IFDC

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Report

an update on the work & progress at the International Fertilizer Development Center

Headquarters—

Comments from the Managing Director

Photo by Charles Butler

Dr. David B. Parbery, IFDC Managing Director, addresses the 12th Annual IFDC Century Club Banquet. Parbery cited soil fertility as the imperative issue in the future—both to feed the world's ever-increasing population and to take care of the global environment.

During my first 4 months as IFDC's Managing Director, I have spent almost as much time overseas as I have at Headquarters. Much of this time has been spent in becoming familiar with the programs that IFDC has mounted on the African continent, investigating new avenues of involvement there, and discussing possible new ventures with international donors.

IFDC's Involvement in Africa

My travel itinerary has included two trips to Africa, the second of which was devoted primarily to visiting Zimbabwe and reviewing the proposal to establish the African Center for Fertilizer Development (ACFD), an item that has been on IFDC's books for more than 10 years.

IFDC has prepared a revised proposal for ACFD, which recommends a new implementation strategy. The revised proposal is in the process of being cleared by relevant agencies and will be submitted soon to international donors for funding. The Government of Zimbabwe and the OPEC Fund for International Development have already committed sufficient funds to initiate the Center. IFDC has been contracted to act as the Executing Agency for the first 5 years.

As envisioned, ACFD will focus on southern and central Africa and coordinate its programs with IFDC-Africa, which is based in Togo, and with the Egyptian Fertilizer Development Center (EFDC), which IFDC is helping the United Nations Development Programme (UNDP) and the United Nations Industrial Development Organization (UNIDO) to implement. Following my visit to Egypt in May, EFDC has requested that IFDC join with it in a regional program for the mideast and north African countries.

IFDC-Africa's mandate covers sub-Saharan Africa, particularly west and east Africa. IFDC is planning to build a permanent base in Lomé, Togo, and to continue the momentum that has been created in its programs there.

Clearly, IFDC will remain heavily involved in the African continent for the foreseeable future.

Five-Year Tactical Plan

IFDC is presently conducting an intensive planning activity, which will continue through August. The activity is designed to produce a 5-year tactical document for the guidance of management. Previously, IFDC had drafted provisional 2-year and 10-year plan documents, but a decision on the final plan was deferred by the Board. It was hoped that negotiations within the Consultative Group on International Agricultural Research (CGIAR) would have progressed sufficiently for IFDC to know its future relationship with the CG system. However, deliberations on restructuring the CGIAR are continuing, and at this point, we have no advice as to whether IFDC will be invited to join the system. Thus, for planning purposes we have to proceed on the assumption that IFDC will remain outside the CGIAR.

The planning process consists of a series of meetings involving all IFDC staff as it is believed that all members should have an opportunity to contribute.

IFDC's Relationship with NFERC

As part of the planning process, meetings have begun between IFDC and the National Fertilizer and Environmental Research Center (NFERC) of the Tennessee Valley Authority to determine how a closer working relationship can be established between the two organizations. These meetings will extend beyond the preparation of the 5-year plan and will continue throughout the year.

Links with Other IARCs

We are also exploring opportunities for collaboration with other international agricultural research centers (IARCs). Even though IFDC may remain outside the CGIAR, the Center will pursue closer working relationships with CGIAR members. Collaborative programs already exist with the International Rice Research Institute (IRRI), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Food Policy Research Institute (IFPRI), the International Center for Agricultural Research in the Dry Areas (ICARDA) and the International Center for Tropical Agriculture (CIAT). In addition, negotiations regarding collaborative programs are underway with the International Institute of Tropical Agriculture (IITA) and the International Service for National Agricultural Research (ISNAR). We expect that there will be more collaborative programs in the future as the competition for funds intensifies.

David B. Parbery

Philippines—

IFDC/IRRI Conduct Collaborative Environmentally Sensitive Research

IFDC and IRRI researchers are practicing integrated nitrogen management by effectively managing native soil nitrogen, biologically fixed nitrogen from legumes, nitrogen from crop residues and green manures, and chemical fertilizer nitrogen. By so doing, they are lowering the requirements of nitrogen fertilizer and reducing environmental pollution.

It has long been known that nitrogen losses on rice soils are quite large. The objective of the IFDC/IRRI collaborative nitrogen research project is to assess nitrogen losses and identify ways to increase nitrogen efficiency and overcome these losses.

Through that research IFDC and IRRI scientists have learned that proper placement of urea fertilizer, effective fertilizer timing, and controlled nitrogen release offer the greatest opportunity for improving nitrogen efficiency and overcoming losses. Through denitrification research the scientists have discovered that nitrogen losses also occur between cropping seasons. Originally their work focused on only one rice crop followed by a fallow period or an upland crop.

Between the cropping seasons nitrate can form in the soil; the soil is flooded during the rice crop but as it dries out during the fallow and upland cropping period, nitrate is rapidly formed. When the land is prepared for rice cropping by flooding, this nitrate is lost by denitrification and leaching.

Working with IRRI scientists, Dr. Roland Buresh, IFDC Soil Scientist, stationed at IRRI, has attempted to make more effective use of nitrate and prevent nitrogen losses. Buresh's counterparts at IRRI include Dr. S. K. De Datta, Agronomist, with expertise in crop/soil management; Dr. J. K. Ladha, Soil Microbiologist, with expertise in biological nitrogen fixation; and Dr. Dennis P. Garrity, Agronomist, with expertise in legumes and cropping systems. Buresh's expertise is in fertilizer efficiency and soil/nitrogen transformation processes.

The scientists have used green manures, legumes, and alternate crop/soil management practices between cropping seasons of rice as means of recycling and conserving soil nitrogen. The strategy that the multidisciplinary team of scientists has used is to effectively use fertilizer nitrogen in combination with the effective management of soil nitrogen and nitrogen from crop residues, green manures, and legumes. Nitrogen (as nitrate) that is taken up by plants such as green manures is recycled when the plant residues are incorporated during land preparation for rice. Additionally, legumes grown either before or after wet-season rice provide a major source of biological nitrogen fixation in rice crops.

"We have found that the nitrogen from added fertilizer is frequently less than 50% of the nitrogen that is taken up by the plant," Buresh says. "The remainder is derived from the soil."

IFDC is working closely with IRRI to identify crop and soil management practices that effectively utilize native soil fertility, thereby reducing nitrogen fertilizer requirements for rice and reducing the emissions of nitrous oxide, a greenhouse gas formed during denitrification.

Egypt—

Egyptian Fertilizer Development Center Progressing

With technical assistance provided by IFDC, the Egyptian Fertilizer Development Center (EFDC) is steadily progressing toward a full-fledged research and development organization.

For the past 4 years, IFDC has been involved in the development of EFDC. With funding from UNDP, the project is being executed by UNIDO. Under subcontract with UNIDO, IFDC is assisting in the implementation of the Center by providing a full range of technical assistance capabilities.

The overall mission of EFDC is to develop cost-effective fertilizer products and practices that are needed by Egyptian farmers and that can be economically produced by the local industry.

The specific objectives of EFDC are (1) to establish a research and development center with the capability of examining in detail technical and economic problems facing Egypt's fertilizer sector and (2) to ensure that fertilizer is offered in the form that is needed, of the appropriate quality, at a price that is affordable by the farmer, and that can be economically produced by the manufacturer.

One of the components of IFDC's technical assistance to EFDC is the installation of bench-scale equipment for phosphate, nitrogen, and physical properties laboratories.

During the past quarter IFDC fabricated and procured equipment for the physical properties laboratory. During April 15-May 19, 1990, David W. Rutland, IFDC Physical Properties Specialist, visited the EFDC facilities at Talka, Egypt, where he supervised the installation of this equipment and training of the personnel in its operation.

The equipment for the nitrogen laboratory has been procured and is in storage at IFDC. The phosphorus laboratory equipment is also being procured and fabricated. Tentative plans call for this equipment to arrive at EFDC by early September 1990.

According to Owen W. Livingston, Director of the Outreach Division, IFDC personnel will assist in the installation of the nitrogen and phosphorus laboratory equipment at EFDC. Dr. G. Erick Peters, IFDC Chemist, will visit EFDC to assist in the development of a nitrogen program.

The project also includes provisions for an NPK granulation pilot plant with a nominal 1-ton/hour capacity to produce experimental products that will be market tested by the appropriate governmental agencies cooperating with EFDC.

Currently, Jorge Polo, IFDC Senior Project Analyst, and George W. Bolds, IFDC Pilot Plant Operations Coordinator, are serving as technical advisors to UNIDO regarding the evaluation of bids for the NPK granulation pilot plant. The bids are under evaluation, and potential suppliers have been invited to visit Egypt to discuss the details.

When it is functioning, EFDC will produce fertilizer of experimental and demonstration quality that will allow the scientists of EFDC and other organizations an opportunity to determine the most appropriate products for Egyptian agriculture.

Using COMFAR software from UNIDO, Polo has assisted in providing training to EFDC staff concerning the preparation of feasibility studies. One of these studies involves the feasibility of producing in Egypt fertilizer products containing NPK plus micronutrients; this study was used as a base case for the training exercise. The Egyptian group will be trained to conduct prefeasibility studies for future projects in Egypt.

Ahmed Soliman, Production Superintendent from Abu Zaabal Phosphate Company, Egypt, is participating in a 10-month individual training program at IFDC. According to Soliman, EFDC holds promise for the future development of Egyptian agriculture. "The Center is bringing the agricultural and the industrial sectors together to share ideas, communicate, and work toward common goals," he says.

Photo by David W. Rutland

Dr. David B. Parbery (center), IFDC Managing Director, inspects the EFDC physical properties laboratory. Looking on are Helmy El Saied (left), Technician, and El Sayed Abul Kasem, Manager, Physical and Chemical Properties Laboratories.

Headquarters—

Development Official Broadens Board's Perspective

Mr. Joe Wheeler, Chairman
Development Assistance Committee
Organization for Economic Co-Operation and Development

The appointment of Joseph C. Wheeler, Chairman of the Development Assistance Committee of the Organization for Economic Co-Operation and Development (OECD), to IFDC's Board of Directors broadens the Board's perspective.

Prior to his appointment to OECD, Wheeler was Deputy Executive Director of the U.N. Environment Programme, headquartered in Nairobi, Kenya. He had previously served as Deputy Administrator of the U.S. Agency for International Development, Washington, D.C.

A graduate of Bowdoin College (Maine) with a B.A. degree in political science, Wheeler received a Master's degree in public administration from Harvard University.

As one of OECD's main committees, the Development Assistance Committee seeks to improve the volume and effectiveness of the development assistance programs of its 19 members (developed countries). It regularly reviews its members' aid programs and policies, monitors aid and development trends, and provides general orientations for its members' aid policies.

In looking toward the challenges of the next century, Wheeler believes that "a heightened sense of urgency is propelling a new consensus about environmental issues among the decisionmakers in the developing countries and industrial countries alike. Today's development process is now recognized as being lopsided; symmetry must be restored."

There is a paradox in the development strategy. That is, although development is resource-utilizing and therefore puts pressure on the sustainability of our forests, soils, water, and air, it is only through a process of coordinated development that we can achieve the balance which will save us, according to Wheeler.

"We must hurry to make [better] use of our best agricultural areas if we are to stop the misuse of low-potential areas that should be utilized for forests or grazing or left alone altogether," he says. "We must hurry to apply known technology and to develop new technology if we are to provide 10 billion+ people (by the mid-21st century) a decent living without destroying our fragile biosphere. We must hurry to create the conditions for job creation and income growth because, without efficient production and adequate income, the development process cannot be sustained."

His view of the future world portrays one that will require "significant changes in values, driven by environmental imperatives, but consistent with the global ethic that we all deserve access to a 'good life' process."

According to Wheeler, a new course in development strategy must be charted. "There is growing evidence that we are not now on course toward a sustainable civilization for all 10 billion people expected in the next century. Only a recognition of the issues and an understanding of the needed changes in course will get us to the dynamic balance needed to pass on a sustainable process to future generations." In highlighting the "need for speed in obtaining symmetry" in development, Wheeler brings a sharper focus to a number of issues for both developing countries and donors.

"Development strategies at the country level need to be designed to move quickly toward a broad-based approach, reaching the whole population. . . . This means speeding up the search for technology that will be energy efficient and resource saving. It means challenging developing-country communities to come up with programs that will at the same time accelerate the development process and achieve greater restraint in the way limited natural resources are utilized. While we have no choice but to 'use' natural resources, they must be used in such a way that they can continue to be available for future generations."

For Wheeler the most important single action that donors could take to reduce hunger would be to support developing-country strategies to increase rural income through a rise in agricultural productivity that is economically sound, environmentally safe, and sustainable.

And where does IFDC fit into the development strategy for the future? Wheeler has a clear concept of the Center's role. "I am a great believer in the central role of agriculture in development and the role of fertilizer in increasing agricultural production. I think we're going to see a period ahead—when our population is doubled—when we will need to be enormously efficient in food production. Although fertilizer will have an important role, there will be new constraints—environmental constraints. IFDC needs to promote the *efficient* use of fertilizer . . . . We must get the most production possible out of fertilizer. In the future, we will find ourselves increasingly concerned with how to use this commodity—this tool of development—more efficiently."

In closing, Wheeler says all of us must now be concerned with the "question of balance and the environmental room in which we operate."

Togo—

IFDC-Africa Conducts 8th Annual WAFMEN Research Planning Meeting

Thirty-one delegates from 14 countries—Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo—attended the eighth annual research planning meeting of the West African Fertilizer Management and Evaluation Network (WAFMEN). This meeting was conducted by IFDC-Africa in Lomé, Togo, during March 12-16, 1990.

Since 1983 IFDC has coordinated the activities of this network on fertilizer management and evaluation involving national scientists from research institutes and universities and extension personnel and staff of agricultural development programs in West Africa.

The goals of this regional Network are:

1. To stimulate interest in the role of fertilizers in improving soil fertility and increasing national agricultural output.
2. To evaluate the countries' natural resources and find ways to use these as fertilizers.
3. To promote efficient use of fertilizers by farmers through improved management practices.
4. To develop a cadre of national research scientists.
5. To facilitate the dissemination of research information.

Opening the 8th annual meeting were the Director General in the Ministry of Rural Development, Ekue Assiongbon, who represented the Honorable Ministre du Developpement Rural of Togo, and Dr. David B. Parbery, IFDC's Managing Director.

Representatives of each Network country presented the results of the 1989 field trials that were carried out in their respective countries. In addition, highlights of the results of on-farm trials in Mali and Nigeria were outlined.

Overall organizer of the meeting was Dr. Uzo Mokwunye, then Coordinator of IFDC-Africa's Agronomic Research, and now Acting Director of IFDC-Africa.

Commenting on the progress of the Network, Mokwunye says, "Since our first meeting in 1983 in Niamey, Niger, we have come a long way as a Network. The research planning meeting has evolved as a very effective tool for the exchange of ideas between IFDC scientists and their national counterparts. Additionally, it has provided an opportunity for national scientists to examine regional problems from the point of view of their individual countries."

Additional IFDC staff who participated in the research planning meeting included D. Pierre, Soil Scientist; A. Pinto-Toyi, Associate Soil Scientist; Dr. Andre Bationo, Soil Scientist; Dr. E. Ayuk, Socioeconomist; Dr. Julio Henao, Biometrician; and M. Terry Frederick, Engineering/Training Coordinator.

The organizers expressed appreciation to the International Development Research Center (IDRC), which has funded WAFMEN activities since 1985 and UNDP, which has agreed to fund the Network for the next 5 years.

Closing the meeting was Dr. Paul L.G. Vlek, then Director of IFDC-Africa, now Professor and Director of the Institute of Agronomy in the Tropics of Georg-August University, Göttingen, West Germany (see page 7).

Togo—

Agromineral Workshop Emphasizes Geologists' Role in Africa's Agricultural Development

"In view of the soaring prices of conventional fertilizers, which discourage our farmers from using them, geologists could contribute by seeking new alternatives compatible with our [West African] development." These were the words of Professor Komlanvi F. Seddoh, Chancellor of the Benin University of Togo, as he opened a workshop on Agromineral Resources for Agronomic Use in West Africa, conducted by IFDC in Lomé, Togo, during February 24-March 1, 1990.

IFDC, with financial and technical support from the Bundesminister für Wirtschaftliche Zusammenarbeit (BMZ), of the Federal Republic of Germany, organized the workshop, which was attended by 25 participants from 13 countries. The participants were from Benin, Burkina Faso, Cameroon, Ghana, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

The workshop faculty included IFDC staff members—M. Marc André, Dr. Carlos Baanante, M. Terry Frederick, Dr. Ampah Kodjo Johnson, Dr. G. H. McClellan, Dr. Uzo Mokwunye, Dr. H. Werner Muller, Dr. Amitava H. Roy, and S. J. Van Kauwenbergh. The Bundesanstalt für Geowissenschaften und Rohstoffe (BGR) was represented by Dr. W. Heimbach and the Deutsche Gessellschaft für Technische Zussamenarbeit (GTZ) by Dr. Wilms.

This agromineral workshop was organized to provide a synthesis of the agromineral situation in six selected countries (Benin, Burkina Faso, Ghana, Mali, Mauritania, and Niger), which have been visited by the IFDC/BGR team during a country visit in 1989; and to examine

national research and development proposals on agrominerals, which could be submitted to potential donors.

The workshop highlighted the following topics: (1) a general overview of the geological situation in Africa and particularly in West Africa; (2) the mineralogic aspects of agromineral resources that could be used for fertilizer production or soil amendments such as phosphate, lime, sulfates, potash, sulfides, clay and peat; (3) technoeconomic assessment of agromineral-based products; (4) marketing of nonconventional fertilizers in West Africa. Different areas and means of possible use have also been reviewed, with a special emphasis on simple and low-cost techniques taking into account market and plant size, and existing infrastructure.

The data base on West African geology was demonstrated. This data base, which was established during the first phase of the West African Program for Research on Agromineral Resources, contains a list of bibliographic references in relation to the characterization and assessment of phosphate rocks and other mineral resources that have potential for agronomic use. It also comprises results of chemical analyses that have been performed on a number of deposits in West Africa. It was decided that the data base should be continually updated.

Nine national proposals were presented on research and exploitation of phosphate deposits in Benin, Burkina Faso, Ghana, Mali, and Mauritania; prospecting of peat in Benin; and production of sulfuric acid in Burkina Faso. The participants requested that IFDC provide the necessary assistance to finalize the proposals that they drafted for presentation to donors.

The ensuing discussions highlighted the realities that exist in the region. Most countries give first priority to agricultural development in order to attain food self-sufficiency. Because fertilizers require considerable foreign exchange investments, governments are striving to find more cost-effective sources of fertilizer supply through the exploitation of indigenous natural resources. Therefore, they are highly aware of the significance of the efforts that IFDC is investing to help them in this area and fully supportive of the objectives and activities of the Geology Network.

"We are grateful to IFDC-Africa for having established this Network, which is the only forum of that sort where West African geologists can come and meet their colleagues, exchange points of view, discuss their projects, and look for the technical and financial assistance required for their implementation," said Professor F. Tchoua of Cameroon.

The participants unanimously stressed the need to open the Network to other experts from other disciplines, especially agronomists. "The usefulness of our research is based on its agronomic impact," explained Dr. Cisse Alpha Cheick of Mali. It was agreed that this type of interaction between relevant disciplines is possible at home and is even required during the project design stage in order to ensure the integration of all aspects involved during implementation. In the future, joint activities might be planned with other IFDC-Africa networks such as WAFMEN.

The participants visited the Hahotoe and Kpogame phosphate deposits and the beneficiation plant of the Office Togolais des Phosphates (OTP).

This second annual meeting marked the actual establishment of the Geology Network, which was one of the main objectives set for the IFDC-coordinated West African Agrominerals Research Program.

STAFF NEWS

New Staff Member

Gildardo Carmona Research Associate and Greenhouse Supervisor

Gildardo Carmona, who was a Visiting Scientist at IFDC during September 1987-December 1988, was recently employed by the Center as a Research Associate and Greenhouse Supervisor. He is involved in the nitrogen program, specializing in upland research. His work focuses on urease inhibitors; in addition, he assists all IFDC researchers with their greenhouse experiments.

A native of Mexico, Carmona taught soil science at the University of Nuevo Leon, Monterrey, Mexico, for 26 years. In addition to his teaching responsibilities, he served in several administrative positions at the University. The soil scientist served in a variety of capacities within the Mexican Association for Agriculture Education, the Mexican Soil Science Society, and the Mexican Science and Technology Bureau.

While serving as a Visiting Scientist at IFDC, Carmona received the 1988 Visiting Scientist Award from the IFDC Century Club. Among his previous awards was the 1980 Science and Technology, Agriculture

Gildardo Carmona Research Associate and Greenhouse Supervisor

Research Award, from the National Bank of Mexico.

Carmona received a B.S. degree in agronomy/agricultural engineering from Antonio Narro Agricultural University in Saltillo, Mexico. His M.S. degree in soil fertility from the University of Tennessee was sponsored by a Rockefeller Foundation scholarship.

Departures

Dr. Paul L.G. Vlek Formerly Director, IFDC-Africa

Dr. Paul L.G.Vlek

Dr. Paul L.G. Vlek, formerly Director of IFDC-Africa, Lomé, Togo, is now a Professor and Director of the Institut für Pflanzenbau in den Tropen und Subtropen, Georg-August Universitat, Göttingen, West Germany.

Dr. Vlek had this to say about his association with IFDC over the past 14-1/2 years: "It has been a good learning experience for my new assignment. I hope that IFDC-Africa maintains its momentum."

During his tenure with IFDC, Vlek served in a number of capacities in addition to heading up the Africa center; these included Director, Agro-Economic Division; Research Leader, Nitrogen Program, Agro-Economic Division; and Soil Scientist.

The originality and creativity of Vlek's research efforts are widely recognized by his fellow scientists. The quality and effectiveness of his research activities are evidenced by the achievements that he and his colleagues have made in IFDC's nitrogen research program. Their successful efforts to reduce the losses of fertilizer nitrogen are helping to increase food availability in the developing countries. Vlek is well known for his great enthusiasm for his work, which has influenced his peers to also strive to generate useful information that will ultimately benefit the farmer in the developing countries.

In addition to his administrative and research activities at IFDC, Vlek served as an editor of *Fertilizer Research*, an international journal on fertilizer use, and technical advisor to the Director of Tropsoils.

Having more than 50 publications to his credit, his achievements as a communicator are noteworthy. Among these publications are two books that he edited; they are entitled *Micronutrients in Tropical Foodcrop Production* and *Management of Nitrogen and Phosphorus Fertilizers in Sub-Saharan Africa.*

The native of Amsterdam, Netherlands, received a B.S. degree in tropical soils/soil chemistry and an M.S. degree in soil chemistry/soil mineralogy/tropical soils from the State Agricultural University, Wageningen, Netherlands. From Colorado State University (U.S.A.), he received a Ph.D. degree in soil chemistry/plant nutrition.

Dr. Adolfo Martinez Formerly Agricultural Economist

Dr. Adolfo Martinez, formerly IFDC Agricultural Economist, has accepted the position as Deputy Director of the Honduras Agricultural Research Foundation.

During his 10-year stay at IFDC Martinez was involved in all phases of IFDC's work—research, technical assistance, and training. As for research, he conducted economic evaluations of new fertilizer products and application practices and developed studies on crop response and economics of fertilizer use and demand forecasting. He analyzed agricultural practices under several farm management alternatives for optimum crop production.

Dr. Adolfo Martinez

In the technical assistance area, he participated in projects related to sector planning. As for training, he developed and managed international programs related to fertilizer marketing, agricultural data collection and analysis, and efficiency of fertilizer use. This work took him to Bangladesh, Colombia, Ecuador, Indonesia, Malaysia, Nicaragua, Peru, Syria, Thailand, and Venezuela.

From 1985 to mid-1987 Martinez served as Agricultural Economist for the IFDC/CIAT phosphate project in Cali, Colombia.

Martinez holds M.S. and Ph.D. degrees in agricultural economics from Louisiana State University and a B.S. degree in agricultural engineering from University Nacional Colombia.

Syria—

Training Program Focuses on Development of Efficient Fertilizer Recommendations for the Mediterranean Region

The Tel Hadya Headquarters of ICARDA was the site of the IFDC training program focusing on the "Development of Efficient Fertilizer Recommendations for the Mediterranean Region," conducted during February 18-March 8, 1990.

Attending the program were eight participants from Algeria, Jordan, Libya, Syria, and Tunisia.

One of the objectives of the program was to identify and describe the components of a national fertilizer program. Another was to review recent advances in soil and crop science.

The program reviewed statistics and economic procedures used in the evaluation of fertilizer research data. The participants became familiar with computer use for analysis of fertilizer research data. They gained experience in testing and evaluating fertilizers and application methods using the latest techniques in field research.

In addition, they enhanced their abilities in the interpretation of research results and of soil test results for making fertilizer recommendations to farmers.

IFDC staff members who served on the faculty included Dr. Adolfo Martinez, formerly IFDC Agricultural Economist, now Deputy Director, Honduras Agricultural Research Foundation, San Pedro Sula, Honduras, and Dr. Julio Henao, Biometrician. ICARDA staff who participated in this training program included Dr. Lawrence Przekop, Training Director; Dr. Abdallah Matar, Soil Scientist, Farm Resources Management Program (FRMP); and Dr. Mustafa Pala, FRMP Agronomist; Dr. Michael Jones, FRMP Agronomist; and Dr. Peter Cooper, FRMP Agronomist and Leader. Complementing the IFDC and ICARDA staff was Dr. Necdet Yurtsever, Deputy Director, Soil and Fertility Research Institute, Ankara, Turkey.

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IFDC is a public, nonprofit organization dedicated to increasing food production through the development of new and improved fertilizers and fertilizer know-how for developing countries.

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