AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY
BATCH #16

1. SUBJECT CLASSIFICATION

A. PRIMARY: Agriculture — AF00-1400-G690

B. SECONDARY: Plant production--Leguminous grains and vegetables--Iran

2. TITLE AND SUBTITLE
Technical workshop,Aug.8-12,1966,Karaj Agr.College,Univ.of Tehran

3. AUTHOR(S)
(101) USDA/ARS,Regional Pulse Improvement Project (Iran)

4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1966	27p.	ARC IR633.3.R336a

7. REFERENCE ORGANIZATION NAME AND ADDRESS
USDA/ARS

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*

9. ABSTRACT

10. CONTROL NUMBER	11. PRICE OF DOCUMENT
PN-RAA-931	
12. DESCRIPTORS	**13. PROJECT NUMBER**
Environmental tests Grain legumes Iran Meetings	**14. CONTRACT NUMBER** PASA RA(AJ)3-00 Res.
	15. TYPE OF DOCUMENT

AID 590-1 (4-74)

JR
633.3
R336a

REGIONAL PULSE IMPROVEMENT PROJECT
United States Department of Agriculture
United States Agency for International Development
Government of Iran

Workshop Program - August 8-11, 1966

Monday, August 8

9:30 A.M. - Auditorium, Biology Building, Karaj Agricultural College.

Introductions and welcome remarks:
Dr. Peter H. van Schaik, Project Leader
Engineer Ebrahim Riahi, Dean, Karaj Agricultural College.
His Excellency Engineer H. E. Khadivi, Parliamentary & Technical Deputy Minister of Agriculture.

11:00 A.M. - Tour of College.

12:30 P.M. - Lunch.

2:30 P.M. - Slides, movies, and informal discussions on pulse crop production.

Tuesday, August 9

9:00 A.M. - Karaj Agricultural College Research Farm.

Research discussions:

CHICKPEAS - Yield trials and nurseries, Dr. Kenneth Evans, Eng. Jamshid Jaffari.
Entomology - Mr. Kenneth Gibson, Mr. Shannon Wilson, Eng. Karim Kamali.
Plant Pathology - Dr. Walter Kaiser, Eng. Dariush Danesh.
Soils-Agronomy - Dr. Glenn Horner, Eng. Behzad Mansouri.

MUNGBEANS - Yield trials and nurseries, Dr. Kenneth Evans, Eng. Mehdi Khosroshahin.
Plant Pathology - Dr. Walter Kaiser, Eng. Dariush Danesh.
Soils-Agronomy - Dr. Glenn Horner, Eng. Behzad Mansouri.

Afternoon - Informal small group discussions for those interested in specific aspects of the work.

Wednesday, August 10

9:00 A.M. - Karaj Agricultural College Research Farm.

Research discussions:

BEANS - Yield trials and nurseries, Dr. Kenneth Evans, Engineer Ahmad Sarrafi.
Plant Pathology - Dr. Walter Kaiser, Eng. Dariush Danesh.
Entomology - Mr. Kenneth Gibson, Mr. Shannon Wilson, Eng. Karim Kamali.
Soils-Agronomy - Dr. Glenn Horner, Eng. Behzad Mansouri.

COWPEAS - Yield trials and nurseries, Dr. Kenneth Evans, Eng. Ali Ellini.
Plant Pathology - Dr. Walter Kaiser, Eng. Dariush Danesh.
Entomology - Mr. Kenneth Gibson, Mr. Shannon Wilson, Eng. Karim Kamali.
Soils-Agronomy - Dr. Glenn Horner, Eng. Behzad Mansouri.

Afternoon - Informal small group discussions for those interested in specific aspects of the work.

Thursday, August 11

8:30 A.M. - Leave Tehran for Varamin.

Visit facilities and farm of Ministry of Agriculture, Seed & Plant Improvement Institute, Varamin Research Station.

End of Conference.

ATTENDANCE

Regional Pulse Improvement Project

U. S. Personnel, Iran:
Dr. P. H. van Schaik, Project Leader; Dr. G. M. Horner, Soil Scientist; Mr. K. E. Gibson, Entomologist; Mr. S. W. Wilson, Entomologist; Dr. W. J. Kaiser, Pathologist; Dr. K. H. Evans, Plant Breeder.

U. S. Personnel, India:
Dr. R. M. Matsuura, Plant Breeder; Dr. F. J. Williams, Pathologist.

Iranian Personnel:
Engineer Dariush Danesh, Pathologist; Eng. M. Ali Ellini, Plant Breeder; Eng. Jamshid Jaffari, Plant Breeder; Eng. Karim Kamali, Entomologist; Eng. Mehdi Khosroshahin, Plant Breeder; Eng. Behzad Mansouri, Soil Technician; Eng. Mohammad Moaddab, Agronomist; Eng. Massoud Mojtehedi, Agronomist; Eng. Mahmoud Okhovat, Pathologist; Eng. G. Reza Rassoulian, Entomologist; Eng. Ahmad Sarrafi, Plant Breeder; Eng. Manuchehr Taghavi-Bayat, Agronomist.

Karaj Agricultural College

Engineer E. Riahi, Dean; Dr. R. Hejazi, Vice-Dean; Dr. J. Sharif, Vice-Dean; Professor H. Schaybani, Horticulture Department; Eng. Ali Mofidi, Horticulture Department.

Ministry of Agriculture, Iran

His Excellency Engineer H. E. Khadivi, Deputy Minister.

Seed & Plant Improvement Institute:
Eng. Khoshettakel, Director of Research; Eng. Parviz Parvaneh, Forage & Legume Crops; Eng. Ali Rubabi (Varamin); Eng. S. Javaherian (Varamin); Eng. K. Aliabadi-Zadeh (Varamin); Eng. A. Kahrabayan (Meshed); Mr. H. Rezai, (Rezaieh); Mr. G. Nafici (Shiraz); Eng. R. Monajim (Isfahan).

Plan Organization, Iran

Dr. M. B. Bayat, Chief, Planning Department (Agriculture).

The Pahlavi University, Shiraz, Iran

Dr. S. Sharifi, Acting Dean and Head, Department of Pest Control;
Dr. M. Niknejad, Head, Department of Plant Breeding and Genetics.

Turkey

Mr. Nihat Çanitez, Ministry of Agriculture, Ankara and Eskeshehir.

Afghanistan

Mr. Mohammad Aref Noori, Director, Cereal Crops Improvement Section, Ministry of Agriculture, R.G.A., Kabul.

India, Pakistan

Although delegates had been proposed, formalities for obtaining passports could not be completed in time for attendance.

F.A.O., United Nations (Iran)

Mr. Cazantets, Engineer Hajimi, Agronomists, Varamin-Garmsar Project.

U. S. Embassy, Tehran

Mr. C. S. Stephanidis, Agricultural Attache; Mr. R. H. Harlan, Economic Affairs Counselor.

R.P.I.P. TECHNICAL WORKSHOP

The conference opened on Monday, August 8, 1966 with remarks of welcome by Engineer Ebrahim Riahi, Dean of Karaj Agricultural College of Tehran University. He welcomed the delegates on behalf of the College staff, and also expressed his pleasure at having this Project associated with the College. He stressed the importance of the Regional Pulse Improvement Project, not only in connection with the overall development of Iran, but also because of its potential effect for improved nutrition for the people of the whole region.

Dean Riahi introduced Professor Schaybani, Head of the Horticulture Department, as Chairman of the Conference. Professor Schaybani, however, declined because of pressing duties in his dual role both at Karaj and as Dean of Rezaieh Agricultural School in Northwest Iran, where he was going to conduct competitive entrance examinations.

His Excellency Engineer H. E. Khadivi, Parliamentary and Technical Deputy Minister of Agriculture, spoke on behalf of the Minister. He also stressed the importance of this Project in connection with Iran's development, and wished the participants a pleasant, useful, and successful conference.

Professor H. Schaybani spoke briefly to thank Government of Iran authorities for their part in the functions of the Project. He declined the Chairmanship of the Conference, and instead requested Dr. P. H. van Schaik, Project Leader, to assume this responsibility.

Dr. van Schaik briefly spoke on the reasons "Why We Are Here," and outlined some of the background reasons of land area, population increases, and nutritional status which led to the proposal for and establishment of the Regional Pulse Improvement Project.

REGIONAL PULSE IMPROVEMENT PROJECT

Workshop Conference - 8/8/66

Dr. Peter H. van Schaik
Project Director

I will not take much of your time with a long speech, but I would like to take a few minutes to discuss with you the reasons why we, the American team, are here; which reasons in many respects are the same that you, our associates in this work, are here today.

In the past, most efforts on the part of America to assist developing nations have taken the form of "ACTION Programs," which were primarily based on the direct transfer and application of technical knowledge with the goal being immediate results.

Recently however, the realization has taken hold that for long range results, considerable research must be done in the foreign environments to gain technical knowledge useful to and applicable in a particular country. We have learned, in many instances the hard way, that information from one part of the world may not be directly transferable to another. The simple introduction of new varieties of crops is seldom entirely successful. Generally, introduced plants suffer from new diseases, insects, and parasites. Often slight changes in photo-period, light intensity, and temperature ranges affect imported plants.

It is generally recognized that increased use of fertilizers is a primary necessity for increased yields of crops in most countries. But research is needed to learn what kinds of fertilizers, at what rates, and by what methods they should be applied.

Pest control measures are generally regarded as important for improved agriculture, but various physical, economical, and sociological factors must be considered in the development of effective practical programs.

That improvements in agricultural production are necessary, very few people will contest. Just now, Iran is projecting an agricultural production program for self-sufficiency within 15 years.

This can be done by two means. First, and in some ways the easiest way, is by bringing more land under cultivation, and secondly, by increasing the production per unit of land under cultivation. For many countries, this second method is the sole source because new lands are no longer available. On a world-wide basis, there are approximately 13 1/3 billion hectares, but only 3½ billion, or about one-third are considered agricultural lands, of which again only 1.4 billion hectares are arable. In many countries, populations are increasing faster than gains made in food production, and therefore in most countries, there is less and less arable land per person. It presently varies from 527 persons per 40 hectares in Japan to only 1 person per 40 hectares in Oceania. The 1960 world population was more than 3 billion, and at an annual rate of 1.8% will reach 3.6 billion by 1970. Obviously this necessitates large increases in the yield per hectare of basic foods, particularly in high protein foods, to avoid and correct malnutrition. At the present time, 2/3 of the world's people live in countries with nutritionally inadequate national average diets. The diet-deficit areas include all of Asia, except Japan and Israel; all of Africa, except the southern tip; the northern part of South America; and almost all of the Central American countries. This deficit includes 900 calories per day below diet-adequate

areas, daily protein consumption of less than 2/3 of adequately fed areas, and daily fat consumption of less than 1/3 of what is considered necessary.

Protein content of a particular food is a widely accepted indicator of nutritional quality. Not only do we know the importance of protein and its component amino acids for growth, normal activity, and good health, but usually foods rich in protein are also comparatively good sources of many other essential elements. Animal proteins are considered the best source, but protein from pulses is also quite effective in supplying nutritional balance.

Standards have been established providing for a minimum requirement of 60 grams of total protein per person per day, of which 20 grams should be combined animal and pulse protein.

In spite of their importance as a diet protein source and a secondary function as crops capable of fixing nitrogen from the air, and the fact that they are quite generally grown and accepted, the pulse crops have received very little attention in agricultural improvement programs. According to the FAO World List of Plant Breeders in the Near East, South Asia and Far East regions of Asia, only 9.2 professional man years are devoted to pulse crop improvement. The per capita land area devoted to these crops varies considerably. The extent to which people depend on vegetable protein for their dietary requirements influences this. For instance, in the Far East, where livestock is extremely scarce and meat is expensive or not consumed for religious reasons, over 25 hectares of pulses are grown per 1,000 population, against 6.4 hectares in the Near East region.

The Iran 1960 National Census lists a total of 125,442 hectares of

combined pulse crops--about 5.7 hectares per 1,000 population--at an average yield of 0.6 tons per hectare. These figures allow for about 3.4 kilograms of pulse crops per person per year, or 9.1 grams per day. At an average of 24% protein, this therefore means that the Iranian people obtain about 2.2 grams of protein per person per day from pulse crops. Against a basic requirement of about 10 grams of pulse protein per person per day, this indicates the degree of dietary deficiencies which occur.

The country of Jordan, to cite another example, produced an average of 12,500 tons of lentils, chickpeas, and broadbeans per year between 1958 and 1964. With a population of about 2 million, this provided about 17 gram of pulse crops, or 4.1 grams of protein per day per person, almost twice th of Iran, but still not sufficient.

These then are some of the reasons why we are here. The Regional Pulse Improvement Project was first proposed in 1963 to the governments of some 15 countries in Asia. Iran and India were chosen as the locations for the two centers where research on varietal improvement, disease and insect control, and cultural and management practices would be concentrated.

We have a staff of six American and twelve Iranian technicians working here, who will be your hosts during the next few days. In addition to the work you will see here, our activities extend in Iran in cooperation with th Ministry of Agriculture and the Pahlavi University in Shiraz.

We are pleased to see you all here, and look forward to a useful and pleasant exchange of information and ideas during this conference.

After this, the opening session was adjourned.

The group was then taken on a tour of the facilities of Karaj College, guided by Vice-Dean for Administrative and Student Affairs, Dr. Hejazi.

After this tour, a film was shown, produced by Asgrow Seed Company and entitled "First the Seed." It showed the complete process from research toward development of a new variety through the testing, seed increase and production phases, including quality control and industrial processing of such crops as beans, peas, corn and various vegetable crops.

The delegates were then entertained at a luncheon by the College.

No formal programs were scheduled for the afternoons. They were left open for individual or small group consultations and discussions.

Tuesday and Wednesday, August 9 and 10, 1966, were spent on the Karaj College Farm, viewing the pulse crop research plots. Highlights of the work seen during these days were:

BREEDING AND VARIETAL IMPROVEMENT

Crops: Chickpeas, mungbeans, dry beans, and cowpeas.

Observation and screening nurseries, consisting of single rows, six meters long, including approximately 4,000 chickpea types, 3,500 of beans, 1,000 of cowpeas, and 1,000 of mungbeans. These include a wide range of plant types and growth characteristics. Seed for these originated in many different areas in the world.

Note-taking on characters of possible importance in testing and breeding programs was discussed. Procedures followed in obtaining information on such characteristics as plant vigor, flowering date, maturity of first pods and total maturity, disease resistance, and pod and seed size were outlined.

Discussions were held to establish uniform varietal trials of chickpeas, beans, and lentils in several countries to obtain information on variety-location interactions. This will also give information on the total area to which any potential new variety developed in the research program may be adapted. Proposals for this testing program will be sent to the countries in the near future.

The large-seeded white chickpea varieties grown commonly in Near and Middle East countries were of particular interest to participants from India, where this type is not known.

Yield trials include preliminary and advanced trials in all crops. The differences between these as well as the plot layout, experimental design, and data obtained were explained for each crop.

Copies of Progress Report No. 3 for the 1965 Season, as well as the Report of the 1965 Plant Introduction Observation Nurseries, were distributed.

ENTOMOLOGY

Mr. Gibson introduced the entomology phase of the workshop with a broad general discussion of the purpose of the entomology work in the Project.

A. Entomologists have two basic responsibilities:
   1. To determine the cheapest, safest, and most effective pest control practices for pulse crops. (This includes investigations on chemical and biological control, or a combination of both, and studies involving life cycles and pest collections.)
   2. To provide other Project disciplines protection from pests which might interfere with their investigations.

Engineer Karim Kamali led the discussion on chickpea work.

A. Yield tests and nurseries were sprayed for protection against *Heliothis sp.* and *Spodoptera exigua*. DDT-Lindane combination was applied June 2, with knapsack sprayers at a rate of $1\frac{1}{2}$ kilograms of DDT to 500 liters water per hectare. Application was conducted on first appearance of *Heliothis* larvae, which coincided with the emergence of the first chickpea pods.

B. Experimental work on chickpeas was conducted for *Heliothis sp.* Seven treatments were used with 4 replications of each treatment. Complete randomization of 4-row plots was used. Results were obtained by harvesting only the two middle rows of each plot, and selecting at random 10 plants for evaluation of damaged pods. In addition, yield tests will be taken for further evaluation.

Treatment Number	Material (per hectare)	Percent Damage
1.	1 Kg. DDT + 300 gm. Lindane	1.28
2.	2 Kg. DDT + 600 gm. Lindane	1.78
3.	½ Kg. DDT + 150 gm. Toxaphene	4.22
4.	1 Kg. DDT + 300 gm. Toxaphene	2.07
5.	1 Kg. Sevin	0.74
6.	2 Kg. Sevin	1.44
7.	Untreated check	3.91

Mr. Gibson introduced the work on dry beans with a general discussion of the dry bean pest complex. Mites, jassids, beet armyworm, and aphids are considered to be of major importance, but future observations may add to this list.

In addition, protection work was discussed.

A. Protection from beet armyworm was provided for the yield tests and nurseries. A DDT-Lindane combination was applied at a rate of 1½ kilos DDT + 500 grams lindane per hectare.
   1. In early August, rapidly increasing populations of jassids and mites necessitated further protection sprays for the yield tests and nurseries.
   2. Diazinon at 600 grams per hectare, Malathion at one kilo per hectare, and Dimethoate at one-half kilo per hectare were applied for control.

B. Dry bean investigations: Engineer Karim Kamali discussed in detail the aphid investigations conducted on dry beans.
   1. Seed treatment before planting was conducted using treatments with 4 replications. One month after planting, plant samples were taken from 10 plants in the two middle rows of each plot. Aphids were counted and registered in severity by degrees from 0 to 5 for each plant.

0 = No aphids
1 = 1 - 10
2 = 10 - 20
3 = 20 - 50
4 = 50 - 100
5 = 100+

Treatment No.	Material
1.	Dimethoate 4 oz./100# seed
2.	Dimethoate 8 oz./100# seed
3.	Untreated check

Results showed populations ranging from 4.2 to 8.5 as measured by these index figures. In addition, yield tests will be obtained for further evaluations.

2. Foliar sprays were applied to compare the effects of seven different treatments. Four replications were used.

Treatment No.	Material
1.	Diazinon 500 gm./ha.
2.	Diazinon 750 gm./ha.
3.	Malithion 1 Kg./ha.
4.	Malithion 2 Kg./ha.
5.	Dimethoate 500 gm./ha.
6.	Dimethoate 1 Kg./ha.
7.	Untreated check

Population sampling was conducted one day before and five days after spraying. A total of 50 leaves were picked from each plot. Populations ranged from 8 to 112 aphids per leaf before spraying. However, five days after spraying, only 11 aphids were counted per plot on both treated and check.

Mr. Wilson discussed in detail Jassid control experiments on dry beans.

3. Dry beans were sprayed for Jassids using seven treatments of 4 replications. Sweeps were conducted at prespray and will be conducted 5 days after spraying. Twenty-five sweeps were made in the two middle rows of each 4-row plot. In addition, yields will be evaluated.

Treatment No.	Material
1.	Diazinon ½ Kg./ha.
2.	Trithion 1 Kg./ha.
3.	Malathion 1 Kg./ha.
4.	Ethion ½ Kg./ha.
5.	Dimethoate ½ Kg./ha.
6.	Sevin ½ Kg. + Tedion 2 Kg./ha.
7.	Untreated check.

4. Experimental control of Jassids on dry beans was conducted using 6 replications of 2 treatments.

Treatment 1 = Dylox, 2 Kg. + Erysit, 640 grams per hectare
Treatment 2 = Untreated check.

Sweeps were made in the two middle rows of each 4-row plot. A total of 25 sweeps per plot was used. Sweeps were made at prespray, and will be conducted at 5 days after spraying. In addition, yields will be evaluated.

Mr. Wilson discussed the general pest complex on cowpeas. Aphids, beet armyworm, and Jassids appear to be the major pests, but later observations may include more species.

A. Engineer Karim Kamali led the discussion on cowpea pest protection.
   1. Protection sprays were conducted on yield tests and nurseries for beet armyworm. A DDT-Lindane combination was used at $1\frac{1}{2}$ kilograms per hectare and 500 grams, respectively.
   2. Later in the season, increasing aphid populations in the nursery and yield tests required control measures. Diazinon at 600 grams to 800 liters of water per hectare was used.

B. Entomology cowpea trials were discussed by Engineer Kamali.
   1. A total of 7 treatments were applied with 4 replications each for the purpose of testing various pesticides on beet armyworm. Results were obtained by taking 50 leaves from each plant and recording the feeding of the beet armyworm. Feeding damage was given a rating from 0 (no damage) to 5 (very severe). Damage ranged from 0.57 to 0.88, with no significant difference in treatments.
   2. An additional trial was conducted on cowpeas. Diazinon was applied at the rate of 600 grams per hectare for aphid control. Populations ranged from 30 to 747 per 50 leaves before control, but both check and treated plots averaged 2 aphids per 50 leaves after treatments.

Detailed results of all trials will be described in Project Progress Reports at later dates.

SOILS - AGRONOMY

The Soils-Agronomy phase of the program is concerned with crop and soil management problems, such as fertilization, irrigation, planting procedures, and rhizobia inoculation. Work is being done on each of the five major crops under study at this location, although emphasis is placed on cowpeas, dry beans, and chickpeas.

Date of planting. This experiment is in 6 replications with each plot 6 meters long and 5 rows wide. Plant dates were as follows:

1. Lentils - March 12, 29, April 16, and May 3.
2. Chickpeas - March 26, April 14, May 3 and 21.
3. Dry beans, cowpeas, and mungbeans - May 3, 18, June 1 and 16. Two earlier plantings of these 3 crops were unsuccessful because of damage by seed corn maggot and disease.

No apparent growth differences were observed for the lentils and chickpeas, but the first plantings of cowpeas and mungbeans had less vegetative growth than the later plantings. Leaves dropped prematurely from the first and second plantings of dry beans. Regrowth then occurred.

Plant population density. Variables include spacing between rows and between plants within the row. Plots are 5 meters long and 4 rows wide, and arranged in 6 replications. Row spacings are 50, 60, and 75 centimeters, and plants are spaced within the row to give 100,000, 200,000, 300,000, and 400,000 plants per hectare. Dry beans, chickpeas, and cowpeas are the test crops. Certain growth characteristics, such as pods per plant and seeds per pod, will be determined, in addition to seed yield.

Observations to date reveal greater plant height and more complete filling of the space between rows, with an increase in population density.

Fertilization. The primary objectives of the fertility study are to determine the correlation between soil test values and response to phosphorus fertilization, and the influence of acid-forming compounds on the availability of phosphorus in calcareous soils. Concentrated superphosphate at rates of zero, 50, and 150 kilograms P/hectare were applied, with and without 100 kilograms N (as ammonium sulfate)/hectare, for dry beans and cowpeas. The fertilizer was applied by 2 methods--mixing in the surface soil and banding near the seed. In another experiment, 0 and 50 kilograms P/hectare were combined with 0, 2,000, and 4,000 kilograms/hectare of elemental sulfur (acid-forming compound) for cowpeas. Plots are 5 meters long and 5 rows wide, and are arranged in 6 replications.

Plant growth indicates a positive response to phosphorus fertilization, but additional data are needed to indicate the effect of the acid-forming compounds on phosphorus availability.

Irrigation. This experiment consists of irrigation of cowpeas at 3 levels of soil moisture and 3 stages of plant growth. Plots are 15 meters long and 6 rows wide, arranged in 3 replications. The 3 moisture levels are: (1) high, or when 2/3 of the available soil moisture remains; (2) medium, or when 1/3 of the available soil moisture remains; and (3) low, or when the plants begin to wilt. The 9 treatments are as follows (soil moisture at start of irrigation):

	Plant Growth Stage		
Treatment	Pre-bloom	Bloom	Post-bloom
1.	High	High	High
2.	High	Medium	Medium
3.	Medium	High	Medium
4.	Medium	Medium	High
5.	Medium	Medium	Medium
6.	Low	Medium	Medium
7.	Medium	Low	Medium
8.	Medium	Medium	Low
9.	Low	Low	Low

Plant growth at the bloom stage was greatest when irrigated at the high moisture level and lowest when irrigated at low soil moisture. High soil moisture delayed blooming slightly.

Results of these trials will not be complete until the end of the season and harvest. Final results will be published in future reports.

PLANT PATHOLOGY

During the Workshop Conference, the group saw numerous plant diseases in the RPIP field plots at Karaj College and at the Ministry of Agriculture Experiment Station at Varamin.

Diseases were observed on beans (Phaseolus vulgaris), chickpeas (cicer arietinum), cowpeas (Vigna sinensis), and mungbeans (Phaseolus aureus). Although the lentils (Lens culinaris) had been harvested, the diseases of this crop were discussed and photographs shown to those interested. Project staff offered assistance to anyone who wished to send diseased plant material for identification. This will also help in determining the type, severity, and distribution of major pulse crop diseases.

Beans: Discussion by Dr. Walter J. Kaiser and Eng. Dariush Danesh.

Both virus and root rot diseases have been important on beans in our Karaj plots and virus diseases very important throughout Iran. Common Bean Mosaic Virus (CBMV) has been found in numerous bean varieties. This virus is particularly important because it is seed borne and can be introduced into new areas just by planting infected seed.

In the Pathology bean plots at Karaj, tests were set up to determine the incidence of virus diseases, including CBMV. Eight bean varieties were planted, using both certified seed from the U. S. and seed from local sources. One month after planting, the incidence of virus diseases (mainly CBMV) was found to be over 20% in some local varieties, but almost nonexistent in varieties from certified seed. The importance of high quality disease-free seed therefore was pointed out and discussed.

Bean root rot became important mainly after flowering. Infected plants are stunted and yellow, and generally lose their leaves much sooner than healthy plants. Seed production is often poor because pods usually dry up prematurely. The root system is sparse and existing roots become discolored or rotted. Isolations have yielded primarily Rhizoctonia solani, which is a well-known root rot pathogen.

Soil fumigation experiments with methyl bromide (2 lbs./180 sq. ft.) were conducted in the Pathology bean plots at Karaj. The fumigant was injected beneath a polyethylene cover which covered the treated plot area. Covers were removed in 48 hours, and the plots planted after 14 days. Weed control was excellent in the fumigated plots, but growth of the bean plants was greatly retarded and the plants were yellow in color. Nitrogen was applied to half of each fumigated plot, but there was no response in plant growth. It appears that beans are extremely

sensitive to the bromine which is left in the soil after fumigation with methyl bromide.

Chickpeas: Discussion by Dr. Walter Kaiser and Eng. Dariush Danesh.

This year a virus and root rot disease were of economical importance in various regions of Iran, including the Karaj area. The virus disease was particularly prevalent on younger plants, whereas the root rot problem was generally most noticeable after flowering.

Virus-infected plants are stunted and yellow in color, and the phloem is discolored. Many of the infected plants are killed and those which survive generally do not flower and produce pods. In one large chickpea planting (over 16,000 plants) at Karaj, approximately 10% were virus-infected. Aphids appear to be transmitting the virus to chickpeas from nearby virus-infected alfalfa. The chickpea virus seems to belong to the Alfalfa Mosaic Virus group. It has been transmitted to other leguminous plants in greenhouse studies.

Plants infected with root rot are usually stunted and yellow in color, and the xylem is often discolored. The plants have a sparse root system and existing roots are discolored or rotted. Various fungi have been isolated from discolored roots, such as *Rhizoctonia solani*, *Pythium sp.* and *Fusarium spp.* Pathogenicity tests will be conducted to determine which fungi are pathogenic to chickpeas.

Cowpeas: Discussion by Dr. Walter Kaiser and Eng. Mahmoud Okhovat.

The most important diseases of cowpeas in Iran this year were caused by viruses. We have isolated two distinct viruses. The most common encountered one has been found in many areas of Iran. The virus is present in numerous cowpea varieties and appears to be seed borne. Infected plants are usually stunted and symptoms on leaves are mosaic, deformation, and blistering. The virus has been transmitted to healthy cowpeas and beans.

The other virus, of which a few cases have been encountered in the Karaj plantings, causes infected plants to turn yellow. Leaves may exhibit yellow mottle symptoms. In preliminary studies, this virus has been transmitted to healthy cowpea plants.

Mungbeans: Discussion by Dr. Walter Kaiser and Eng. M. Okhovat.

A virus disease has been found in different areas of Iran, including Karaj. A root rot and root knot nematode disease were more limited in distribution, being confined mainly to the Karaj-Varamin area. The virus is present in many mungbean varieties, and appears to be seed borne. Leaves of infected plants often exhibit symptoms of deformation, blistering, and mosaic.

Plants infected with root rot are stunted and turn a yellowish color. The plants often defoliate much sooner than healthy plants. Roots are discolored and rotted. Various fungi have been isolated from the roots of infected plants, such as Rhizoctonia solani and Fusarium spp.

In scattered areas at Varamin, plants infected with root knot nematode have been found. Infected plants are an off-color and the roots are covered with nematode galls. Numerous small white female root knot nematodes could be seen with a hand lens when a cross-section was made through a gall.

Lentils: Discussion by Dr. Walter Kaiser.

A root rot disease was of extreme importance in the Karaj plantings. Numerous varieties were infected and many were killed by the disease. Infected plants were stunted and yellowish in color. Plants generally began drying up and eventually died, often before producing mature seed. Roots were poorly developed and either discolored or rotted. Isolations from these roots yielded Rhizoctonia solani, Pythium sp., and Fusarium spp. With the advent of hot weather, Macrophomina phaseoli, a root rot pathogen which thrives under high temperatures, was also isolated.

Lentil plantings observed in other locations, such as Varamin and Ghazvin, showed little or no disease symptoms, even though the varieties were the same in many cases. Opinions were expressed that cultural practices during the growing season, such as method and frequency of irrigation, might affect the severity of the disease. This will be investigated both in greenhouse and field studies.

A virus similar to the chickpea virus was found scattered through the lentil plantings at Karaj. Leaves on infected plants were twisted and deformed, and some had mosaic symptoms. The virus has been transmitted to other leguminous plants.

On Thursday, August 11, the group visited the Ministry of Agriculture Research Station at Varamin, about 45 kilometers southeast of Tehran.

After remarks of introduction to the Station activities by the Director, Engineer Rubabi, a tour of the Station farm, particularly of pulse crop trials, was made. Chickpeas, lentils, and beans had been harvested and only cowpeas and mungbeans were left in the field. In all crops, trials included joint yield tests, made up of entries from both Pulse Project nurseries and the Ministry of Agriculture, and various advanced and preliminary yield trials of only indigenous Iranian strains. The joint entry yield trials were grown at both Varamin and Karaj, and the similarities and differences in performance between the locations were observed and discussed.

Particularly in cowpeas, it was noted that Iranian strains are more vegetative in contrast to strains from other countries contributed from pulse project stocks which at this stage of development have more pods formed and appear to be earlier in maturity.

In mungbeans, one strain in particular attracted considerable interest, because of its heavy pod-set and early maturity. It was Strain Number 16 (31569) obtained from the U.S.D.A. collection. After refreshments were served, and a conducted tour of the cotton quality testing laboratories, the first workshop of the Regional Pulse Improvement Project was officially closed.

The following is a translation of an article about the RPIP Conference appearing in Iranian newspaper, Mehr Iran, Issue No. 2665, Wednesday, August 10, 1966 (Mordad 19, 1345).

KARAJ IS CENTER OF PULSE PROJECT IN IRAN

Illustration Caption: Dr. van Schaik is speaking during the opening Seminar. Engineer Khadivi, the Under-Secretary of the Ministry of Agriculture, Engineer Riahi, Dean of the Karaj College of Agriculture, and Professor Schaybani, head of the Horticulture Department of the College are seated beside the speaker's rostrum.

Dr. van Schaik, leader of the pulse crop project and an outstanding engineer of American agriculture, placed the following information at our disposal.

The Seminar will place the Project under study for a period of four days. Besides Iranians, Indian and Afghan representatives are attending the conference. One year has elapsed since the beginning of the Project. Eight American specialists help in the implementation of the Project.

The Project will be studying improvement of pulse crops through research from the standpoint of the improvement in genetics and breeding, plant diseases, entomology, and pathology. Seeds are imported from all parts of the world--America in particular--and studied in Iran, which is the center of the Project.

At present, 4,000 varieties of chickpeas, 2,000 varieties of cowpeas, 1,000 varieties of lentils, and 1,000 varieties of mungbeans are being grown and studied. After experimentation here, these varieties are sent for study to other Asiatic countries.

Some of these varieties give very good results. Some of them do not show attractive results. The center of the Project is Karaj, but studies are also being made in Varamin, Meshad, Rezaieh, Isfahan, Shiraz, and Khuzistan.

The Project will run for a period of at least ten years, and the results will be published and placed at the disposal of the farmers by the Ministry of Agriculture.

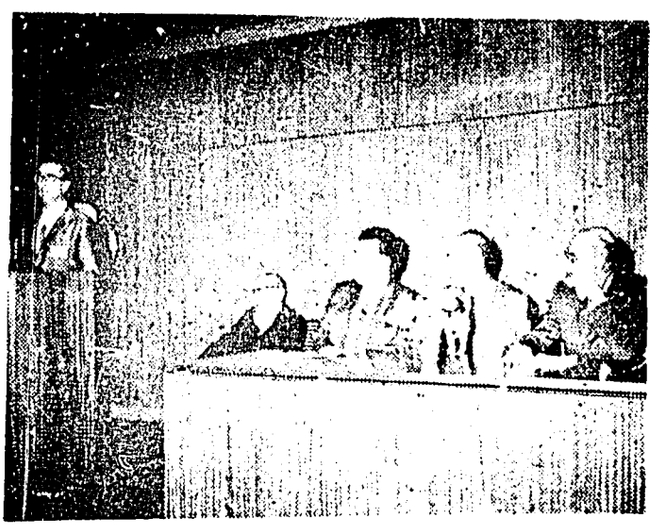
مهر ایران

۶ صفحه ناشر افکار حزب مردم

صاحب امتیاز و مدیر مسئول محسن موقر

۴شنبه ۱۹ امردادماه ۱۳۴۵-۲۲ ربیع الثانی ۱۳۸۶-۱۰ اوت ۱۹۶۶

شماره ۲۶۶۵ تکشماره ۲ ریال



آقای وان چك در جلسه سمینار سخنرانی می کند ، آقایان مهندس خدیوی معاون وزارت کشاورزی - مهندس ریاحی رئیس دانشکده کشاورزی کرج - دکتر شیبانی مدیر گروه باغبانی دانشکده کرج در جایگاه هیئت رئیسه سمینار دیده میشوند

مرکز طرح بقولات ، ایران - کرج است

آقای وان چك مدیر طرح بقولات از مهندسین برجسته کشاورزی آمریکا طی مصاحبه‌ای اطلاعات زیر را در اختیار خبرنگار ما گذاشت سمینار بقولات بمدت ۴ روز طرح بقولات را بررسی میکند نه تنها از کشور ایران بلکه از هند و افغانستان نمایندگانی در این کنگره شرکت دادند یکسال از فعالیت این طرح میگذرد هشت نفر از متخصصین امریکائی باجرای این طرح کمك میکنند این طرح از نظر اصلاح نباتات ژنتیك - بیماری های گیاهی - حشره شناسی - خاك شناسی مورد بررسی قرار میگیرد از تمام نقاط جهان بخصوص از آمریکا بذر وارد می کند و در خاك ایران بررسی میکند البته مرکز طرح ایران است.

واریته‌هایی از امریکا و قبرس و لبنان وارد می کنند تا حال ۴۰۰۰ واریته نخود - ۲۰۰۰ واریته چشم بلبلی ۱۰۰۰ واریته عدس - ۱۰۰۰ واریته ماش وارد نموده و آزمایش میکنند .

این واریته‌ها را پس از آزمایش بسایر کشورهای آسیائی جهت بررسی ارسال میدارند .

یکعده از این واریته ها نتیجه خیلی خوب میدهند .

یك عده نیز نتیجه جالبی بدست نمی دهند . مرکز طرح کرج و در شهرهای ورامین - مشهد رضائیه - اصفهان - شیراز - خوزستان نیز بررسی هایی انجام میگیرد. دانشکده کشاورزی تحقیق میکند وزارت کشاورزی نتیجه تحقیقات را اصلاح مینماید.

این پروژه در مدت ۱۰ سال اجرا میشود در خاتمه نتیجه بررسی‌ها در تمام نقاط ایران بصورت نشریات بوسیله وزارت کشاورزی در اختیار کشاورزان قرار میگیرد.

خبرنگار مهر ایران - کرج

Translation of another article appearing in Mehr Iran, Issue No. 2665, Wednesday, August 10, 1966 (Mordad 19, 1345).

LEGUMES PROJECT SEMINAR AT KARAJ COLLEGE OF AGRICULTURE

The seminar of the pulse crop improvement project attended by American and Iranian specialists, representatives of India and Afghanistan, Engineer Khadivi, Under-Secretary of the Ministry of Agriculture, Dean of the College of Agriculture, and university professors, was opened at Karaj College of Agriculture on Monday, and will last four days.

Engineer Riahi opened the meeting saying:

"I thank all those who have attended the seminar on behalf of the professors of the College and myself.

"This seminar is connected with a legumes project--one of the most valuable projects pursued by the College, the Ministry of Agriculture, the Plan Organization, and American specialists. You are all aware that pursuant to the Revolution of the Shahanshah and the people, agriculture and other activities have taken a wonderful forward leap.

"This Project will extend considerable assistance towards the nutrition of the people of the major part of Asia, which has protein shortages.

"I open this seminar in the celebrated name of His Imperial Majesty, Aryamehr, and before finishing introduce Professor Schaybani, Head of the Horticulture Department, as chairman of the seminar."

Then Engineer Khadivi, Undersecretary of the Ministry of Agriculture, in a comprehensive speech exhalted the white revolution of H.I.M., Aryamehr, and appreciated the objectives of the seminar which aim at improving nutrition in the Middle East and other Asian countries.

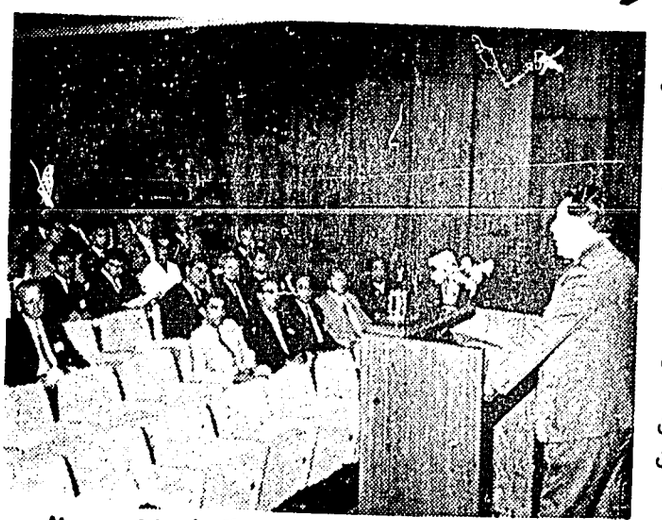
Professor Schaybani, Head of the Horticulture Department of Karaj Agricultural College, and also Dean of the Rezaieh College of Agriculture, thanked the authorities of the Plan Organization for having extended cooperation towards the implementation of the Project. He introduced Dr. van Schaik as Chairman of the Seminar, because he had to go to Rezaieh to conduct competitive examinations of the College. The members of the Seminar approved the appointment of Dr. van Schaik.

Then Dr. van Schaik spoke, saying that the world is confronted with food shortages which, considering the increase of populations, can be clearly seen. Concerned authorities must adopt some basic measures for feeding mankind. He said studies are being carried out in this region with legume crops to assist in the efforts to improve the nutritional status of the people.

After adjournment of the opening meeting of the seminar, the participants, guided by Dr. Hejazi, Deputy-Dean of the College, visited the different parts of the faculty.

Illustration Caption: Engineer Khadivi, Under-Secretary of the Ministry of Agriculture, speaking during the opening session of the seminar.

سمینار طرح بقولات در دانشکده کشاورزی



آقای مهندس خدیوی معاون وزارت کشاورزی در حال سخنرانی در جلسه افتتاحیه سمینار

ازروز دوشنبه سمینار طرح بقولات بمدت چهار روز باشرکت متخصصین ایرانی وآمریکائی و نمایندگان کشور هـای هند و افغانستان باحضور آقای مهندس خدیوی معاون وزارت کشاورزی رئیس دانشکده کشـاورزی و اساتید دانشگاه در دانـشکده کشاورزی کرج تشکیل گردید.

ابتدا آقای مهندس ریاحی طی بیاناتی اظهار داشت:

ازطرف خودوقاطبه استادان دانشکده ازتشریف فرمائی آقایان باین سمینار تشکر می نمایم.

این سمینار مربوط به طرح بقولات است، یکی ازارزنده ترین طرح هائی که با مساعی کامل دانشکـده وزارت کشاورزی • سازمان برنـامه • متخصصین آمریـکائی تعقیب می شود همه آقایان اطلاع دارند دراثرانقلاب شاه و مردم کشاورزی و سـایر فعالیت ها جهشی عجیب بجلو کرده است.

این طرح به تغذیه جمعیت قسمت بزرگی ازآسیا که باکمبود پروتئین مواجه است کمك شایان خواهد کرد.

این سمینار را بنام نـامی شاهنشاه آریامهر افتتاح می کنم و قبل از خاتمه عرایضم آقای دکتر شیبانی مدیرگروه بـاغبانی را بسمت رئیس سمینار معرفی می- نمایم.

آنگاه آقای مهندس خدیوی معاون وزارت کشـاورزی طی بیانات مشروحی ازانقلاب سپید شاهنشاه آریامهر تجلیل کرد و هدفهای سمینار راکه ازدیادمواد غذائی درخاورمیانه و ایرکشور های آسیائی است موردستایش قرار داد.

افغانستان نموداراست ما بایستی برای تغذیه بشرفکراساسی داشته باشیم.

درباره طرح بقولات دراین منطقه بررسی می کنیم تابتوانیم گامی برای تغذیـه جمعیت روز افزون آسیا بردارایم.

آقای دکترشیبانی مدیـر گروه باغبانی دانشکده ورئیس دانشکده کشاورزی رضائیه از مقامات سازمان برنـامه که به اجرای این طرح کمکهای قابل توجهی می کنند تشکر کرد و از اینکه مجبور است برای انجام کنکوردانشکده رضائیه عازم آن شهرستان شود، ضمن سپاسگزاری آقای وان چك را بسمت رئیـس سمینارمعرفی کرد که موردتصویب اعضای سمینارقرارگرفت•

آنگاه آقای وان چك مدیرطرح ازمهندسین آمریکائی اظهارداشت دنیا بافقرغذائی مواجه است با توجه بازدیادجمعیت کمبود مواد پروتئین ازکشور هـای آسیائی بخصوص از کشور های هند و

در خـاتمه جلسه شـرکت کنندگان سمینار براهنمائی آقای دکترحجازی معاون دانشکده از قسمت های مختلف دانشکده بازدید کردند.

خبرنگار مهرایران ـ کرج

KAYHAN
INTERNATIONAL EDITION

(Vol. VII) No. 2123. Tehran, Thursday, August 11, 1966. (Mordad 20, 1345). Price: 5 Rials.

AGRICULTURAL SCIENTISTS MEET IN IRAN

A group of agricultural scientists from seven nations are meeting at the Karaj Agricultural College to conduct research on pulse crops — peas, beans, lentils — to shorten what they call "the gap between what the people of Asia now eat and what they can and should eat to keep healthy."

Represented in the regional pulse improvement conference are scientists from Iran, Turkey, Pakistan, Egypt Afghanistan, Jordan, Lebanon and the United States.

The first of its kind to be called for this region, the conference is sponsored jointly by the Ministry of Agriculture, Tehran University and the U.S. AID Mission to Iran.

Iran is a centre of research in this field. The U.S. Department of Agriculture is co-operating in the work of the centre which was opened two years ago.

Opening the four-day conference, Iranian Undersecretary of Agriculture Hoseinqoli Khadivi said meetings of this nature "are of utmost importance to the development of agriculture in Iran which is being pushed forward vigorously under the principles of the 'White Revolution.'"

Dr Peter H. Van Shaik of US/AID, chairman of the conference, said that in the past co-operative efforts on the part of the U.S. with developing nations had mostly taken the form of "action programmes" designed to bear immediate results.

"Recently, however," he said, "the realisation has grown that for long-range results considerable research must be done in local environments to gain technical knowledge useful to and applicable in a particular country."

The aim of the project is to promote research on the improvement of the varieties of crops, on disease and pest control and on the best techniques to help increase production of grain legumes in the Near East and South Asia.

Tehran Journal

(VOL. XII) No. 3636 TUESDAY, AUGUST 16, 1966 (MORDAD 25, 1345) PRICE 5 RIALS

LOOKING FOR WAYS TO FEED FUTURE GENERATIONS

WITH THE recent example of a hungry India not far away and the population problems of countries such as China, Iran is looking ahead and planning to be self-sufficient in food products within 15 years.

There are two ways to go about feeding the increased future generations: either to increase the land under cultivation, or to increase the yield of land already cultivated. The former system in Iran has so far lagged because of a lack of irrigation, but with new dams being completed, many hectares of good soil which lay idle because of a dearth of water will soon be giving Iran more food.

A better yield of presently cultivated lands requires experiment with different strains of crops and combating diseases which often render crops useless at the last moment. A seminar this week at the Karaj Agricultural College, which was attended by scientists from seven nations, was one of the first important steps toward the world food problem. Concentrating mainly on pulse crops the scientists introduced some facts and figures that in practice will assist countries suffering from food problems and forestall such problems in Iran.

Large Part

Presently a large part of the world has food problems because of inflating populations and poor agricultural systems. For example, some tribes in Africa rely to a great extent on small patches for growing beans and lentils while many South American nations, though having productive soil, have the encroaching jungle to combat. The world population in 1960 was over 3 billion and with the present 1.8 per cent yearly increase will reach 36 billion by 1970. Few people really seriously think that feeding 0.6 billion can be a problem but this figure written in full reads 600,000,000 an impressive increase.

There are about 13.2 billion hectares of land in the world and only about a third 2.5 billion is considered agricultural land while only 1.4 billion hectares are actually arable. Eventually with fully-utilized land reaching its capacity, the problem of optimum yield will prove the only solution. It is to this that the Karaj seminar is looking ahead.

Even Iran, which as yet has a relatively low population ratio to the land available, is faced with a food problem, having to import wheat and other products. Presently there are about 126,000 hectares of combined pulses grown in Iran giving a daily average of 901 grams of pulse crops (beans, peas and lentils) per person. The protein content of pulses averaging at around 24 per cent, give Iranians an average of 2.2 grams of pulse protein while the adequate estimated is 10 grams of daily protein. Such a deficit in nutrition adequacy is very often made up from cereal crops and Iran has the advantage of growing large quantities of rice.

One of the results of conferences such as the Karaj seminar, apart from helping feed the world, will be the gradual elimination of inferior strains of food crops. If an experiment shows that Cyprus Chicken Peas give a 40 per cent higher yield than the common Iranian variety, then shortly farmers will introduce these peas instead. Lebanese Cow Peas also give a 21 per cent higher yield than their Iranian counterpart. If for no other reason, farmers would soon adopt them for higher profits once they learnt this fact.

While many countries are beginning to look to the sea for future food requirements, there are still many improvements to be made on the land. It is however not sufficient just to improve the yield for crops have many natural enemies such as blight and worm plagues. A farmer who is smiling with contemplation of a fruitful harvest can be in tears the next day because of locusts. Conservation and protection of crops must also go hand in hand with such experiments.

As more and more countries take a closer interest in the nutritional situation of their people, conferences such as the Karaj one will become commonplace and instead of national farming co-operatives, there might be international ones.

A.R.P.

TOUR—A group of agricultural scientists from seven nations tour the Karaj Agricultural College while here to study ways and means of improving pulse crops—beans, peas, lentils and so on. The aim of the project—sponsored by the U.S. Department of Agriculture—is to increase food productions for the peoples of the Near East and Asia.