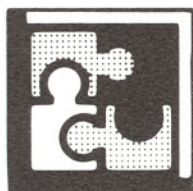


# Report



## Burma—

### Fertilizer Sector Evaluated

An IFDC-directed study team commissioned to evaluate Burma's fertilizer sector recently completed a report detailing its findings and recommendations for increasing the effectiveness of that sector.

This project, funded by the U.S. Agency for International Development, was conducted under a subcontract with the South-East Consortium for International Development.

Dr. Paul J. Stangel, IFDC's Deputy Managing Director, served as leader for the study team. Other members of the team included Dr. Ray Hooker, Economist (a private consultant), and Dr. Sam Portch, Soil Scientist with Winrock International.

The team members visited a range of agricultural production and fertilizer distribution centers in Burma during October 5-November 7, 1987. They worked with Burmese counterparts from the Agricultural Corporation and the Ministry of Agriculture, Fisheries, and Forestry. Their work included a review of the present supply and use of fertilizer and required supply system,

and basic issues facing the fertilizer sector.

Agriculture dominates the economy of Burma. Rice, along with the pulses (beans), accounted for nearly 40% of the foreign exchange earned by the country in 1986/87. However, because of slowing in the growth of domestic rice production and low international prices of rice, foreign exchange earnings from rice have recently dropped drastically.

On the positive side, the policies of the Government of Burma over the past decade have been geared toward increased use of fertilizer and the introduction and spread of improved local varieties as well as high-yielding varie-

ties. Burma is fortunate in that it does have a comparative advantage over many Asian countries in the production of rice and, therefore, can and does export significant quantities. The success of these positive policies is evident: Rice production has increased nearly 90% since 1973/74. Fertilizer use has nearly quadrupled and domestic production, specifically nitrogen, has risen from nil in 1970 to self-sufficiency by the end of 1986/87 with small quantities of urea available for export. However, Burma still ranks among the lowest in Asia in intensity of fertilizer use.

As a result, Burma is faced

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Burmese officials of the Agricultural Corporation and Dr. Paul J. Stangel (second from left), Deputy Managing Director of IFDC, inspect a fertilizer warehouse in Mandalay.



with some difficult choices that will have a strong impact on the future growth of the country's fertilizer sector. The most significant choice concerns the policies related to the production of rice and upland crops and allocation of limited supplies of fertilizer. The Government of Burma has recognized the need for expanded production of crops other than paddy. It has introduced a program of agricultural diversification to expand the production of 19 upland crops. However, this will take time and an increased amount of fertilizer. For the present, the Government faces a serious foreign exchange crisis and must make some difficult choices. Significant though small increases in foreign exchange earnings can be generated over the short term by exporting surplus urea whereas larger increases can be realized over the long term through allocating this fertilizer for use on rice and upland crops.

Stangel summarized the team's

report in this way: "In a nutshell, we recommended that Burma shift from exporting its surplus urea fertilizer to using the fertilizer domestically to increase the production of rice and oilseeds. Secondly, we recommended that fertilizer prices at the farm level be increased to more closely approximate the actual cost. Additionally, recommendations on phosphate and potash fertilizers should reflect local conditions, taking into account differences in soil fertility, climatic conditions, and profitability of use, particularly for upland crops. These actions will result in increased foreign exchange earnings on rice, conservation of foreign exchange by reducing the import of cooking oils, and a decrease in subsidy with a resultant increase in local currency available to the Government that could be used for priority areas of agricultural development."

The team also recommended that the efficiency of Rangoon Port be improved in regard to handling fertilizer

imports. In addition, a fourth recommendation called for an increased role of rail transport in moving fertilizer from Rangoon Port to central and upper Burma.

Fifth, the Government was urged to begin now in planning the construction of additional nitrogen capacity (to be commissioned by the mid-1990s) to satisfy rising domestic needs as well as generate foreign exchange by exporting surplus production on the international markets. As for raw materials, Burma has ample quantities of low-cost, good-quality natural gas.

The team suggested that these and other recommendations be integrated into a national fertilizer program that involves a number of key ministries including Agriculture, Fisheries, and Forestry; Energy; Transport and Communications; Planning; and Finance. The report was completed in early 1988, and the findings and recommendations are now under consideration by the Government of Burma. ■



Headquarters—

## Book on CERES Wheat Model Nearing Completion

A new publication to be released this year is aimed at providing agricultural research and extension specialists a tool to help wheat farmers in reducing their risks while maximizing their crop yields.

Collaborators on the book, *CERES Wheat: A Computer Simulation Model for Wheat Production*, gathered at IFDC during the past year to finalize their work.

Dr. Joe Ritchie, Professor, Department of Crop and Soil Sciences, Michigan State University; Douglas C. Godwin, IFDC Agronomist/Systems Modeler; and Dr. Susanne Otter-Nacke, Technical University of Munich, F. R. Germany, are the authors of the forthcoming publication.

Scheduled for publication in 1988, the book is "targeted toward groups interested in simulating crop production, especially those involved in agricultural research and extension and those government agencies concerned with policy planning regarding wheat production," according to Ritchie.

This book results from a joint project by the U.S. Department of Agriculture and IFDC. The primary purpose of the crop modeling project is to minimize the risks that the farmer confronts and to

maximize his profits. This approach complements and makes more effective the costly and time-consuming experimentation traditionally used in agricultural research. Modeling makes it possible for scientists to avoid duplication of effort and speed up agricultural development.

By using the computer models, scientists are able to assess the effects of cultivar, site, weather, and management practice for a specific crop at a specific location. The information that they are then able to generate provides government planners, extension agents, and farmers the ability to make desirable choices.

The new book documents the wheat model and includes diskettes to be used on an IBM-compatible microcomputer. Also included in the package are instructions on how to "run" the model and how to prepare individualized data for "running" the model.

"This is a user-friendly model," says Ritchie. In other words, it can be used by people of disciplines other than agronomy and soil science. In addition, people who do not have computer experience can use the model." ■

(Note: This book will be published by Texas A&M University.)

## UPDATE ON TRAVIS P. HIGNETT FUND

In March 1987 the IFDC Century Club—a nonprofit group composed of IFDC staff and community leaders from the Muscle Shoals, Alabama, area—established the Travis P. Hignett Fund.

The Club felt that this was a fitting tribute to a colleague who has made many outstanding contributions to the fertilizer field during the past 50 years. Often referred to as "Mr. Fertilizer," Mr. Hignett continues to serve as Special Consultant to IFDC and is a source of valuable information for his coworkers and scientists around the world.

Monies contributed toward this Fund are to be used to provide fellowships to aspiring developing-country scientists and engineers who wish to study or conduct research projects at IFDC. The Century Club pledged US \$500 as seed money to help establish the Fund and challenged Mr. Hignett's friends throughout the world to match the Club's contribution either individually or as small groups. To date, the Club has collected US \$4,300 toward the Fund; in order to endow a fellowship program, the Club needs to collect at least US \$5,000 so that the fellowship award program can be initiated.

Anyone wishing to make a donation to assist the Century Club in this worthy effort should make his/her contribution payable to the "IFDC Century Club," designating that it should be applied to the "Travis P. Hignett Fund." Donations should be sent to: IFDC Century Club, P.O. Box 2040, Muscle Shoals, Alabama 35662.



## Perspective

Major changes are occurring in developing-country agriculture that are and will continue to have a strong impact on the fertilizer sector worldwide. These changes will affect not only the types and quantities of fertilizers that are supplied but also the application method that is used by the farmer to optimize fertilizer use.

Traditionally food-deficit countries such as India, China, Indonesia, Pakistan, Brazil, as well as many oil-producing Middle East countries, are all either self-sufficient and/or net exporters of one or more of the following crops: wheat, rice, maize, and sugarcane. As a result, world agriculture has huge surpluses of basic supplies of food (some of it in developing countries), but which is inaccessible to many because of economic or geographic constraints. In some cases, the mix of these supplies is not always of the right type to meet the growing demand for more diversified diets by certain populations having increasing incomes.

To obtain an international viewpoint on the subject, we interviewed Dr. Paul J. Stangel, Deputy Managing Director of IFDC. The text of that interview follows.

**Q:** What must be done to create a balance in the present agricultural situation in developing countries?

**Stangel:** Agriculture in developing countries faces two challenges. First, it must sustain the basic food production (rice, wheat, and maize) with sufficient growth to cope with the growing population who are mostly poor and will need the traditional foods. Second, in an increasing number of cases developing-country agriculture must diversify its crop mix to include crops that give a particular country a comparative advantage in exports or where growing domestic demand, particularly for oil crops such as groundnuts, sesame, and soybeans; fruits; and vegetables, is left unsatisfied. For example, Country X, located near the Middle East, may need to export agricultural products to earn foreign exchange. Therefore, its agricultural system must be diversified to include those commodities that will capitalize on the country's natural advantage in terms of agroclimatic conditions, market situation, and special farming skills. Because Country X has abundant sunlight, adequate irrigation, and a relatively long growing season, it



Having achieved self-sufficiency in many of the basic food crops, several developing countries are diversifying their agriculture and thereby providing a more balanced diet for their people. These Bangladesh workers are cultivating a vegetable crop.

### Diversification of Developing-Country Agriculture Dictates Changes in Fertilizer Industry

can grow certain fruits in large quantities and of considerable high quality. As an added advantage, there is an increasing demand for such products in Country X, as well as in the oil-rich surrounding countries. Even though countries Y and Z may also be able to produce fruits of similar quality, they may wish to choose another crop to specialize in since Country X has a comparative advantage due to its geographical proximity to markets. Otherwise, surpluses of these fruits will result as now exists with the staple crops today.

**Q:** What changes will this diversification in agriculture create in the demand for fertilizer?

**Stangel:** There will be more emphasis on greater and more effective use of phosphate, potassium, and secondary and trace elements, particularly sulfur, magnesium, and zinc. In other words, diversification will require a greater need for balanced fertilization.

The fertilizer industry must decide whether to supply the necessary fertilizers as straight materials or as various combinations of NPKs (either as bulk blends, compacted materials, or chemically combined products). The cost of these fertilizers to farmers will depend on the production method that industry chooses. The flexibility of choices and cost-effectiveness depend on the infrastructure (production and transportation capabilities) available in a particular country, especially the laboratory facilities available to identify specific nutrient needs and to allow scientists to write NPK prescriptions to remedy specific fertilizer problems.

**Q:** What changes in the fertilizer industry do you foresee developing as a result of these new crop mixes in developing countries? Will new manufacturing processes be required?



**Stangel:** Historically, most developing countries have been geared to providing fertilizers in a high-analysis, single-nutrient form (particularly urea). With the current agricultural diversification, the demand will expand rapidly for a much wider range of fertilizers, including ammonium nitrate, potassium chloride, potassium sulfate, sulfur-containing phosphates, and a range of secondary and micronutrient compounds. As a result, the fertilizer industry must broaden its supply and technical base to provide these materials. An increased investment in capital and the further development of human resources with specialized skills will be required to allow fertilizer production to be technically correct and financially profitable to both the farmer and industry.

As for the processes, supplying NPKs entails certain problems. For example, if industry chooses the bulk blending route, the job of locating raw materials of suitable physical and chemical properties to produce a quality blend may prove to be difficult. Historically, industry has used the chemically combined approach to supply fertilizers to developing countries; however, this route is more expensive than bulk blending and lacks the flexibility of making a wide range of NPKs, even though the end quality is higher. As markets diversify, the demand for a broader range of fertilizer products increases. This can become increasingly

difficult using the chemically combined route, particularly where volumes of individual products are low.

To provide solutions to this dilemma, IFDC has for the past few years been concentrating on forging a "marriage" between the chemically combined method and bulk blending to create a process called "compaction." Compaction allows the use of least cost raw materials, and the resulting product is homogeneous and approaches the quality of fertilizer offered through the chemically combined route but at a lower cost.

IFDC has also done extensive work on briquetting, primarily with nitrogen, but NPKs or secondary or micronutrients could be used as well.

In addition, liquid fertilizers are new to major areas of the developing world; however, as labor costs increase at the farm level and the demand for a more diversified fertilizer product increases, industry will need to supply liquid NPKs, which will save labor and still provide a high-quality finished product.

**Q: What effect will these changes have on the price of fertilizer? of food?**

**Stangel:** Depending on the level of sophistication the fertilizer industry in developing countries adopts as far as technical expertise and infrastructure are concerned, the cost of fertilizer to the farmer should remain relatively low.

The cost to produce a given unit of food should be lowered, hence, affordable to an increasingly large population.

**Q: How will these changes affect the diets of developing-country people?**

**Stangel:** As a result of the diversification of agriculture allowing the production of fruits and vegetables in addition to the traditional foods such as rice, wheat, and maize, the people of developing countries will have an increasingly more balanced diet than has been possible under previous agricultural policies.

**Q: How will these shifts toward diversification influence world trade and economy?**

**Stangel:** If countries are realistic when considering their comparative advantage in producing certain crops, diversification should enhance world trade and thus world economy. We will see an increased emphasis on the interdependence in world trade of an ever-broadening range of agricultural products.

This means a major realignment must occur in developed and developing countries alike in export of basic commodities of food. The net result will be a new group of countries exporting basic commodities with others focusing more and more on high-value crops or added-value products of basic commodities. ■

## Board Acquires Additional Latin American Accent

The newest Latin American representative to join the IFDC Board of Directors is enthusiastic about that appointment.

Dr. Gustavo Nores, formerly with the Centro Internacional de Agricultura Tropical (CIAT) and now associated with Argentina's National Agricultural Research Institute, looks forward to the next few years of serving on the Board, which he anticipates will be exciting years for IFDC and agricultural development.

"The major reason that I agreed to serve on the Board is more to learn than to contribute since fertilizer is one of the key factors that will foster agricultural development in developing countries, and work being done by IFDC is regarded as essential all over the world."

After receiving M.S. and Ph.D. degrees in agricultural economics from Purdue University (U.S.A.), the Argentine native accumulated an impressive array of credentials while associated with a variety of organizations.

In an interview during the recent Board Meeting, Nores discussed his most rewarding position, that of Deputy Director General of CIAT.



Dr. Gustavo Nores

"That experience was valuable because it allowed me to become familiar with the problems of agricultural sectors of

many developing countries, particularly Latin America and the Caribbean," he says. "It gave me the opportunity for making a small contribution through the work of CIAT."

During his tenure at CIAT, Nores visited with farmers from more than 50 countries of the world. Through this contact, he gained an insight into their production circumstances, problems, constraints and aspirations.

"Their enthusiasm and professionalism as farmers has taught me many lessons—it has left a mark on my appreciation of what people can do and the value of capturing the farmer's viewpoint and his household's perspective in technology design," Nores says. "In other words, I now view agricultural development through farmers' eyes."

According to Nores, his contact with developing-country farmers has given him an appreciation of the production circumstances in different continents, countries, regions, and villages, but at the same time the possibility and tremendous potential that the international agricultural research centers (IARCs) have as the vehicle for transferring the experiences across countries



and catalyzing the work of national and international agricultural research institutions that can contribute to solving specific research problems.

When asked to give his opinion of what the future holds for the IARCs, Nores had this to say: "The IARCs are a small but critical component of a global research and development system that must generate knowledge or technology and transfer this to farmers. A major role of the IARCs is to support national research programs by assisting them in developing their own capabilities as well as conducting research that they are not equipped to do."

As Nores sees it, agricultural technology can be a key to development—an engine for development, and development implies more international trade in the long run, not only of manufactured goods but also agricultural

products.

"In spite of the present, temporary surpluses of grain in the United States and Europe, millions of people are undernourished because they cannot afford to buy food," Nores says. "The IARCs have an international responsibility to assist the developing countries in improving their food production situation and, thus, their diets."

Besides his work at CIAT, Nores has made valuable contributions in the agricultural arena through his work in a number of organizations. Among his most outstanding positions are Agricultural Adviser to the Minister of Economics, Government of Argentina; Vice President, National Meat Board, Argentina; and Consultant, Latinoconsult S.A.

Nores serves on the boards and commissions of several international organi-

zations. In March 1987 he was appointed to membership on the Technical Advisory Commission of the Consultative Group on International Agricultural Research. In addition, he is currently a member of the Research Advisory Commission of the Caribbean Agricultural Research and Development Institute and a member of the Steering Committee, Kellogg International Fellowship Program in Food Systems, which is coordinated by Michigan State University.

His curriculum vitae lists a number of outstanding awards, which Nores has received during his career. The latest one was bestowed on him during 1987 when he was awarded special recognition by the Colombian Institute of Agriculture (ICA) for his contributions to agricultural research in Colombia. ■

## African Representation on Board Strengthened

At a time when renewed international attention is focused on food production and agricultural development in the Sub-Saharan African region, high-level African representation on IFDC's Board of Directors has been strengthened. The Minister of Foreign Affairs and International Cooperation in Togo, Yaovi Adodo, has joined the Board and attended his first meeting in October 1987.

One of the highlights of the October meeting was a presentation by Dr. Paul L.G. Vlek, Director of the IFDC-Africa Center. Vlek outlined a comprehensive program of research and training that will be implemented by IFDC-Africa over the coming years.

Commenting on the importance of IFDC's Africa program, Minister Adodo says: "The initiative to create the Center comes at a crucial but most welcome time because for many African countries agriculture has become the priority of priorities and the driving force for economic development."

In selecting the most valuable element of the Center's program at this time, Minister Adodo says, "Technology transfer is the most important aspect of the Center's program, and we hope that IFDC-Africa will play a leading role in helping African countries to devise and implement policies to rationally and efficiently use fertilizer resources in the promotion and development of tropical agriculture."

Minister Adodo recognizes that the Center is "committed to development approaches that recognize the physi-



Minister Yaovi Adodo

cal constraints of our continent and is sensitive to the pace of rural development in Africa."

Commenting further concerning his ideas on the Center, the Togolese Board member says, "IFDC-Africa deserves support not only from donors but also from the countries that can and will be the primary beneficiaries of the Africa program of research and training. Based on my experience, I feel that the most effective and lasting form of cooperation is that which is based on mutual respect and understanding between international and national de-

velopment agencies and that acknowledges the broad cultural diversity of developing nations."

The Togolese Minister has a distinguished record of involvement and achievement at national and international levels. In 1977 he was appointed Director of International Cooperation and gained in-depth experience involving development issues in Africa. In 1980 Minister Adodo was given responsibility for technological issues affecting economic development in Togo.

Following his appointment as Ambassador to the European Economic Community (EEC), Minister Adodo achieved the highlight of his career to date—the successful negotiation of the third successive Lomé Convention between the EEC and the African, Caribbean, and Pacific (ACP) countries in 1984, when he represented the interests of 65 ACP countries in relation to trade, price supports, and protocols for commodities such as rice and beef.

On completion of the third Lomé Convention, Minister Adodo became Minister of Planning and Industry; subsequently, in 1987 he was appointed to his present position, that of Minister of Foreign Affairs and International Cooperation.

Minister Adodo says that he is particularly pleased to have this opportunity to contribute to the important global mission of IFDC at this time by participating in the work of the Board of Directors. ■





Togo—

## Board of Directors' Africa Committee Reviews IFDC-Africa's Program

At the end of a meeting of the Board of Directors' Africa Committee, the Chairman Dr. Pieter van Burg of the Netherlands concluded that the IFDC-Africa Center "is proceeding along program lines that are consistent with the stated objectives of the Center." The program review meeting was held at IFDC-Africa in Lomé, Togo, during January 7-9.

According to Dr. Paul L.G. Vlek, Director of IFDC-Africa, the objectives of the Center are "designed to overcome the constraints to fertilizer use by filling the manpower needs, conducting and promoting research, and providing technical assistance for sector development."

Besides Van Burg, the Africa Committee is composed of Dr. Bukar Shaib, Nigeria; Dr. Anton Amberger, F. R. Germany; Minister Y. Adodo, Togo; Dr. Christian Pieri, France; Joseph Wheeler, U.S.A.; and Dr. Samuel Muchena, Zimbabwe. Also attending the program review committee meeting were Dr. Donald L. McCune, IFDC Managing Director; Dr. Amitava H. Roy, IFDC Special Projects Engineer; and Rudolph Binsack, Consultant to Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

The committee reviewed the present and proposed programs of the Center and conducted discussions on the agronomic, economic, sociology, resource development, and communications

areas. Other topics considered were linkages with national and international organizations, funding, and future staffing.

The current staff of the IFDC-Africa Center includes soil scientists, marketing specialists, engineers, sociologists, extension agronomists, communications specialists, and support staff. Three of these staff members are outposted—two in Niger and one in Zimbabwe.

At the conclusion of the meeting, the committee members viewed the future building site of the Togo Center—a 12-hectare plot of land donated by the Government of Togo. ■

## Training Program Highlights



Philippines—

### Marketers Trained in Manila

Twenty-four marketing managers attended an IFDC training program in fertilizer marketing held in Manila, Philippines, during December 7-18, 1987.

These marketers came from India, Indonesia, Malaysia, Nigeria, Pakistan, Philippines, Senegal, South Korea, Sri Lanka, Thailand, United Arab Emirates, and Western Samoa.

This 2-week program, cosponsored

by the Fertilizer Pesticide Authority (FPA), boasted very good participation by private industry. In fact, representatives from five different industrial companies served as guest speakers during the program.

FPA's Administrator, Luis T. Villa-Real, welcomed the group to the Philippines during the opening ceremony. IFDC faculty consisted of D. I. Gregory, Marketing Specialist (serving as Program Manager); R. S. Giroti, Training Administrator; Dr. Dennis H. Parish, Director of the Outreach Division; and J. H. Allgood, Marketing Specialist.

This training program, which is designed to meet the need for skilled fertilizer marketing and management personnel, used a variety of means to achieve its objective. In addition to the formal activities, two field trips added to the practicality of the program.

On one trip to Cabanatuan, Central Luzon—a business center located in the major rice-producing area of the Philippines, the participants met with a fertilizer wholesaler and a retailer. The training participants interacted with the owners and took part in a discussion period. Prior to



Andy Cayanga (lower left), fertilizer wholesaler in Cabanatuan City, Philippines, provides IFDC marketing program participants a detailed description of his fertilizer marketing practices.



## First Fertilizer Use Training Program Conducted in Middle East



The barley- and wheat-based farming system areas of Syria served as the backdrop for a training program on "Research on Effective Use of Fertilizer," held in Aleppo, Syria, during January 10-28.

The program, cosponsored by the International Center for Agricultural Research in the Dry Areas (ICARDA) and IFDC, attracted fourteen research officials from 12 countries, including Iran, Jordan, Kuwait, Malaysia, Morocco, Nigeria, People's Republic of China, Syria, Tunisia, Turkey, and Zimbabwe.

The IFDC faculty included Dr. Adolfo Martinez, Agricultural Economist; Dr. L. A. León, Soil Scientist; and Dr. D. H. Parish, Director of the Outreach Division. In addition, a number of ICARDA staff members presented papers during the training program.

The training program included formal sessions and field activities. Participants were involved in the design, statistical and economic analysis, and reporting of fertilizer research experiments.

During field trips to the barley- and wheat-based farming systems areas, the researchers learned about management of nitrogen and phosphate fertilizers used on the region's soils, which are high in pH and have low rainfall regimes.

On another field trip to the Homs Fertilizer Factory in Homs, Syria, the participants observed the production of calcium ammonium nitrate, urea, and triple superphosphate (using Syrian phosphate rock).

In summarizing the program, Parish had this to say: "The program

covered all facets of IFDC's activities on fertilizer-sector development, and the research that ICARDA is doing to improve yields was a cornerstone of the training program. The IFDC resource literature proved extremely popular both with the participants and the ICARDA staff." ■



ICARDA personnel operate a machine designed for planting field trials.

*(Continued from page 6.)*

the field trips, the participants were asked to identify some of the marketing challenges found in these companies; after returning to their meeting room, they conducted a "case study" discussion regarding what they had observed.

The second field trip took the marketing managers to the International Rice Research Institute, where Dr. C. P. Mamaril, Coordinator of International Network for Soil Fertility

and Fertilizer Evaluation for Rice (INSFFER), and Dr. Roland Buresh, IFDC Soil Scientist, coordinated a visit to inform the participants about the problems associated with rice production. They observed research trials and talked with soil scientists about their work in rice production.

As for the highlights of the program, Gregory summarized it this way: "The opportunity to assess the impact of fertilizer marketing liberali-

zation in the Philippines created a lively and lengthy debate. In addition, the participants achieved a very high standard of marketing decision making using the popular Alpha fertilizer marketing simulation computer program. This teaching aid, used to supplement the formal presentations and discussions on fertilizer marketing, once again proved to be a valuable component of the training program." ■



# Upcoming Training Programs

Program	Location	Dates
<b>Headquarters</b>		
<i>Fertilizer Sector</i>		
Workshop on Fertilizer Sector Development and Agricultural Production in Selected Countries of the Mediterranean, Middle East, and North Africa	IFDC	May 1-14, 1988
Advances in Fertilizer and Irrigation Technology in the United States	IFDC	May 8-27, 1988
Fertilizer Sector Development Training Program for Graduate Students	IFDC	July 25-August 5, 1988
<i>Fertilizer Marketing</i>		
Fertilizer Marketing Management Training Program	IFDC	August 15-September 23, 1988
<i>Fertilizer Production and Technology</i>		
Investment Analysis and Decisionmaking—Fertilizer Sector Projects	IFDC	June 6-24, 1988
<i>Fertilizer Use</i>		
Soil Testing and Soil Fertility Management	Auburn University/IFDC	July 19-21, 1988
<b>Regional Programs</b>		
<i>Fertilizer Use</i>		
Statistical and Economic Analysis of Fertilizer Experimental Data Training Program (Spanish)	Cali, Colombia	July 11-29, 1988

NOTE: Dates are subject to change.

For further information on these training programs, please contact the Director, IFDC Outreach Division.



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