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6080058 Morocco (7) Key Wheat

CEREAL PROJECT ACTIVITIES 1968-1969

SUMMARY

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I. Objectives and Organization

The over-all objective of the Increase in Cereals Project is to increase Moroccan wheat production by 50% by 1974, representing virtual self-sufficiency. This objective is to be attained through the increased use of fertilizer, the development of high-yielding varieties capable of maximum response to fertilizer, and the training of Moroccan personnel to conduct an integrated program of research, seed multiplication, and extension. The "Operation Fertilizer" program, started in 1966, encouraged the increased use of fertilizer on local varieties through the use of credit and extension programs. This program did not, however, address the problems of research into varietal development, fertilizer use, and cultural practices.

Based on the positive results from the importation of seed of various semi-dwarf Mexican varieties into India, Pakistan, and Turkey, it was decided to import 500 MT of these varieties for planting in Morocco in 1968-69. Although only very limited test results over two years were available for these varieties in Morocco, the results obtained in the above-mentioned countries, as well as the experience with some 400 hectares of these varieties in Tunisia during 1967-68, indicated a probable similar success in Morocco.

The importation was divided among five varieties, as follows: 250 tons of the variety Siete Cerros which had been the best yielder in the Moroccan trials; 100 tons each of Inia and Tobari; and 25 tons each of Penjamo and Norteno. The short-term objectives of this seed importation were to increase seed of these varieties, demonstrate their yielding ability to farmers throughout the country, and to train a core of Moroccan personnel in the conduct of an integrated wheat production program.

In order to coordinate the various activities of the program, a Wheat Committee was organized in the Ministry of Agriculture. This committee, headed by the Director of Studies and Economic Affairs, was composed of representatives from the Ministry of Agriculture's Divisions of Studies and Economic Affairs, Agronomic Research, Agricultural Extension, and USAID.

Technical expertise to be furnished by the U.S. included an Agronomy Advisor responsible for over-all coordination, three Agronomy Advisors (Cereals) to assist with the extension/production aspects, and two Research Agronomists to assist with national research programs.

The Research Agronomists were to be provided from CIMMYT, the developers of the semi-dwarf Mexican varieties, through a regional contract which also supplied similar personnel to the USAID-supported wheat program in Tunisia.

The direct-hire Agronomy Advisor was already on-board while the three Agronomy Advisors (Cereals), two provided through a contract with the Near East Foundation, and one CIMMYT Research Agronomist arrived between late July and early November.

Although part of the seed arrived in late August, the varieties Inia and Tobari were not landed at Casablanca until near the end of November. As it developed, the unusual weather conditions actually favored later planting dates and the delayed arrival was not as serious as first expected. Vehicles and some farm equipment arrived in time to be used but much of the research and demonstration work had to be done with locally-available equipment. Most of the agricultural extension equipment and materials arrived too late to be used during the 1968-69 season and were stored for use during the coming year.

II. Observations

Mexican wheats were bred to perform well under dry and semi-arid conditions. Normally, they should be ideal for Moroccan conditions. However, Morocco experienced one of the wettest planting and growing seasons on record. Rains were heavy and frequent, and sunshine was limited. Total precipitation throughout the wheat area averaged nearly 50% above normal. The rains prevented adequate seedbed preparation, upset planting schedules, prevented farmers from applying herbicides, encouraged unprecedented weed growth, and created ideal conditions for a massive outbreak of *Septoria* leaf blight which was especially damaging to the Mexican varieties which have little resistance to this disease. A number of fields of Mexican wheat were a total or near total loss, particularly those planted to Siete Cerros. (Local varieties were generally more resistant to *Septoria* though they are notoriously susceptible to rusts. However, climatic conditions did not favor rust development.) *Septoria* also struck at a time when Mexican wheats were heading and, thus, most vulnerable.

The Hessian fly, of little importance in other countries where Mexican varieties have been grown, caused considerable damage in many fields.

Farmers cooperated fully and tried, in spite of the weather, to follow recommended practices. These included plowing, disking, sowing with grain drills, chemical weed control, and generous application of fertilizers. Had the weather been one of normal rainfall, many farmers would have realized bumper crops.

III. Results

A. Research

The Moroccan Agricultural Research Division conducted field trials at nine locations, eight of which were dryland plots and one of which was irrigated.

A Mexican variety, Siete Cerros, led in the irrigated trial, producing 58 quintals/hectare as opposed to 47 quintals for the average of the Italian varieties.

Mexican varieties outperformed "local" varieties in the dryland plots, averaging 20.1 quintals/hectare compared to 16.5 for the local varieties. Only the Italian varieties were higher rated, averaging 25.4 quintals/hectare over the eight locations. Climatic conditions contributed heavily to the relative success of the Italian varieties. They are rather susceptible to rusts which were not important this year, but are resistant to Septoria.

B. Demonstrations

In the demonstration field trials, laid out in one hectare per variety plots, two Mexican varieties tied for top place, followed by an Italian variety, then by the other three Mexican varieties. "Local" varieties were the lowest yielding. Mexican varieties average 21.85 quintals/hectare, while local and Italian varieties combined averaged 16.54. Demonstration trials were conducted at five locations by the Extension Service under supervision of American Agronomists. In four of these, the top yielder was a Mexican variety. Mexican varieties also ranked second and third in three trials.

The Extension Service also conducted a number of smaller demonstrations throughout the country. Results of these are not yet available.

C. Production Results

Although complete results are not as yet available from all participating farmers, the information presently available suggests the following conclusions:

1. Average yields of local varieties are not expected to exceed 7 quintals/hectare this year. Total Moroccan wheat production is expected to be about 50-60% of last year's crop.

2. Over-all average yield of Mexican varieties was about 12 quintals/hectare.

3. Siete Cerros did extremely well in the southern and eastern regions with an average yield of over 20 quintals/hectare, moderately well in the central region with yields of approximately 12 quintals/hectare, and averaged 5 or less in northern areas where Septoria was most severe. Individual yields of up to 32 quintals/hectare were recorded in southern areas.

4. Tobari had the best over-all yield with an average of 18 quintals/hectare and performed consistently well in all areas of the country.

5. The yields of Inia were highly variable, ranging from an average of 28 quintals/hectare in the south (and in certain late planted fields in the north) while in the remainder of the country yields were about 10 quintals/hectare. Individual yields of 31 quintals/hectare were recorded in the Tadla and Kenitra areas.

6. Penjamo averaged about 13 quintals/hectare and performed consistently well in all areas. Best recorded was 30.5 quintals/hectare in the Casablanca region.

7. The performance of Norteno resembled that of Siete Cerros with highest average yields in the south and poorest performance in the northern areas. Over-all average yield was about 12 quintals/hectare with an individual yield of 29.4 reported from the Tadla.

Total Seed Production

Final figures are not yet available. All farmers have not yet delivered and all seed has not yet been cleaned. However, as of 21 August, a total of 21,600 quintals of clean seed with a test weight meeting accepted seed standards had been delivered to the grain warehouses (SCAM's). The breakdown is as follows:

	Quintals
Siete Cerros	5,300
Inia	6,600
Tobari	7,100
Norteno	1,500
Penjamo	1,100
	21,600

An additional 5-6,000 quintals are probably yet to be delivered. It is not certain if all of this seed will meet germination and purity standards.

D. Compensation

In order to determine the extent of the heavy disease losses in the northern wheat-producing areas, the statistical service of the Ministry of Agriculture carried out a field survey on the Mexican varieties following accepted sampling techniques. These results, in the form of estimated yields, allowed the determination of those farmers whose yields were insufficient to recover production costs, estimated to average 560 DH/hectare.

To maintain good relations with the farmers who had willingly cooperated in this special wheat program, Ministry and AID officials agreed to compensate farmers for actual losses suffered.

IV. Recommendations and Future Programs

For the 1969-70 crop year, between 15-20,000 hectares are expected to be seeded to Mexican varieties. The emphasis will be on maximizing the number of farmers who will have experience with these varieties. Consequently, the average

holding per farmer is expected to be much lower than last year with more farmers planting from 10 to 20 hectares rather than 50 or more hectares as was the case last year. It is apparent from the interest already being shown that there should be no problem in obtaining cooperating farmers. Virtually every farmer who participated last season has asked to have seed next year, even those who had complete losses due to Septoria. In addition, many who saw the demonstrations and multiplication fields are eager to obtain seed for themselves.

Extension service personnel in many provinces have already received numerous requests for seed. Casablanca, for example, has requests for some 4,000 hectares, a threefold increase over last year's area. Similar demands are being reported from other provinces, plus requests for seed from provinces which were not included in last year's program.

During the 1969-70 and subsequent seasons, emphasis should be on the following points:

1. Selection and multiplication of varieties fully tested in Morocco and adapted to Moroccan conditions, especially with resistance to Septoria.

2. Conduct of a research program to determine optimum fertilizer levels and cultural practices for the high-yielding semi-dwarf varieties under Moroccan conditions.

3. Conduct of a complete extension program designed to demonstrate to farmers through on-farm trials and demonstrations the values of the varieties developed and the practices determined.

4. Improvement of the Moroccan seed multiplication program to assure adequate quantities of clean seed of improved varieties.

5. Continue training of Moroccan technicians both on the job and elsewhere.

With the arrival of two additional Research Agronomists from CIMMYT, the research staff will be complete and full programs toward points 1 and 2 above will be put into operation. The three Agronomy Advisors already on-board, plus a fourth under recruitment for Fes, will allow a maximum effort toward an extension program. In addition, four Moroccan trainees returning from eight months of training with CIMMYT in Mexico are expected to contribute heavily to the program.

Although 1968-69 was not, perhaps, as successful as had been hoped, it now appears that the total program suffered only a minor setback and can still be expected to meet long-range goals. In fact, in some respects, the experience this last year has had positive results in underlining the problems which remain to be solved. Furthermore, it was far better to learn about the Septoria problem when the area sown to susceptible varieties was still relatively small, rather than two or three years hence when the area involved might have been 50 or 100 times larger.