Research 4
- 6- Durum wheat Research 5
- 7-Barley Badia

- 8- Barley Furat 1
- 9- Winter chickpea Ghab 1
- 10- Winter chickpea Ghab 2
- 11- Lentil Idleb 1

A few days ago, five of the above varieties - Research 4, Research 5, Sham 3, Furat 1, and Idleb 1 - were adopted during the Meeting of the National Committee for the Identification of Varieties, held on 28th September, 1987 in the Ministry of Agriculture and Agrarian Reform (Syria). There are available recently in the Program a number of promising varieties of lentil, wheat, barley, and forages whose identification is expected and their release to the farmers of this country (Syria) will be soon.

Concerning the research in fertilization, the joint efforts with the Directorate of Soils have given promising results in the field of barley fertilization in Zone B and Zone C where a good response appeared for phosphate fertilization in the areas of little rain, and for nitrogen fertilization in the areas with relatively more rain. Concerning Supplementary Irrigation, ICARDA and the Directorate of Irrigation and Water-Use work together and the preliminary results promise the possibility of improving the efficient use of water resources available in this country in order to increase the agricultural productivity in Syria.

As for the Training and Qualifying of technicians, the field to which we give the second place among our interests, there are more than 600 researchers and technicians who have been trained in Syria since 1981, a number which represents about 40% of the total number of the trainees in the ICARDA region, which consists of twenty four countries stretching from Pakistan in the East to Morocco in the West, and from Turkey in the North to Sudan and Ethiopia in the South.

In addition to the training of the technicians, this Program arranges many international meetings, and annual and travelling conferences, and field-days and various other activities during each season.

Concerning Financial Support, ICARDA within its capacity offers some facilities for transportation, agricultural machinery, and other things. Besides this, it pays a large proportion of the expenses required for research, organization of conferences and scientific visits to fields, and other things. It also puts all its scientific capacities and achievements, computer services, and the Germplasm Bank at the service of this program.

Finally, Brothers, I would like to emphasize our intensive care in supporting the progress of this joint coordination for the benefit of this country (Syria) and ICARDA. This has been our guide, and it will remain so, and I thank you all once more and wish you and your worthy conference all success and harmony.

Afterwards, Dr Samir El-Sebae Ahmed, Responsible for the Joint Scientific Program, presented a brief review of the activities of this program during the 1986/87 season and the previous seasons, accompanied with a slide presentation of the most important achievements which this program fulfilled in the field of improving the crops of cereals, food legumes, forages and pastures, farming systems, training and exchange of information, technical and financial support, and future ambitions of the program.

Dr Samir Ahmad explained that this program has been able in a few years to breed many new varieties, a number of which have been recently adopted by the Committee of Variety Identification in the Ministry of Agriculture and Agrarian Reform. They are the varieties of Durum Wheat Sham 3, Bread wheat Research 4, Durum wheat Research 5, and two Barley varieties (Badia and Furat 1), together with lentil variety Idleb 1. There are also some other varieties of wheat and barley and excellent pasture fodders which are on their way to being identified and released to farmers in Syria.

Concerning the Improvement of Pastures, Forages, and Sheep, the Joint Program carries out much combined research on farmers' fields all over the Syrian provinces, and on relatively large areas, with the view of introducing the annual medic in rainfed farming in order to replace the fallow during crop rotations, and to make forage available for sheep. The Program could also breed local lines of legume promising and suitable for cultivation in the various provinces of the country. These lines have the potential to tolerate the hard environmental conditions. It is expected that these lines will be submitted for identification this year, together with some promising lines of fodder vetches which are also expected to be adopted and released to farmers in Syria shortly.

As far as (Farm Resource Management) is concerned, ICARDA's cooperation is maintained with the Directorate of Soils in order to study the response of barley to phosphate and nitrogen fertilizers in all zones of barley cultivation. Cooperation is also maintained with the Directorate of Irrigation and Water-Use concerning supplementary irrigation. All preliminary results indicate the significance of this joint collaboration in increasing the productivity of crops, particularly barley crops, in the country. Dr Ahmed also referred to the importance of the Program in training a good number of the national scientists whose number exceeded eighty this season. They received training in all fields of agricultural research and the means of its development in Syria, in short and long courses.

Technical, financial, and advisory support has also been presented this year in order that this Program remains successful and permanent in its role, scientific, advisory, and economic.

Afterwards, the session had a break, then the Meeting continued its sessions, according to the time-table.

All the results of the Joint Research for the 1986/87 season were reviewed and discussed in an encouraging scientific atmosphere. The results were good and promising. The participants also outlined a joint scientific plan for the 1987/88 season, which was discussed and adopted as follows:

Cooperative Scientific Plans for the 1987/88 Season

I. Cereal Crops Improvement (Durum wheat, Bread wheat, and Barley):

A. BREEDING OF CEREAL CROPS:

It was agreed that:

- 1- ICARDA provides the Directorate of Scientific Agricultural Research with germplasm and lines of durum wheat, bread wheat, and barley for testing and evaluation at their stations and agricultural research centers, and for turning them to good account in their breeding programs. The Breeding Nurseries are not included in the Cooperative Scientific Program, therefore, the National Program takes the full responsibility for them.
- 2- The two parties agreed that the Regional Yield Trials, carried out in Syria in the 1987/88 season, are joint trials. And they have been considered as an advanced and helpful step in selecting the lines whose testing was made in On-farm trials, which are usually carried out on the farmers' fields at the centers, agricultural research stations.

The Directorate of Scientific Agricultural Research undertakes the responsibility for carrying out Regional Yield Trials at its centers and stations, and for paying the full expenses required.

The following are the titles and locations of Joint Trials:

<u>Trial</u>	<u>Location</u>
A. Durum and Bread wheat:	
1. Regional Durum Yield Trial of 24 cultivars and lines (RDYT) No. 88.	Research Centers of: Gellin - Qamishli
2. Regional Durum Yield Trial of 24 cultivars and lines (RDYT) No. 90.	Research Centers of: Qarahtha - Raqqqa - Homs- Idleb.
3. Regional Wheat Yield Trial of 24 cultivars and	Reserach Centers of: Gellin - Qamishli

lines (RWYT) No. 43.

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| 4. Regional Wheat Yield
Trial of 24 cultivars and
lines (RWYT) No. 45. | Research Centers of:
Qarahtha - Deir Ezzor -
Al-Ghab - Homs. |
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B. Barley:

- | | |
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| Regional Barley Yield Trials
of 24 cultivars and lines
(RBYT) No. 33. | Research Centers of:
Izra'a - Hassakeh. |
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3. ICARDA welcomes and encourages the visits of the scientists who are working on cereal crops for the Directorate of Agricultural Research Center, and for other scientific institutions attached to the Ministry of Agriculture and Agrarian Reform, to its main research station at Tel Hadya and other sub-stations of ICARDA in Syria, in order to work side by side with the scientists of ICARDA, and to select what is suitable for the requirements of the national program during the season of selection and harvest. It is expected that such procedures will save effort and avoid duplication of research, and enhance interaction and information exchange between the two parties.
4. The Directorate of Agricultural Research Center encourages the scientists of cereal crops working at ICARDA to visit the stations and scientific agricultural centers of the Directorate in order to exchange information and expertise.
5. It was previously agreed that joint visits of the scientists of the two parties would be organized during the season, and within the framework of the Cooperative Scientific Program in order to evaluate the joint trials.
6. The Directorate of Agricultural Research Center will test the best lines of wheat and barley available at Tel Hadya, the main ICARDA Station, in order to enhance the scientific interaction between the two parties.
7. More attention should be paid to breeding and identifying varieties of wheat suitable for Zone C in Syria.

B. PATHOLOGY OF CEREAL CROPS

It was agreed that:

1. Evaluation of the present status of cereal diseases in Syria under natural and artificial conditions of infection should be continued, and the results should be disseminated, but the contribution number of senior

collaborators should be reduced.

2. Promising varieties and lines of cereals which have been tested in On-Farm Trials under natural and artificial conditions of infection should be evaluated at the Cereal Disease Nurseries in Syria.

C. TECHNOLOGY OF CEREALS PROCESSING (Quality Assessment)

It was agreed that the Directorate of Agricultural Research Center and other research programs attached to the Ministry of Agriculture and Agrarian Reform would cooperate with ICARDA in giving quality assessment for the promising wheat and barley varieties and lines.

D. ENTOMOLOGY AND PHYSIOLOGY OF CEREALS, COLLECTION AND UTILIZATION OF GERMPLASM

It was agreed that cooperation in the fields of entomology and physiology of cereals and collecting germplasm of wheat and barley would be increased and supported in order to be utilized in the different breeding programs. Research projects in these fields will be prepared in order to be implemented as soon as they have been approved by the scientists.

E. WHEAT AND BARLEY ON-FARM TRIALS

It was agreed that more advanced trials than the Regional Yield Trials conducted in Syria should be carried out by sowing the best cultivars and lines resulting from Regional Yield Trials, whether they belonged to the Directorate of Agricultural Research Center, ICARDA, or both. These advanced trials are called On-Farm Trials, and are carried out on farmers' fields and at research centers and stations, provided that the Directorate of Agricultural Research Center takes full responsibility for the implementing, supervising, and the expense of On-Farm Trials located within their centers and stations. As for the trials situated on the farmers' fields, they will be carried out and followed up by the joint labor of the scientists of both ICARDA and the Directorate. But ICARDA alone will be responsible for all the expenses of these trials.

Table 1. Zones under Irrigation.

Variety / Line				
Bread wheat	Years of trial	Durum Wheat	Years of trial	Site
1. Mexipak	continuous	1. Gezira 17	continuous	1. Deir Ezzor Res. Station
2. Sham 4	continuous	2. Sham 1	continuous	2. Raqqa Res. Station
3. Bhouth 4	continuous	3. Douma	1st year	3. Qarahta Res. Station
4. Douma 8815	1st year	4. Lahn	3rd year	4. Al-Tyba Village (Deir Ezzor)
5. Douma 6419	3rd year	5. Hazar	3rd year	5. Sheikh Jum'a (Raqqa)
6. Sunbird	2nd year			6. Al-Latamna (Hama)
7. Nsr	1st year			7. Al-Hassaka (Tel Shamiyya)
8. Smuru	1st year			
9. Lami	1st year			

Table 2. Zone A

Variety / Line				
Bread wheat	Years of trial	Durum wheat	Years of trial	Site
1. Mexipak	continuous	1. Gezira 17	continuous	1. Gellin Res. Station
2. Bhouth 4	continuous	2. Sham 1	continuous	2. Homs Res. Station
3. Sham 4	continuous	3. Douma 6102	3rd year	3. Idleb Res. Station
4. Douma 6419	2nd year	4. Balikh	3rd year	4. Al-Ghab Res Station
5. Douma 9457	1st year	5. Umrabi' 9	2nd year	5. Al-Qamishli Res.Station
6. W3918/JUP	3rd year	6. Umrabi' 5	1st year	6. Al-Shajara (Dar'a)
7. NKT'S	2nd year	7. Douma 6056	3rd year	7. Khan Sheikhun (Idleb)
8. Snunu	1st year	8. Douma 10082	1st year	8. Tartab (Al-Qamishli)
9. Hudhud	1st year	9. Douma H326/13	1st year	9. Yahmul (Aleppo)
10.Sunbird	2nd year	10.Daki	2nd year	
		11.Sajour	1st year	

Table 3. Zone B

Variety / Line						
Bread Wheat	Years of Trial	Durum Wheat	Years of Trial	Barley	Years of Trial	Site
1. Mexipak	Continuous	1. Hourani	Continuous	1. Arabi Abiad *	Continuous	1. Izra'a Res. Station
2. Hudhud	1st year	2. Sham 3	" "	2. Furat *	" "	2. Ira'a (Dara)
3. W3918/JUP	3rd year	3. Douma 6056	3rd year	3. Arabi Aswad	" "	3. Soran (Hama)
4. NKT'S	2nd year	4. Douma H315	1st year	4. Furat 654	3rd year	4. Tel Durra (Hama)
		5. Douma 300	1st year	5. Rehan 3	3rd year	5. Aleppo Res. Station
		6. Douma 6102	2nd year	6. Furat 2463	1st year	6. Ibteen (Aleppo)
		7. Balikh 2	3rd year	7. Furat 2358	1st year	7. Hashisha (Raqqqa)
		8. Dara'a	2nd year	8. WI 2198/EMIR	1st year	8. Tel Brak (Hassake)
		9. Daki	2nd year	9. EMIR/APM/HC 1905	1st year	9. Tel Bedar (Hassake)
		10. Umrabi 17	1st year	10. Furat 2157	1st year	10. Salamin (Idleb)
		11. Hokan	1st year	11. Asale 4	2nd year	

* Control

Table 4. Zone D

Variety/Line		Site
Barley	Years of trial	
1. Arabi Aswad *	Continuous	1. Al-Hassake Res. Station
2. Furat 3386	1st year	2. Tel Z'aiter (Hassake)
3. Furat 1705	2nd year	3. Tel Skera (Hassake)
4. Furat 654	2nd year	4. Mansha't al-Rashid (Raqqqa)
5. Tadmor	3rd year	5. Beer Nayef (Raqqqa)
6. WI 2291	3rd year	6. Bwaider (Aleppo)
7. Arabi Abiad *	Continuous	7. Al-Salamieh (Hama)
		8. Khabab (Dara'a)
		9. Albatrana (Aleppo)

* Control

F. ON-FARM TRIALS

It was agreed that a number of promising cultivars and lines of wheat and barley which proved to be excellent in the Field Vertification Trials, and which were implemented on large areas of the farmers' fields, should be cultivated this season as a final stage in the trials before submitting them for release. Each variety must be cultivated on an area of some DUNOMS (1000 m²). Such trials will make the test of candidate cultivars and lines available for release for larger-scale commercial cropping. They will also make some elite seeds available if any variety is released to be handed over to the Seed Multiplication Organization, a procedure which will save time in the process of seed multiplication itself. Moreover, as these fields will be considered as first class demonstration fields, ICARDA will be responsible for all financial expenses required for the cultivation, supervision, and harvesting of these fields. The Directorate of Agricultural Research Center will participate technically with ICARDA in implementing field observations and readings, and harvesting, according to the following plan:

A. Irrigation Zone

Variety/line		Site
Bread wheat	Durum wheat	
1. Sham 2	1. Gezira 17	Al-Raqqa
2. Sham 4	2. Sham 1	
3. Mexipak	3. Lahn	
4. Douma 6419		
5. Siri 82		
6. W3918/JUP		

B. Zone A

Variety/line		Site
Bread wheat	Durum wheat	
1. Mexipak	1. Gezira 17	Al-Ghab
2. Sham 4	2. Sham 1	
3. W3918/JUP	3. Umrabi	
	4. Douma 6056	
	5. Balikh	
	6. Hazar	

C. Zone B:

Variety / Line			Site
Bread wheat	Durum wheat	Barley	
1. Mexipak	1. Hourani	1. Arabi Abiad	Izra'a (Dara'a) Aleppo Res Station
2. W 3918/JUP	2. Sham 3	2. Furat 1	
	3. Douma 6102	3. Furat 654	
	4. Douma 6056	4. Rehan 3	
	5. Umrabi		
	6. Balikh		

D. Zone C

Variety/Line	Site
Barley	
1. Arabi Aswad	Al-Batrana (Aleppo)
2. Tadmor	Beer Nayef (Al-Raqqa)
3. WI 2291	Tel Skira (Al-Hassake)

II. Food Legume Crop Improvement (Faba Bean - Lentil - Chickpea):

A. FABA BEAN

a-1. Faba Bean Breeding

- 1) Faba Bean International Screening Nursery-Large Seed (FBISN-L-88):**

This trial will be conducted at each of the following research centers: Hama, Al-Ghab, Idleb, Dier Ezzor, Tel Hadya (ICARDA).

- 2) Faba Bean International Screening Nursery-Determinate (FBISN-88):**

This trial will be conducted at each of the following research centers: Deir Ezzor, Homs, Tel Hadya (ICARDA), Lattakia (ICARDA).

- 3) Faba Bean International Chocolate Spot Nursery (FBICSN-88):**

This trial will be conducted at each of the following research centers: Gellin, Tartous, Al-Ghab, Lattakia (ICARDA).

- 4) Faba Bean International Ascochyta Blight Nursery (FBIABN-88):**

This trial will be conducted at each of the following research centers: Gellin, Tartous, Al-Ghab, Lattakia (ICARDA).

- 5) Faba Bean International Yield Trial Large-Seed (FBIYT-L-88):**

This trial will be conducted at each of the following research centers: Homs, Deir Ezzor, Gellin, Hama, Tartous, Tel Hadya (ICARDA).

- 6) Faba Bean International Yield Trial Small-Seed (FBIYT-S-88):**

This trial will be conducted at each of the following research centers: Aleppo, Deir Ezzor, Tartous, Tel Hayda (ICARDA).

- 7) Faba Bean International Yield Trial Determinate (FBIYT-D-88):**

This trial will be conducted at each of the following

research centers: Dier Ezzor, Hama, Tel Hadya (ICARDA),
Lattakia (ICARDA).

a-2. Faba bean On-Farm Trials:

Variety/Line	Years of trial	Site
1. Hama 4	3rd year	1. Idleb Res. Station
2. Hama 9	1st year	2. Hama Res. Station
3. Hama 15	3rd year	3. Deir Ezzor Res. Sta.
4. Hama 25	1st year	4. Homs Res. Station
5. ILB 1814	3rd year	5. Tartous Res. Station
6. FLIP 81-239FB	1st year	6. Tel Hadya (ICARDA)
7. Cyprian (imp.)	continuous	7. Al-Mselmiyya (Aleppo)
8. Local (control)	" "	8. Al-Farhaniyya (Homs)

B. CHICKPEA

b-1. Chickpea Breeding

1) Chickpea International Screening Nurseries-Winter (CISN-W-88):

This will be conducted at each of the following research centers: Tartous, Gellin, Al-Ghab, Aleppo, Jableh, Izra', Jendiress (ICARDA), Tel Hadya (ICARDA).

2) Chickpea International Screening Nurseries-Spring (CISN-SP-88):

This trial will be conducted at each of the following research centers: Idleb, Al-Ghab, Hama, Gellin, Jendiress (ICARDA), Tel Hadya (ICARDA).

3) Chickpea International Ascochyta Blight Nursery (CIABN-88):

This trial will be conducted at each of the following research centers: Al-Ghab, Tartous, Jableh.

4) Chickpea International Screening Cold Trial Nursery (CISCTN-88):

This trial will be conducted at each of the following research centers: Al-Qamishli - Homs.

5) Chickpea International Yield Trial-Winter (CIYT-W-MR-88):

This trial will be conducted at each of the following research centers: Al-Ghab, Idleb, Himo, Izra', Gellin, Hama, Jableh, Tartous, Homs, Jendiress (ICARDA), Tel Hadya (ICARDA).

6) Chickpea International Yield Trial-Spring (CIYT-SP-88):

This trial will be conducted at each of the following research centers: Tartous, Gellin, Himo, Idleb, Al-Ghab, Jendiress (ICARDA), Tel Hadya (ICARDA).

7) Chickpea International Yield Trial - Large-Seed (CIYT-L-88):

This trial will be conducted at each of the following research centers: Izra', Idleb, Homs, Hama, Gellin, Jendiress (ICARDA), Tel Hadya (ICARDA).

8) Chickpea International Yield Trial - Winter-Tall (CIYT-W-MR-T-88):

This trial will be conducted at each of the following research centers: Izra', Gellin, Idleb, Al-Ghab, Jendiress (ICARDA), Tel Hadya (ICARDA).

b-2. Chickpea On-Farm Trials:

Variety/line	Years of trial	Site
1.Ghab 1*	Continuous	1. Research Centers of: Idleb, Al-Ghab, Homs, Izra', Gellin, Jableh, Himo, Tel Hadya (ICARDA)
2.Ghab 2*	Continuous	9. Atareb (Aleppo)
3.FLIP 81-293	3rd year	10.Al-Alqamiyya (Aleppo)
4.FLIP 82-150	2nd year	11.Al-Sqelbiyya (Ghab)
5.FLIP 82-238	3rd year	12.Taftanaz (Idleb)
		13.Ibta' (Dar'a)
		14.Kherbet Ghazala (Dar'a)
		15.Al-Damlakhiyya (Qamishli)
		16.Al-Tha'la (Al-Sweida)

*Control

b-3. Village Projects:

It was agreed that the Directorate of Scientific Agricultural Research would cooperate with the International Center for Agricultural Research in the Dry Areas (ICARDA) in conducting a number of trials on winter chickpeas - Varieties of Ghab 1 and Ghab 2 - on relatively large areas of farmers' fields, employing modern techniques suitable for mechanical planting, harvesting, and chemical weeding. These fields will fulfil three purposes: research, demonstration, and productivity. ICARDA will provide the required seeds, herbicides, Rhizobia, together with the major financial expenses required for the implements for these fields during planting and harvesting. Both ICARDA and the Directorate of Scientific Agricultural Research will be responsible for the technical supervision of the project and the organization of the necessary field days during the season.

The following are the locations of these fields:

Site	Area (in hectares)
Tel Akin (Al-Ghab)	2
'Alqamiyya (Aleppo)	2
Al-Tha'la (Al-Sweida)	2
Ibta' (Dar'a)	2

C. Lentil

c-1.Lentil Breeding

1) Lentil International Screening Nursery Small-Seed (LISN-S-88):

This trial will be conducted at each of the following research centers: Aleppo, Al-Qamishli, Idleb, Gellin, Izra', Tel Hadya (ICARDA).

2) Lentil International Screening Nursery - Large-Seed (LISN-S-88):

This trial will be conducted at each of the following research centers: Aleppo, Al-Qamishli, Idleb, Gellin, Izra', Tel Hadya (ICARDA).

3) Lentil International Screening Nursery - Tall (LISN-T-88):

This trial will be conducted at each of the following research centers: Aleppo, Al-Qamishli, Idleb, Gellin, Izra', Tel Hadya (ICARDA).

4) Lentil International F3 - Tall (LIF3-T-88):

This trial will be conducted at Idleb and Izra' research centers.

5) Lentil International Yield Trial Small-Seeded (LIYT-S-88):

This trial will be conducted at each of the following research centers: Al-Qamishli, Idleb, Gellin, Izra', Breda (ICARDA), Tel Hadya (ICARDA).

6) Lentil International Yield Trial - Large-Seeded (LIYT-L-88):

This trial will be conducted at each of the following research centers: Al-Qamishli, Idleb, Gellin, Izra', Breda (ICARDA), Tel Hadya (ICARDA).

c-2. Lentil On-Farm Trials:

Variety/line	Years of trial	Site
1.Hourani Control	Continuous	Research Centers: Al-Qamishly, Idleb, Gellin, Izra', Hama, Aleppo, Breda (ICARDA), Tel Hadya (ICARDA), Al-'Alqamiyya (Aleppo), Ibta' (Dar'a), Taftanaz (Idleb), Souran (Hama), Al-Damkhiyya (Qamishli)
2.Idleb 1 (contol)	"	
3.FLIP 85-20L	2nd year	
4.FLIP 86-29L	2nd year	
5.815-15	2nd year	

c-3. Lentil Village Projects:

It was agreed that the Directorate of Scientific Agricultural Research will cooperate with the International Center for Agricultural Research in the Dry Areas (ICARDA) in planting lentil on relatively large areas of farmers' fields, employing modern techniques such as mechanical planters and harvesters and chemical weeding. It was also agreed that three fields will be conducted at Dar'a, Idleb, and Aleppo, using the lines of Hourani 1, Idleb 1, ILL 16, Kurdi. ICARDA will provide the major financial expenses required for the cultivation of these fields, while both ICARDA and the Directorate of Scientific Agricultural Research will cooperate in the technical supervision and organization of field days required for the projects.

The following are the locations of the above projects:

Ibta', Taftanaz (Idleb), 'Alqamiyya (Aleppo).

D. Diseases of Food Legumes:

1. Continuation of the survey of the most important diseases of food legumes (in Syria) will be continued.
2. Food legume varieties and lines resulting from the On-Farm trials will be evaluated.
3. Faba bean ascochyta blight will be under the integrated control of Lattakia Research Center (ICARDA).
4. The nematode-stricken chickpea zones will be defined in Syria.

III. Improvement of Forage crops, Pasture, and Sheep:

1. The integrated productive farming system of sheep, cereals and pastures (medic-wheat in one farming rotation) will be continued at the village level in the Provinces of Idleb, Dar'a, and Al-Hasaka.
2. Medic₂ field trial of (14) varieties in four farmers' fields 800 m² each will be conducted in the villages of Sayyadi (Idleb), Sinjar (Idleb), Smehan (Al-Hasaka), Nahta (Dar'a), and at Himo Research Center.
3. The response of medic, vetch, and vetchling to bacterial inoculation will be studied at Himo Research Center.

IV. Livestock Production Research:

1. Participation in conducting trials of the integrated productive farming system and pasture trials on farmers' fields at Al-Tah (Idleb).
2. Inclusion of "Sheep" in the farming rotation program at Qamishli Research Center.

V. The Joint Cooperation Between Soils Directorate and the ICARDA Farm Resource Management Program:

The Directorate of Soils will cooperate with the International Center for Agricultural Research in the Dry Areas (ICARDA) - Farm Resource Management Program - in the fields of barley fertilization in Zone A and Zone B, and of Durum wheat (Sham 1 variety) fertilization in Zone A and Zone B.

1- Project Objective

- A. The project aims at relating the effective factors to barley productivity, e.g.

- The quantity of rain and its distribution
- Type of soil
- Depth of th soil
- Farming rotation
- Amount of nitrogen and phosphorus in the soil at the time of cultivation.
- Added quantities of fertilizers.

by utilizing the means of testing the developed results extant at ICARDA, and by cooperation between the local scientists and the technical scientists available at ICARDA.

- B. The project also aims at defining the economic quantities of fertilizers which can be added to barley according to the conditions of Zone B and Zone C, and to wheat in Zone A and Zone B.

2. Locations of the Project

Barley: Governorates of Hama, Aleppo, Raqqa. Hassaka, being represented as the major provinces for barley cultivation in Syria. Trials were carried out within three seasons: 1984/85 - 85/86 - 86/87.

Wheat: Governorates of Aleppo, Idleb, Hassaka. There trials were carried out in the 1986/87 season.

3. Number of Trials

Barley: 1984/85 season 11 trials
 1985/86 season 22 trials
 1986/87 season 23 trials
Wheat: 1986/87 season 20 trials

4. Plan of Work, 1987/88

A. Conducting the barley fertilization 1987/88 is to be continued for the last season in order to make available the results of trials for four consecutive seasons. There will be concentration this season on the districts with shallow soils, and the number of trials will be about 18 , which will be compared with the fields cultivated by the farmers in the same place.

B. Conducting the Durum wheat (Sham 1 variety) fertilization in Zone A and Zone B in the Governorates of Aleppo, Idleb, and Hama will be continued by carrying out 18 trials within the research project of "Soil Test Calibration."

C. 1) A study of the results of trials in the previous three seasons and an attempt to relate the effective factors in barley production will be made and a joint report is to be prepared. 2) The Annual Report about the wheat fertilization trials for the 1986/87 season is to be prepared.

5. Time-Table for the 1987/88 season:

October 1987: Selecting trial locations and defining qualities of soil

November 1987: Planting the trials and taking samples of soils.

Feb/March 1988: Classifying the soils of locations for wheat and barley.

Mar/April 1988: Increasing the joint field visits for conducting the trials of wheat and barley.

May/June 1988: Harvesting the trials and taking samples of plants and soils.

July/August 1988: Preparing the results of trials, their statistical analysis, and holding a preparatory meeting to outline a program for the coming season, and to discuss the possibility of expansion.

September 1988: Holding a meeting for the participants in

order to discuss and adopt the results which will be presented at the annual meeting.

October 1988: Holding a joint work session in order to define the method for analysing the results of the four-year trials on barley and the analysis of the results of the two-year trials on wheat.

6. Obligations:

The Ministry - Soils Directorate:

- To cooperate with ICARDA scientists in choosing sites for trials.
- To classify the soils of trial sites.
- To cooperate with ICARDA in cultivating the trials.
- To nominate seven agronomists (two from the Central Administration + five from the Governorates) for supervising the execution of trials and recording the required readings along with the ICARDA scientists.
- To cooperate with ICARDA scientists in taking the necessary samples (of soil and plants) from the time of cultivation until harvesting.
- To cooperate with ICARDA in recording the results and analysing them (Two agronomists from the Central Administration).
- To cooperate with ICARDA in writing up the report about the results of trials.
- To participate in the analysis of some samples of soils and plants.

ICARDA:

- To cooperate with the national scientists in choosing the trial sites.
- To plant the trials by using the specific trial sowing machine, and to provide fertilizers and seeds.
- To provide all the expenses of trials.
- To cooperate with the Directorate staff in supervising the execution of trials and in recording the required readings.

- To provide the rain gauges.
- To cooperate with the Directorate scientists in taking the required samples of (soil + plant) from the cultivation time until harvesting, and analysing them.
- To cooperate with the Directorate scientists in recording the results and analysing them.
- To cooperate with the Directorate scientists in preparing both the report of the results of trials and the economic and social analyses.
- To give awards to the staff working in this collaborative program.
- To provide training for the national staff who work in the project. Training includes courses: short - medium - long (a week - 3 weeks), (four month), (a year).
- To cooperate with the national staff in analysing the results of years (a collective analysis) in a way that the effective factors are related to the production of barley and wheat within one formula or more in order to predict the productivity of these two crops according to the prevalent conditions during the season.
- To provide the joint barley fertilization project for the 1987/88 season with a field vehicle, a mechanical sowing-machine with its supplementary implements, provided that they will be handed over finally to the Soils Directorate directly after harvesting so that the carrying out of field trials of the barley fertilization program becomes the responsibility of the Soils Directorate, along with ICARDA scientists.

7. Publication of Research Results

- The Ministry insists that publications should be described as follows:

**The Ministry of Agriculture and Agrarian Reform
The International Center for Agriculture
Research in the Dry Areas**

and that publications should appear in both Arabic and English and with the agreement of the two parties.

8. An internal COORDINATOR will be nominated by the Farm Resource Management Program (ICARDA), in order to organize the project with the Director of Soils. The ICARDA General Coordinator of the Program and the General Coordinator of the Ministry of Agriculture and Agrarian Reform will cooperate in organizing the program.

List of locations of joint barley trials for the 1987/88 season

Between the Directorate of Soils and ICARDA (Farm Resource Management Program) in Syria:

Governorate	Site	Previous crop	Zone	Name of Farmer
Al-Hassaka	Tel Beko	Fallow	B	Dawood Husein Fatimi
	Tel Beko	Barley	B	'Uthama M.Ben Hassoun
	Sayyid Ali	Fallow	B	Ali Khalaf Suliman
	Um Al-Kibar	Barley	C	Alawi Muhammad
	Maghluja	Fallow	C	Muhammad Al-'Addad
	Al-'Arisha	Residual	C	Saleh Al-Khabour
Al-Raqqa	Qaysariyya	Fallow	B	M.Al-'Isa Ibrahim
	Um Hremleh	Fallow	B	Khalil Barho Hmedi
Al-Raqqa	Kherbet al-Fijl	Fallow	C	'Assaf Musa Sultan
	Al-Nasriyya	Fallow	C	Ahmad Abdulla 'Abbas
	Al-Taiba	Residual eff.	B	Ahmad Hamideh
Hama	Tel al-Durra	Fallow	B	Ahmad Qasim Haidar
	al-Shaikh			
	Ali	Fallow	C	Isma'il Badr al-Jadf
Aleppo	al-Shaikh			
	Ali	Brley	C	Ali al-Jadf
	Suha	Barley	C	Jasem Khaleif
	Suha	Residual eff.	C	Abdul Razzaq al-Ahmad
	Shghaidleh	Fallow	B	Suliman al-Hassoun
	Shghaidleh	Barley	B	" "
	Al-Halawiy-yeh-1	Fallow	C	M.Khalif al-Jannud
	Al-Halawiy-yeh-2	Fallow	C	Nayef Khlaif
	Tel Hadya	Fallow	B	ICARDA trial sites
	Breda	Fallow	C	" " "
	Breda	Residual eff.	C	" " "
	Ghrerifeh	Fallow	C	" " "
	"	Residual eff.	C	" " "

A Study of the joint effect of nitrogen and phosphorus on wheat crop at trial site for 1987/88.

Site	Farmer	Governorate	Zone	Previous crop	Phosphorus rate
Afes	Husain Alloush	Idleb	A	Lentil	4.03 - 4.61
Khan Shaikhun	Ibrahim Najjar	Idleb	A*	Lentil	5.82 - 8.3
Jubas	Abu Trad	Idleb	B	Lentil	6.96 - 10.01
Murek	M.Safa Kilani	Hama	A	Lentil	9.28 - 8.41
Tman'a	Ali Shinnewi	Idleb	B	Lentil	8.7 - 11.14
Algamiyyeh	M.Jamil Sa'id	Aleppo	A	Lentil	12.24 - 11.6
Ta'um	M.Jamil Harb	Idleb	A	Chickpea	4.15 - 3.46
Taftanaz	Ali Bard	Idleb	A	Chickpea	6.91 - 9.7
Tel Raf'at	Mustafa Makki	Aleppo	A	Chickpea	7.89 - 9.28
Chalkh	Al-Mukhtar	Idleb	A	Chickpea	7.78 - 6.34
Mishmishan	Muhammad Sa'id	Idleb	A	Chickpea	6.96 - 6.07
Algamiyah	M.Jamil Sa'id	Aleppo	A	Chickpea	6 - 5
Ta'um	M.Jamil Harb	Idleb	A	Vegetables	5.18 - 3.46
Khan Shaikhun	Ahmad al-Yusuf	Idleb	B*	Vegetables	5.76 - 7.49
Algamiyah	M.Jamil Sa'id	Aleppo	A	Vegetables	4.93 - 4.76
Murek	Abdel Aziz				
	Uthama	Hama	A	Vegetables	5.8 - 5.8
Taftanaz	Uthama Hallaq	Idleb	A	Vegetables	6.49 - 7.49
Tel Raf'at	Rashid Yusuf	Aleppo	A	Vegetables	8.12 - 6.61
Tel Hadya	(Station)	Aleppo	B	Vegetables	
Jendiress	(Station)	Aleppo	A	Vegetables	

* The two sites of Khan Shaikhun are: the 1st is in the rainfed Zone A, and the 2nd is in the rainfed Zone B.

VI. Joint Cooperation Between the Directorate of Irrigation and Water-use and the ICARDA Farm Resource Management Program in the Field of Supplementary Irrigation:

The joint cooperation program for improving farming resources includes the economic improvement of essential food crops in the rainfed districts by employing the techniques of supplementary irrigation for wheat, being the main crop suitable for testing within the farming rotation in a way which does not conflict with the State plan for productive crops.

Research Activities for the 1987/88 season:

A. At the International Center for Agricultural Research in the Dry Areas (ICARDA)/Tel Hadya:

The activities include the following:

The First Trial

A study of the supplementary irrigation of wheat by employing the field survey method.

1. The Objective of the Study

1-a) To define the economic requirements for water and the system of irrigation (rate and available doses) for wheat crop according to the number of water and fertilizer treatments.

1-b) To find the reciprocal relationship between the required rates of water and the additional quantities of fertilizers and their effects on production.

1-c) To define the crop factor by means of mathematical relations used in estimating the maximum evapo-transpiration ratio (Paney-Cradle-Class-Benmann.)

1-d) To find the experimental relationship to be used in defining the rate of water requirement for wheat under the climatic, environmental, and biological factors of the trial site.

2. Design of trial

The trial was designed on the ground that the split plots were randomly chosen (Fig. 1) containing four water treatments including the control (They were considered major treatments.)

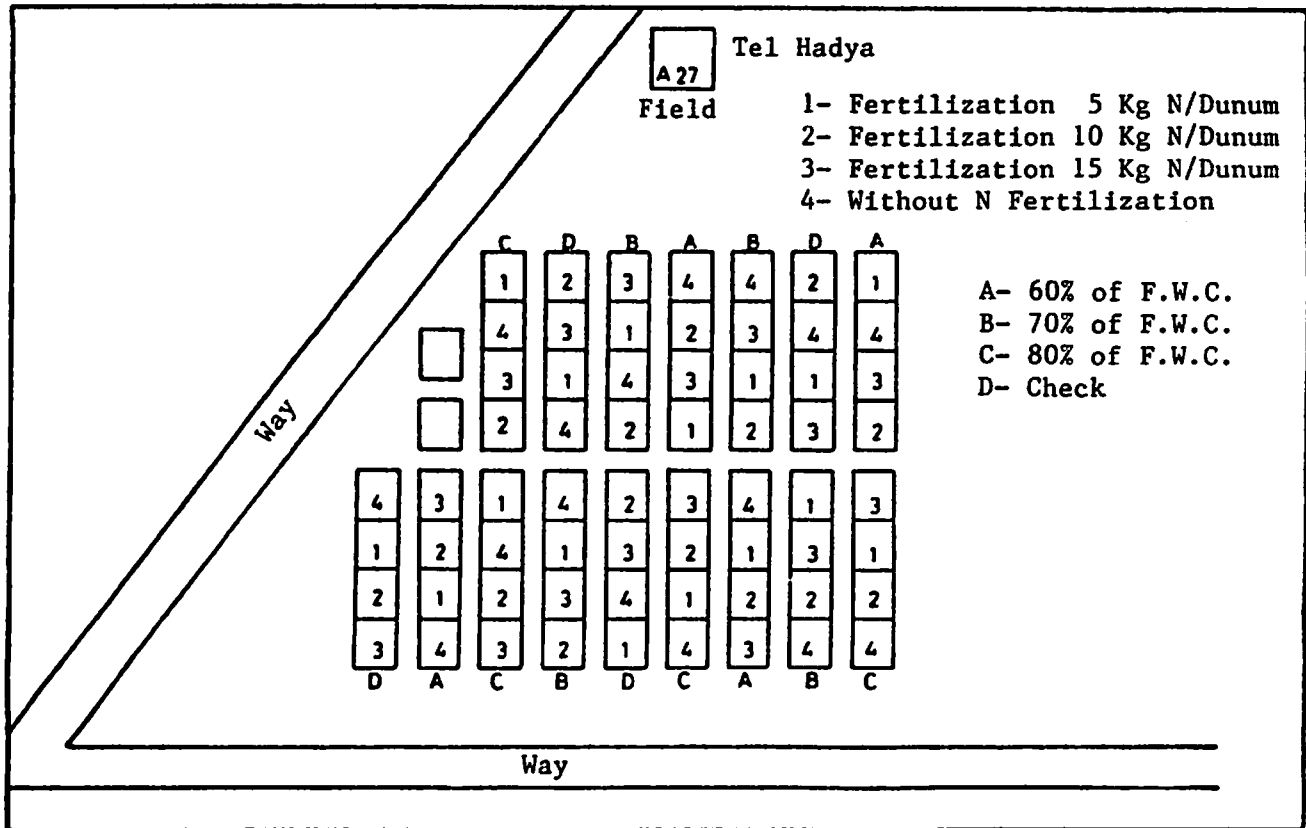


Fig 1: Executive Plan

Diagram No. 1

Water treatment	Moisture percentage from the field survey	
	Minimum	Maximum
A	60	100
B	70	100
C	80	100
D	Control without irrigation (Rainfed)	

and three fertilizer treatments in addition to a control without fertilization (Diagram 2) (as secondary treatments) for four replications.

Diagram No. 2

Fertilizer treatments	Fertilizer rate (kg N/ha)
1	50 kg N/ha
2	100 kg N/ha
3	150 kg N/ha
4	

The total quantity of phosphorus fertilizer (100 kg P_2O_5 /ha) was added before cultivation together with half the quantity of nitrogen fertilizer. The remaining half will be added at the tillering stage.

As for the trial survey, it is as follows;

- Survey of plot $5 \times 6 = 30 \text{ m}^2$
- Width of paths and circumference 3 m

Number of plots = No. of main treatments x No. of (check)
 $64 = 4 \times 4$

sub-treatment x No. of replications
 4

Cultivation was accomplished by the sowing machine.

- The Second Trial:

It is a study of wheat supplementary irrigation by employing the method of water balance. The objective of this trial is to develop supplementary irrigation techniques and identify the

varieties which are more responsive to irrigation and fertilization. A study of actual water requirement for wheat, irrigation programming under local circumstances, and maintaining the effect of positive irrigation on the productivity of the crop and the improvement of its quality, are to be made.

- Design of Trial:

The trial was designed according to the method of random split plots of the second class.

- Irrigation Treatments:

Non-Irrigated Control

Irrigation to supplement 20% of water balance
Irrigation to supplement 40% of water balance
Irrigation to supplement 60% of water balance
Irrigation to supplement 80% of water balance
Irrigation to supplement 100% of water balance

- Varieties:

Varieties employed are Sham 1 (Durum wheat) and Sham 4 (Bread wheat).

- Treatments of Fertilizer:

- Control without fertilizer
- By adding 50 kg N/ha
- By adding 100 kg N/ha

The phosphoric rate (100 kg P_2O_5 /ha) is to be fixed.

The method of irrigation is sprinkling.

The number of replications are four.

B. Farmers' Fields Trials:

1. The first trial deals with wheat supplementary irrigation by employing the method of field survey. The objectives of the trial are:

1-a) To define the kind of farming management, and the form of the supplementary irrigation which can be used to develop farming resources and secure a fixed crop and economic balance.

1-b) To evaluate the techniques of supplementary irrigation in the farmers' fields, and to estimate the actual water consumption and to schedule irrigation according to the actual local requirements for increasing the crop and its stability.

Sites

- Tel ad-Daman (Blas village)
- Mare' (Herbel village)

Design of Trial

The trial was designed by employing the method of full random split plots of the first class.

Irrigation Treatments:

- Non-irrigated control
- 33% of water balance
- 66% of water balance
- 100% of water balance

Fertilizer Treatments

In Zone A the following quantities of nitrogen fertilizers are used:

- 0% kg N/ha
- 50% kg N/ha
- 100 kg N/ha
- 150 kg N/ha

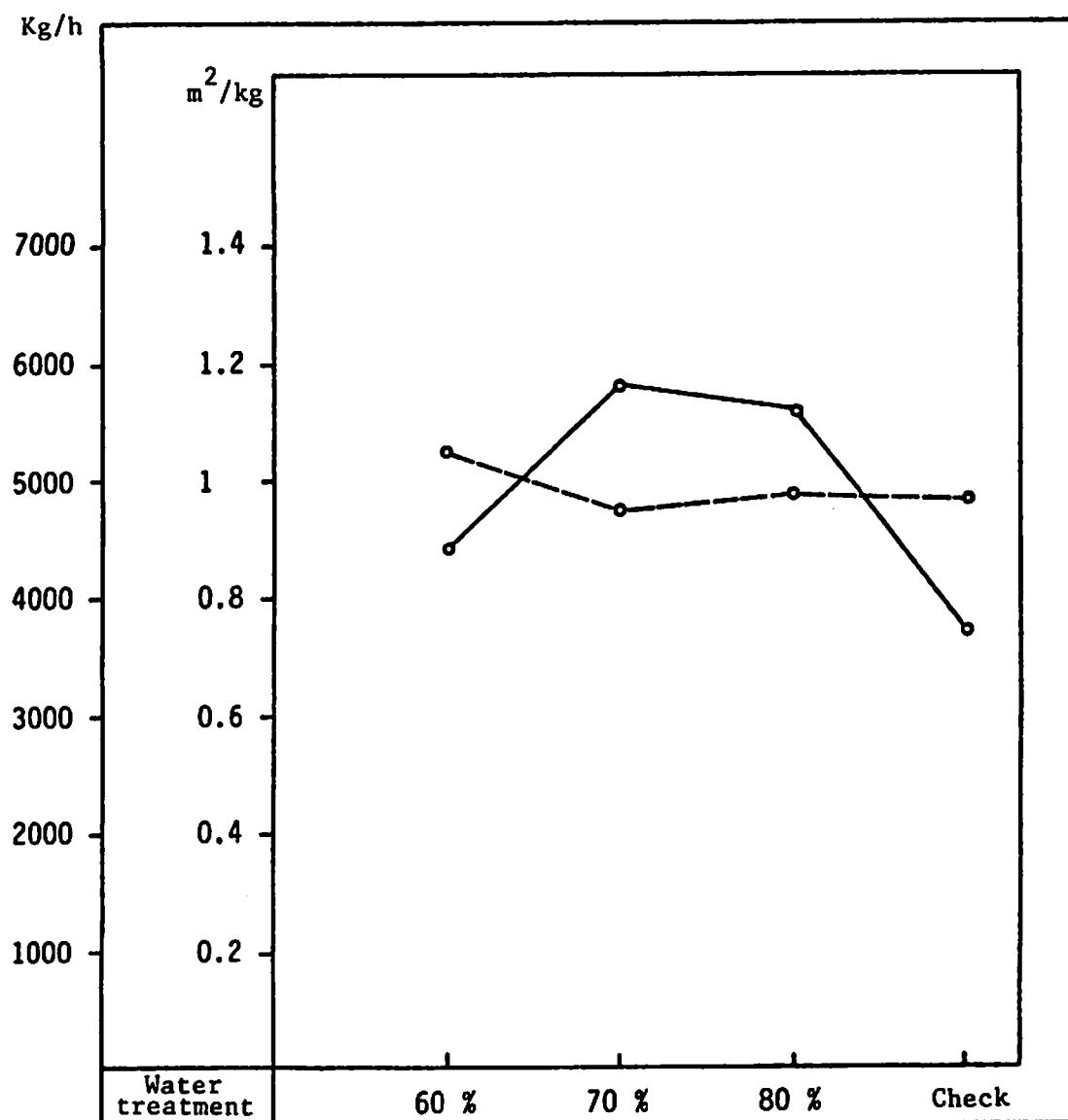
The first dose (30 kg N/ha) is to be given directly before cultivation; the second dose is to be given before tillering, in addition to the stability of phosphorus rate (100 kg P_{205} /ha), number of replications (4), and seeding rate (130 kg/ha).

Diagram No.3:

The Average Wheat Production according to Fertilizers and Water Treatments:

Treatments		Average Production		Treatments of
		fertilizer		water
Water	Fertilizer	kg/ha		
60%	N ¹	4674	4368	
	N ₂	4856		
	N ₃	4359		
	N ₄	3584		
70%	N ¹	5587	5771	
	N ₂	6641		
	N ₃	6521		
	N ₄	6334		
80%	N ¹	5755	5616	
	N ₂	6829		
	N ₃	6350		
	N ₄	3529		
Control	N ¹	4160	3688	
	N ₂	3641		
	N ₃	3902		
	N ₄	3047		

Figure 2. The relationship between the crop and the amounts of water given to each treatment.



Results

Although the available results are based on the data of one season, it is possible to conclude:

1. Superiority of water treatment 80% of the field capacity with the second fertilizer treatment (100₃ kg N/ha) where the yield is 6.83 tons/ha at the rate 0.79 m³/kg wheat (Fig. 2). The second best was the water treatment 70% with the second fertilizer treatment₃ (100 kg N/ha), yielding 6.64 tons/ha at the rate of 0.83 m³/kg wheat. The next best was the third fertilizer treatment (150 kg N/ha, yielding 6.52 tons/ha at the rate of 0.84 m³/kg wheat.
2. As for the average yield of the single water treatment and of all other treatments, the water treatment 70% of field capacity was superior, where the production average was 5.77 tons/ha₃ and the water consumption 5489 m³/ha or an average of 0.95 m³/kg wheat. (Fig. 2). This is followed by the water treatment 80% of the field capacity, where the water consumption rate was 5422 m³/ha and the average yield was 62 tons/ha, that is to say, the average water consumption for the production unit is 0.97 m³ water/kg wheat.
3. The best formula for determining the water requirement is Penman's, then Planey - Cradle, and last, Class A where the average of:

$KC = 0.71$ (Penman)
 $KC = 0.91$ (Planey - Cradle)
 $KC = 0.77$ (Class A.)
4. It is possible to use the average of the monthly KC value for the water treatments in calculating water consumption.

VII. Training and Exchange of Information:

A. Improvement of Cereal Crops:

No. of trainees	Subject	Place	Duration & date
1	1. <u>Residential courses:</u> Cereal improvement	Aleppo	4 months 1 Mar - 16 June
2	2. <u>Short courses:</u> Barley pathology and methods of breeding	Aleppo	2 weeks 21 Mar - 4 Apr
1	Physiology of hard environmental factors	Aleppo	2 weeks 15 - 28 March
9	Readings of cereals pathology	Aleppo	One week April
1	3. <u>Individual Courses:</u> Evaluation and employ- ment of germplasm	Aleppo	3 weeks May
1	Cereal entomology	Aleppo	1 month/1 Apr - 1 May
1	Quality of cereal crops	Aleppo	2 weeks/ October
2	Analysis of trial data	Aleppo	2 weeks October
	4. <u>Visiting Scientists:</u> Wild cereal hybridi- zation	Aleppo	2 weeks dates given later.

Remark: All trainees are from the Directorate of Agricultural Research Center.

B. Improvement of Food Legume Crops:

No. of trainees	Subject	Place	Duration & date
1	1. <u>Residential Courses:</u> Food legume improve- ment	Aleppo	3 1/2 months March-16 June
1	2. <u>Short Courses:</u> Lentil mechanical harvesting	Aleppo	2 weeks May 1988
1	Control of food Legume entomology	Aleppo	1 week April 1988
3	Food legume pathology	Aleppo	2 weeks/March 1988
1	3. <u>Individual Courses:</u> Microbiology of food lgumes.	Aleppo	1 Month March 1988
1	Entomology of food legumes	Aleppo	3 Months April-June, 1988

Remark: All trainees are from the Directorate of Agricultural Research Center.

C. Improvement of Forage and Pasture Livestock Crops:

No. of trainees	Subject	Place	Duration & date
1	1. <u>Residential Courses:</u> Improvement of forage, pasture, sheep.	Aleppo	4 Months March - June
1	2. <u>Individual Courses:</u> Sheep feeding	Aleppo	9 Months Nov 1987 - June 30, 1988
1	Pasture management	Aleppo	" "
1	Farmers' field trials	Aleppo	" "
1	Improvement of marginal Natural Pasture	Aleppo	2 Months March - April
<u>Remark:</u> All trainees are from Directorate of Agric. Res. Center except the course assigned to Improvement of Marginal Nat. Pastures.			

D. Improvement of Farm Resource Management

No. of trainees	Subject	Place	Duration & date
2	1. Residential Courses Farm Resource Manage- ment	Aleppo	1 1/2 Months 14 Feb - 31 Mar
?	2. Short Courses: Active Uses of Fer- tilizers	Aleppo	2 weeks 10-28 January
?	3. Individual Courses: Fertilizer Trials on Farmers' Fields	Aleppo	1 Year 7 Oct 1987 - 7 Oct 1988

Remark: All trainees are from the Directorate of Soils.

Discussion has been concluded on the following:

Obligations of the Syrian Ministry of Agriculture and Agrarian Reform:

1. To cooperate with ICARDA in planning and conducting the joint trials.
2. To charge the national staff working in the various agricultural research centers and stations with the execution of the joint trials in the agricultural research centers and stations in Syria, and to undertake all necessary expenses required.
3. To cooperate with ICARDA in carrying out the joint trials on farmers' fields in the various agricultural provinces in Syria.
4. To provide the necessary land for the execution of joint trials in agricultural research centers and stations, together with the requirements of agricultural research such as fertilizer, weed control, harvesting, and other agricultural research such as fertilizer, weed control, harvesting, and other agricultural services.
5. To provide some promising cultivars and lines of cereals, food legumes, fodder crops to be compared with those of ICARDA for defining the best cultivars and lines suitable for cultivation in Syria.
6. To participate with ICARDA in organizing Field Days and joint visits to the trial sites for the parties concerned in this program and visitors, in order to see the activities of the program on-site in the different districts of Syria.
7. To cooperate with ICARDA in preparing the annual and regular reports of the joint program.
8. To participate in the joint and annual meetings of the program, and in the discussions of the plan and schedules for joint cooperation.

Obligations of the International Center for Agricultural Research in the Dry Areas (ICARDA):

1. To cooperate in planning and preparing joint trials whether at research stations and centers or elsewhere.
2. To cooperate in the execution of farmers' verification trials

and to cover all the expenses required.

3. To provide a larger proportion of varieties and germplasm of cereals, legumes, and forages for testing in the joint trials and selecting from them the most suitable items for farming in Syria.
4. To provide the necessary means of transportation and agricultural machinery for conducting the joint trials outside research centers and stations, in addition the provision of means of transport during the time of planting, haresting and joint visits.
5. To provide training opportunities for the staff of the Ministry of Agriculture and Agrarian Reform in the fields which serve the national program in Syria, and to cover all the expenses of training and some other requirements such as stationery and scientific equipment.
6. To organize regular and annual meetings, exchange visits, send publications and newsletters issued by ICARDA, and cover all expenses required.
7. To put at the disposal of the joint program all facilities and capacities available at ICARDA such as computer; labs for testing soil, insects, diseases, qualities of cereals, legumes and forages; the germplasm bank; and the agricultural workshop. The results of all joint trials are annually analysed by the ICARDA computer. ICARDA also helps in analysing some national trials for the Directorate of Agricultural Research Center.
8. To cooperate in preparing, reviewing and publishing the annual report of the joint scientific program, and to cover all the expenses required.
9. To organize the joint annual meetings, and cover most of the related expenses.
10. To participate in organizing Field Days and visits, and cover most of the expenses.
11. To provide lodging, accommodation, and transportation for most of the participants from the Ministry of Agriculture and Agrarian Reform during their visits to CIARA (Aleppo) and the sites of joint trials all over the country (Syria).
12. To organize and encourage direct contact of the scientists with the experts and specialists belonging to various national programs.
13. To provide some encouraging awards to the Ministry Staff participating in the joint scientific program.

It has been also agreed on the following points:

1. All correspondence concerning the above program should be addressed to ICARDA through the Coordinator nominated by ICARDA, or his Deputy when the former is away; and to the Directors of different Directorates and Organizations, participating in this program, or to their deputies.
2. It is important that all Research Directorates of Soils, Irrigation and Water Use, Steppe and Range, Livestock, and ICARDA should be informed in advance about the visits, time of cultivation and harvesting so that the staff concerned will be able to participate.
3. No research trials should be planted or harvested without advance notice or the participation of the national staff concerned.
4. The importance of rendering the prescribed plan into a clear budget by both the Ministry of Agriculture and Agrarian Reform and ICARDA.
5. Increasing the number of field visits which should be arranged in advance by the participating parties.
6. Expansion in conducting pilot and demonstration projects at village level, which help in releasing and evaluating the improved varieties at the farmers' level and in relatively large areas.
7. Maintaining lines and local varieties and utilizing them in improving new varieties.
8. Increasing the number of Field Days which should be organized in advance between the parties concerned.
9. Serious attention should be given to the newspaper advertisements and propaganda about the new varieties. It is necessary that the parties concerned should participate in issuing newsletters and specific reports which provide information about these varieties and lines.

At the end of the Meeting, all participants expressed their deepest satisfaction with the results of this meeting and the achievements of the joint program. They all wished more progress and success for this joint cooperation. And they all agreed that the Seventh Annual Meeting for the program should be held in the first week of October, 1988.

**List of Participants in the Sixth Annual
Meeting for the Joint Scientific Cooperation**

Between

The Ministry of Agriculture and Agrarian Reform

and

**The International Center for Agricultural Research
in the Dry Areas (ICARDA)**

Aleppo , October 1-3, 1987

From the Ministry Of Agriculture and Agrarian Reform:

Dr Hassan Sa'ud	Assistant Minister of Agriculture and Agrarian Reform, Representative of His Excellency Vice-Prime Minister for Public Services and the Acting Minister of Agriculture and Agrarian Reform.
Mr Arfan Alloush	Director of Statistics and Planing
Mr Hazem Al-Samman	Director of Qualifications and Training
Dr Rafeeq Al-Saleh	Director of Agricultural Affairs
Mr Akram Al-Omar	Director of Agricultural Guidance
Mr A. R.Qrunfla	Director of Information and Public Relations
Mr Nafe' Zu'ayen	Department of Information
Mr Tawfeeq Al-Darra	Information Directorate (Journalism Office)
Mr A. Khaleq As'ad	Director of Steppe and Range
Mr Sameer Isma'il	Assistant Director of Steppe and Range

From the Ministry of Planning:

Mr Hamid Mer'i	Assistant Minister of Planning
Dr Riyad Yasmina	Planning Director of International and Economical Relations
Mr Bassam Al-Siba'i	Assistant Director of International and Economical Relations
Mr Riyad Sa'd ed-Din	Director of Agriculture and Pasture Planning
Mr Bassam Al-'Attar	Agronomist, a Staff member
Ms. Da'd Rihawi
Ms. Sawsan Al-Hamwi

From the Regional Leadership;

Dr Qasem Al-Haj Ali	Peasants Regional Office
Mr Kamel Qaddah	Journalism

From Aleppo Governate

Mr Muhammad Nour Mawaldi	Governor of Aleppo
Mr Muhamed Walid Hafez	Director of Agriculture and Agrarian Reform - Aleppo
Mr Ahmad Farouq Hallaq	Director of Water Supply - Aleppo
Mr Zuhair Ahmad	Aleppo Governate

From the Arab Center for Studies of Dry Lands and Arid Zones:

Dr Nouri Rahume	Assistant General Director
Dr Lulu Rushdi	Director of Botanic Studies
Dr Mustafa Al-Shurbaji	Botanic Studies - Pasture Dept.
Dr A. S. Tawfeeq	Botanic Studies Cereals Dept.
Dr Nabeel Ibrahim Hassan	Expert in Animal Nutrition
Dr Fawwaz Al-'Azme	Expert (contractor with the Center)

From the Syrian Universities:

Dr Ghanem Haddad	Dean, Faculty of Agriculture - Damascus
Dr Ahmad Jallul	Dean, Faculty of Agriculture - Tishreen
Dr Ahmad Al-Ahmad	Dean, Faculty of Agriculture - Aleppo
Dr Kaser Ma'soud	Faculty of Agriculture - Aleppo Uni.
Mr A. Hamid Hafez	*****

From the Directorate of Agricultural Research Center:

Dr Hassan Al-Ahmad	Director of Scientific Agri. Research
Mr Walid Al-Taweel	Assistant Director of *****
Dr Majed Al-Ahmad	*****
Dr Afeef Ghanem	Head, Dept. of Food Legumes Improvement
Mr Ali Shhada	Head, Dept. of Cereal Crop Improvement
Mr Bassam Mawlawi	Head, Dept. of Pasture and Forage Crop Improvement.
Dr Adnan Sweid	Head, Dept. of Livestock Research
Mr Baha ed-Din Jamal	Dept. of Cereal Crop Improvement-Barley
Mr Muwaffaq Muhamad	Dept. of Pasture and Forage Crop Improvement
Mr A. Maseeh Nassif	Dept. of Legumes Improvement (chickpeas)
Mr Ziad Hallaq	Dept. of Cereals Crop Improvement
Mr Ayyoub Zaza	Head, Dept. of Seed Diseases
Dr Khalil A. Halim	Research at the Dept. of Protection
Mr Muhy ed-Din Jaba	Dept. of Cereals Improvement (Wheat)
Mr Fuad Al-Ashqar	Dept. of Legumes (Lentil)
Mr Yaseen Swaidan	Dept. of Fodders and Pastures
Mr 'Eed al-Misri	Dept. of Legumes (Faba Beans)
Mr Ahmad Fateh Al-Qadri	Head of Scientific Agricultural Research Center - Kamishli
Mr Fathalla Jajan	Head of Scientific Agricultural Research Center - Hassaka
Mr A. Hamid Ba'aj	Head of Scientific Agricultural Research Center - Deir Ezzor
Mr Mahmud Al-Muz'il	Deir Ezzor Research Center
Mr Mahmud Al-Naef	Head of Scientific Agricultural Research Center - Raqqah
Dr Ameen Haj Qasem	Head of Scientific Agricultural

Mr Ahmad Za'tari	Research Center - Aleppo
Dr Saleem Ra'i	Aleppo Research Center
	Head of Scientific Agricultural
	Research Center - Jableh
Dr Talal Mustafa	Head of Scientific Agricultural
	Research Center - Tartus
Mr Mufeed al-Omar	Head of Scientific Agricultural
	Research Center - Idleb
Mr Mathna Al-Jundi	Head of Scientific Agricultural
	Research Center - Homs
Mr A. R. Al-Bared	Head of Scientific Agricultural
	Research Center - Hama
Mr A. Razzaq Al-Kurdi	Head of Scientific Agricultural
	Research Center - Al-Ghab
Mr Hilal M. Kiwan	Head of Scientific Agricultural
	Research Center - Gellin
Mr Hassan Abu Hazeh	Head of Scientific Agricultural
	Research Center - Qarahta
Mr Fawzi Ne'meh Beddewi	Head of Scientific Agricultural
	Research Center - Izra'
Mr Hael Mazhar	Head of Scientific Agricultural
	Research Center - Al-Sweida

From the Soils Directorate

Dr Ilias Jabbour	Director of Soils - Ministry of Agric- ulture and Agrarian Reform
Mr Khazza' Al-Haj	Head, Dept of Soil Fertility and Plant Nutrition.
Dr Abdul Rahman	Assistant Director of Soils
Mr Talal El-Khadra	Assistent Head of Dept of Soil Fertility and Plant Nutrition
Mr Zuhair Al-Misri	Head, Dept of Soil Fertility and Plant Nutrition - Aleppo
Mr Jamil Nayyal	Head of Soils Department - Aleppo

From the Directorate of Irrigation and Water-Use/Douma:

Dr Riyad El-Shayeb	Head of Research and Water Studies Dept
Mr Yusuf Sabouni	Head of Irrigation and Water-Use Dept

From the General Organization for Seed Multiplication:

Dr Nassan Muhammad	General Director of Organization for Seed Multiplication
Dr Jamal El-Din Rudwan	Head of tissue cultivation Dept.

From the Syrian-Libyan Company for Industrial and Agricultural Investments (SYLICO)

Mr A. Nasr Salloum	Chairman of the Company Directorate
Mr Ayyash Al-Hemesh	Director of Agric. Assembly in Ras El-Ain
Mr Bashar Makhluta	Director of Planning and in SYLICO- Damascus

From the Arab Company for Livestock Development

Mr Kamal Haddad Director of Project for Livestock
Development in Kamishli

From Information Media

Mr Mahmud Khayyata Director of Broadcasting and
Television - Aleppo
Mr Waleed Najm Middle East Newspaper
Mr Isam Zannum *****
Mr Mustafa Al-Najjar Director of Tishreen Newspaper
Office - Aleppo
Mr Sa'ban Milarji Representative of SANA, Director of
Aleppo Office
Mr Ibrahim Al-Ahmad Representative of SANA, Aleppo Office
Mr Joseph Tarsha TV Photographer - Photo News - Aleppo
Mr Sa'id Al-Kurdi Assistant Photographer - Photo News -
Aleppo
Mr Fahd Al-Dimashqi TV Photographer - Photo News - Aleppo

Farmers And Representatives Of Some Other Agricultural Units:

Mr Hikmat al-Barouk Farmer from al-Tah, Ma'arret al-Nu'man
Idleb
Mr Nasr'Edo Yousef Farmer from Dair Sharqi, Ma'arret
al-Numan, Idleb
Mr Ramadan 'Edo Yusef Farmer from *****
Mr Shhadah al-Arnus Head of Production Office - peasants
Association at Ma'arret
Mr Muz'el Sultan Farmer from al-Tah Village

From: The International Center For The Agricultural Research In The Dry
Areas (ICARDA):

Dr G. Koopman Deputy Director General
Dr A. Van Schoonhoven Deputy Director General for Reseach
Dr A. S. Shuman Assistant Director General
Mr S. El Fayoumi Administrative Director

Cereals Crop Program - ICARDA;

Dr G.B. Head of Cereal Improvement Program
Dr Omar Mamluk Cereal Improvement Program Cereal
Pathology
Dr Melodi Nashit Cereal Improvement Prog.- Durum Wheat
Dr Ortiz Ferrara Cer. Imp. Prog.- Bread Wheat
Dr S. Ceccarelli ***** - Barley
Ar A Acevedo ***** - Agronomy
Dr M. Taher ***** - High Elevations
Dr H. Qetata ***** - Training
Dr S. K. Yaw ***** - Entomology
Dr Ross Miller ***** - Agronomist
Mr Macheal Micheal ***** - Agronomist
Mr Issam Naji ***** - Agronomist

Mr J. Van Leur
Mr Antuwan Asbati
Mr Mazen Al-Jarrah
Mr Riyadh Saqqal

***** - Cereal Pathologist
Cereal Improvement program

Food Legumes Crop Improvement program - ICARDA:

Dr K.B. Singh	Acting Head of program
Dr W. Erskine	Lentil
Dr Larry Robertson	Faba Bean
Dr Habib Ibrahim	Training
Dr R.S. Malhotra	Chickpea
Dr M.B. Huwari	Food Legume Pathology
Dr Saleem Hanonick	*****
Dr Doglass Beck	Microbiology
Dr Said Saleem	Agronomy
Dr 'Ureib Tahhan	Entomology
Mr Ihsanu al-Haq	Chickpea
Dr Susan Weigand	Entomology
Dr France Weigand	Legume Pathology
Dr Muhamad al-Sherbini	Faba Bean Breeding
Mr Bashar Baker	Verification Fields
Mr Mahmud Hamzeh	*****
Mr Hassan Misri	..
Mr Nabil Al-Ansari	Training
Mr Fadel Afandi	Microbiology
Mr Ilias Zoud	Legume Pathology
Mr Talal Fadel	Legume Pathology

Forage And Pasture Improvement Program - ICARDA:

Dr P. Cocks	Head of Program
Dr L. Materon	Microbiology
Dr Ali M.A. Mun'em	Training
Dr Euan Thomson	Sheep
Dr Allen Smith	Natural Pastures
Mr Hanna Soumi	Medic
Mr Akram Sam'an	Medic
Mr Narses Narsoyan	Medic
Mr Mustafa Bilar	Pasture Crop Pathology
Mr Safouh Rihawi	Fodder Efficiency Lab.
Mr A. Hamid Antar	Traininng
Mr A. Karim Fardawi	Pastures
Mr Aladin Badinjki	Medic

Farming Resource Management Program - ICARDA:

Dr Peter Cooper	Head of Program
Dr Abdulla Matar	Soil Fertility
Dr Bakhet Sa'id	Training
Dr H. Hari8ss	agronomy
Dr Mustafa Pala	Weed Control
Dr Michael Jones	Agronomy/Fertilization
Dr Eugene Perrier	Supplementary Irrigation
Mr Hisham Salahiyeh	Water Control project
Mr A. Qader Summaquieh	*****

Mr Sabeeh al-Dehneh	Water Control Project
Mr Ahmad Mazeed	Agricultural Systems
Mr Ahmad Musa al Ali	*****
Mr Afeef Dekarmanji	*****

Germplasm program - ICARDA:

Dr B. Somaroo	Head of Program
Dr L. Holly	Expert in Genetics
Dr K. Makkouk	Expert in Plant Virus Infections
Dr Y. Adham	Assistant Expert in Germplasm

Training Unit - ICARDA:

Dr L. Prezkop	Head of Unit
Mr Nidal Kabbani	Training Unit

Scientific And Technical Information Program - ICARDA:

Mr J. Woolston	Head of Program
Mr Mrs. Joyce Kerly	Journalist of Program
Mr Murtada Seraj El Deen	Head of Photograghy Unit
Mr Majed Khateeb	Photographer

Joint Scientific Cooperation Program - ICARDA:

Dr Samir Al-Sebai	Coordinator of National research, Responsible for the Joint Program
Mr Hamdi Ram Hamdani	Assistant Coodinator Of National Research
Miss Silva Cholakyan	Secretary of Conference