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PD-AAR-697

ISN 41108

Sudan - C. R. Jackson

We arrived in Khartoum about 8:00 a.m. on February 2 and were met by Dr. James Riley and Abd El Moniem Mohmed El Obeid, agricultural project assistant, USAID, Khartoum. We were taken to the Meridian Hotel and soon thereafter met with Mr. Robert Sweet, agricultural officer, USAID. We discussed the status of agricultural research and research organizations in the Sudan. Mr. Sweet stated that the Agricultural Research Corporation (ARC) has great prestige in research and that the best people in the Sudan wanted to work for this organization. Dr. Riley stated that ARC scientists are grossly underfunded in terms of operating and capital equipment money. Many are just hanging on waiting until funding becomes available .

We next visited the Mission Chief, Mr. Mudge. We discussed very briefly the purpose of our visit and he welcomed our help in any way possible, saying that the country was in bad economic situation and could presently only pay half of the debt service this year, even with more loans.

We had a very stimulating visit with Dr. El Jack, Minister of Agriculture for the Sudan. He expressed a variety of ideas and was well versed in the agricultural situation in the Sudan. The main crops in the Western Sudan are millet, sorghum, and ground nuts. The western portion of the country is mostly rural areas and they need development. Most groundnuts are produced there for confectionery purposes. There are severe drought problems in the western Sudan and the small growers there require more extension work and improved seed. More storage facilities are needed because farmers are eager to produce more. Dr. El Jack mentioned again that the west needs an improved program for seeds.

In the entire country there is a competition between planting time and labor availability as related to cotton and groundnuts. Cotton is particularly grown in the irrigated schemes south of Khartoum in an area called the Gezira. In this same area, 500,000 acres of peanuts were grown in the last few years as a part of a rotation scheme.

Groundnut oil is not used much in the Sudan, rather cottonseed oil has a place in the domestic economy. There is a new mill at Port Sudan for export of oil. Agricultural labor is becoming scarce and expensive because of many competing enterprises.

In the south of the country, the government is concentrating on food crops especially groundnuts. He stated that the Sudan is a semi-continent.

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(Jul 81)

We next visited Mr Kailani who was manager of the Sudan Oilseeds Company, Ltd. This is a government organization established in 1974 as a sole exporter of oilseeds from the Sudan. Mr. Kailani stated that pests and deterioration of seed were the two main constraints to peanut production and utilization in the Sudan. The Oilseeds Company only shells and sorts peanuts. The hand-picked selected (HPS) goes to Europe as whole kernels and the oil stock is sold to foreign mills or to local mills. There are two shelling plants, one is at Port Sudan and one is near Khartoum. The former plant has modern electronic sorting equipment and either has aflatoxin laboratory or uses a contract laboratory in Europe.

Productivity in the Western Sudan seems to have been declining. The low productivity is perhaps due to poor seed and the Barberton variety which has been used for 20 years. Two-thirds of the country's production is consumed in the country as kernels or oil. The Sudan Oilseeds Company is one of the largest exporters of groundnuts in the world and in 1978 it took about 16.8% of the world export trade in peanuts or about 134,000 metric tons of export. The exports were made up of Sudanese groundnut kernels for crushing, high quality HPS which were certified aflatoxin free, and hand-picked selected groundnuts in the shell.

Our next visit was with Department Heads at the Khartoum University. We spent an evening session with them in a round table dicussion concerning peanuts.

Dr. Abdullahi Mohamed Osman El Karouri, Head of the Department of Agronomy, reviewed some of the basic information about peanut cultivation in the Sudan.

Dr. Farah Hassa Adam of the Department of Rural Economy discussed the lack of work that has been done on productivity of groundnuts in the rain fed and irrigated areas of the country.

Dr. Ahmed Hashin Ahared of the Department of Crop Protection was especially conversant with the peanut mottle virus saying that up to 100% of the plants in some fields were affected. The effect of the virus disease on yield was a 14-40% reduction. The virus is aphid transmitted.

Many other comments were made by other faculty members present. They included: Dr. Salah Eldin Osman Mahgoub, Food Scientist in the Biochemistry Department; Dr. Hago Mohammed Abdelmagid, Department of Biochemistry and Soil Science; Dr. Ali Ibrahim Ahmed, Department of Agricultural Botany; Dr. Ahmed Humeida Ahmed, Department of Rural Economy, Dr. Tag El Din El Sheikh Musa Hugo; and Dr. Mohammed Ali Salama.

Some of their opinions concerning the Gezira irrigated agriculture as it related to peanuts were that problems exist with aklaline calcarous soil, role of nitrogen, microbiological nitrogen fixing, microelements, the nitrification of nitrogen in residue, and the need to determine if a foliar carbon source is appropriate. The meeting adjourned after 2 1/2 hours of discussion.

On February 2, 1981, we visited the Food Research Center located near Khartoum University. The Food Research Center is an agency of the Agricultural Research Corporation that has been set up in the Sudan for many years to do agricultural and allied research. We visited with members of the oils, fats, and oilseed products research laboratory. Our host was Abdel Wahab Khidir Ahmed and we also discussed the program with Professor Hahabish. The program of the oilseed products research laboratory has been (1) analytical evaluation of varieties, (2) production and improvement of peanut butter, (3) evaluation of the nutritional value of seed cake, (4) effective storage conditions on the peanut and peanut by-products, and (5) follow-up of the aflatoxin incidence in peanuts. Although these subjects were given to us as a part of the program very little work is evidenced in terms of reports or information. The main reason for this seems to be that the lack of equipment has hampered any real in-depth experimental investigations. The trained personnel at the oilseed research laboratory is certainly in evidence but the funds to do any research are lacking.

While at the Food Research Center we also visited a number of other sections having to do with animal products, canning of fruits and vegetables, and production of millet flour and its baking properties. A large portion of the Food Research Center was built with funds provided by FAO in the late 1960's.

In the afternoon, we visited with people at the headquarters at the Western Sudan Agricultural Research Project which is located in Khartoum and had a long interesting discussion with Dr. James Riley.

On February 3, 1981, we travelled southward to Wad Medani to the headquarters of the Agricultural Research Corporation Research Center. The Station at Wad Medani is called the Gezira Research Station. We obtained a great deal of information from various people. For convenience I will list them in separate paragraphs following the name of the person giving us the information.

Dr. Hassan Mohamed Ishag - In the Sudan in irrigated fields on the Experiment Station, they have obtained yields of up to 3.8 metric tons per hectare. However, the average for the irrigated area in farmers' fields is 700 KG per hectare; in the rain fed non-irrigated areas, the average yield is 300 KG per hectare. In the irrigated Gezira area, they experience losses of up to 45% of

the groundnuts at harvest. A rotation of cotton, wheat, peanut, and fallow is presently used in the irrigated areas. Under irrigation, hand-harvesting is usually the rule because the soils are heavy clays. They are experimenting with a new variety #430AB9G. At present time, no fertilizer is used but they are looking forward to the use in a few years of phosphorous and perhaps potassium. Land preparation in the Gezira is very important and seed beds must be well prepared If not, emergence is drastically reduced. Currently, they are planting on 60 cm beds and getting a plant population of 90,000 plants per hectare. They experience up to 80% yield loss due to uncontrolled weeds. Herbicides are effective and appreciated by farmers but hard currency is in very short supply so pesticides cannot be obtained from the developed world. Several years ago, the Minister of Agriculture formed a groundnut improvement working group composed of research, industrial and commercial interests. This group has not been highly effective in promoting peanut interests.

Dr. El Ahmadi - The variety improvement program in the Sudan is getting some attention but Dr. El Ahmadi suggests that the yield using the present variety could be doubled without much difficulty. The number one use of peanuts in Sudan is for oil. Dr. El Ahmadi suggests that the priority of constraints is:

(1) Screening for oil content He is particularly interested in using the Southern Regional Plant Introduction Station collection for this screening.
(2) Drought resistance for the western part of the country where there is no irrigation.
(3) Resistance to aspergillus flavus.
(4) Adaptation to heavy clays including peg strength and resistance to pod rot and saturated soils.

Dr. Joshi and Mr. Kamal M. El Hafaim - the Plant Propagation Administration under the Ministry of Agriculture operates a seed production program to develop sufficient seed for farmers in the Gezira. Because there are no breeders seed of the variety, Ashford, which is used almost exclusively in the Gezira, the seed production program has selected the best seed that can be found of this variety and has multiplied and certified the seed. They produced 700 tons last year. In the case of Barberton variety, which is used in the non-irrigated western Sudan, 500 acres were raised last year. The seed production program is an FAO project with considerable support from Iraq. About 2,500 acres are under cultivation to raise groundnuts seed for the entire country. A complete seed processing plant will be ready in about one year.

Dr. Tigani - There are no very serious insect pests of peanuts in the irrigated Sudan if the crop is planted at the proper time. However, if the crop is planted late it will be attacked by a greater number of insects, especially termites in the soil. Stored product insects are negligible. Dr. Tigani is also Director of the Gezira Agricultural Experiment Station at this location.

Dr. Mohammed A. Ali - Dr. Ali is the National Coordinator for Plant Diseases and is a Plant Pathologist. The disease situation in Sudan is not serious at the present time. Leafspot developes very late in the season and doesn't do much damage. They have very little information on aflatoxin although a number of experiments have been conducted to try to determine the effects of watering, variety, time of lifting and such variables. The difficulty is that there is no capability for analysis of aflatoxin and the samples from these experiments cannot be analyzed. Rust is rare. Seed dressings of Aldrin-thiram are used and are effective. Rosette is found in the far southern Sudan but not around the Gezira. Other virus diseases are apparently not important. The primary constraint given by Dr. Ali is a lack of even fundamental equipment.

At the end of our discussions, Dr. Ishag summarized the general priorities for research. He applied his priorities to both areas, that is, the irrigated Gezira and eastern portions of the country near the Nile Rivers, and the western rain fed portion of the country. In both areas, breeding peanuts for oil content is a high priority. In both areas, disease surveys are needed and research in mechanization, fertility and.aflatoxin are sought. In the west alone, there is a need for breeding for drought resistance.