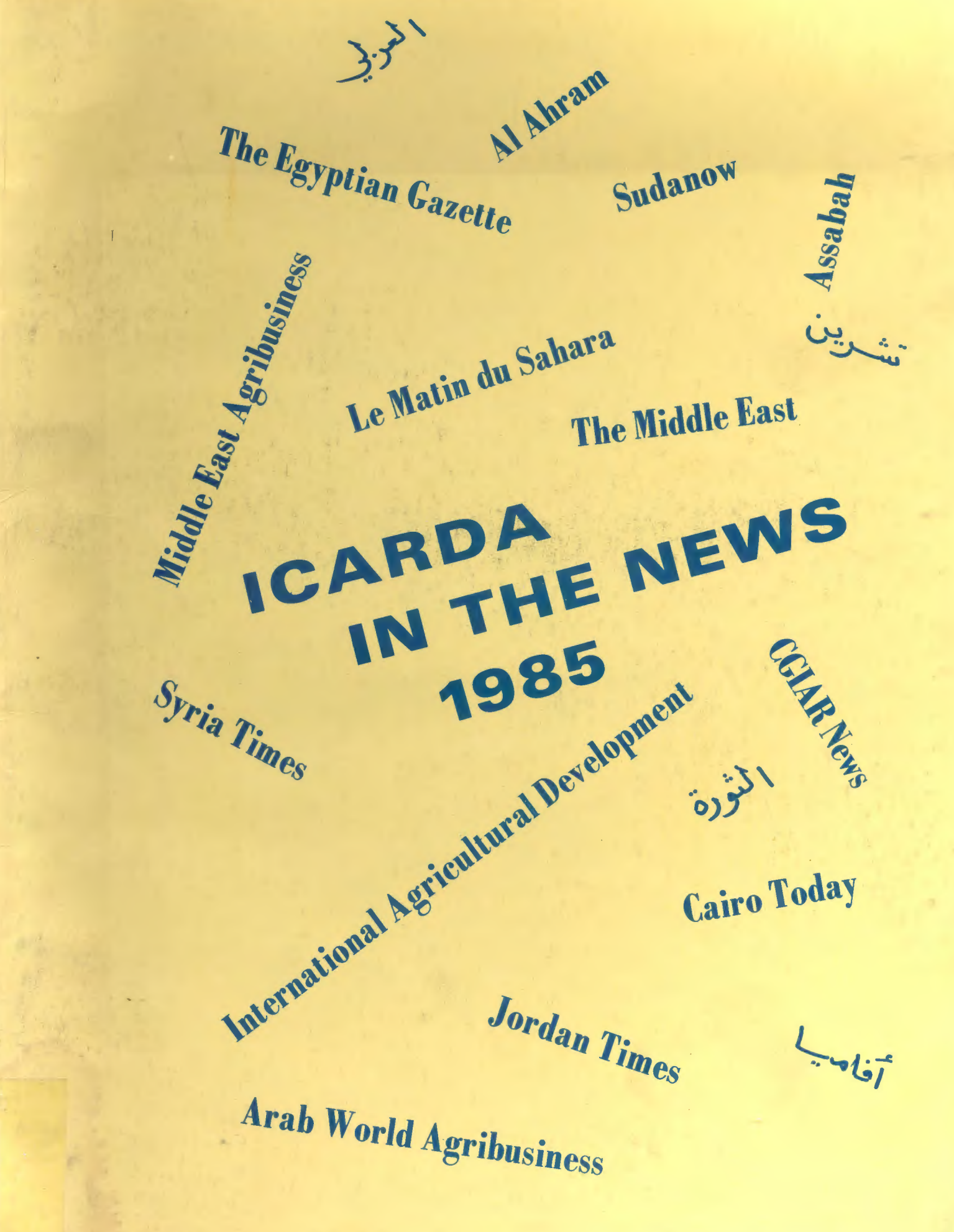
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Vol. 5, No. 9 October, 1985

New barley cultivars for Tunisia

TUNISIA has released three new high-yielding barley cultivars — Taj, Roho, and Faiz. They have better yields and disease resistance than the local cultivars Ceres and Martin. Two of the new cultivars are well-adapted to low rainfall.

Tunisian seed organisations are multiplying enough seed of the new cultivars to plant 5,000 hectares next season.

Barley is Tunisia's second most important cereal crop, grown on 30 per cent of the area devoted to cereals and accounting for 22 per cent of national cereal production. One-fifth of the country's barley goes for human consumption, but barley is also a vital animal feed.

Past agricultural research bypassed barley, which is confined to the country's poorer soils and dry areas. In 1978, however, the National Agricultural Research Institute of Tunisia (INRAT) began a barley improvement programme.

The new cultivars are a result of five years of collaborative work on barley and cereal pathology by INRAT and the International Center for Agricultural Research in the Dry Areas (ICARDA).

ICARDA also supplies Tunisia with durum and bread wheat germplasm for testing in the northern and central parts of the country.

Jordan Times March 19 198[illegible]

Bashir calls for intensified international cooperation in rainfed agriculture

By Monika Warich
Special to the Jordan Times

AMMAN — Although the cultivation of crops under irrigation is of growing importance in Jordan, rainfed agriculture prevails, particularly in the highland areas of Jordan and in order to tackle the difficulties pertaining the rainfed agriculture in arid zones, cooperation with regional and international organisations is necessary and should be intensified, according to Minister of Agriculture Mohammad Bashir.

The minister was speaking Monday at the opening of a conference and workshop on rainfed agriculture at the University of Jordan. The conference is organised by the International Centre for Agricultural Research in Dry Areas (ICARDA), the United States Agency for International Development (USAID) and the Ministry of Agriculture. Delegates from many countries, including Syria, the United States, Egypt, Oman, Kuwait and other Arab countries, Pakistan and West Germany are taking part in the conference.

During the three-day conference, delegates will discuss topics important for the development of rainfed agriculture such as soil and water management, farming systems, grazing animals and the cultivation of crops particularly suitable for arid areas.

Information network

The central point of view in these discussions, however, will be the establishment of an information distribution network for research results on rainfed agriculture potential, Dr. Wilbour Thomas, director of the Near East Bureau of USAID said in his speech in the opening session. The purpose of such a network would be to increase the quantity and quality of rainfed agriculture research and available information, he added.

The Ministry of Agriculture is supporting research in rainfed agriculture and is very interested in expanding the cooperation with regional and international organisations as well as in the introduction of technology from abroad, Mr. Bashir pointed out. Recently, a new library and a documentary centre for agricultural research have been established in the Ministry of Agriculture, he added.

The conference will close on Wednesday with a final review of the proceedings and delegates are expected to issue recommendations for improving agricultural production in the upland areas and arid regions.

Seven for agricultural link-up

Now Libya will be linked to research schemes like Icarda's project in Syria

Libya has become the seventh country to join the Association of Agricultural Research Institutions in the Near East and North Africa (Aarinena).

The association was formally launched at a conference in Damascus at the end of July, under the sponsorship of the UN's Food and Agriculture Organisation (FAO), the International Centre for Agricultural Research in the Dry Areas (Icarda) and the International Service for National Agricultural Research (Isnar).

The first six countries to become members were Egypt, Iraq, Pakistan, Sudan, Somalia and Syria, and regional organisations such as Icarda, Isnar, the Arab Organisation for Agricultural Development (AOAD) and the Arab Centre for the Study of Arid Zones and Dry Lands (Acsad) are also joining. At least eight other countries have expressed an interest in gaining membership.

The association will address one of the most serious obstacles to agricultural development in the Middle East – the weak links between researchers in different disciplines and in different countries. It is to sponsor networks of scientists from various disciplines working on a wide range of crops, and will encourage an exchange of information through seminars and visits.

Aarinena will also help to establish research networks, covering topics such as food field crops, small ruminants and the interrelationship between soil, water and plants.

For the moment, Aarinena is based at the FAO headquarters in Rome. Its secretary-general is Abdel-Wahab al-Mursi, an Egyptian who is the FAO senior agricultural research officer for the Near East.

The association is due to hold conferences every two years, and Al-Mursi says that at the 1987 conference it may be decided to shift its headquarters from Italy to one of the countries of the Middle East.

The president of Aarinena's executive committee is Hassan al-Ahmad, director of research at the Syrian ministry of agriculture, while the vice-president, Dr Zahrawi, is from Morocco.

Syrian villagers milk their sheep. Such farmers are helping ICARDA scientists test new forage crops for improving the supply of sheep feed.

About 60% of the Arab world's meat requirements depend on feed imports. The problem is worsening as human population rises and rangelands deteriorate from overgrazing.

In this article *Lynn Simarski*, the science writer, explains what the International Centre for Agricultural Research in the Dry Areas (ICARDA) in Syria, together with other research organisations, is doing to alleviate the livestock and feed crises.

IN RECENT years, makeshift stands displaying sheep carcasses have appeared along the Aleppo-Damascus highway. Lack of feed has been forcing Syrian farmers to slaughter their sheep and sell them at a loss. An official in the country's fodder organization estimated that Syria's sheep herd had dropped from 13 million at the beginning of 1984 to 8-8.5 million by October — a loss of about 5,000,000 head.

The livestock feed shortage, worsened last year by drought, is not unique to Syria. Half the cultivated areas of the Middle East and North Africa share sheep, forage, and pasture problems that are an important research focus of the International Centre for Agricultural Research in the Dry Areas (ICARDA). Based in Aleppo, Syria, the centre seeks to improve food supply in the Middle East and North Africa through strengthening national research programmes.

The livestock feed shortage — especially acute in winter and spring — is worsening as the human population and food demand rise rapidly in the entire region. Of the Arab world's meat requirements 60% are now met by imports, according to the Arab Organization for Agricultural Development. From Morocco to Iraq, demand for meat may grow at 10% annually over the next two decades, says Dr John Gerhart, a Ford Foundation representative formerly based in Cairo.

But the rainfed areas where much sheep production takes place are deteriorating. "We see alarming signals such as soil erosion, loss of soil fertility, and declining crop yields," says Dr Peter Cooper, head of ICARDA's farming systems research programme.

Past research has largely ignored the complex problems of unirrigated areas. "Climate, soil, and agriculture vary enormously in the region," says Dr Cooper. "There are also great ethnic differences. The farming systems are extremely dynamic, with complicated migrations of people and livestock. A single scientific discipline cannot solve the problems. A systems approach is required which considers both the social and technical aspects of farm production."

ICARDA agricultural economist, Dr Ronald Jaubert, has studied the farming system in Syria's dry lands (areas with less than 350 mm of rainfall a year) where declining agricultural productivity has spurred emigration. Syria's problems reflect those of the region as a whole.

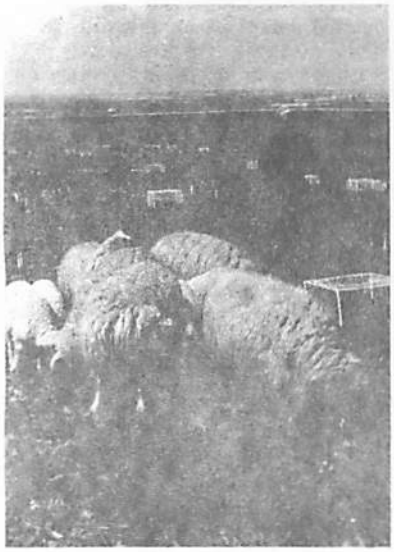
Deserting the dry lands

"In these areas, which have 25% of Syria's rural population, many flocks are sent to the steppes to feed in the spring after the rains," Dr Jaubert explains. "There is heavy grazing, with little effort to maintain soil fertility or stop erosion. Near Deir ez Zor on the Euphrates, dunes are forming: one step toward desertification."

Next to eastern Syria's steppe lands, which can be grazed but are too dry for cropping, is another zone that is still dry but receives enough rain for cultivation. According to Dr Jaubert, when tractors and cultivation extended to this area in the early 1950s, yields were two tonnes per hectare; but barley yields have since dropped by half or more. Now the farmers are lucky to get one tonne in a good year. Overall, he argues, such areas have not contributed to the increased national agricultural production. That has come mainly from lands with irrigation and high rainfall.

One reason is that soil quality has declined. "Agriculture there is a mining activity now — farmers are taking out nutrients and putting nothing back in," says Dr Jaubert. "If degradation continues, it could offset the production gains made in the irrigated areas."

Scientists at the Syrian Ministry of Agriculture, the Arab Center for Studies of Arid Zones and Dry Lands, and ICARDA have linked to work on solutions. "The present system of feeding livestock must be adapted to the land's actual capability," explains Dr Jaubert. "Introducing new



A flock of Awassi sheep in northern Syria. Lack of feed in winter and spring has been forcing Syrian farmers to slaughter their sheep and sell them at a loss.

Shortage of sheep feed in dry areas

forage crops could improve soil fertility and supply livestock feed. Yet we can't expect high and immediate economic returns; stabilizing the farming systems and stopping the decline is a more realistic goal."

Replacing phosphate

At the same time, joint Ministry-ICARDA studies show potential to improve yields of barley, an important feed crop grown on one million hectares in Syria each year. New techniques include adding phosphate fertilizer to soils, improving soil organic matter, and introducing legume crops that add nitrogen to the soil.

"Fertilizer can triple the barley grower's income in some types of cropping rotations," says ICARDA agronomist Dr Dyno Keatinge. "Northern Syria's soils are extremely deficient in phosphate. We've found that adding it can increase yields and reduce crop failures. There's also good scope for better agronomic management. We hope that results of studies by the Syrian Soils Bureau and ICARDA can help the Syrian government to formulate policies to encourage phosphorous use in dry areas."

Studies of sheep feed in Syria by ICARDA livestock scientist Dr Euan Thomson focus on the farmers' conditions as well as the research station. "Agronomic research is often conducted in isolation from livestock research, but our sheep trials combine agronomy with grazing studies," he says. "For three years, we've tested how forage species perform with and without fertilizer and grazing."

Dr Thomson does his trials in farmers' fields in dry areas of northern Syria where barley cultivation predominates. The farmers test whether forage crops such as vetch, *Lathyrus*, and peas can fit into present crop rotations as sheep feed, as well as improve next year's barley by adding nitrogen to the soil. "The farmer's sheep graze the crops, and he is compensated if he loses by testing a new practice, although this has not been necessary so far," Dr Thomson says.

At the other end of the Mediterranean in Morocco, widespread drought since 1980 has necessitated costly grain imports. Scientists from a Mid-American Agricultural Consortium project also report overgrazing and feed shortages in their study area.

They are working on better cereals, water-conserving cropping strategies, and integrated production of grains and forages. Researchers also hope to plant fallow areas with feed forages such as medic and vetch.

Throughout the Maghreb

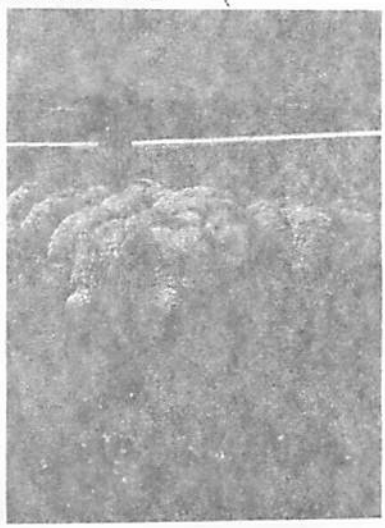
In Tunisia, drought and rural exodus are familiar dilemmas. The 1981 drought hit Tunisian livestock severely, especially sheep and goats. In a survey of the Goubellat area — subject like much of the region to low and undependable rainfall — Tunisian scientists found that most livestock is owned mostly by small, family farmers. Studies in the Baur Rbia area of Tunisia showed that sheep fertility is low, but that better nutrition and management could increase fertility up to 90%.

More research is needed in the entire region on forage crops that can be stored and used during winter when feed is scarce. The initial cost of establishing pasture and forage systems is high, and would probably require government-furnished credit and technical support.

Clearly, farmers must be the focus for the new strategies to succeed. After several years of trials in farmers' fields, ICARDA scientists say that farmers' reactions to new techniques have proved at least as valuable as technical results. "Many of the region's traditional farming systems have a great deal of rationality, so it's not just a matter of "convincing" or "changing" the farmer," adds anthropologist Dr Cynthia Myntii from the Ford Foundation.

But the intricate web of farmers, crops, and livestock rests upon an increasingly fragile base. As Dr Gerhart warns, "areas that have been farmed for a thousand years will disappear from cultivation in 30 years — if sustainable farming systems are not developed."

How many sheep can a medic pasture feed? Grazing trials such as these, on fields with and without fertilizer, are giving the answer.



Faba Beans:

Egypt's Ancient Crop

Faba beans are an ancient crop in the Nile Valley. More than 3,000 years ago, Ramses III was recorded as offering 11,998 jars of shelled beans to the god of the Nile. Today, they are fried for a nutritious snack called **tameya,** *or stewed to make* **medames,** *a popular breakfast in Egyptian and Sudanese villages and cities. Faba beans are also the subject of a very important agricultural research program. Lynn Teo Simarski examines the Nile Valley Project jointly staffed by Egyptian and Sudanese scientists for Cairo Today readers.*

MURTADA SURAJ EDDIN

Egyptian and ICARDA scientists discuss the problems of faba bean farmers.

OVER 120 EGYPTIAN AND SUDANESE farmers are testing new faba bean varieties and growing techniques in a joint effort between Egypt and Sudan to improve and stabilize production of this protein-rich staple of Nile Valley diets. The Nile Valley project, now in its sixth year, aims directly at farmers' fields--mostly small plots worked primarily by hand.

Hassan Ali Hasan, a Nile Delta farmer, grows about two feddans of faba beans every year. "In 1983, I lost three-fourths of my crop because of weeds," he recalls. His bean yields--like those of other Egyptian and Sudanese farmers--often drop disappointingly low.

But for more than a decade, Egyptian agronomists have achieved yields of faba beans more than double those of farmers, who must battle insect pests, weeds, plant diseases, and lack of water.

Narrowing this yield gap is the goal of the project, which is funded by the International Fund for Agricultural Development (IFAD). The International Center for Agricultural Research in the Dry Areas (ICARDA) coordinates the effort and supplies technical assistance. ICARDA, based in Aleppo, Syria, works generally to increase food supple in the Middle East and North Africa.

Cooperation--between countries, farmers, and scientists--is a hallmark of the project, which has spawned an international network of expertise on faba beans. Various funding organizations, including the World Bank, regard the project as a model for strengthening local research programs, according to ICARDA Director General Dr. Mohamed Nour. "The project sets a new example for development assistance," he says. "Scientists from two countries are collaborating with one objective, supported by ICARDA and IFAD."

Instead of importing experts, the project has harnessed the considerable talent already available in Egypt and Sudan. "The two countries' scientists hnow what needs to be done," explains Dr. Bhup Bardawaj, the project's director of administration. "Outsiders often set the program for many development projects, but the Nile Valley Project is different--local scientists develop research plans and revise them based on new knowledge gained and exchanged each year."

ICARDA helped bring Egyptian and Sudanese scientists together, explains former ICARDA Deputy Director General Dr. Geffrey Hawtin. "The two countries are natural partners--very similar technically, culturally, and biologically."

"The idea of integration between Egypt and Sudan is very old, yet this is the first project in which they are working together on a crop important to both, exchanging visits and seeds," says Dr. Mohamed Bakheit Saed, director of Sudan's Agricultural Research Corporation.

MURTADA SURAJ EDDIN

An Egyptian feba bean farmer in his field. The crop is becoming even more important as meat prices rise.

One result has been the conservation of valuable genetic traits preserved in "land races." These old strains of faba beans not bred by scientists, but harboring diverse and valuable genes, have all but been replaced in Egypt by modern varieties. "Such faba bean races in Upper Egypt had migrated to northern Sudan, and are now used in breeding better varieties," explains Dr. Abdullah Nassib, Deputy Director of Egypt's Field Crops Research Institute.

But farmers' fields are the ultimate touchstone. "The greatest constraint to improving agriculture in many developing countries is the divorce of research from the farmer," says Dr. Mohan Saxena, head of food legume improvement at ICARDA. "A scientific team can produce good yields with plenty of plant protection chemicals and water. The question should be: what's the best economic strategy for the farmer?

"We did little research in farmers' fields before," says Dr. Nassib, "and the farmer stood back and didn't participate at all. Now, agronomists and economists are working side-by-side with the farmer." The project has helped Egyptian scientists, based in research stations near downtown Cairo, get out into rural areas.

Egyptian scientists first focused on two areas that represent about 60 percent of the country's faba bean production: Kafr El Sheikh in the Delta, and Minya further south. Fayoum farmers were added later. Using new practices, farmers reaped higher yields of 60 percent in Kafr el Sheikh, 30 percent in Minya, and 22 percent in Fayoum.

Economists visit the project farmers several times during the growing season to verify if the new practices are profitable. "The farmers in all three areas got an average increase in net income of 166 Egyptian pounds per hectare with the recommended packages of techniques," says Dr. Abdel Mawla Basheer, Director of the Agricultural Economics Research Institute in Cairo.

Testing in farmers' fields also spreads the word. "Other farmers come to see my fields," says Mohamed el Joheri, a Delta farmer who grows part of his crop with new techniques. Mr. Hassan, the farmer with the weed problems, cultivated the traditional way next to a research field last year--and plans to change his techniques. "The higher population of plants made their stand better than mine," he says, "and I'm going to plant seeds closer together in the future."

MURTADA SURAJ EDDIN

An Egyptian scientist inspects the crop of a faba bean farmer.

Project farmers are enthusiastic after testing the first herbicide for chemical weed control in faba beans. "We had no herbicide to recommend to farmers before, and they had to rely entirely on hand weeding," explains Dr. Nassib. "Village labor is scarce and expensive, so some farmers are forced to leave their crop unweeded. Now, the farmers can rely completely on this herbicide for weed control."

Scientists have also come up with the first commercial faba bean variety, Giza 402, to resist a devastating parasitic weed called broomrape. "With Giza 402, farmers can get up to 50 percent higher yields in broomrape-infested fields," Dr. Nassib says. "The project allowed us to test the variety widely. Next year, we'll have 14,000 feddans growing the variety, and by 1986 we hope to expand to 70,000 feddans from Giza to Aswan."

International cooperation facilitated by the project has also accelerated the battle against chocolate spot disease, a blight that causes heavy losses in Egypt. "Before, there was no faba bean able to resist chocolate spot infection," Dr. Nassib says. "Through screening hundreds of lines of germplasm coming from ICARDA, we were able to discover a line from Ecuador that resisted the disease."

Proper storage of beans is another research focus. Scientists found a special quality of bean in a Minofaya village--called *ful mackmorra*--that sells at triple the normal price. The reason: unique underground bins protect the stored crop from light, oxygen, and pests, while preserving the tenderness and buff color preferred by consumers.

Sudanese scientists have also come up with field-tested techniques tailored to their country's farmers. They advise three simple changes from farmers' current practices in northern Sudan: more frequent irrigation, slightly earlier planting, and insect control. Last year, the 77 farmers in el Zeidab reaped an average yield increase of 76 percent using the new techniques.

Both Sudanese and Egyptian scientists speak enthusiastically about the lessons they have learned from farmers. "Our agricultural extension bulletins currently recommend that faba bean farmers should till the soil twice," says Egypt's Dr. Nassib. "By going to the fields, however, we've learned that farmers don't till the compact soil when faba beans are grown after rice. They're 100 percent right, because tilling can delay sowing and reduce yields. Now we're finding varieties that fit well into the farmer's system of no tillage for the whole Delta region."

The Nile Valley project's practical approach--firmly rooted in farmers' fields--is now expanding to another country, Ethiopia, where faba beans also are an important crop.

In spite of comparatively modest funding, scientists from Egypt and Sudan have helped farmers in improving their yields. "This is our objective," says ICARDA's Dr. Nour. "Now that good seeds and proper production practices are in our hands, we must encourage governments to increase seed production. It is important to get these advances out to the farmers now." □

Food
Why time is running out

While the world's attention is focused on the famine in Sudan and Ethiopia, some voices are warning that, unless urgent action is taken, other parts of the Middle East could face a similar nightmare in the not-too-distant future.

Mohammed Nour, director-general of the Aleppo-based International Centre for Agricultural Research in the Dry Areas (Icarda), was Sudan's minister of agriculture in 1969-70. If anyone had suggested to him then that in 15 years Sudan would be begging for food, he would have taken it as a "serious national insult". Now he is worried that, given the region's population explosion, soil degradation and water shortages, "in another 15 years – by the year 2000 – it could be as late for some countries as it is now for Sudan and Ethiopia".

If Sudan is the Middle East's agricultural disaster area, Turkey is its success story. [illegible] achlan, of London University's Oriental and African Studies [illegible]cribes Turkey as "the outstanding example of a substantial and successful agricultural country in the region. In almost every area of cultivation it is the regional leader, often producing as much or more than all other states of the Middle East together".

The Middle East has the world's fastest growing food deficit. In 1982 imported food was costing a staggering $12.7 billion. Business Editor **Susannah Tarbush** talked to agricultural experts about the scale of the crisis, and what can be done to stave off disaster.

Nour sees an element of drama in the way the region is sandwiched between Sudan in the south and Turkey in the north. The two countries seem to symbolise alternative directions for the region's agriculture, which will face enormous challenges between now and the end of the century.

Population growth is unlikely to decline very much. According to the UN Food and Agriculture Organisation (FAO), the population of the Arab world will jump from 164 million in 1980 to 279 million in the year 2000. Not only will there be more mouths to feed, but per capita food consumption will continue to increase as it did in the 1970s. One reason for this is increasing urbanisation. With the exodus from the rural areas to towns and cities likely to continue, governments will face the problem of feeding their rapidly-swelling urban populations.

In the 1970s, the oil boom had a profound impact on agriculture throughout the region. Now the downturn in oil revenues is hitting countries such as North Yemen, Egypt, Jordan and Syria which have supplied migrant labour to the Gulf. The drop in workers' remittances, and a reduction in aid flows from the oil states,

could squeeze investment in agriculture.

The area is also suffering from serious soil degradation and desertification. As McLachlan points out, the rural exodus tends to lead to the permanent loss of farming skills. "Once marginal areas are abandoned as the result of mass migrations or the movement of individual farmers from their holdings, they are unlikely to be reclaimed for intensive farming," he says.

The most serious problem looming over the region, however, is its shortage of water. There is the ever-present threat of a failure of the rains on which agriculture still depends so heavily. If less dramatically than Sudan and Ethiopia, Morocco has been seriously afflicted by drought in recent years. Jordan and Syria have also suffered.

At the same time, concern is growing over the rapid depletion of the region's underground water resources as a result of over-use. As for rivers, some analysts predict growing conflict between Turkey, Syria and Iraq over the sharing of the water of the Euphrates, and between Sudan and Egypt over the Nile.

Will Middle East agriculture rise to the challenge? On past performance, the prospects do not look good. The Middle East has the world's most rapidly growing food deficit, and a recent study suggests the gap in food staples will grow rapidly by the year 2000.

In the 1970s several countries that had been net exporters of grain – including Egypt, Morocco, Iraq and Syria – became net importers. Only Turkey managed to transform itself from a net importer to a net exporter.

The cost of food imports to the Arab world shot up from $1.7 billion a year in 1970-72 to $12.7 billion in 1978-82. By 1980, Egypt was importing 40-45 per cent of its food needs, Jordan more than 50 per cent, Libya 60 per cent and Saudi Arabia 75 per cent. Rising incomes and government policies to improve nutrition increased per capita consumption.

Food security has become something of an obsession in the Middle East in recent years. But there has been some frustration that, despite governments' growing awareness of the problem, so little has been done to deal with it.

In the early 1980s the Arab Organisation for Agricultural Development (AOAD) produced a multi-volume plan for Arab food security. The total cost of the 153 projects it envisaged was $33 billion at 1975 prices, and they were to be completed by the year 2000. Yet most of them still exist only on paper (*see our June 1984 issue, p 38*). One top Arab official refers to the plan as a "study in futility".

Perhaps the most disappointing effort to solve the Arab world's food security problem was the creation of the Arab Authority for Agricultural Investment and Development (AAAID) in the mid-1970s to funnel billions of petrodollars into Sudan. The exportable surplus of Sudanese produce was expected to go a long way towards filling the region's food gap. The once-fashionable idea that Sudan could become the "breadbasket of the Arab world" now rings very hollow.

Many countries declare that agricultural self-sufficiency is one of their goals, but, according to J A Allan of Soas, only nine countries in the region can realistically expect to achieve it. Iraq could become self-sufficient through irrigation alone, while Iran, Lebanon, Syria, Turkey, North Yemen, Algeria, Morocco and Sudan could become self-sufficient through a combination of irrigated and dryland farming. For most of these countries, however, self-sufficiency remains a distant dream.

Allan notes that, of the countries with no hope of self-sufficiency, only Egypt has a large population (over 45 million). He feels that the governments of the deficit countries are "grievously, and some would say overly, aware of the strategic disadvantages of the economic dependency which is the consequence of agricultural inadequacy".

At the Abdul Hameed Shoman Foundation seminar on agriculture held in Amman in late 1984, Professor Ian Carruthers of Wye College distinguished between food security and self-sufficiency. While countries must have food security, he argued, "domestic production is not necessarily the best way of achieving it. Food imports, possibly long-term, may be more secure".

Carruthers added that "self-sufficiency in the modern era can be an illusion and much more apparent than real. If a country is self-sufficient in chickens but imports the feed, how secure is it? Even if it grows the feed but the feed grains require imported fertiliser, pesticides, tractors and so forth, how secure is it?"

The recent fracas between the US government and the EEC over the sale of up to one million tonnes of subsidised US wheat to Algeria shows how vital the region has become as a battleground for the world's major grain exporters, notably the US and the EEC. Huge imports of grain are a major economic burden on the recipients, and low prices can depress domestic production. There is, in addition, an inevitable political dimension. Even if grain exporters do not crudely brandish the "food weapon", countries may feel vulnerable to political pressures.

Egypt is one of the world's major importers of food staples – its food import bill of $3 billion is equivalent to 10 per cent of its GDP. Allan notes that Egypt has been, in turn, the client of the USSR and the US. "Since it is the latter which can alone provide food staples, as well as the finance to fund Egypt's economic development, Egypt is committed, if unwillingly, to a close dependence on the US."

Harvesting the potato crop

Morocco suffered flour shortages earlier this year when US wheat sales were suspended, affecting shipments also to Tunisia, Egypt and Iraq. Although the cause was a legal wrangle between the US Department of Agriculture and US shipping interests, at least some Moroccans interpreted the move as an expression of US displeasure at Morocco's "treaty of union" with Libya signed last August. (Libya has since agreed to lend Morocco $100 million for wheat purchases.)

Certainly in the past the US has shown itself ready to use concessional grain sales as an instrument of foreign policy. It recently announced a $2 billion programme to stimulate agricultural exports over three years, with the Middle East and Asia its main targets.

The Gulf states have a particular concern over the possible use of the "food weapon" and the risk of a closure of the Strait of Hormuz cutting off food imports. The Gulf Co-operation Council (GCC) has accordingly made the establishment of a strategic food reserve one of its prime objectives.

Saudi Arabia has pulled off the feat of achieving self-sufficiency in wheat – albeit at an enormous cost through its programme of subsidies.

In the Jordan valley

The Gulf has seen some interesting high-technology approaches to the problems of farming in an extremely hostile environment, but worries are growing about the depletion of underground water. Kuwait's new treated sewage effluent scheme may encourage the wider use of such systems (see p20).

But it is to the traditional food-producing countries that the region must look for major increases in food production. Only four per cent of Arab land is arable. In the future, there is little hope of major expansion into new agricultural land, except in Sudan and parts of the Maghreb. If production is to be increased, the emphasis must be on making better use of existing cultivated land.

Much investment has been poured into the region's irrigation systems in the hope of reducing the violent swings in production caused by erratic rainfall. But they have so far failed to live up to their promise. Poor management and inefficient water control and drainage have led to a progressive loss of land through salination and water logging. Yields are far below their potential and some badly-affected areas are being abandoned, as in Iraq. The wadi irrigation schemes on the Tihama plain in North Yemen are suffering from poor maintenance and a lack of spare parts for machinery. Much effort is clearly needed on rehabilitating irrigation schemes if the enormous investment they represent is not to be wasted.

Some countries are suffering from agricultural labour shortages. In North Yemen, for example, migration to the oil states has contributed to the decline of agriculture and loss of terraces, and to sharp increases in labour costs. Increased attention is now being paid to the role of women in agriculture (see our March issue, p32) and to the use of appropriate forms of mechanisation.

In some countries migrant labour has been brought in to fill the manpower gap – Moroccans, Egyptians and Sudanese to Iraq; Egyptians and Pakistanis to Jordan; Tunisians, Sudanese and Moroccans to Libya; Omanis and Yemenis to the Gulf.

The land tenure system has also been

Abu Jassim and his flock

Shihad al-Jassim (Abu Jassim), a farmer in the Bueda area, south-east of Aleppo, typifies many farmers in the Middle East and North Africa who live in areas of low rainfall (200-300mm a year).

Abu Jassim farms 20 hectares in a crop-fallow rotation, so that in a given year half his land is planted with barley and the rest left fallow. The barley provides him with feed for his small flock of sheep. But it is a precarious existence, as was shown last year when Syria was hit by drought. The delicately-balanced barley-livestock system broke down after the young barley crop was used to graze the flocks in February.

Normally the sheep graze on the stubble of the harvested barley in the summer, and are later fed with barley grains. But with no harvest the feed ran out, and the farmers were forced to sell or slaughter their sheep. Prices of ewes slumped from 600 Syrian pounds ($153) to 200 ($51), and an estimated three million of Syria's 12 million sheep were slaughtered.

Abu Jassim is now taking part in an experiment designed by Icarda's farming systems programme (FSP) to find ways of making the barley-livestock system more productive and less vulnerable. Instead of leaving land fallow, Abu Jassim last year planted it with the forage legumes vetch and lathyrus. In addition, 50 kilograms per hectare of phosphate fertiliser was applied to half his land.

The forage is a valuable form of feed for sheep, and the experiment included a comparison of the milk yield and weight gains of sheep fed on lathyrus or vetch with those grazed on local rangeland.

FSP's work at various sites in Syria has relevance to countries throughout the area – it is estimated that 40 per cent of the arable land in the region has low rainfall, and another 20 per cent medium rainfall (300-400mm). Yet, despite their importance, the areas of low rainfall have been neglected, and are in decline.

Low rainfall and a precarious existence

"These dry areas of today will be the deserts of tomorrow," warns Peter Cooper, FSP leader. He explains that, over the past 30 years or so, mechanisation and population increases have led to ever more intensive cultivation, with disastrous results.

Land used to be left fallow for one or more years between barley crops, but this practice has been increasingly replaced by continuous barley cropping. This has contributed to falling barley yields.

"Because of these very low yields, farmers are cultivating more and more land," Cooper says. They are moving into ever stonier and shallower soils, in a "downward spiral".

Nutrients are being "mined" from the earth, leaving progressively less fertile soils. There is little use of fertiliser in the area.

But there is hope for the dry areas. FSP has, for example, found that the use of even small amounts of phosphate fertiliser can produce a "major dramatic response" in production levels. And it seems that it makes production possible even in bad years: at its Brida research station, FSP was able to obtain yields of 1.5 tonnes per hectare in the drought of last year by using fertiliser, while the crops of farmers nearby failed.

blamed for poor agricultural performance. In Morocco, for example, 75 per cent of the farming families hold five hectares or less and own 25 per cent of agricultural land. Holdings are also fragmented, with 1.9 million farms divided into 11.6 million parcels.

Yet land reforms have failed to have the planned effects. In Iraq and Syria, for example, land reform has discouraged private farmers from cultivation and led to a "commitment to the creeping bureaucratisation of the countryside", says McLachlan.

But the outlook is not totally gloomy. At least governments are now paying more attention to agriculture, which is receiving increased allocations in development plans. Planners are becoming worried about the growth of urban populations. They are increasingly interested in rural development and are looking at previously neglected areas. In addition, it is recognised that rural populations form a vital market for industry.

At last officials are waking up to the potential of areas of low and medium rainfall, so long shunned in favour of areas of irrigation and high rainfall (see *box*). Agricultural research scientists are convinced they have at least some of the answers to the food problems of the region – if only governments will take notice.

At Icarda, for example, work is under way on basic food crops – barley, durum and bread wheat, faba beans, chickpeas, lentils and forage crops. The aim is to find seeds and techniques that will give improved yields, and provide stability of production so that a year of bad rainfall need not result in total disaster.

Icarda's director-general Mohammed Nour stresses that Icarda must prove itself in Syria if it is to have a real impact throughout the region. Icarda aims to prove that "in Syria we can double the yield of barley". Another priority is to develop a lentil harvester that will reduce the great cost of harvesting by hand.

Icarda is keen that "application of phosphate is more extensively adopted", and will encourage the use of native species of medic (a plant used as pasture). "These are not dreams, but realities," claims Nour.

Researchers hope that two new bodies – the Rain-fed Agriculture Information Network (Rain) and the Association of Agricultural Research Institutions in the Near East and North Africa (Aarinena) – will back up their efforts. The formation of Rain was discussed at an Icarda/US Agency for International Development (USAID) workshop in Amman in March, while Aarinena's inaugural meeting will be held in Damascus this month.

Nour puts his faith in the enterprising farmer

But if Icarda's findings are to be translated into action, there must be close co-operation with national programmes. Some of the region's agricultural scientists complain about their low status in the eyes of governments. One Pakistani scientist working in the Middle East, noting the large number of Pakistani scientists working abroad, comments, "They call it the brain drain: I call it kicking scientists out." He claims that his country is willing to pay expatriates 10 times the salaries it pays its own scientists.

A Moroccan agricultural scientist asserts that governments tend to see a high-powered corps of scientists as a potential threat to their own authority. He claims that Moroccan scientists live in relatively poor residential areas. Agriculture tends to have low prestige as a university subject, and Western agricultural scientists working in the area feel this must change if the discipline is to attract high-calibre people.

Some of the harshest criticisms are directed at the extension services which perform the key function of transmitting improved seeds and improved practices to the farmer in the field.

In some countries there is a wide gap between research and extension. One Moroccan wheat breeder notes that, although he and his colleagues did a lot of work, "it never reached the farmer". Now Morocco is making more effort to co-ordinate research and extension programmes.

Extension services throughout the region leave a lot to be desired. They have too few staff, and they are underpaid and poorly motivated. Unless extension workers are carefully selected, coming preferably from the area in which they will work, farmers may look on them as outsiders to be resented or ignored.

But many observers put their faith in the natural intelligence of the farmer, and are sceptical about the importance of extension in "spreading the word".

"The first breakthrough is likely to be through the entrepreneurial farmer rather than through a government changing policy," says Nour. He notes that in Turkey it was a few private farmers who first imported high-yielding seeds before they were taken up and promoted by the government.

Government policies on incentives to farmers have an important effect on production. "Price policies have discriminated against the farmer by paying him less than international prices, resulting in growing disparities between farm and non-farm incomes and thus slowing the increase in production," says the FAO.

But the question of food prices is extremely sensitive in the Arab world. When faced with the prospect of rioting urban populations protesting at increases in the prices of basic foods – as has happened in the past few years in Egypt, Morocco, Tunisia and, most dramatically, Sudan – governments often decide to rescind the increases.

Food subsidies are a major issue, particularly in Egypt where bread is heavily subsidised. Subsidies do tend to discourage private investment in agriculture, and migrating peasants could easily become hungry dissatisfied urban dwellers.

Subsidies on inputs are also important in encouraging production. But too often such inputs fail to reach small farmers who do not qualify for agricultural credit.

It will clearly take an enormous effort on the part of researchers, governments and organisations if agriculture is to meet the challenges of the next 15 years. Many hope the region will draw the appropriate lesson from Sudan – a country with great agricultural potential now suffering the combined effects of natural calamity and years of poor planning and bad management. □

Conference debates food crops research

PARTICIPANTS at the Arab Conference for Agricultural Research on Basic Food Crops, held at the University of Aleppo, Syria, earlier this year, highly praised the collaborative research efforts between the International Centre for Agricultural Research in the Dry Areas (ICARDA) and the national agricultural research programmes in the Arab world.

They particularly highlighted work with the Syrian national programme in developing new wheat varieties, the barley improvement work in North Africa, and the highly successful ICARDA/IFAD Nile Valley Project on faba beans in Egypt and Sudan.

Jointly organised by ICARDA and the Arab Fund for Economic and Social Development, the conference was attended by representatives of nine Arab organisations concerned with agricultural research and development, and the International Fund for Agricultural Development (IFAD), the Food and Agriculture Organisation of the United Nations (FAO), and the International Service for National Agricultural Research (ISNAR).

Also present were directors of many agricultural research centres in the Arab countries, and deans of faculties of agriculture in some Arab universities.

Mr Hamid Maari, Syria's Deputy Minister of State for Planning Affairs, opened the conference on behalf of Dr Kamal Sharaf, the Minister of Planning Affairs, who sponsored the meeting. Mr Maari stressed the food problems facing the Arab world and the great efforts and co-operation in agricultural research which will be needed to combat them.

Dr Mohamed Imady, chairman of the Board of Directors of the Arab Fund for Economic and Social Development, stressed the need to place the achievements of ICARDA at the disposal of the Arab countries and to foster collaboration between ICARDA and the national agricultural research centres in the region.

Dr Imady also praised ICARDA's efforts and the centre's achievements, and indicated the Fund's intention to continue its support of the centre.

Dr Mohamed A Nour, ICARDA's director general, expressed his appreciation to the Arab Fund for Economic and Social Development for organising the conference in co-operation with ICARDA, to Dr Kamal Sharaf, Syrian Minister of State for Planning Affairs, for sponsoring the event, and to Dr Mohamed Khesh, director general of the Arab Centre for Studies of Arid Zones and Dry Lands (ACSAD), for his participation in the conference.

ICARDA director general Dr Mohamed Abdullah Nour

Dr Nour commended the support and facilities offered by the Syrian government which had allowed the conference to take place in Aleppo.

The conference reviewed the achievements of ICARDA since its establishment in 1977, particularly with respect to wheat, barley, and faba beans, and the centre's role in supporting national agricultural research in the region.

The wheat improvement programme in Syria, barley research in the North African countries, and the highly successful ICARDA/IFAD Nile Valley Project on faba beans in Egypt and Sudan were used to illustrate the role which ICARDA can play in collaborating with the national programmes.

Participants also examined the need to improve co-ordination in research between ICARDA, the national programmes, and Arab and international research and development organisations, and how the media, agricultural extension, and training can be used to increase the efficacy of the efforts of these bodies.

In the recommendations of the conference, the participants praised the research efforts of ICARDA and its co-operative ventures in the region. They also commended the centre's training activities and made recommendations for ways in which training activities could be expanded. Proposals included a comprehensive survey of the manpower needs of agricultural research in the Arab world, and strengthening higher studies programmes at Arab universities.

The conference noted the support provided by the Arab Fund for Economic and Social Development, the International Fund for Agricultural Development, and the OPEC Fund to ICARDA and ACSAD, and expressed its hope that this support should continue.

Participants also expressed their hope that other national and regional funding bodies would contribute to agricultural research and thus to increasing the production of basic food crops in the Arab world. They recommended that similar meetings should be organised in future in other countries in the region, with a view to fostering and encouraging co-operation and collaboration in agricultural research throughout the region.

New straw collector for research plots

A new straw collector developed at the International Center for Agricultural Research in the Dry Areas (ICARDA) will help researchers to compare the straw from new cereal varieties.

Cereal straw is an important animal feed in the region. "Many farmers are interested not only in a cereal variety's grain yield, but also in how much straw it produces for feed," explains Dr Jitendra P Srivastava, head of ICARDA's cereals programme. In some dry areas, barley with sheep is the only farming option. "In drought years, the crop can be so bad that it is not even worth harvesting, and the farmer's only return is from grazing sheep on the straw," he says.

Farmers, in fact, have sometimes rejected high-yielding varieties which produced little straw. The release of new lines screened for straw quantity and quality would allow farmers to improve livestock nutrition without added cost.

The region's researchers, however, lacked a suitable tool to measure the straw yield of promising varieties in test plots. Now, ICARDA's straw collector can be attached at the end of a plot combine to allow the evaluation of grain and straw — both key components of a wheat or barley variety's productivity.

The implement collects dry matter and allows separation of threshed grain from other matter through aerodynamic principles, using gravity to filter straw and chaff from the air stream of harvested material.

This straw collector for test plots assists evaluation of straw quality and quantity from new cereal cultivars.

Sieves and meshes, which may cause clogging, are unnecessary.

The collector weighs 20kg and is compact enough not to hamper the combine's manoeuvrability. It can be fitted to available plot combines without major modifications. Up to 10 kg of straw and chaff can be collected and weighed on a spring balance right in the field. The collector, designed by ICARDA agricultural machinery engineer Dr P Jegatheeswaran, costs about $150.

West Germany's Wintersteiger Company, well known for its agricultural research plot equipment, has expressed interest in manufacturing the collector on a commercial scale.

Circle 232 on enquiry card

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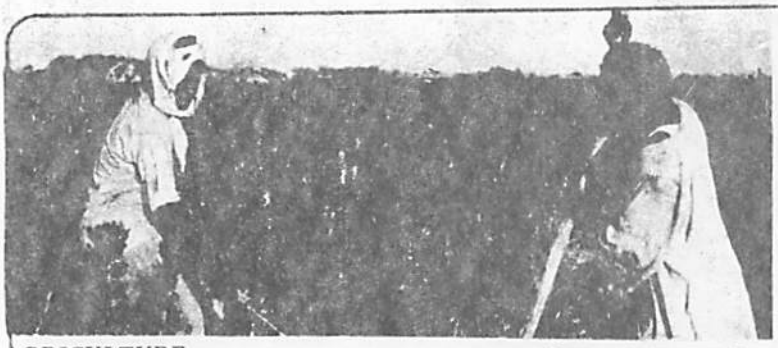


Photographs by Murtada Seraj el Din

AGRICULTURE

Better varieties are on the way

Faba productivity improving

Many Sudanese farmers take a morning break for a filling breakfast of ful masri, or stewed faba beans. In Egyptian cities, students snack between classes on nutritious fried falafel. As meat prices rise, faba beans prepared in these and other ways are becoming even more important in the diets of the poor and middle income groups in both countries. Over 120 Egyptian and Sudanese farmers are testing new fuba bean varieties and growing practices in the Nile Valley Project, a joint effort between Egypt and Sudan to improve and stabilise production of this protein-rich staple food. The project, now in its sixth year, has aimed directly at farmers' fields – mostly small plots worked primarily by hand. This report from ICARDA science writer, Lynn Teo Simarski.

FABA BEENS ARE an important crop for Nile Valley farmers, rated first or second as an earner among Sudan's winter crops. The country met its demand with local production until 1982-83, when production problems forced Sudan to import faba beans for the first time. For more than a decade, Egyptian and Sudanese agronomists have achieved faba bean yields more than double those of farmers. But the ideal conditions of the research station often fail to reflect the reality of farmers' fields, where insect pests, plant diseases, weeds, and water shortages decimate yields.

Narrowing this yield gap is the goal of the project, which is funded by the International Fund for Agricultural Development (IFAD). Coordination and technical assistance are supplied by the International Centre for Agricultural Research in the Dry Areas (ICARDA), based in Aleppo, Syria. ICARDA works generally to increase food supply in the Middle East and North Africa. Cooperation between countries, disciplines, farmers, and scientists, is a hallmark of the project, which has produced an international network of expertise on faba beans. Various funding organisations, including the World Bank, regard the project as a model for strengthening local research programmes, according to ICARDA director general Dr. Mohamed Nour. 'The project sets a new example for development assistance', he says. 'Scientists from two countries are collaborating with one objective, supported by ICARDA and IFAD.'

Instead of importing costly outside experts, the project has harnessed the considerable talent already available in Egypt and Sudan. 'The two countries' scientists know what needs to be done,' explains Dr. Bhup Bhardawaj, the project's director of administration. 'Outsiders often set the programme for many development projects, but the Nile Valley Project is different – local scientists develop research plans and revise them based on new knowledge gained and exchanged each year. By using local expertise, we also save a considerable amount of what it would cost to hire foreign experts.'

'ICARDA scientists come to see our crop during the growing seasons and we discuss how to solve our problems,' says Dr. Mustafa Hussein, director of Sudan's Hudeiba Research Station. 'It's a very busy visit, only for a few days, but its value is beyond description.'

ICARDA helped bring Egyptian and Sudanese scientists together, explains former ICARDA deputy director general Dr. Geoffrey Hawtin. 'Scientists in both countries recognised that ICARDA plays a leadership role in the region's legume research,' he says. 'Besides, the two countries are natural partners – very similar technically, culturally, and biologically.'

'The idea of integration between Egypt and Sudan is very old, yet this is the first project in which they are working together on a crop important to both, exchanging visits and seeds,' says Dr. Mohamed Bakheit Saeed, former director general of Sudan's Agricultural Research Corporation.

But farmers' fields are the ultimate touchstone. 'The greatest constraint to improving agriculture in many developing countries is the divorce of research from the farmer,' says Dr. Mohan Saxena, head of food legume improvement at ICARDA. 'A scientific team can produce good yields with plenty of plant protection, chemicals and water. The question should be: what's the best economic strategy for the farmer?'

'We did little research in farmers' fields before, and the farmers stood back and didn't participate at all,' says Dr. Abdalla Nassib, deputy director of Egypt's Crops Research Institute. 'Now, scientists work side by side with the farmer.' The project has helped Egyptian scientists based near downtown Cairo to get out into rural areas.

In Sudan, as well, 'our research results used to be left on the shelves,' says Dr. Hussein. 'After seeing the results of participating farmers, other farmers have picked up new production techniques.'

Research advances often fail to benefit farmers because scientists in different disciplines tend to work separately. The Nile Valley Project holds annual meeting between breeders, agronomists, soil scientists, economists, and nutritionists – many of whom now describe themselves as a family of researchers across disciplines and nations.

Cooperation spawns practical results that the farmer can use. 'When agronomists and economists sit down together, as they do in the project, the agronomist is obliged to think about the cost of new techniques,' points out ICARDA agricultural economist, Dr. Thomas Nordblom.

Boosting production requires an understanding of how and where faba beans are grown in Sudan. The traditional growing area is north of Khartoum, with longer winters and cooler weather than the region south. 'Production is confined to the narrow belt of cultivable land irrigated by pumping schemes along the Nile,' explains Sudan's Dr. Saeed.

Research in northern Sudan illustrates the project's practical approach. New varieties and techniques developed

on the research station are tested in the field. 'We ask the farmers to try them first in a small area, which helps us identify the key element in increased yield,' says ICARDA's Dr. Saxena. 'They tell us when a new variety or practice isn't effective for them. Farmers are also compensated if they lose their crop. Then we go to larger areas where farmers are given proper irrigation, chemicals, and spraying equipment to test the techniques on a commercial scale.' In 1984, for example, 77 Sudanese farmers did this on 350 feddans of the Zeidab scheme.'

About 30 farmers from Aliab, Shendi, and Selaim irrigation schemes are also testing new techniques. 'The total number of farmers does not include, of course, relatives, neighbours, and those who attend our fields days to see the results,' says Dr. Hussein.

Project scientists have come up with better practices tailored to northern Sudanese farmers. 'They advise three simple changes from farmers' current techniques: more frequent irrigations, slightly earlier planting, and insect control,' says Dr. Farouk Salih, faba bean breeder and director of Sudan's Shambat Research Station. Last year, the 77 farmers in El Zeidab reaped an average yield increase of 76 per cent using the new practices.

The researchers are eager to see the recommendations at work on a bigger scale. 'The money spent on the project could be recovered in two years using the new practices on one of the northern Sudan irrigation schemes alone,' points out Dr. Bhardawaj.

'Now we have the package, but we need the Ministry of Agriculture to secure the inputs so the farmer can benefit,' says Dr. Hussein. 'Most farmers are willing to implement the recommendations, but they don't have enough water, for example, to increase irrigation frequency. They also need fuel for pumps, spare parts, and insecticides.'

The pilot production plots in the Zeidab scheme, which have proven so successful, represent only about one per cent of the irrigation scheme. 'The Sudanese government must take over, since the project's limited funds cannot insure water supply and plant protection chemicals for tens of thousands of acres,' points out Dr. Bhardawaj.

Another target of Sudanese researchers has been pest losses, a prime reason for the country's shift to importing faba beans. Insects can destroy as much as 40 per cent of crop during storage in Sudan. A cooperative effort between the project and the northern region's Departments of Plant Protection and Extension has focused on teaching farmers pest-free storage.

The bruchid weevil is a [illegible] severe pest. In an [illegible] researchers found that farmers deliberately plant bruchid-infested seed, because it is hard to sell and also because it germinates faster than sound seed. However, according to the project entomologist at Hudeiba, Dr. Abdel Gadir Bushara, the more insect-drilled holes in the seed, the less vigorous the resulting plant.

'The real consequences come later down the farm-to-market chain,' explains ICARDA's Dr. Nordblom, 'when the infested seeds go from the farm to fetch a low price in Khartoum.'

The project has demonstrated cheap methods for proper storage in villages where the farmers live. An educational poster campaign spread the word on who to contact for advice. Selected farm stores were cleaned and fumigated. 'They were inspected recently and not a single sack was infested,' says Dr. Hussein.

Again, the goal is to better the poor farmer's lot. As explained by Dr. Hamid Fakki, an economist from Wad Medani, the price of faba bean is very low at harvest time. Farmers lack proper storage, so the crop falls into the hands of large-scale merchants who can then sell the crop later at a handsome price. If farmers could control pests in their stores, they could hold the beans and sell them when the price is right.

Now, the task is to instruct farmers and supply proper protection chemicals on a large scale. 'Sudan's pest control department has a good staff who know how to identify the pests, but they lack materials: sprayers, vehicles, fuel, and pesticides,' says ICARDA agricultural economist Dr. Abdul Bari Sulkini, who helped survey farmers' problems in Sudan.

Another project goal is to expand faba bean growing to non-traditional areas south of Khartoum, such as the Gezira region. 'There's a shortage of suitable land in the north to grow all the food crops we need,' explains Sudan's Dr. Saeed. 'The new areas near Khartoum and southward offer plenty of space. Irrigation water is cheaper than north of Khartoum because it is supplied by gravity. Also, faba beans could fit well into present rotations there as a winter crop.' Sudan has already followed this strategy with wheat, once restricted to the north as a winter crop, but mostly produced today in the areas south of Khartoum.

The new areas present additional challenges for the plant breeder. 'We must identify faba beans that suit the area's hotter climate,' says Dr Saxena. 'Adapted varieties do not exist — we [illegible] new kinds that can withstand the host of root diseases in these areas.' Project breeders, in collaboration with ICARDA scientists, are crossing plants with each other to produce a type with a better genetic make-up. The Sudanese scientists will then evaluate them under local conditions.'

Downriver in Egypt, scientists have also made significant research advances. Using new practices, farmers reaped higher yields of 60 per cent in Kafr el Sheikh, 30 per cent in Minya, and 22 per cent in Fayoum, with an average increase in net income of 166 Egyptian pounds per hectare. Another advance is the identification of Egypt's first herbicide for chemical weed control in faba beans. Village labour is expensive and hard to find, forcing some farmers to leave their crop unweeded. Four Delta farmers were so impressed with the herbicide trials in their fields that they sent a telegram to the Egyptian Ministry of Agriculture asking for the chemical on the market.

Egyptian scientists have also come up with the first commerical faba bean variety, Giza 402, to resist a devastating parasitic weed called broomrape. 'With Giza 402, farmers can get up to 50 per cent higher yields in broomrape-infested fields,' says Egypt's Dr. Nassib. 'The project allowed us to test the variety widely. Next year, we'll have 14,000 feddans growing the variety, and by 1985/86, we hope to expand to 70,000 feddans from Giza to Aswan.'

International cooperation fostered by the project has accelerated the battle against chocolate spot disease, a blight that causes heavy losses in Egypt. 'Before, there was no faba bean able to resist chocolate spot infection,' Dr. Nassib says. 'Through screening hundreds of lines of germplasm coming from ICARDA, we were able to discover a line from Ecuador that resisted the disease. The exchange of information and material through the project made the discovery possible.'

The Nile Valley Project's practical approach – firmly rooted in farmers' fields – is now expanding to another country, Ethiopia, where faba beans are also an important crop.

Breaking out of the vicious circle of low cereal prices

INCREASING wheat yields under irrigation is clearly of the greatest importance in Saudi Arabia, but the overwhelming bulk of wheat and other cereals produced throughout the Middle East depends on rain. In the Middle East and North Africa it is reckoned that 90% of the bread wheat grown is rain-fed, and half of that is grown on land receiving less than 400mm a year. An even higher percentage of durum wheat is grown in drier areas (250-500mm), and a similar percentage applies to barley.

The need to increase yields is important for nearly all governments, but to the farmer it may often be a matter of survival. What are the promising paths to success?

The first problem is to break out of the vicious circle pictured above. Consumer subsidies in most countries keep returns to farmers low, since only wealthy nations can afford to maintain producer prices at attractive levels and still keep urban anger at bay. Low producer prices not merely reduce the incentive to grow more, but deny farmers the income to buy inputs, notably seed, fertilisers and crop protection equipment and materials.

The fact that yield increases can be strikingly high, given the right materials and incentives, has been shown by an experiment undertaken by the International Centre for Agricultural Research in the Dry Areas (ICARDA). Six dryland sites in northern Syria — with rainfall ranging from 417 to 232 mm — were selected. The three drier areas concentrated on barley rather than wheat.

The experiment calculated the rate of return — that is, the increased revenue divided by the extra costs incurred where local habits were abandoned in favour of recommended practices, involving the use of nitrogen and phosphorous together with herbicides. In one case it was a phenomenal 4.21 — this was for durum wheat in an area receiving 323mm of rainfall. The lowest was 1.32 on a site just below the 300mm rainfall level.

A vast amount of modern technology has gone into the relatively new pivot irrigation systems, where huge capital expenditure makes high efficiency and productivity levels essential. Now more attention is being devoted to subsistence farmers in marginal, low rainfall areas, where moisture is both inadequate and variable. The usual soils are shallow, stony, coarse in texture, with poor water-holding capacity, and with low organic and high pH levels.

ICARDA's research workers have isolated a number of practices which should contribute to improved yields, although they stress that economic incentives ought to be employed to reduce the financial risks inherent in variable, rain-fed agriculture.

First is more use of nitrogen and phosphorous (a separate article in this issue, page 9, deals with correcting deficiencies in trace elements). Fertilisers, however, are site-specific: few safe generalisations can be made about the appropriate levels of application except after soil tests or crop response trials. Generally it is absence of adequate nitrogen which limits production in wetter areas, and absence of phosphorous in drier areas. This is because high rainfall results in leaching of N to below the root zone, whereas a lower rainfall, while it results in the accumulation of nitrate in the upper soil, will increase the amount of N available in the root zone.

The route to higher grain yields in rain-fed semi-arid regions is described in this article, based on work by ICARDA

Because nitrogen improves the growth of the canopy over previously bare soil, less moisture evaporates, and more goes through the plant, producing higher dry matter production. Fears that fertilisers, nitrogen in particular, used in dry years may lead to rapid consumption of limited soil moisture, and thereby increase crop stress and reduce yield, are not substantiated by ICARDA's trials in Syria. With appropriate fertiliser rates, losses in kernel weight have not exceeded 10% even in dry years, while yields have been increased.

To fallow or not?

While in extremely low rainfall areas (under 300mm) fallowing does not restore much moisture — particularly in shallow or coarse-textured soils — yields of barley have been dramatically increased when preceded by a fallow rather than by another barley crop, rather surprisingly.

The reasons for this are not completely known. They may be linked to the toxic compounds produced by turned-in stubbles which are known to inhibit the development of the subsequent crop. Breaking continuous cereal rotation with a legume crop does, however, increase barley yield and ensures that the land is not idle. The main problem is to find legumes with the most efficient nitrogen-fixing nodules.

A third route to success is early sowing. Instead of employing the traditional system by which farmers wait for the first rains to produce weeds which are then ploughed in, thereby delaying sowing by anything between three and eight weeks, early sowing combined with herbicides gives effective weed control and allows a longer and more favourable period for crop growth and development. Jordan's Ministry of Agriculture and its University have consistently proved this. The advice is to plant by the calendar rather than on rainfall arrival.

When to broadcast

In higher rainfall (300-650mm) areas, drill seeding is superior to broadcasting. Combine drilling in which the phosphorous fertiliser can be placed in a band near the seed is recommended, but in drier rainfall areas the value of drilling has not been consistent, largely because seed is drilled too close to the surface.

As an article in our last issue showed, early rains which germinate the seed can be followed by periods of drought (*AWA* Vol 1 No 5 pages 10-11). In such a situation broadcasting does provide some insurance by spreading the seed through a range of depths, so that in the event of a post-rain drought, the deeper seeds can grow on.

Finally, varieties. While there have been striking developments in the production of high-yielding varieties for irrigated areas, little has been done to help low-rainfall farmers who require seeds with drought resistance. Local varieties, while showing extreme variation, can provide the right genes for many of the qualities required thanks to their long history of selection by both nature and man. Much effort is going into improving varieties in the search for crops better able to withstand weed competition, easier to harvest, more tolerant to cold, superior in germination and deep planting, and of high grain quality.

WITH the world set for another record wheat yield, forecasts of a trade war, designed to relieve the acute grain surpluses burdening both the USA and EEC, continue to bewilder farmers and traders.

At the very time when the US Secretary of Agriculture, John Block was in Paris roundly condemning the "growing trend towards protectionism, export subsidies and other trade distortions," and calling for a commitment to curb these practices, his office in Washington was calculating how much American wheat could be absorbed this year by those North African territories whose own demands continue to rise while drought exacts its penalties.

The projected sale of one million tons of soft wheat to Algeria at a price of around $117 a ton would be the first fruits of the new USA farm relief programme. Under it, surpluses are given free to exporters to enable them to undercut the world price (or, as the USA would put it, compete with it): a practice which the EEC considers contrary to the General Agreement on Tariffs and Trade (GATT). The Americans deem this hypocritical but it is a measure of Mr Block's desperation.

The total estimated North African demand for imported wheat and flour in the last crop year (1984/5) was around 12.6 million tons. This is a region hitherto dominated by US wheat sales, but in recent

THE EGYPTIAN GAZETTE

September 10, 1985

$32m gained annually from bean exports

THE Minister of Agriculture and Food Sufficiency, Dr. Yussef Wali yesterday declared open the 6th conference of the Regional Project for improving bean production in the Nile Basin. The project, which is implemented in Egypt, the Sudan and Ethiopia, is financed by the International Fund for Agricultural Development.

In his address, the Minister highlighted the results of the project since its implementation in 1979. He welcomed Ethiopia, being a new beneficiary in the next stage of the project which is to start in 1986 and continue till 1988.

He said that the applied research of the project executed by the farmers realised their targets in increasing productivity in Egypt and the Sudan.

He added that Egypt is self-sufficient as regards bean production. It was possible to export more than 15,000 tons last year whereas Egypt used to import beans worth 32 million dollars per year.

He welcomed the idea of executing a similar project to improve wheat produce in the Nile Valley. Dr. Wali said that Egypt will send to the Sudan 10,000 tons of wheat seeds of "Giza 155" and "Sakha 69", varieties whose studies proved their successful cultivation in the Sudan.

The Sudanese Minister of Agriculture addressed the participants saying that the Sudan has benefited immensely from this programme in raising productivity through the application of guidelines set by the project experts.

The five-day conference will focus on topics dealing with advanced technological methods used in agriculture, solving storage problems and exchanging expertise among the countries of the Nile Basin in this respect.

— GSS

The fabulous bean

The farmer is also at the centre of a project to increase yields of a food vital to the people of the Nile valley. From Aleppo, Lynn Teo Simarski reports on current efforts to boost production of the faba bean.

For more than a decade, Egyptian agronomists have achieved yields of faba beans more than double those of farmers, who must battle against insect pests, weeds, plant diseases and a lack of water.

Narrowing this yield gap is the goal of a joint project between Egypt and Sudan to improve and stabilise the production of faba beans – a protein-rich staple food of the Nile valley.

The faba bean, known as *ful* in Arabic, is an ancient crop in the Nile valley. More than 3,000 years ago, Ramses III was recorded as offering 11,998 jars of shelled beans to the god of the Nile.

Today, they are fried for the nutritious snack *falafel* or stewed to make *medames*, a breakfast popular in the villages and cities of Egypt and Sudan. As meat prices rise, faba beans are becoming an even more important part of the diet of the poor.

More than 120 Egyptian and Sudanese farmers are testing new faba bean varieties and cultivation techniques in the Nile valley project, now in its sixth year. The research is aimed directly at farmers' fields – mostly small plots worked primarily by hand.

The effort is funded by the International Fund for Agricultural Development (Ifad). Other funding organisations such as the World Bank regard the project as a model for strengthening local research programmes, according to Mohammed Nour, the director general of the International Centre for Agricultural Research in Dry Areas (Icarda) based in Aleppo.

Rather than importing costly experts from outside, the project has harnessed the considerable talent already available in Egypt and Sudan. Local scientists develop and revise research plans on the basis of new knowledge, which is increasing every year.

Through its leading role in regional legume research, Icarda helped bring Egyptian and Sudanese scientists together. "The two countries are natural partners – very similar technically, culturally and biologically," says Geoffrey Hawtin, Icarda's former deputy director-general.

But farmers' fields are the ultimate touchstone. "The greatest constraint to improving agriculture in many developing countries is the divorce of research, from the farmer," explains Mohan Saxena, head of food legume improvement at Icarda.

"A scientific team can produce good yields with plenty of plant-protection chemicals and water. The question should be, what's the best economic strategy for the farmer?"

The project's investigation of the faba bean in Egyptian diets illustrates how collaboration between disciplines has paid off. Certain components of the bean can cause a disease in susceptible children called favism, a type of anaemia that may have been known in ancient Egypt.

"It was always recorded that faba bean was the food of the poor in pharaonic times," explains Leila Hussein, head of biochemistry research in Cairo's National Research Centre. "It's possible that favism was the reason."

She is investigating faba bean varieties 30-50 per cent lower in two chemicals believed to cause favism, and is trying to see whether a weak vinegar-like acid can block the chemicals' action.

Plant breeders are now taking her results into account. "New types of faba bean with low levels of the suspected chemicals could be bred for areas where people are genetically prone to favism," explains Abdullah Nassib of Egypt's Field Crops Research Institute.

New varieties and techniques are then tested in the field. "We ask the farmer to try them in a small area, which helps us identify the key element in increased yield," says Saxena.

"Then we go to larger areas where farmers are given irrigation, chemicals and spraying equipment to test the techniques on a commercial scale.

"In 1984, for example, 77 Sudanese farmers did this on 350 feddans in El-Zeidab in northern Sudan."

Egyptian scientists focused first on two areas that account for about 60 per cent of the country's faba bean production – Kafr al-Shaikh in the Delta and Minya further south. Fayoum was added later.

Using new practices, farmers obtained increases in yields of 60 per cent in Kafr al-Shaikh, 30 per cent in Minya and 22 per cent in Fayoum.

Economists visit the project farmers during the growing season to check whether the new practices are profitable.

"The farmers in all three areas got an average increase in net income of 166 Egyptian pounds per hectare with the recommended packages of techniques," says Abdel Mawla

The food of the poor since pharaonic times

Basheer, director of the Agricultural Economic Research Institute in Cairo.

Project farmers were enthusiastic after testing the first herbicide for chemical weed control in faba beans. "We had no herbicide to recommend to farmers before, and they had to rely entirely on hand weeding," explains Nassib.

"Village labour is scarce and expensive, so some farmers are forced to leave their crop unweeded. Now, the farmers can rely completely on this herbicide for weed control."

"I had stopped planting faba bean because of weeds, but now that I have the herbicide I'm growing them again," says one farmer, Salah Tantouri. "The herbicide doubles my yield."

Scientists have also come up with the first commercial faba bean variety, Giza 402, to resist a devastating parasitic weed called broomrape.

"With Giza 402, farmers can get up to 50 per cent higher yields in broomrape-infested fields," says Nassib.

International co-operation facilitated by the project has accelerated the battle against chocolate spot disease, a blight that causes heavy losses.

Sudanese scientists have also come up with field-tested techniques tailored to their country's farmers. They advised three simple changes in farmers' practices in northern Sudan: more frequent irrigation, slightly earlier planting and insect control.

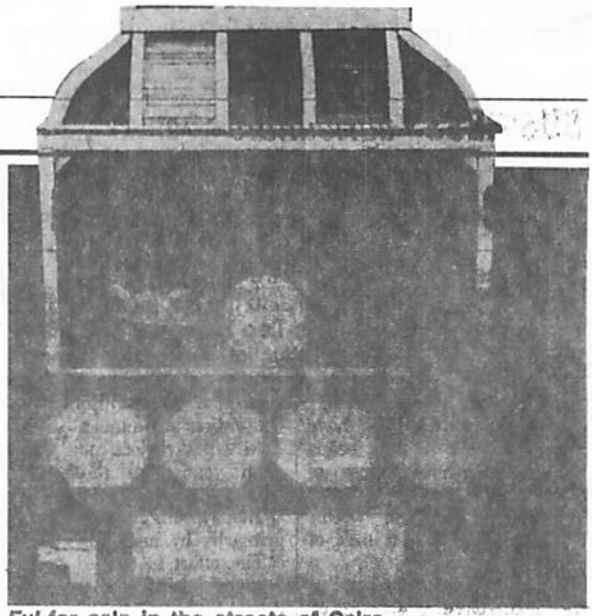
Last year, the 77 farmers in El-Zeidab reaped an average yield increase of 76 per cent using the new methods.

As much as 40 per cent of a crop can be destroyed by insects during storage in Sudan. Researchers recently demonstrated cheap methods of pest-free storage.

Both Sudanese and Egyptian scientists speak enthusiastically about the lessons they have learned from farmers. "Our agricultural extension bulletins currently recommend that faba bean farmers should till the soil twice," says Nassib.

"By going to the fields, however, we've learned that some farmers don't till the compact soil when faba beans are grown after rice. They're 100 per cent right, because tilling can delay sowing and reduce yields."

The Nile valley project's practical approach is now expanding to Ethiopia, another country where faba beans are an important crop. □



Ful for sale in the streets of Cairo

The challenge of growing more food in the dry areas of the world has been taken up by the Syrian based International Centre for Agricultural Research in the Dry Areas (ICARDA). Science Writer Lynn Teo Simarski writes about:

BETTER HARVESTS IN THE ARID AREAS

In the vast dry region stretching from Morocco to Pakistan, farmers battle against sparse and unpredictable rainfall and rising population. The gap between food production and consumption in the Middle East and North Africa is widening fast; imports now meet more than half of food needs.

The International Centre for Agricultural Research in the Dry Areas (ICARDA) which is based in Aleppo, Syria, began research in 1977 to improve food production in the region. ICARDA—one of 13 centres in the global network sponsored by the Consultative Group on International Agricultural Research— focuses on the rainfed areas where the poorer farmers live; it has a 948-hectare experiment farm near Aleppo, and offices in Egypt, Tunisia and Lebanon.

Less than seven percent of the region's land is arable, and only three countries—Afghanistan, Iran and Sudan—can appreciably expand cultivation into new areas. The rainfed lands cover more than 70 percent of the region's cultivated acreage but contribute less than one-third of total agricultural production. Most government budgets neglect the dry lands; financial resources go instead into irrigated areas, where non-food crops such as cotton are often grown.

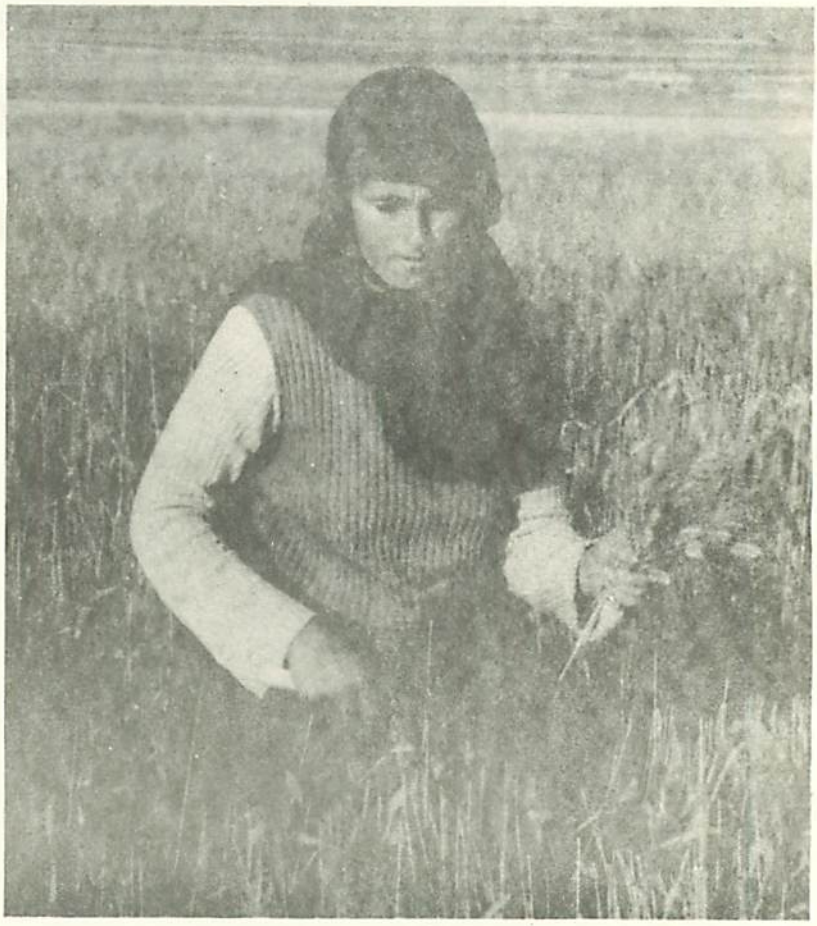
Farming Systems

Sparse and irregular rainfall makes farming in the ICARDA region notoriously risky, so farming systems scientists seek to stabilize, as well as increase, the small farmer's production and income. "In the dry areas, the farmer's growing conditions and income vary greatly from year to year and place to place", says Dr. Geoffrey Hawtin, ICARDA Deputy Director General, "so it's difficult to predict whether an agricultural practice, technology, or variety will be worthwhile to a farmer."

The farming systems approach is new in the region. Advances are tested by the region's farmers themselves, guided by ICARDA and national scientists, is essential to reap practical results from ICARDA's research. Successful technologies can then be integrated into farmers' present practices step-by-step. The inter-disciplinary programme, headed by soil physicist Dr. Peter Cooper, includes a soil chemist, crop physiologist, weed scientist, microbiologist, meteorologist, an anthropologist, and agronomists and agricultural economists. Projects cover barley-livestock systems, wheat-dominated system, and general agricultural issues. Another study looks at the high elevation agriculture of Pakistan; a project in Tunisia is examining the factors that keep farmers from adopting improved practices.

The programme's scientists first identify the limits on production in a given area, usually through surveys in which farmers define their problems; they then search for solutions. If farmers' wheat is attacked by insects, for example, researchers seek a control measure. Next, the new technique or variety —often drawn from the centre's other programmes—is tested on the farm.

In one project that covers the whole of northern Syria there has been some unexpected findings. A survey and trials of barley in that area showed that yields



Cr Lynn Teo Simarski

A Syrian woman collecting spikes of durum wheat

respond dramatically to phosphate fertilizer, but much less so to nitrogen—just the opposite of prior expectations. ICARDA trains area researchers from many countries in the approach, and publicises a farming systems newsletter.

Wide Variety

The nations of the Middle East and North Africa vary widely in wealth. Oil rich countries—such as Saudi Arabia, Bahrain, the United Arab Emirates, Kuwait and Qatar—can afford costly import bills, but these five countries contain only ll million of the region's more than 300 million people.

Scarcer foreign exchange in the rest of the region cannot keep up with rising agricultural imports. The United Nations lists some countries in the area as among the poorest in the world. Egypt, for instance, now imports about half its food. Algeria, while richer in oil resources, meets about two-thirds of its food needs with imports. Recent drought has worsened the situation in some countries, with cereal crops hit hard in Morocco, Tunisia and Jordan. The International Wheat Council expects Morocco's 1984 wheat imports to be 50 percent higher than in 1983.

Only through intensifying local food production—with better varieties and technologies—can the ICARDA region hope to lower imports. "The crops we research constitute about 80 percent of what people eat in the Middle East", points out ICARDA Director General Dr. Mohamed Nour, "we're not interested in introducing exotic crops such as asparagus or broccoli; rather we are concentrating on improving the yields of basic food crops".

ICARDA is a world centre for research on barley, lentils, and faba beans, and a regional centre for wheat and chickpeas; it also works to improve farming systems, pasture, forage, and livestock. Other research extends to high elevation and irrigated areas. The centre has four major scientific programmes—farming systems; cereals; food legumes; pasture, forage and livestock. Plant genetic resources and training are other important priorities.

Cereals

People in the ICARDA region consume the most cereals per capita in the world. Cereals, especially durum and bread wheat, supply three-fifths of the calories in the area's diet. They also account for about 90 percent of output of the regions's major staples. ICARDA research shows that new seeds and practices can double cereal yields in the rainfed areas where more cereals are grown. Dr. Jitendra P. Srivastava, durum breeder and cereal programme leader, says that past research has concentrated on bread wheat, eclipsing the durum wheat and barley suited to more arid areas.

Better varieties are a key first step to more local cereal production. The centre's researchers work on barley, durum, bread wheat and triticale. They seek varieties that can yield well in dry years, and even better in good years—along with improved growing practices.

ICARDA sends promising stocks all over the Middle East and North Africa for evaluation. These lines contain genes that resist insects and diseases, and others that tolerate drought or salinity. Back at headquarters in the cereal quality laboratory, the new lines are tested again—this time for baking, cooking and nutritional value in traditional Middle East dishes such as bulghur, khobz (flat bread), and freke.

Joint cereal breeding between ICARDA and CIMMYT, (based in Mexico), as well as Syrian national scientists, spawned two notable successes after four year trials. In 1983, Syria released a new durum variety, Sham-l, for rainfed areas, and a new bread wheat line, Sham-2, for the country's irrigated and high rainfall regions. Both cultivars consistently out-yield the varieties that farmers now use.

The mountainous areas of Pakistan and Morocco demand special cereal breeding strategies for extreme temperatures, low rainfall, and shallow soils. ICARDA and national researchers are testing advanced cereal lines at elevations over 1000 meters, particularly for cold and disease tolerance.

Harvesting barley in a dry area near Aleppo

Cr.Lynn Teo Simarski

Food Legumes

ICARDA's food legume improvement programme (FLIP), led by agronomist Dr. Mohan Saxene, centres on faba beans, lentils and chickpeas. Legumes, "the poor man's meat", are a cheap, important protein source in regional diets, and supply profitable cash crops for the small farmer.

Legumes also complement cereals in the area's cropping systems, since they can be grown in fields normally left fallow between cereal crops. Nodules on legume roots are natural fertilizer factories, as they "fix" nitrogen in the soil. Legumes thus improve subsequent cereal yields, while reducing farmers' spending on commercial nitrogen fertilizer.

New faba bean strains and growing practices are tested under irrigation at ICARDA's experiment farm near Aleppo, and under the high rainfall of the Syrian coast near Latakia—sites similar to faba bean areas elsewhere in the region. A special project on faba beans in the Nile Valley of Egypt and Sudan, now in its fifth year, has encouraged inter-action between researchers in those countries, and brought research results to the farmers' fields, with significant yield gains. New advances from the experiment farms are tested side-by-side with farmers' traditional practices.

On another front, FLIP researchers are battling against broomrape, a serious weed parasite on legumes in the region. "A broomrape infestation can wipe out an entire field of faba beans, given the right conditions," explains FLIP head Dr. Saxene. FLIP scientists have identified naturally-resistant lines of faba bean, lentil and chickpea, and sent them to the region's breeders for evaluation and incorporation into local crops.

Lentil scientists at ICARDA focus on taller, large-seeded varieties that yield better and can be harvested by machine. Native lentils are a short, stubby crop grown in rocky soils and uneven fields, making mechanical harvest difficult. Ripe lentils must also be gathered quickly before pods rupture—leading to a harvest-time labour crunch in lentil areas. ICARDA plans to help national programmes transfer mechanical harvest solutions to the varied range of lentil farmers.

FLIP's most dramatic advance has been with new types of chickpeas that can be sown months earlier, in winter instead of spring. The large-seeded Kabuli chickpeas for winter planting yield twice as much as traditional, spring-sown types, since they draw on moisture from the entire rainy season. If the new varieties and production practices penetrate the entire Mediterranean region, chickpea production could double to one million tons from the present 500,000 tons.

Six years of joint research conducted with another CGIAR institute, ICRISAT, show that freezing temperatures and ascochytra blight disease are two main hazards to winter sowing. New lines being tested in 16 countries, from Morocco to Pakistan, are surmounting these obstacles. A new chickpea cultivar called ILC-482 will be distributed to farmers for winter sowing in Syria, and is likely to be introduced in Lebanon. Other successful varieties are expected to be ready soon for Jordan and Cyprus.

C.Lynn Teo Simorski

ICARDA scientists and Syrian farmers inspecting new types of barley

Pasture, Forage, and Livestock

ICARDA's pasture, forage and livestock programme, headed by Dr. Philip Cocks, a pasture ecologist, brings an ecological perspective to another urgent agricultural problem to the region—scarce feed for livestock. Sheep, in particular, are a vital part of agricultural production in the Middle East and North Africa. Meat and animal product consumption is growing—at prices many of the poor cannot afford.

At the same time, rising populations of sheep and other livestock are grazing delicate rangelands beyond safe ecological limits. Another ingredient of the feed crunch in Syria is declining barley yields in dry areas near the steppe. Shortage of sheep feed in Syria—not helped by drought—decimated millions of animals.

Syria is the laboratory for ICARDA's pasture and forage research, says Dr. Cocks. "We want to get our new farm and cropping strategies working here before we move to the rest of the region."

A top priority is to develop ways to use Syria's fallow lands as an alternative to destroying marginal areas. Every year, a large part of cereals farmland is left fallow after harvest. Research shows that planting nitrogen-fixing legumes as pasture and forage crops after cereals could increase soil fertility and boost yields of the subsequent cereal crop. The pasture can also be grazed and the forages cut for hay—supplying sheep with the feed they need at critical times, such as late winter and early spring.

The programme has identified local wild medic species with good potential for pasture in Syria. These plants add nitrogen to the soil and are also adapted to cold. New crops like these, as well as livestock husbandry practices and crop rotation techniques, are tried out with farmers in villages near Aleppo.

Genetic Resources

ICARDA's genetic resources programme safeguards the world's major collection of genes of important Middle Eastern and North African crops. The centre has a a genetic stock of 60-70,000 holdings for future breeding, including material of durum wheat, barley, chickpeas, lentils and faba beans.

Continued on page 24

Continued from page 13

Better Harvests in the Arid Areas

"We're spearheading the effort to stem the loss of genetic variability in the region," says Dr. Bhal Somaroo, programme head. Developing better crops requires a broad genetic base, with a spectrum of genes suited to varied climates and landscapes—a conservation task far beyond the capability of small farmers.

Since the mid-1960s, concern about germplasm loss has grown, particularly for agricultural crops and their wild relatives. ICARDA is strategically situated for genetic conservation, as many cultivated plants evolved in the Mediterranean and Near East area. To preserve crop diversity for the future, ICARDA expeditions collect germplasm called "land races".

"Such races—grown for a long time by farmers—have not been improved by scientists," explains Dr. Somaroo. "A land race is therefore adapted to a particular ecological environment. It also has an adaptable genetic makeup".

New scientifically-bred varieties are rapidly replacing land races in most of the world. In the Near East and North Africa, for instance, a new blight-resitant chickpea will probably supplant indigenous chickpeas. In the future, however the new chickpea could fall prey to an unforeseen insect. Breeders could then be able to draw genes from ICARDA's seed collection that might prove resistant to the pest.

Much of ICARDA's stock is "active"—sent to countries in the region for study or breeding. A separate base collection will, however, be left sealed for up to 25 years.

Geographical and genetic gaps in the gene bank are constantly being filled, and ICARDA expeditions have sought germplasm from Turkey, Lebanon, Syria, Jordan, Iraq and Morocco. Part of each collection is left with the host country, and local scientists are trained in genetic conservation techniques to carry on after ICARDA scientists depart.

Outreach

The lack of trained personnel—the backbone of national research programmes—is a key cause of lagging crop productivity in the region; ICARDA thus gives high priority to training. Trainees from many countries come to the centre each year for six month practical courses, working closely with scientists in the centre's major programme.

A new, informal network for legume research now spans the region, composed of more than 60 centre-trained scientists; this exemplifies ICARDA's approach to strengthening local research capacity and overcoming the professional isolation of many scientists in developing countries. Young researchers spend six months at ICARDA learning about the centre's genetic stock and research resources. Back home, they keep in touch with the centre for further training and exchange of breeding material.

Visiting scientists also work with ICARDA staff on specific topics related to their local research, whilst degree students conduct thesis research at ICARDA. In addition, short practical workshops on many topics, from hay-making to seed production, are held regularly at the centre's experiment farm. Other training workshops are conducted within countries of the region. Outreach also includes a range of publications on ICARDA's activities, including regular newsletters on cereals, faba beans, and lentils, as well as a host of research reports and workshop proceedings.

Le Matin du Sahara 23 Jan, 1985
Morocco

RECHERCHE AGRONOMIQUE

Accord de coopération

entre le Maroc et l'ICARDA

RABAT, (MAP). — Un accord de coopération en manière de la recherche agronomique a été signé vendredi dernier à Rabat entre le Maroc et le Centre international des recherches agronomiques pour les zones arides (ICARDA).

Cet accord, qui a été signé par M. Othmane Dem nati, ministre de l'Agriculture et de la Réforme agraire et Mohamed Nour, directeur général de l'ICARDA, met l'accent sur le développement de la coopération entre le Royaume et cet organisme spécialisé par l'échange des expériences, études et données relatives à la recherche agronomique ainsi qu'à travers l'assistance technique et l'octroi d'équipements. Il permettra également au Maroc de participer aux rencontres et congrès traitant des questions d'intérêt commun.

L'ICARDA est un organisme international financé par le groupe consultatif international des recherches agronomiques, l'Organisation des Nations Unies pour l'alimentation et l'agriculture (FAO), la BIRD et le programme des Nations Unies pour le développement (PNUD). Il a été créé dans le but de rechercher les moyens susceptibles d'améliorer les cultures vivrières dans les zones arides et semi-arides.

THE EGYPTIAN GAZETTE

September 10, 1985

$32m gained annually from bean exports

THE Minister of Agriculture and Food Sufficiency, Dr. Yussef Wali yesterday declared open the 6th conference of the 'egional Project for improving bean production in the Nile Basin. The project, which is implemented in Egypt, the Sudan and Ethiopia, is financed by the International Fund for Agricultural Development.

In his address, the Minister highlighted the results of the project since its implementation in 1979. He welcomed Ethiopia, being a new beneficiary in the next stage of the project which is to start in 1986 and continue till 1988.

He said that the applied research of the project executed by the farmers realised their targets in increasing productivity in Egypt and the Sudan.

He added that Egypt is self-sufficient as regards bean production. It was possible to export more than 15,000 tons last year whereas Egypt used to import beans worth 32 million dollars per year.

He welcomed the idea of executing a similar project to improve wheat produce in the Nile Valley. Dr. Wali said that Egypt will send to the Sudan 10,000 tons of wheat seeds of "Giza 155" and "Sakha 69", varieties since studies proved their successful cultivation in the Sudan.

The Sudanese Minister of Agriculture addressed the participants saying that the Sudan has benefited immensely from this programme in raising productivity through the application of guidelines set by the project experts.

The five-day conference will focus on topics dealing with advanced technological methods used in agriculture, solving storage problems and exchanging expertise among the countries of the Nile Basin in this respect.

— GSS

SYRIA TIMES, Wednesday, July 31, 1985

Agricultural research conference concludes deliberations

DAMASCUS, (SANA) — The Director of the Agricultural Scientific Research in Syria, Dr. Hassan al-Ahmad was elected Chairman of the Federation of Agriculturl Research Institutes in the Near East and North Africa (FARNENA) at the conclusion session of the FARNENA Conference held here on Tuesday.

The participants elected Dr. Tihami Zehrawi from Morocco as Deputy Chairman and Hassan Khalifa from Sudan, Ala' Eddin Dawud from Iraq, Yousef Argon from Turkey and Gholam Rasoul Sando from Pakistan as members of the FARNENA's Executive Committee.

Dr. Abdul Wahab al-Mursi from the FAO, was elected FARNENA's Secretary General.

It was approved unanimously that the provisional headquarters of the FARNENA is the FAO's Executive Bureau in Rome. It was also approved that FARNENA's next conference is to be held after two years. The representatives of Morocco and Cyprus offered to host the conference.

At the conclusion session, Dr. al-Ahmad thanked the conferees for the trust they gave him, pledging to exert his utmost efforts to carry out his duties successfully. He asked all members to collaborate with FARNENA's Executive Committee to serve agricultural development.

Meantime, the Assistant Director Generalof the International Centre for Agricultural Research in Dry Areas (ICARDA), Dr. Adnan Shoman made a statement to a SANA correspondent in which he said that the Conference had achieved its goals.

He added that the three organizations have made contacts with the concerned countries to arrange for the convening of the conference and establishing FARNENA.

SYRIA TIMES, Tuesday, July 30 1985

Agricultural research conference continues

DAMASCUS, (SANA) — The first general conference of the Federation of Agricultural Research Institutes in the Near East and North Africa (FARNENA) here on Monday continued its activities.

The conferees listened to a report prepared by the UN Food and Agriculture Organization (FAO) covering the recommendations adopted by a technical consultation symposium on cooperation in agricultural research. The symposium was held in Cyprus in 1983 and recommended the establishment of FARNENA.

The Deputy Regional Representative of FAO's Branch in the Near East, Dr. Kamal Thabet, read a report discussing prospects of development of the Federation's activities and tasks. Dr. Thabet also spoke about the Federation's goals, including the setting up of networks of agricultural research centres in the region and the enhancement of cooperation among existing agricultural research centres in the region.

A number of issues were also dealt with by three reports prepared by the participating organizations, namely FAO, the International Centre for Agricultural Research in Dry Areas (ICARDA) and the International Service of National Agricultural Research (ISNAR).

The conferees also discussed the procedures to be adopted by the Federation in electing members of its Executive Committee, including the Federation's Chairman, Deputy Chairman and Secretary General.

The conferees also paid a visit to the offices of the Arab Centre for the Studies of Arid Areas and Dry Zones (ACSAD) in Damascus. During the visit, the conferees watched a documentary film about the centre's activities, its projects and accomplishments in the field of land reclamation and development of dry and arid lands in the Arab world.

The Arab and foreign delegations to the conference expressed admiration over the achievements of the Centre and praised the efforts exerted by its officials to develop agricultural production in the region.

Syria Times 2 Apr, 1985

Conference on agricultural research continues deliberations

ALEPPO. (SANA) — The Arab conference on Agricultural Research on Basic Food Crops here on Monday continued its activities at Aleppo University. Yesterday's meeting was headed by the Director General of the Arab Centre for Studies of Dry Areas and Arid Zones, Dr. Mohammad al-Khish.

A paper was read about the Centre's systems and accomplishments in the fields of agricultural development and livestock production.

The paper dealt with the importance of agricultural mechanization and major programmes and projects contributing to the promotion of agricultural production and the achievement of food security in the Arab world.

The paper also pointed out the importance of the production of improved wheat and barley seeds, in particular, to meet the needs of the Arab countries. The paper said the Centre has been able to develop four kinds of wheat, pasture tree seeds and work out advanced methods to grow fruit trees.

Later in the day, the Rector of Aleppo University chaired the conference's fourth session devoted to the activities of the International Centre for Agricultural Research in Dry Areas ICARDA, the training of cadres needed for the development of agricultural work and research in dry areas and arid zones.

A paper on this topic indicated that since 1971 about 600 people from various Arab countries have been trained at ICARDA. From Syria, the paper said, over 140 technicians received training at ICARDA's courses, which aim at supporting national programmes and the development of scientific research methods.

AL AHRAM
Daily Newspaper 9 Sept. 1985

Sudanese Minister of Agriculture holds discussions in Cairo

Mr. Siddig Abdeen, Sudanese Minister of Agriculture, arrived yesterday in Cairo to attend a conference on agricultural research (NVP) which will be held in Cairo from 9-13 September to discuss agricultural problems facing the dry areas.

Scientists from Egypt, Sudan, and Ethiopia will participate in this conference.

Dr. Yussef Wali, Deputy Prime Minister and Minister of Agriculture and Food Sufficiency will meet with the Sudanese minister and the accompanying delegation to review and discuss the collaborative agricultural projects between Egypt and Sudan.

جريدة الأهرام
تاريخ ١٩٨٥/٩/٩

وزير الزراعة السوداني يجرى مباحثات بالقاهرة

وصل الى القاهرة أمس السيد صديق عابدين وزير الزراعة السودانى فى زيارة لمصر يحضر خلالها مؤتمر البحوث الزراعية الذى يعقد فى القاهرة خلال فترة من ٩ الى ١٣ سبتمبر الحالى لمناقشة مشاكل الزراعة فى المناطق الجافة .

ويشارك فى هذا المؤتمر عدد من الخبراء الزراعيين فى مصر والسودان واثيوبيا .

كما يلتقى الدكتور يوسف والى نائب رئيس الوزراء ووزير الزراعة والامن الغذائى بالوزير السودانى والوفد المرافق له لبحث مشاريع التكامل الزراعى التى تقوم بتنفيذها الشركة الزراعية المصرية السودانية بالسودان

الصباح

تونس ـ السبت 6 ربيع الثاني 1405 ـ 29 ديسمبر 1984 ـ العدد 11582 ـ السنة 34 ـ السعر 180 مليما وبالسعودية 2 ريال
ASSABAH — 29 Decembre 1984 — Prix en France 3 F.F

ثلاثة أصناف جديدة من الشعير ذات انتاجية عالية في تونس

سنابل الشعير ذات الانتاجية العالية

حظي الشعير في السنوات الخمسة الماضية باهتمام كبير في تونس وخاصة في الخطة الخمسية السادسة. وشعورا بالمسؤولية فقد عكف الباحثون الفلاحيون على تطوير زراعة هذا المحصول ايمانا منهم باهمية الوصول الى الاكتفاء الذاتي من هذه المادة. وكأي محصول هناك عوامل عديدة تحد من انتاج الشعير، بعضها لا يمكن التحكم فيه مثل العوامل المناخية ـ الا ان بعضها الاخر يمكن عن طريق البحث العلمي التحكم فيه مثل:

1) ايجاد واستنباط اصناف مناسبة لظروفنا المناخية السائدة، تكون ذات انتاجية عالية نسبيا واكثر مقاومة للامراض الشائعة، حيث ان اصناف الشعير المتداولة حاليا لدى المزارع التونسي تتصف بمردود انتاجي ضعيف خاصة في مناطق الوسط والشمال الغربي، اضافة الى حساسيتها لكثير من الامراض وكذلك للرقاد. لذلك كان لابد من العمل لايجاد انواع بديلة هدفها التغلب على هذا العامل الهام.

2) البحث عن طرق زراعية افضل تضمن انتاجية عالية خاصة في مناطق الوسط والجنوب حيث يسود نظام مناخي خاص لا يتصف بقلة الامطار فحسب بل باختلاف معدلاته من سنة الى اخرى وقلة انتظام توزيعه خلال فترات نمو المحصول.

منذ عام 1980 قام المعهد القومي للبحوث الفلاحية في تونس (INRAT) بالتعاون مع المركز الدولي للابحاث الزراعية في المناطق الجافة (ICARDA) بابحاث مكثفة على زراعة الشعير في تونس ومن خلال الاعمال المنجزة في السنوات الاربعة الماضية تم التوصل الى انتاج ثلاثة اصناف من الشعير ذات مردود اعلى من الاصناف المتداولة محليا لدى المزارعين مثل مارتان وسيريس.

ويمكن ان نوجز خصائص هذه الاصناف الجديدة من خلال الارقام في المواسم الفلاحية الاربعة الماضية 80ـ84، فالصنفين الاول والثاني اعطيا مردودا يزيد 20 الى 30٪ عن الصنف مارتان في مناطق ذات معدل مطري سنوي 200ـ300مم في وسط وشمال غربي البلاد التونسية. كما تمكن الصنف الثالث من اعطاء انتاج زاد بنسبة 35٪ عن الصنف سيريس في مناطق معدلها المطري السنوي 300ـ450مم وهذه الاصناف الجديدة تمتاز بمقاومة اعلى بكثير من مقاومة الاصناف الحالية للعديد من الامراض الهامة والشائعة التي تصيب الشعير في بلادنا

ومنذ عامين (موسم 82/83) قام المعهد القومي للبحوث الفلاحية بتزويد قسم تحسين الانتاج في ديوان الحبوب بكميات هامة من بذور هذه الاصناف لدراستها على مستوى اوسع لدى المزارعين وكانت النتائج مشجعة حيث تاكد تفوقها فقد كان متوسط انتاجها خلال الموسمين 82/83 و83/84 يزيد عن الصنف مارتان بـ 30 الى 40٪ في مناطق ذات معدل مطري 200ـ400 مم.

٪ واضافة لذلك فقد تم مد العديد من المزارعين خلال الموسم الماضي بكميات من بذور هذه الاصناف لتجربتها ومقارنتها مع الانواع المستعملة لديهم فكانت متفوقة بشكل ملحوظ ولاقت استحسانا لدى المزارعين الذين طالبوا بالمزيد من بذور هذه الاصناف. وفي هذا الموسم فاق عدد المزارعين الذين يختبرون تلك الاصناف على الاربعين مزارعا، موزعين في مناطق معدلها المطري 200ـ400مم.

وفي نفس الوقت تقوم تعاضدية البذور (COSEM) والتعاضدية المركزية للبذور والمشاتل الممتازة (CCSPS) باكثار هذه الاصناف حيث غطت في هذا الموسم 220 هك لدى هاتين التعاضديتين، وانتاج تلك المساحات من المنتظر ان يكفي لزراعة 5000 هك من البذور المحسنة في الموسم القادم.

وجدير بالذكر ان المعهد القومي للبحوث الفلاحية يقوم الآن باتخاذ الترتيبات اللازمة لتسجيل تلك الاصناف الثلاثة تحت الأسماء التالية:

ـ الصنف الاول: روحو
ـ الصنف الثاني: تاج
ـ الصنف الثالث: فائز

وذلك تمهيدا لوضعها رسميا في متناول المزارع التونسي بدءا من الموسم القادم 85/86.

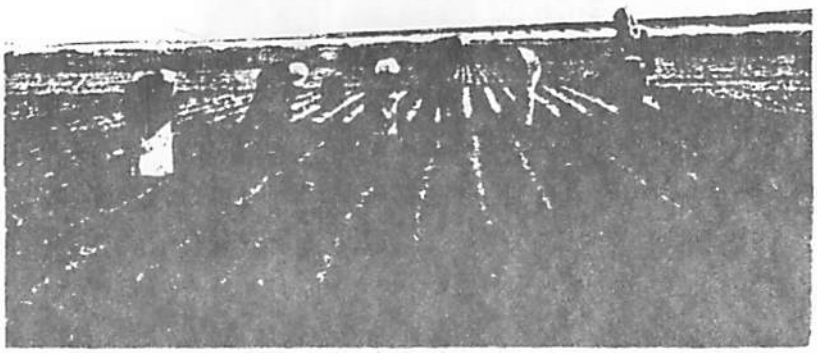
والعمل الآن في هذا المجال ما يزال مستمرا في المعهد القومي للبحوث الفلاحية وذلك بالتعاون مع ديوان الحبوب، لتحقيق الاهداف المرجوة بقصد التوصل الى احسن الطرق الزراعية وخاصة في الوسط التونسي للحصول على احسن انتاجية ممكنة لتلك الاصناف الملائمة للمناطق قليلة الأمطار.

الأمن الغذائي

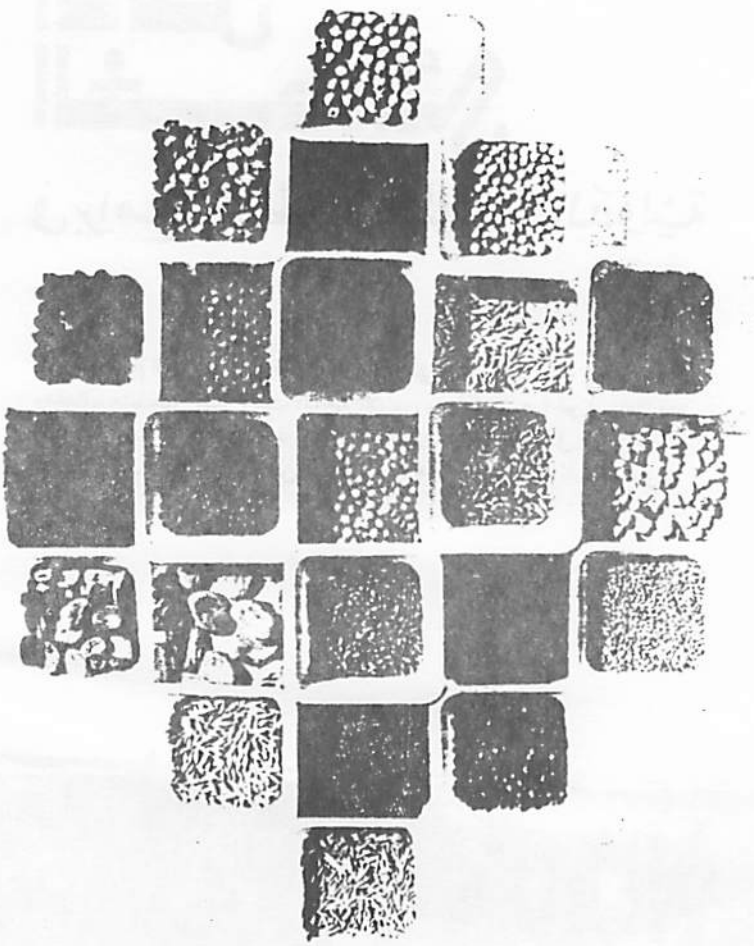
في برامج المنظمات والهيئات الدولية

استطلاع : صادق يلي

« على تخوم الوطن العربي وقريبا منه ، بل وحتى في بعض بلدانه ، زحف الجوع والجفاف وانخفض المطر وقلت انتاجية الأرض ، وأطل شبح الجوع حاملا معه الموت من وسط أزمة غذاء تأخذ بخناق هذه الدول . فماذا فعلنا في الوطن العربي لتجنب زحف الجفاف وانخفاض المطر ؟ ، هذه محاولة لحمايتنا من نذر المستقبل »!



٩٤٨ هكتاراً هي المساحة الكلية لمحطة الأبحاث الزراعية في تل حديا التي تبرعت بها حكومة الجمهورية العربية السورية لاقامة مراكز البحوث الزراعية عليها .



القمح والشعير والفول والعدس والحمص هي المواد الغذائية الأساسية التي تدخل ضمن برامج المركز الدولي للبحوث الزراعية في المناطق الجافة (ايكاردا) .

ظهر مصطلح « الامن الغذائي » كتعبير أزمة عندما عقدت منظمة الأغذية والزراعة للامم المتحدة إجتماعا في روما عام ١٩٧٤ ، لتدرس الرؤيا الكابوسية بأن شبح المجاعة لا يزال يخيم على المجتمع البشري . واستطاع هذا المؤتمر أن يضع بعض التصورات لاستغلال الموارد الطبيعية في توفير « الأمن الغذائي » . ومنذ ذلك التاريخ بدأت الهيئات والمنظمات الدولية المختلفة تنفيذ برامج محددة لزيادة انتاجية المشاريع الغذائية ، واستصلاح مزيد من الأراضي غير المستصلحة ، ومكافحة التصحر ، وغير ذلك من برامج تصب في خدمة ذلك الهدف الكبير .

ان مشكلة الغذاء تعد من أكبر المشاكل التي تواجه العالم ، وخصوصا في المناطق التي تعتمد في زراعتها على ما تجود به السماء من أمطار ، وهناك عوامل عديدة ساهمت في تفاقم مشكلة الغذاء ، من أهمها اشتداد موجة الجفاف ، وانخفاض معدلات الانتاج للمحاصيل الغذائية الأساسية ، ثم تعاظم الطلب على المواد الغذائية ، بتأثير نمو السكان بمعدلات مرتفعة للغاية ، وكانت النتيجة ان اتسعت الفجوة بين الطلب على الموارد الغذائية وبين ما ينتج منها ، ومن المتوقع أن تصل هذه الفجوة في منطقتنا العربية الى أرقام عالية ، قدرت من قبل المنظمات الدولية بحوالي ٥٢ مليون طن ، تشكل الحبوب وحدها الثلثين ، ومن أجل ذلك كان لابد من تركيز الجهود التنموية لزيادة الانتاج من المواد الغذائية الأساسية ، ومن خلال رفع مستوى مردود المحاصيل الغذائية ، والتوسع في زراعة هذه المحاصيل ، والى توفير موارد مالية خارجية لتلبية احتياجات برامج التوسع الزراعي في بلادنا العربية ، وكذلك دعم وتعزيز البحوث الزراعية الهادفة الى زيادة انتاجية المحاصيل الزراعية .

وفي حلب الشهباء ، عاصمة الشمال السوري ، نظم الصندوق العربي للانماء الاقتصادي والاجتماعي بالتعاون مع المركز الدولي للبحوث الزراعية في المناطق الجافة (ايكاردا) مؤتمرا بعنوان « المؤتمر العربي للبحوث الزراعية على المحاصيل الغذائية الاساسية »

ايكاردا

ونحن اليوم نريد أن نسلط الضوء على نشاطات أحد هذه المراكز الدولية ، التي تهتم بالبحوث الزراعية ، وهو المركز الدولي للبحوث الزراعية في المناطق الجافة ، ومقره مدينة حلب في الجمهورية العربية السورية ، واختصر اسم هذا المركز الى « ايكاردا » . وهو جزء من شبكة عالمية تشرف عليها المجموعة الاستشارية للبحوث الزراعية الدولية ، تمتد خدمات هذا المركز من المغرب العربي غربا ، حتى باكستان شرقا ، ومن تركيا شمالا حتى السودان جنوبا ، وتشمل ٢٢ بلدا ، يزيد عدد سكانها عن ٣٠٠ مليون نسمة . ومن المعروف أن هذه المناطق التي يخدمها المركز تعاني من نقص كبير في الغذاء ، اذ تضطر الى استيراد المحاصيل الزراعية أكثر مما تصدر ، ومما يزيد من مشاكلها تعرض المنطقة المتواصل للجفاف وانخفاض الأمطار ، بالاضافة الى انتشار الأمراض والحشرات الضارة ، مما يؤدي الى نقص الانتاج ، وزيادة الاعتماد على الاستيراد ، لذلك تتركز أبحاث « ايكاردا » بشكل أساسي على الأنظمة الزراعية البعلية في المناطق التي تنخفض فيها معدلات الأمطار الشتوية ، كما تعمل على توسيع نطاق أبحاثها ، حيث تشمل المناطق المروية أيضا .

يقول الدكتور محمد عبدالله نور المدير العام للمركز الدولي للبحوث الزراعية في المناطق الجافة « ايكاردا » « ان أبحاث المركز تتركز بصورة عامة على محاصيل الشعير والعدس والفول ، وهناك مسؤولية اقليمية أخرى يتولاها المركز ، وهي تحسين القمح الطري والقمح الصلب والحمص ، كما تنصب بحوث المركز على المحاصيل العلفية الرعوية ثم الأنظمة الزراعية » .

ويضيف الدكتور نور قائلا : « يتألف برنامج المركز من أربعة برامج رئيسية ، وهي برنامج الأنظمة الزراعية ، وبرنامج تحسين محاصيل الحبوب ، وبرنامج تحسين البقوليات الغذائية ، وبرنامج تحسين المراعي والأعلاف والمواشي ، وهناك أقسام رئيسية اخرى تعمل لمساعدة البرامج الأولى وهي : وحدة المصادر الوراثية ، وقسم التدريب ، وقسم الاعلام والتوثيق ، ثم قسم خدمات الكمبيوتر .

شام ١ شام ٢

ان أهم انجاز قامت به (ايكاردا) خلال عملها ، هو اعتماد الحكومة السورية توزيع صنفين جديدين من القمح القاسي والقمح الطري تحت اسم شام ١ وشام ٢ ، بعد أربع سنوات من الاختبار والتقييم ، في حقول المزارعين في أنحاء مختلفة من سوريا ، وذلك من خلال برنامج التعاون العلمي المشترك بين وزارة الزراعة و (ايكاردا) .

يقول المسؤول المختص عن هذا البرنامج : « ان هذين الصنفين يمتازان بكفاءة عالية ، فحبوب شام ١ تتمتع بخصائص نباتية جيدة ، وذات نوعية ممتازة ، بالاضافة الى كفاءتها الانتاجية العالية ، وقدرتها الكبيرة على التأقلم ، ويضيف قائلا : وبالرغم من أن هذا الصنف معروف بمقاومته لمرض الصدأ المخطط ، الذي يصيب عادة سنابل القمح ، الا أنه قابل للاصابة بمرض التفحم ، وهو مرض يمكن مقاومته بمعالجة البذور بالمطهرات الفطرية .

أما صنف القمح الطري شام ٢ فهو الآخر هجين يمتاز بقدرة انتاجية عالية ، وقد مر باختبارات عديدة لمدة أربع سنوات ، في حقول المزارعين تحت ظروف الزراعة المروية ، وفي المناطق ذات معدلات الأمطار العالية ، كما أثبت مقاومته للامراض ، ويمتاز شام ٢ بجودته العالية لصناعة الخبز ، واحتوائه على نسبة عالية من البروتين .

وقد تم اكثار بذار هذين الصنفين من قبل مؤسسة اكثار البذار السورية ، تمهيدا لتوزيعها على المزارعين ، وأوصت « لجنة اعتماد الأصناف » بزراعة شام ١ في المناطق البعلية ذات معدلات الامطار العالية ، في حين أوصت بزراعة شام ٢ المناطق المروية ، أو المناطق المرتفعة الأمطار ، كما ثبت أن القمح الصلب شام ١ صنف مبشر في بلدان أخرى من دول المنطقة .

الشعير

ويأتي الشعير كأحد الأنشطة الأساسية في برنامج عمل (ايكاردا) فكانت تونس المكان الذي اختير لاجراء البحوث الزراعية على أرضها ، فمن المعروف ان للشعير دورا غذائيا هاما ، وخصوصا في المجتمعات الريفية المحدودة الدخل ، وذات الطبيعة القاسية والأمطار القليلة ، فالشعير يساهم بقسط وافر من الطاقة الغذائية في مثل هذه المجتمعات ، الا أن النسبة العظمى لاستهلاك الشعير يتمثل في صناعة الأعلاف ، نظرا لتقدم في تربية وتسمين الحيوانات والدواجن في أقطار شمال أفريقيا ، حيث يبلغ ما يستهلك لهذا الغرض حوالي ٥٠٪ من اجمالي الشعير المنتج سنويا ، كما يلعب الشعير دورا كبيرا في تغذية الحيوان خصوصا في المناطق الجافة أو شبه الجافة ، وقد أثبتت الدراسات أن قيمة التبن تمثل ٣٩٪ من القيمة الاجمالية لمحصول الشعير ، وترتفع هذه القيمة في السنوات التي يشح فيها المطر .

لهذا كان لابد من قيام تعاون وثيق بين (ايكاردا) وبين البرامج الوطنية في المغرب العربي ، فقد قام المعهد القومي للبحوث الفلاحية ، والمعهد القومي للعلوم الفلاحية في تونس باستنباط أصناف جديدة من القمح الطري والصلب والشعير ، تكون ملائمة للمناخ في تونس .

يقول أحد المختصين عن هذا البرنامج : « لقد تم الحصول على أربعة أصناف جديدة ذات انتاج عال وهي (كريم وبن بشير) من القمح الصلب (تانيت وصلامبو) من القمح الطري ، أما بالنسبة للشعير فقد استنبط المزارع التونسي صنفين هما (مارتان وسيريس) ، ويضيف المختص قائلا : « لقد حققت هذه الأصناف انتاجا متطورا ، وذلك بفضل التحسين المستمر للتقنيات الزراعية من مستلزمات الانتاج ، كالبذور والأسمدة الكيمائية ومبيدات الحشرات وادخال الميكنة الزراعية ، فقد ارتفع الانتاج من ٤٠٠ كغ للهكتار سنة ١٩٧٠ ، الى ١٠٣٠ كغ عام ١٩٨٣ للقمح الصلب ، ومن ٣٧٠ كغ للهكتار ، الى ٨٦٠ كغ للهكتار بالنسبة للشعير خلال نفس الفترة .

ان برنامج تحسين الشعير في تونس الذي تتولاه (ايكاردا) قد توصل الى انتخاب ثلاثة اصناف جديدة من الشعير أطلق عليها (تاج وفاتز وريحان) ، وتمتاز بأنها متفوقة على انتاج البذور المحلية المزروعة في تونس ، وقد أظهرت التجارب المشتركة في السنوات القليلة الماضية وجود سلالات شعير مبشرة ، أعطت تفوقا ملحوظا على كافة الأصناف المحلية والمحسنة ومنها صنف (ريحان) .

البقوليات : الفول والعدس والحمص

تعتمد الملايين من سكان مصر والسودان وخصوصا الفقراء وذوي الدخول المحدودة على الفول كوجبة رئيسية ، وقد تزايد الطلب على الفول خلال السنوات الأخيرة ، بحيث لم يعد الانتاج المحلي يكفي للايفاء بالطلب ، ومع تزايد عدد السكان أصبحت الحاجة ملحة لتبني سياسة رشيدة ، لتوفير هذه المادة الضرورية ، فقد انخفض انتاج الفول في مصر في السنوات الأخيرة ، وتناقصت المساحات المزروعة بالفول من ١٤٧,٨٦٠ هكتارا خلال السنوات من ١٩٦٠ ـ ١٩٧٠ ، الى ١١٠,٩٥٣ هكتار خلال السنوات ١٩٧١ ـ ١٩٨٠ ، نتيجة عوامل عديدة ، لعل من أهمها منافسة المحاصيل الشتوية الأخرى ، كالقمح والبرسيم ، كما رافقت هذه زيادة في الطلب ، نتيجة للنمو السكاني السريع ، مما اضطر الى استيراد ١٣٧ ألف طن من الفول عام ١٩٨٠ .

لذلك جاء مشروع وادي النيل الذي تبنته (ايكاردا) والصندوق الدولي للتنمية الزراعية (ايفاد) ومنظمات اخرى دولية ووطنية من مصر والسودان ، ممثلة في وزارات الزراعة في كلا البلدين ، تتويجا لهذا المشروع الحيوي ، فقد أثبتت نتائج الدراسات في محطات البحوث الزراعية امكانية زيادة الكفاءة الانتاجية لمحصول الفول بنسبة كبيرة ، اذ بلغ متوسط الانتاج في محطات البحوث ٥٢,٨ طنا مقابل ١,٦ طنا للهكتار في حقول المزارعين . ومن المعروف أن محصول الفول له أهمية زراعية ، حيث يعمل على تحسين خصوبة التربة ، بما يثبته من أزوت جوي عن طريق العقد البكتيرية ، يقول أحد المختصين في برنامج البقوليات ودور (ايكاردا) في هذا المجال : « ان (ايكاردا) تساهم بدور فعال في انجاح مشروع وادي النيل ، حيث تقوم بتقديم المساعدات العلمية والفنية والادارية ، اذ يشترك علماؤها في الاجتماعات السنوية ، ووضع البرامج البحثية ، والمشاركة في الندوات والمؤتمرات والزيارات الميدانية لمواقع التجارب ، كما أنها تقدم أيضا مساعدات جليلة للبرنامج الوطني في السودان ، عن طريق تزويدها بالتجارب الدولية لمحصول الفول بمختلف أنواعها ، والطرز الوراثية المختلفة لتقييمها واختبارها تحت الظروف البيئية للبلاد ، وعمل التهجينات بين السلالات المبشرة ، وذلك في المزرعة الرئيسية (لايكاردا) في حلب ، وتقديمها للبرامج الوطنية في مصر والسودان ، وهذه التجارب تهدف الى الجمع بين العوامل الوراثية المرغوبة ، التي تؤدي في النهاية الى امكانية استنباط أصناف جديدة عالية المحصول ، ومقاومة للأمراض والحشرات والأعشاب الطفيلية ، وذات جودة ممتازة .

ولما كان العدس والحمص من البقوليات الأساسية ، فقد أولت (ايكاردا) هاتين الغلتين اهتماما جيدا ، وذلك باستنباط الطرز الوراثية ، أو الأصناف التي تتمتع بالصفات الفينولوجية المناسبة ، ذات القدرة على تحقيق غلة عالية وثابتة في كل من المناطق البيئية الثلاث لانتاج العدس ، وهي المنطقة المرتفعة ، ومنطقة البحر المتوسط ، ذات الارتفاع المتوسط والمنخفض ، ثم المنطقة الجنوبية التي تضم بنجلادش ومصر وأثيوبيا والهند وباكستان والسودان ، فقد شملت أبحاث (ايكاردا) على الصفات الخاصة في التراكيب الوراثية لهذا النبات في المناطق المرتفعة ، بحيث يتحمل البرودة ويقاوم الذبول ، وبالنسبة لبرنامج تحسين الحمص ، فقد ساهمت (ايكاردا) مع المركز الدولي لبحوث المناطق الاستوائية شبه القاحلة (اكريسات) في زيادة انتاج الحمص الكابولي ، وذلك عن طريق استنباط طرز وراثية متفوقة ، مع تحسين طرق الانتاج ، وجعلها في متناول البرامج الوطنية ، يقول أحد علماء ايكاردا المختصين في هذا البرنامج : « لقد استمر اهتمامنا في موسم ١٩٨٢ ـ ١٩٨٣ على تطوير الأصول الوراثية للحمص الكابولي ، واستطعنا استنباط سلالات عالية الغلة ومقاومة للتبقيع الاسكوكيتي ، وهذه الأصناف اقل حساسية لطول الفترة الضوئية ، مع المحافظة على جودتها من الناحية الغذائية والخواص المتعلقة بالطهي ، ولتوضيح مدى الاهتمام الذي نوليه لغلة الحمص فقد بلغت الأصول الوراثية التي يقتنيها بنك الأصول الوراثية (بايكاردا) في الوقت الحاضر ٥٣٤٠ طرازا ، منها ٩٢٠ طرازا أضيفت في موسم ١٩٨٢ ـ ١٩٨٣ ، وقد استطعنا استنباط ٨٤٠ طرازا من الطرز الموجودة في بنك الأصول الوراثية ، عن طريق التهجين ، وهي تمثل ٣٤ بلدا ، وأكبر عدد

الدكتور محمد عبدالله نور/ المدير العام

من هذه الطرز الوراثية جاء من ايران ، ثم من افغانستان ، وتركيا ، وشيلي ، واسبانيا ، وتونس ، والهند » ويضيف المسؤول عن هذا البرنامج قائلا : « ويدل تقييم الاصول الوراثية على أنه من المفيد الحصول على مجموعات اضافية من الاتحاد السوفيتي ، لاستخدامها في انتخاب الأصول المقاومة للتبقع الاسكوكيتي والصقيع ، وتمتاز بأن نباتاتها تكون طويلة ، لانتخاب السلالات ، الكبيرة البذور وذات المحصول المرتفع » .

الأعلاف والمراعي

ومن البرامج الأساسية التي تتولاها (ايكاردا) برنامج تحسين محاصيل الأعلاف والمراعي ، الذي يتمثل في زيادة المراعي والأعلاف المتاحة للحيوانات الزراعية ، فضلا عن تحسين خصوبة التربة كخطوة أولى في سبيل زيادة غلة محاصيل الحبوب ، يقول المسؤول عن هذا البرنامج : « المعروف عن محاصيل الأعلاف الحولية بأنها تلك المحاصيل التي تعاد زراعتها سنويا بقصد الحصول على الدريس أو الرعي ، أما المراعي فهي المساحات الخضراء التي تتجدد من تلقاء نفسها ، وتستخدم أساسا لغرض الرعي ، اننا نركز بحوثنا على استغلال الأراضي التي تترك بورا ، لان توالي زراعة محاصيل الحبوب سنة بعد أخرى يؤدي الى انخفاض المحصول ، لذلك فان زراعة المحاصيل الرعوية أو المحاصيل العلفية قد تساعد في مرحلة لاحقة على تحسين غلة الحبوب ، لأن محاصيل الحبوب تستفيد من زيادة خصوبة التربة ، نتيجة لتثبيت الازوت الجوي بفعل محاصيل الأعلاف البقولية أو المراعي » .

ويضيف المسؤول قائلا : « وقد تمكنا من التعرف على الفصة الحولية أو (النفل) كمحصول بقولي حولي ملائم لظروف التربة والمناخ السائدين في شمال سوريا ، وترجع أهمية هذا النوع الى قدرته على البقاء في مواسم الشتاء الباردة ، وقدرته على تكوين البكتيريا العقدية ، وانتاج محصول عال من المادة الخضراء ، وقد استطاع برنامج الأعلاف أن يطور على نطاق واسع نظما لانتاج الدريس ، مستخدما في ذلك أصنافا من البازلاء العلفية والبيقية ، وكذلك التعرف على العديد من الأمراض التي تصيب المحاصيل الرعوية والعلفية ، وتحديد شدة الاصابة بهذه الأمراض .

في كلمة ألقاها الدكتور محمد العمادي المدير العام للصندوق العربي للانماء الاقتصادي والاجتماعي سابقا ، في المؤتمر العربي للبحوث الزراعية على المحاصيل الغذائية الاساسية ، الذي عقد في حلب في ابريل من هذا العام قال : « ان ما يقوم به المركز الدولي للبحوث الزراعية من جهد في مجال البحث الزراعي على المحاصيل الاساسية للغذاء ، انما يجسد خطوة على الطريق الصحيح لدفع عملية الانتاج الزراعي ، والاسهام في تحقيق الأمن الغذائي في عدد من محاصيل الغذاء الأساسية . وتشكل برامج التعاون العلمي بين (ايكاردا) وعدد من الاقطار العربية ، في محاصيل القمح والشعير والفول ، والتطبيقات العملية للأصناف المحسنة من هذه المحاصيل تشكل الادلة الملموسة لهذا الجهد في المناطق البعلية الجافة من وطننا العربي . □

مد فترة مشروع وادى النيل لتحسين انتاجية الفول فى السودان ومصر ثلاث سنوات اخرى

القاهرة : عبد المجيد الصاوي

عقد المركز الدولي للبحوث الزراعية بالمناطق الجافة (ايكاردا) خلال الايام الماضية مؤتمرا بمدينة القاهرة اشترك فيه عدد كبير من العلماء والخبراء ينتمون الي ٤٠ دولة لعرض ومناقشة نتائج التجارب التي اجريت بشان زيادة انتاجية محاصيل الفول والعدس والحمص وخاصة النتائج التي اسفر عنها مشروع وادى النيل لتحسين انتاجية الفول في السودان ومصر ٠

وقد صرح مدير مشروع وادى النيل في مصر بان جهود العلماء المشاركين في التجارب اثمرت تحولا كبيرا في انتاج الفول وبدات مصر تصدره الي الخارج بعد ان كانت تستورده لسنوات طويلة وان هذه التجارب اجريت طوال السنوات الست الماضية بتمويل من الصندوق الدولي للتنمية من خلال المركز الدولي للبحوث الزراعية في المناطق الجافة والذى خصص ستة ملايين جنيه لهذا المشروع الذى يستهدف تحقيق زيادة انتاجية الفدان في كل من السودان ومصر لسد الفجوة بين ما يحققه الباحثون في حقول التجارب حيث تصل انتاجية الفدان الي ١٥ اردبا وبين ما يحققه المزارعون في الحقول حيث لايتجاوز متوسط الانتاج سبعة ارادب للفدان ٠

واعلن الدكتور محمد عبد الله نور مدير المركز الدولي للبحوث الزراعية في المناطق الجافة ان التركيز علي ابحاث وتجارب الفول طوال السنوات الست الماضية في السودان ومصر يرجع الي ان الفول يعتبر من المحاصيل البقولية الرئيسية في البلدين خاصة وانه يحتوى علي نسبة عالية من البروتين تصل الي ٢٨ في المائة وانه بعد ست سنوات من العمل الناجح في البلدين ،رر المركز الدولي بالاشتراك مع الصندوق الدولي للتنمية مد مدة مشروع وادى النيل لتحسين انتاجية الفول في السودان ومصر ثلاثسنوات اخرى تبدا مع بداية عام ١٩٨٦ وعلي ان تنضم اثيوبيا الي المشروع للمساهمة في سد الفجوة الغذائية بها ٠

واضاف الدكتور محمد عبد الله نور مدير المركز الدولي للبحوث الزراعية في المناطق الجافة انه مع ارتفاع ارقام ضحايا الجفاف والجوع في اسيا وافريقيا تزداد حدة السباق الذى يخوضه علماء الزراعة لحماية نحو ٤٥٠ مليون انسان يتعرضون للمجاعة والهلاك في القارتين٠

اتحاد مؤسسات البحوث الزراعية بالشرق الاوسط وشمال افريقيا يعقد مؤتمره الأول بدمشق

دمشق ـ «الشرق الاوسط» ـ

ادراكا من اتحاد مؤسسات البحوث الزراعية في الشرق الاوسط وشمال افريقيا ، للمشكلات والتحديات التي تواجه التنمية الزراعية في المنطقة ، ووعيا منه بالمسؤوليات التي ينبغي له تحملها ، والتناعا بامكانية تعزيز دور مختلف المؤسسات الزراعية وتاثيرها عن طريق التعاون الفعال ، فقد عقد في دمشق المؤتمر العام الاول لاتحاد مؤسسات البحوث الزراعية في الشرق الاوسط وشمال افريقيا بحضور ممثلي افغانستان ـ قبرص ـ جيبوتي ـ مصر ـ ايران ـ العراق ـ الاردن ـ الكويت ـ لبنان ـ موريتانيا ـ المغرب ـ عمان ـ باكستان ـ الصومال ـ السودان ـ سوريا ـ تركيا ـ اليمن ـ اليمن الجنوبي .

بالاضافة للمنظمات الدولية للتغذية والزراعة (الفاو) والمركز الدولي للبحوث الزراعية في المناطق الجافة (ايكاردا) ومركز خدمة البحوث الوطنية (اسنار) .

وفي هذا المؤتمر الذي دامت جلساته يومين تم عرض البيانات الافتتاحية ، ثم القى الممثل الاقليمي لمنظمة الاغذية والزراعة في الشرق الأوسط كلمة اشار فيها الى المشكلة التي تعانيها المنطقة في ما يتعلق بالغذاء وما تقدمه المنظمة في هذا المجال .

ثم القى المدير العام للمركز الدولي للبحوث الزراعية في المناطق الجافة بحثا يتعلق بهذه المشكلة وكيفية التصدي لها . بعده القى المدير العام للخدمة الدولية للبحوث الوطنية الزراعية بحثا اخر بين من خلاله ، المتطلبات الوطنية الزراعية وكيفية الاعداد لها . كما القى وزير الزراعة السوري كلمة اشار فيها الى التجربة السورية الزراعية ومدى تطورها .

اما عن جلسات هذا المؤتمر ، فقد عرض في الجلسة الاولى تقرير المنظمة عن الاجراءات المتخذة بشأن توصيات المشاورة الفنية عن التعاون في البحوث الزراعية التي عقدت في نيقوسيا في شهر اكتوبر (تشرين الاول) ١٩٨٣ .

وفي الجلسة الثانية عرض بحث هام عن افاق تطوير اتحاد مؤسسات البحوث الزراعية في الشرق الاوسط وشمال افريقيا .

كما عرضت في الجلسة الثالثة بعض النشاطات التي سيقوم بها الاتحاد .

كما تم تقديم بحوث مختارة عن شبكات البحوث ، وعن التدريب في مجال البحوث الزراعية وادارة البحوث . وجرت مناقشات ساهم فيها بعض مندوبي الدول حول بعض النشاطات التي ستنفذ في المستقبل .

وفي الجلسة الخامسة تم انتخاب اللجنة التنفيذية للاتحاد ، وتحدد موعد انعقاد المؤتمر الثاني ومكان انعقاده .

وفي الجلسة الاخيرة تمت الموافقة على التقارير المقدمة .

الاتحاد جهاز مستقل

وجدير بالذكر ان هذا الاتحاد هو جهاز مستقل ، له الشخصية القانونية في اداء الاعمال المناسبة لبلوغ اهدافه المتعلقة في تطوير الزراعة في الشرق الاوسط وشمال افريقيا . ويتألف اعضاؤه من الدول التالية :

افغانستان ـ الجزائر ـ البحرين ـ قبرص ـ جيبوتي ـ مصر ـ ايران ـ العراق ـ الاردن ـ الكويت ـ لبنان ـ ليبيا ـ موريتانيا ـ المغرب ـ عمان ـ باكستان ـ قطر ـ المملكة العربية السعودية ـ الصومال ـ السودان ـ سوريا ـ تونس ـ تركيا ـ الامارات ـ اليمن ـ اليمن الجنوبي .

ويهدف هذا الاتحاد الى :

١ـ رعاية تنمية البحوث الزراعية في الشرق الاوسط وشمال افريقيا .

٢ـ ترويج تبادل الخبرات والمعلومات الزراعية والعلمية والفنية .

٣ـ تشجيع انشاء البرامج المناسبة للتعاون في مجال البحوث والتدريب ، وفقا للاحتياجات والاولويات الاقليمية التي يمكن التعرف عليها .

٤ـ تقديم المشورة للمؤسسات الاعضاء في القضايا المرتبطة بتنظيم البحوث وادارتها .

٥ـ تعزيز الصلات المشتركة بين المراكز والمنظمات القطرية والاقليمية والدولية المختصة بالبحوث بما في ذلك الجامعات ، وذلك عن طريق اشراكها في برامج بحث وتدريب مخططة بصورة مشتركة .

وتتلخص مهام الاتحاد فيما يلي :

١ـ عقد مؤتمرات كل عامين مرة ، يناقش فيها رؤساء ادارات البحوث في المؤسسات الاعضاء ما يتعلق بعمل الاتحاد ، الى جانب سياسات البحوث واولوياتها ، وتقييم برامج البحوث والاشراف على تنفيذها

٢ـ تنظيم فرق العمل ، والحلقات الدراسية لمناقشة المشكلات النوعية او اجراء الدراسات الفنية .

٣ـ تنظيم الحلقات الدراسية او الدورات التدريبية او الحلقات الدراسية العلمية ، تحت رعاية الاتحاد وحده ، او بالتعاون مع المؤسسات والمنظمات الاخرى .

٤ـ انشاء شبكات للبحوث والمعلومات عن طريق المؤسسات القطرية او الاقليمية .

٥ـ رعاية المؤسسات الاقليمية المختصة بفروع علمية معينة ، ودوريات البحوث الزراعية ان كان ذلك مناسبا .

٦ـ اقامة الصلات مع الوكالات والمؤسسات والمنظمات وغيرها من الاجهزة التي تقوم بأعمال مماثلة داخل الاقليم وخارجه .

ويعتبر المؤتمر العام هو السلطة العليا للاتحاد ، وتحقيقا لمقاصد الاتحاد يقرر المؤتمر السياسة التي يسير عليها الاتحاد ، ويوافق على برنامج العمل والميزانية ، ويشرف على تنفيذها ، ويستعرض ما تحقق من تقدم ، ويمارس كل السلطات المخولة له في الدستور .

حقل للشعير في مدينة حلب السورية ويظهر فيه فنيو (ايكاردا)

اصناف جديدة للمحاصيل الزراعية بسوريا يستنبطها المركز الدولي لبحوث المناطق الجافة

دمشق ـ «الشرق الاوسط» ـ من وليد نجم

خلال انعقاد المؤتمر الاول لاتحاد البحوث الزراعية الدولية في دمشق مؤخرا ، التقت «الشرق الاوسط» مع الدكتور احمد عبد الله نور المدير العام للمركز الدولي للبحوث الزراعية في المناطق الجافة (ايكاردا) الذي يتمركز في مزرعة تبلغ مساحتها ٩٤٨ هكتارا تقع في موقع يسمى تل حديا جنوب غرب مدينة حلب السورية .

وحول اختيار هذا الموقع بالذات ، قال مدير عام المركز ان هذا المكان قريب من البيئات التي ينتشر نطاق علمنا بها ، ثم انها هدية مقدمة لنا من الحكومة السورية .

وعن نشاط المركز قال : انه يمتد من المغرب غربا حتى باكستان شرقا ، ومن تركيا شمالا حتى السودان جنوبا ، وتشمل هذه المنطقة ٣٢ بلدا يزيد عدد سكانها على ٣٠٠ مليون نسمة . ويركز على المناطق التي تعتمد على الامطار ، والتي لا تزيد كمياتها من ٢٠٠ ـ ٦٠٠ مم سنويا ، وهذه المناطق كثيرة في دول غربي آسيا وشمال افريقيا . لذا ينصب اهتمام المركز على الاستفادة القصوى من المصادر الطبيعية ، واستخدامها بشكل اساسي لتطوير انظمة زراعية محسنة تعود على المزارع والفلاح والدولة بأكبر فائدة . ويتم ذلك من خلال استنباط اصناف جديدة ومحسنة قادرة على العطاء في الاراضي الجافة بمردود عال ، ومقاومة للامراض والآفات الزراعية ، ومتحملة لوطأة المناخ .

جولة في مزرعة

والجولة في مزرعة تل حديا تعكس هذه الحقيقة بشكل جلي . فاضافة للحقول المخصصة للتجارب هناك الخابور والكومبيوتر ، وعشرات الباحثين ، ونسأل عن اهداف هذا المركز بدقة .. فيأتي الجواب :

ـ اجراء الابحاث لتطوير وتحسين وتعميم انظمة متطورة لزراعة المحاصيل وتربية المواشي والعمل كمركز ابحاث دولي لتحسين محاصيل الشعير والعدس والفول ، والعمل كمركز اقليمي بالتعاون مع مراكز زراعية دولية لتحسين محاصيل اخرى ذات اهمية رئيسية للمنطقة مثل القمح والحمص ، واقامة التعاون وتعزيزه وتوطيد الابحاث مع المعاهد الدولية والاقليمية والوطنية ، فيما يتعلق بتطوير ، واقلمة ، واختبار وتعميم اصناف المحاصيل والانظمة الزراعية وتربية الماشية المحسنة ، ودعم واجراء الدورات التدريبية في الابحاث الزراعية .

كيف انشأ هذا المركز الدولي ؟

هذه الاهداف العريضة تدفع للسؤال عن سر انشاء هذا المركز الدولي ، ومن هي الجهات التي تقف وراءه ، طالما انه يقوم بعمل علمي بعيد عن الربح ، اي انه لا يستثمر الارض لحسابه الخاص .

وكانت الاجابة جاهزة لدى الدكتور عدنان شومان مساعد المدير العام للعلاقات الدولية

ـ من خلال بحث ازمة الغذاء العالمي ، اتجهت انظار المجموعة الاستشارية الدولية للبحوث الزراعية التي انشأها البنك الدولي ومنظمة الاغذية والزراعة العالمية وبرنامج الامم المتحدة للتنمية ، الى المناطق الاستوائية والمناطق الجافة ، للعمل على ايجاد الصيغة المناسبة لتساعدها على زيادة الانتاج الغذائي ، واستقراره ، للحد من تفاقم مشكلة نقص انتاج المحاصيل الغذائية ، واعتماد المناطق الفقيرة المتزايد على استيراد الغذاء من خارجها

وقد توصلت هذه المجموعة الى توصية تدعي لدراسة اوضاع الزراعة والانتاج الزراعي في منطقة الشرق الادنى والقاء الضوء على المشكلات الزراعية الرئيسية التي تعانيها

ومن هنا نشأت فكرة تأسيس المركز الدولي للبحوث الزراعية في المناطق الجافة ، الذي ظهر للوجود عام ١٩٧٧ تلبية لحاجة ملحة في المنطقة الى زيادة الانتاج الغذائي وتحسين نوعه ، وذلك من خلال البحوث التطبيقية ، وبرامج التدريب ، تمهيدا لاحداث ثورة زراعية تساعد على تحسين مستوى المعيشة ودخل سكان هذه المنطقة ، التي تتعرض باستمرار لتزايد في السكان ، واحتمالات الجفاف وانخفاض نسبة الامطار ، وانتشار الامراض الزراعية ، الذي يؤدي لنقص في المحصول ، وما يتبع ذلك من مشاكل اقتصادية لها ابعاد اجتماعية وغذائية وانسانية .

وعن مصادر تمويل هذا المركز الدولي ، يقول الدكتور شومان : ان ميزانية (ايكاردا) تتألف من الاموال التي تخصص لها من قبل المجموعة الاستشارية ، وذلك من حصيلة تبرعات ومساهمات الدول والمؤسسات العربية والدولية .

ومواردها تأتي من الجهات التالية :

الدانمارك ـ اسبانيا ـ استراليا ـ ايطاليا ـ بلجيكا ـ فرنسا ـ كندا ـ السويد ـ المانيا الغربية ـ المكسيك ـ المملكة العربية السعودية ـ المملكة المتحدة ـ النرويج ـ الولايات المتحدة الامريكية ـ البنك الدولي للانماء والتعمير ـ المركز الدولي لتنمية البحوث ـ مؤسسة فورد ـ الصندوق العربي للتنمية الاقتصادية والاجتماعية

وتتلقى ايكاردا دعما ماليا من

ـ منظمة الدول المصدرة للبترول (اوبك) والصندوق الدولي للتنمية الزراعية وبرنامج المساعدات الامريكية للتنمية .

وقد توصل خبراء (ايكاردا) الى احراز تقدم ملحوظ في مجال الابحاث الزراعية ، من حيث استنباط اصناف جديدة من المحاصيل ذات المردود المرتفع ، والقادرة على مقاومة الامراض والظروف والبيئة ، ويتجلى ذلك في سوريا ، حيث وافقت الحكومة مؤخرا على اعتماد وتوزيع صنفي القمح القاسي المستنبط (شام ١) والقمح الطري (شام ٢) . ومن المتوقع ان يؤدي استغلال هذان الصنفان الى زيادة في المحاصيل القمحية في سوريا

دمشق تحتضن غداً المؤتمر العام الأول لاتحاد مؤسسات البحوث الزراعية في الشرق الأدنى وشمال افريقيا

دمشق ـ سانا: تشهد دمشق في مطلع هذا الاسبوع تظاهرة علمية زراعية عربية ودولية كبرى بانعقاد المؤتمر العام الاول لاتحاد مؤسسات البحوث الزراعية في الشرق الادنى وشمال افريقيا الذي يعقد خلال الفترة بين ٢٨و٣٠ تموز الجاري بالتعاون بين ثلاث منظمات دولية هي منظمة الاغذية والزراعة للامم المتحدة «الفاو» والمركز الدولي للبحوث الزراعية في المناطق الجافة «ايكاردا» والمركز الدولي لخدمة البحوث الزراعية الوطنية «اسنار».

وسيفتتح المؤتمر السيد الدكتور المهندس محمود كردي وزير الزراعه والاصلاح الزراعي ويشارك فيه ممثلون عن ٢٦ دولة من دول الشرق الادنى وشمال افريقيا اضافة الى ممثلي عشر منظمات عربية ودولية.

وقد بدأت هذه الوفود تصل الى دمشق تباعا منذ امس للمشاركة في هذا المؤتمر الزراعي الاقليمي والدولي الكبير.

وسيلقي في حفل افتتاح المؤتمر الذي سيقام في الساعة العاشرة من صباح يوم غد الاحد كلمات كل من السيد وزير الزراعة والاصلاح الزراعي والسيد ممثل المنظمة الاقليمي للشرق الادنى والسيد المدير العام للمركز الدولي للبحوث الزراعية في المناطق الجافة والسيد المدير العام للخدمة الدولية للبحوث الزراعية القطرية.

وصرح الدكتور عدنان شومان المدير العام المساعد للمركز الدولي للبحوث الزراعية في المناطق الجافة ايكاردا لمندوب «سانا» بان من اهم ماسيناقشه المؤتمر في جلساته التي تستمر ثلاثة ايام تقرير المنظمة عن الاجراءات المتخذة بشان توصيات المشاورة الفنية عن التعاون في البحوث الزراعية التي اتخذت في ندوة نيقوسيا بقبرص خلال تشرين الاول عام ١٩٨٣.

كما سيناقش في المؤتمر إفاق تطوير اتحاد مؤسسات البحوث الزراعية في الشرق الادنى وشمال افريقيا اضافة الى عرض بعض نشاطاته المقبلة وكذلك شبكات البحوث والتدريب في مجال البحوث الزراعية.

ويختتم المؤتمر اعماله بانتخاب اللجنة التنفيذية للاتحاد واختيار مقر له وتحديد موعد ومكان انعقاد المؤتمر الثاني والمصادقة على التقرير المقدم واقرار التصويات التي يتم التوصل اليها.

وذكر الدكتور شومان ان المنظمات الدولية الثلاث كانت قد عقدت ندوة فنية بشان التعاون في البحوث الزراعية في نيقوسيا بقبرص خلال تشرين الاول من عام ١٩٨٣ بحضور ممثلين عن ١٣ دولة من بينها سورية. وقد تم فيها التأكيد على ضرورة دعم البحوث الزراعية الوطنية في المنطقة وتعزيز التعاون الدولي للوصول الى زيادة الانتاج الغذائي للملايين من البشر.

وقال ان الندوة اقرت في ختام اجتماعاتها انشاء اتحاد لمؤسسات البحوث الزراعية في الشرق الادنى وشمال افريقيا ليكون جهازا غير حكومي لتعزيز التعاون الاقليمي في مجال البحوث الزراعية.

واوضح الدكتور شومان ان من اهداف هذا الاتحاد العمل على رعاية وتنمية البحوث الزراعية في المنطقة وتعزيز تبادل الخبرات والمعلومات الزراعية والعلمية والفنية وتشجيع انشاء البرامج المناسبة للتعاون في مجال البحوث والتدريب وتقديم المشورة للمؤسسات الاعضاء في القضايا المرتبطة ارتباطا وثيقا بتنظيم البحوث الزراعية وادارتها وكذلك تعزيز الصلات المشتركة بين المراكز والمنظمات القطرية والاقليمية والدولية المختصة بالبحوث الزراعية.

وقال الدكتور شومان في ختام تصريحه ان لهذا الاتحاد لجنة تنفيذية مؤلفة من رئيس ونائب رئيس وامين عام واربعة اعضاء.

مؤتمر التبغ أنهى أعماله باللاذقية

اللاذقية ـ سانا: اختتم امس المؤتمر الزراعي السنوي للمؤسسة العامة للتبغ جلسته الاخيرة برئاسة الرفيق محمد مخلوف المدير العام للمؤسسة بعد اجتماعات استمرت خمسة ايام.

وحضر حفل الاختتام الرفاق عازي خضرة امين فرع اللاذقية للحزب والدكتور عزيز صقر محافظ اللاذقية والمسؤولون في محافظات القطر التي تزرع التبغ.

وقد اتخذ المؤتمر العديد من التوصيات من [redacted] زراعة وصناعة التبغ وتوسيع المساحات المخصصة لزراعته التبغ.

كما اتخذ عددا من التوصيات [illegible] في الصعوبات و[illegible]

حشرات التبغ والمضخات والالات الزراعية.

واقر المؤتمر توجيهات بمنح قروض لمزارعي تبغ البرمي والفرجيني واقامة خمسة حقول لاستبذار الجديد بمساحة مائة وخمسين دونما.

كما اقر المؤتمر توصية بتطوير زراعة التبغ الفرجيني بحيث يوازي الانتاج الاستهلاك وزيادة رقعة الاراضي التي ستزرع بالتبغ من خمسة عشر الف دونم الى ثلاثين الف دونم.

ـ والجدير بالذكر أن خطة الموسم المقبل لزراعة التبغ تقضي زراعة ١١٥٣ هكتارا بصنفي البرمي والفرجيني بحيث من المتوقع ان تنتج ستة عشر الف وثمانمائه وثلاثة وتسعين

الفداء

أسبوعية صادرة عن المكتب التنفيذي لمجلس محافظة حماة

العدد : « ٢ » الأحد / ٨/ شعبان / ١٤٠٥/ ٢٨/ نيسان / ١٩٨٥/

المركز الدولي للبحوث الزراعية يطلع على واقع تجارب تسميد الشعير المحلي في المحافظة

اطلع وفد من خبراء مديرية الأراضي في وزارة الزراعة والمركز الدولي للبحوث الزراعية في المناطق الجافة ، على التجارب التي تجريها مديرية زراعة حماة على تسميد الشعير المحلي - بعل - في منطقتي الاستقرار - ٢ - و - ٣ - ضمن إطار البرنامج بين مديرية الاراضي والمركز الدولي المذكور .

وقد أبدى الوفد ارتياحه واعجابه من التجارب التي جرت في قرى - الشيخ علي كاسون - و - المبعوجة - و - معر شحور - مؤكداً على ضرورة متابعة هذه التجارب لاستخلاص النتائج الدقيقة لوضع المعدلات السمادية الثابتة لمختلف الأراضي .

هيثم أبو طوق مدير زراعة حماة أكد على أن النتائج الأولية للتجارب دلت على استجابة تامة للتسميد الفوسفاتي والآزوتي مما يشجعنا على مضاعفة الجهود .

المؤتمر الدولي لاتحاد مؤسسات البحوث الزراعية يختتم أعماله

دمشق - سانا - اختتم مؤتمر اتحاد مؤسسات البحوث الزراعية في الشرق الادنى وشمال افريقيا اعماله هنا امس بانتخاب الدكتور - حسن الاحمد - مدير البحوث العلمية الزراعية في القطر العربي السوري بالاجتماع رئيسا لهذا الاتحاد .

كما انتخب المؤتمر الدكتور - نهامي زعراوي - من المغرب نائبا للرئيس وكلا من الدكاترة - حسن خليفة - من السودان - وعلاء الدين داوود - من العراق - ويوسف ارجون - من تركيا - وغلام رسول ساندو - من باكستان اعضاء في اللجنة التنفيذية للاتحاد .

وانتخب المؤتمر كذلك الدكتور - عبد الوهاب المرسي - من منظمة الاغذية والزراعة الدولية امينا عاما للاتحاد .

وقد اتفق بالاجماع على ان يكون مقر الاتحاد والمؤقت في مقر المكتب الاقليمي لمنظمة الاغذية والزراعة الدولية في روما حيث يقوم حاليا هذا المكتب باعمال الامانة العامة للاتحاد .

كما اقر المؤتمر رفع توصية بذلك الى السيد المدير العام لمنظمة الاغذية والزراعة الدولية للموافقة عليها .

وتقرر عقد المؤتمر الثاني القادم لاتحاد مؤسسات البحوث الزراعية في الشرق الادنى وشمال افريقيا بعد عامين وقد رحب كل من ممثلي المغرب وقبرص باستضافة المؤتمر في بلديهما .

وقبل نهاية الجلسة الختامية القى الدكتور - حسن الاحمد - مدير البحوث العلمية الزراعية في القطر العربي السوري كلمة شكر فيها اعضاء الوفود المشاركة في المؤتمر زملاؤه . وعاهدهم على بذل اقصى ما يستطيع في سبيل نجاح مهمته . وطلب من الجميع ان يكون التعاون مع اعضاء اللجنة التنفيذية للاتحاد دائما لما فيه خير ومصلحة التنمية الزراعية .

هذا وقد ادلى الدكتور - عدنان شومان - المدير العام المساعد للمركز الدولي للبحوث الزراعية في المناطق الجافة - ايكاردا - بتصريح لمندوب الوكالة العربية السورية للانباء ، قال فيه ان المؤتمر قد حقق الغاية التي عقد من اجلها .

واضاف لقد قامت المنظمات الثلاث بسلسلة من المشاورات مع الدول لانجاح عقد هذا المؤتمر وقد تم عقده بحمد الله كما تم تاسيس الاتحاد وذكر انه تم تزويد اللجنة المنتخبة بفيض من الافكار والتطلعات المستقبلية لكي تبدأ عملها لتحقيق اهداف هذا الاتحاد .

واشار الى ان المؤتمر سادته روح من التعاون والثقة المتبادلة وعبر المشاركون عن ارتياحهم لحسن سير اعمال المؤتمر .

نقص غذاء الاغنام فى المناطق الجافة

قطيع من الاغنام من نوع اواسى فى شمال سوريا ، حيث اجبر نقص الاعلاف فى فصلي الشتاء والربيع المزارعين السوريين على ذبح اغنامهم وبيعها بأبخس الاثمان .

ان حوالى ٦٠٪ من احتياجات العالم العربى من اللحوم تعتمد على الاعلاف المستوردة ، كما ان المشكلة تزداد سوءا بازدياد السكان وتدهور الأراضى الرعوية بسبب الافراط فى الرعي . فى هذا المقال يكشف لنا المحرر العلمى لين سيمارسكى الدور الذى يقوم به المركز العالمى للابحاث الزراعية فى المناطق الجافة (ايكاردا) بسوريا بالتضامن مع منظمات البحث الاخرى للتغلب على مشاكل المواشى والاعلاف .

لعل من الامور التى تلفت نظر المسافر على طريق حلب دمشق فى الآونة الاخيرة جلود الضأن وهي معرضة لحرارة الشمس لتجف بعد شدها على مشاجب مؤقتة . فقد اجبر نقص المراعى المزارعين السوريين الى ذبح اغنامهم وبيع جلودها بأبخس الأثمان . ويقدر مسؤولو مؤسسة الأعلاف السورية أن قطعان الاغنام السورية قد انخفضت من ١٣ مليون رأس فى بداية عام ١٩٨٤ الى ٨ – ٨,٥ مليون رأس بحلول شهر اكتوبر من نفس العام بخسارة قدرها حوالي ٥,٠٠٠,٠٠٠ رأس .

والنقص فى الأعلاف ، الذى ازداد سوءا بسبب الجفاف الذى ضرب البلاد فى العام الماضى ، ليس مقتصرا على سوريا وحدها ، حيث نجد أن نصف المناطق الزراعية فى الشرق الأوسط وشمال افريقيا تواجه مشاكل فى نقص علف المواشى وفى المرعى ، مما جعل هذه المشاكل تأخذ جانبا كبيرا من الاهتمام والبحث من قبل المركز العالمي للابحاث الزراعية فى المناطق الجافة (ايكاردا) الذى يتخذ من مدينة حلب السورية مقرا له ، والذى يسعى جاهدا الى تحسين مخزون الأعلاف فى الشرق الأوسط وشمال افريقيا من خلال دعم برامج البحث الوطنية .

والنقص فى اعلاف المواشى – الذى يكون اكثر حدة فى فصلي الشتاء والربيع – ازداد تدهورا بسبب النمو المضطرد فى عدد السكان والطلب المتزايد على المواد الغذائية فى الاقليم بأسره . وحسب تقارير المنظمة العربية للتنمية الزراعية فان ٦٠٪ من احتياجات العالم العربى يتم توفيرها عن طريق الاستيراد .

ويقول الدكتور جون جيرهارت ممثل مؤسسة فورد السابق بالقاهرة ، ان حاجة الدول العربية فى الشرق الأوسط وفى شمال افريقيا من اللحوم سترتفع الى ١٠٪ سنويا خلال العقدين القادمين .

كذلك نجد أن المناطق التى تعتمد على الامطار والتى يأتى منها معظم الضأن قد اخذت هي الاخرى فى التدهور . اننا أمام بوادر تدعو الى القلق مثل تعرية التربة وفقدانها لخصوبتها وتدهور انتاجية المحاصيل ، هذا ما يقوله الدكتور بيتر كوبر رئيس الجهاز الزراعى لبرنامج ابحاث ايكاردا .

ويضيف دكتور كوبر قائلا ان الابحاث فى الماضى تجاهلت بدرجة كبيرة المشاكل المعقدة للمناطق الغير مروية ، فالمناخ والتربة والزراعة تتفاوت بدرجة كبيرة فى الاقليم ، كما ان هناك خلافات عرقية ، اضافة الى ان النظام الزراعى متغير باستمرار مع وجود هجرات معقدة للسكان والمواشى . كذلك فان فرعا واحدا من فروع العلوم لا يمكنه أن يحل هذه المشاكل ، فالمطلوب اذن معالجة شاملة تأخذ فى الاعتبار كل من الجوانب الاجتماعية والفنية للانتاج الزراعى .

وقد قام دكتور رونالد جوبيرت خبير الاقتصاد الزراعى بايكاردا بدراسة النظام الزراعى فى الأراضى السورية الجافة (المناطق التى يقل فيها معدل الأمطار السنوى عن ٣٥٠ ملم) والتى دفع تدنى الانتاجية الزراعية فيها السكان الى الهجرة . فمشاكل الزراعة السورية هي انعكاس لمشاكل الاقليم ككل .

هجرة الأراضى الجافة

ويوضح دكتور جوبيرت قائلا : فى هذه المناطق التى يقطنها ٢٥٪ من سكان الريف السورى تم ارسال الكثير من قطعان الماشية الى السهول لتتغذى على النباتات الربيعية التى نبتت بعد هطول الأمطار ، حيث تتعرض هذه المناطق لرعي مكثف مع مجهودات ضئيلة للمحافظة على خصوبة التربة ووقف التعرية ، كما ان الكثبان الرملية اخذت فى التكوين بالقرب من دير الزهور على نهر الفرات ، وهذه أولى الخطوات نحو التصحر .

وتأتى بعد الأراضى السهلية الشرقية من سوريا التى يمكن الرعي فيها ولكنها قليلة الأمطار بالنسبة للزراعة ، تأتى منطقة أخرى ، وهذه المنطقة معانها لا تزال جافة الا انها تحظى بمقدار كاف من التربة والأمطار تمكن من الزراعة . وحسب راي الدكتور جوبيرت ان انتاج الشعير قد انخفض منذ ذلك الوقت الى النصف أو اكثر . ويعتبر المزارع محظوظا فى الوقت الحالى اذا حصل على طن واحد عندما يكون العام جيدا . وعموما فان الدكتور جوبيرت يرى ان مثل هذه المناطق لم تساهم فى زيادة الناتج القومى

مزارع سورى يتعاون مع ايكاردا لانجاح احدى التجارب التى تقوم بها ، وذلك برعي اغنامه على حشائش البيقة والاعلاف . بعد ذلك يتم قياس كمية الالبان المنتجة .

الزراعى ، الذى يتأتى اساسا من الاراضى المروية والاراضى التى تحظى بمعدلات عالية من الأمطار .

ان أحد الاسباب التى تعيق انتاجية هذه الأراضى هو تدهور نوعية التربة . ويضيف دكتور جوبيرت ان الزراعة فى هذه المناطق اصبحت الآن نشاطا تعدينيا ، فالمزارعون ينهكون خصوبة التربة ولا يعوضون ذلك بأي شئ ، واذا ما استمر التدهور هكذا فربما قضى على المكتسبات الانتاجية فى الأراضى المروية .

وقد بدأت تتأثر جهود العلماء فى وزارة الزراعة السورية والمركز العربى لدراسات المناطق القاحلة والاراضى الجافة وايكاردا المتعلقة بايجاد حلول لهذه المشاكل .

ويوضح دكتور جوبيرت ان نظام الرعي الحالى للمواشى يجب ان يساير الامكانيات الحقيقية للارض ، فادخال اعلاف جديدة يمكن ان يحسن من خصوبة التربة ويوفر اعلاف للمواشى ، ومع ذلك لا يمكننا ان نتوقع عائدا اقتصاديا مرتفعا وسريعا ، اذ أن استقرار النظام الزراعى ووقف التدهور هو الهدف الاكثر واقعية .

اعادة الفوسفات

وفى الوقت نفسه كشفت الدراسات المشتركة لوزارة الزراعة السورية وايكاردا امكانية تحسين انتاجية الشعير الذى يمثل علفا هاما بالنسبة للمواشى والذى يزرع فى مساحة تصل الى مليون هكتار سنويا ، كما أدخلت وسائل جديدة تشمل اضافة الفوسفات كسماد الى التربة وتحسين المواد العضوية فى التربة وادخال زراعة البقوليات التى تضيف النتروجين الى التربة .

ويقول الدكتور دينو كيتنج المهندس الزراعى فى ايكاردا ان المخصبات يمكن ان تزيد من دخل مزارعي الشعير ثلاثة اضعاف عند استعمال بعض أنواع الدورات الزراعية ، ويضيف دكتور كيتنج قائلا ان أراضى سوريا الشمالية تعانى من نقص كبير فى الفوسفات ، وقد اتضح لنا ان اضافته يمكن أن تزيد من الانتاج وتقلل من الاخفاق الزراعى ، كما أن هناك مجال جيد للهندسة الزراعية ، ويختتم دكتور كيتنج حديثه قائلا : اننا نتمنى أن تساعد نتائج الدراسة المشتركة بين ادارة التربة السورية وايكاردا الحكومة السورية فى اعداد سياسات تشجع على استعمال الفوسفات فى المناطق الجافة .

وقد ركزت الدراسات التى أجراها الدكتور ايوان ثومسون خبير المواشى بايكاردا ، على غذاء الاغنام فى سوريا ، وعلى ظروف المزارعين ، بالاضافة الى محطة الابحاث . ويقول دكتور ثومسون ان الابحاث الزراعية كثيرا ما تتم بمعزل عن الابحاث المتعلقة بالمواشى ، الا اننا فى دراساتنا عن الأغنام ربطنا بين الزراعة والدراسات المتعلقة بالمرعى . فقد أجرينا دراسة لمدة ثلاثة اعوام عن كيفية تأثر الأعلاف عند استعمال المخصبات والسماح للمواشى برعيها وبدونها .

وقد قام الدكتور ثومسون باجراء تجاربه فى مزارع المزارعين فى المناطق الجافة من سوريا حيث تسود زراعة الشعير ، وقد قام المزارعون باختبار امكانية ملاءمة محاصيل مثل البيقة والجلبان والبازلا مع الدورة الزراعية الحالية كغذاء للاغنام ، بالاضافة الى مساعدتها فى تحسين انتاج العام القادم من الشعير باضافة النتروجين الى التربة . ويقول دكتور ثومسون ان اغنام المزارع تقوم برعى المحصول ، ويحصل المزارع على تعويضات مالية فى حالة تعرضه للخسارة بسبب هذه التجارب الجديدة ، الا ان امرا مثل هذا لم يحدث حتى الآن . أما فى الجانب الآخر من البحر الابيض المتوسط حيث تقع المغرب فقد ادى الجفاف الواسع الانتشار الذى ضرب المنطقة منذ عام ١٩٨٠ الى استيراد حبوب كلفت الكثير . وقد سجلت مؤسسة زراعية امريكية أيضا افراطا فى الرعي ونقص فى الاعلاف فى المناطق التى تقوم باجراء ابحاث عليها .

وتعمل هذه المؤسسة لايجاد انواع جيدة من الحبوب ووضع استراتيجيات للمحافظة على الماء للزراعة وانتاجية موحدة للحبوب والأعلاف ، كما يتطلع الباحثون فى هذه المؤسسة الى زراعة الأراضى البور بأعلاف مثل البيقة والبرسيم .

فى بلاد المغرب العربى

أما فى تونس فقد أصبح الجفاف والهجرة الريفية من المشاكل المألوفة ، فقد أهلك الجفاف الذى ضرب البلاد فى عام ١٩٨١ اعدادا كبيرة من المواشى التونسية ، وخاصة الضأن والاغنام . ففى مسح أجري على منطقة جبيلات – وهى مثل غيرها من الأراضى التونسية التى تحظى بأمطار قليلة لا يعتمد عليها – وجد العلماء التونسيون ان معظم المواشى يملكها صغار المزارعين ، كما كشفت دراسات أجريت على منطقة بوريبا ان خصوبة الضأن متدنية ، الا أن استعمال الأعلاف والادارة الجيدة يمكن أن يرفع هذه الخصوبة الى ٩٠٪ .

ان كل الاقليم فى حاجة الى اجراء ابحاث مكثفة على محاصيل الأعلاف التى يمكن تخزينها واستعمالها فى فصل الشتاء عندما تقل الأعلاف ، وبما أن التكاليف الأولية لانشاء مراعى ونظام أعلاف مرتفعة ، فهي تحتاج على الارجح الى دعم مالى وفنى من الحكومة .

ولكى تنجح هذه الاستراتيجيات ، لابد أن ينصب التركيز على المزارع ، فبعد عدة سنوات من التجارب مع المزارعين يقول العلماء فى ايكاردا ان تفاعل المزارع مع الوسائل الجديدة قد برهن على الاقل بأنه اسلوب لا يقل شأنا عن النتائج الفنية ، ويقول عالم الاجتماع الدكتور سونثيا منتى من مؤسسة فورد : أن الكثير من النظم الزراعية التقليدية بالاقليم فيها الكثير من العقلانية ، لذلك فان المسألة ليست فقط مسألة اقناع او تغيير افكار المزارع .

ولكن هذا النسيج المعقد الذى يضم المزارعين والمحاصيل والمواشى يقوم على قاعدة رخوة بدرجة كبيرة . وكما حذر الدكتور جيرهارت فان المناطق التى ظلت تزرع لآلاف السنين ستختفى من عالم الزراعة فى خلال ٣٠ عاما ما لم يتم تطوير نظام زراعى مدعوم .

وقت حلب الأغنام فى شمال سوريا ، بينما تظهر منازل احدى القرى المبنية من الطين فى خلفية الصورة .

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