

Report

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

Albania—

IFDC Participates in USAID Agricultural Inputs Study

At the invitation of the U.S. Agency for International Development (USAID), IFDC recently participated in a USAID-sponsored study of the production, distribution, and marketing of fertilizer and other key agricultural inputs in Albania.

Dr. W. E. Clayton, IFDC Transportation and Distribution Specialist, participated in the study, conducted during September 30-October 17, 1991. Other members of the USAID team included J. A. Becker, USAID Agricultural Development Officer and Team Leader; G. Hazel, USAID Project Development Officer; and Dean Alter, USAID Agribusiness Specialist.

Following the breakup of the cooperative farms in Albania about a year ago and the redistribution of the land to the farmers, the totally planned system for supply of agri-inputs to the state farms and cooperatives has virtually collapsed. This situation has proved especially difficult in the case of fertilizers that are produced in-country and which were previously moved regularly through the system under the "Plan," directly to the state farms and cooperatives where they were stored until required.

With the demise of the "Plan" there is no longer any administrative mechanism for supplying fertilizer to the farmers, although small quantities are still moving to some state farms under some form of contractual arrangement. There is, therefore, an almost total lack of fertilizer available to the ex-cooperative, now small farmers, throughout the country. Both the nitrogen and phosphate

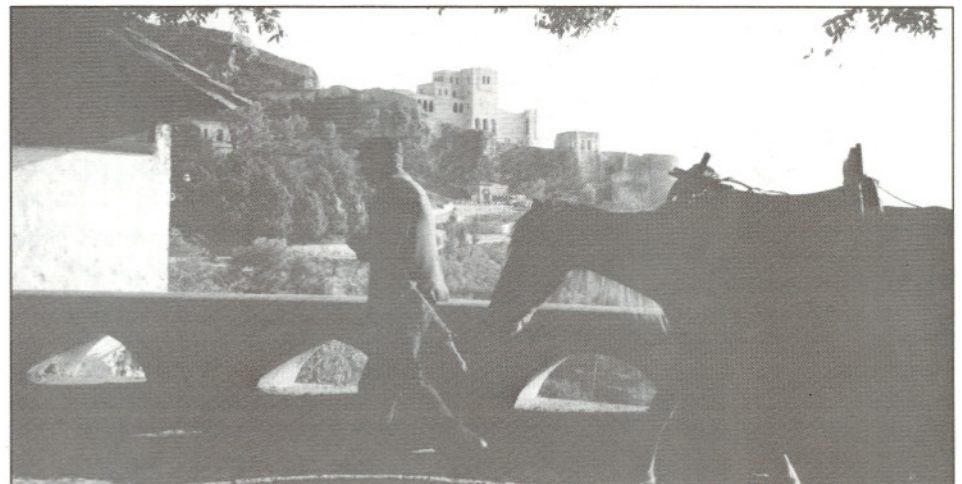


(Photo by Dr. W. E. Clayton)

The beginnings of free enterprise are taking shape in Albania as evidenced by this farmer's privately operated vegetable stand.

factories are closed down because of nonlifting of the finished fertilizers. No private transport, storage, distribution, marketing, or credit facilities exist. Establishment of fertilizer marketing, distribution, and credit systems is clearly the number one priority in the agricultural sector.

"The study team recognized that fertilizer is the critical input for restoring or maintaining agricultural output in Albania," Clayton says. "The first priority is mounting a major fertilizer marketing and distribution effort to get fertilizer moving again through the system to the farmers. We also recommended the urgent technical and economic appraisal and assistance for the fertilizer factories to evaluate and, as appropriate, restore cost-effective production while simultaneously reducing pollution."



(Photo by Dr. W. E. Clayton)

An Albanian farmer and his horse framed against the backdrop of Skanderbeg's Castle in the city of Kruje.

IFDC Report

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Marie K. Thompson

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IFDC is a public, international, nonprofit organization, governed by an international board of directors with representation from developed and developing countries. The Center is supported by various bilateral and multilateral aid agencies, private foundations, and national governments. IFDC focuses on creating sustainable agricultural productivity and food production in the tropics and subtropics through the development and use of improved and environmentally sound fertilizers and fertilization practices.

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Paul J. Stangel

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President's Report



(Photo by Charles E. Butler)

Dr. Paul J. Stangel
IFDC President and
Chief Executive Officer

During the past quarter a number of developments have taken place, involving collaborative arrangements with other international agricultural research centers, presentations at meetings of various donor groups, and expanded opportunities including those in Eastern Europe and the former Soviet Union.

Collaborative Arrangement Between IBSRAM and IFDC

The International Board for Soil Research and Management (IBSRAM) and IFDC have signed a memorandum of understanding creating a mechanism for formal collaboration between IBSRAM and IFDC for the purpose of undertaking research and educational projects that will contribute to enhanced natural resource management and sustainable agricultural development in the tropics and more generally to coordinate activities of the two organizations on these subjects.

The main means of cooperation will be through exchanges of information regarding programs conducted by each organization during regular meetings of an Advisory Committee; planning and implementation of collaborative programs and special projects with common or complementary goals and objectives; exchange or assignment of scientific or other staff for short or long periods; organization of conferences, seminars, training, and workshops to disseminate the results of collaborative research.

The activities to be carried out may include (1) research on soil and water conservation, soil degradation/rehabilitation, nutrient dynamics in soil and plant systems, and development and interpretation of soil databases; (2) joint or complementary training on site characterization, soil and nutrient management, socioeconomic surveys, and extension processes; and (3) joint information on soil and nutrient management techniques and other related topics.

Work is now underway to develop a joint project on nutrient and land use management in West Africa. Consideration is also being given to establish a similar joint effort for a target area in Asia.

IFDC Donors' Meeting in Conjunction with ICW '91

In conjunction with International Centers' Week, '91, held in Washington, D.C., IFDC conducted a donors' meeting on October 26, 1991, with eighteen donor representatives in attendance. Dr. W. David Hopper, Chairman of the IFDC Board of Directors, opened the meeting with a brief background account of IFDC. Next I gave an overview of the broadened focus/programs of IFDC, its change in organizational structure, areas of comparative advantage, and linkages being forged with national and international institutions. Dr. Amitava H. Roy, Executive Vice President and Chief Executive Officer, gave an account of the goals/objectives and proposed activities of the new IFDC programs. Donors responded positively to IFDC's new focus on total nutrient supply and management systems, emphasis on policy and sustainability, and expansion in agribusiness activities.

Proposed Program in Alternatives to Slash and Burn Agriculture

As part of ICW '91, IFDC participated in a planning meeting on the proposed program in "Alternatives to Slash and Burn Agriculture." Hosted by the United Nations Development Programme (UNDP), the meeting was opened by Dr. Nyle Brady, Senior Consultant. Dr. Brady described the alternatives to slash and burn program as a hybrid effort while emphasizing the environmental issues of greenhouse

gases, decline in biodiversity, and several agricultural programs for its overall success.

The project (still in the planning phase) will be conducted cooperatively by six centers/programs including the International Institute of Tropical Agriculture (IITA), the International Rice Research Institute (IRRI), the Centro Internacional de Agricultura Tropical (CIAT), the International Council for Research in Agroforestry (ICRAF), Tropical Soil Biology and Fertility Programme (TSBF), IFDC, six to eight national programs, and a series of nongovernmental organizations.

The focus will be to (1) assess the potential for the reclamation of land that has been abandoned, (2) develop alternatives to slash and burn, and (3) evaluate means of protecting forest margins. Six sites will be chosen; Cameroon, Zambia, Brazil (Amazon), Mexico, Peru, Indonesia, Philippines, and northern Thailand are being considered.

The overall goal of the project is to develop alternative land use strategies and corresponding technology and policy options that simultaneously help reduce deforestation and improve the well-being of resource-poor farmers in the forest margins.

The direct beneficiaries of this project are the farmers and consumers of developing countries in the humid tropics. The farmers will benefit through the adoption of technologies that provide sustainable crop yields and sufficient firewood, fodder and fiber, plus increased income and improved living standards. Consumers will benefit through greater availability of produce and lower prices.

The ultimate beneficiaries are the societies at large, at the national and global levels, as benefits derived

through decreases in deforestation and soil degradation will be a major contribution to the environment in the form of better ecosystem services, the preservation of biodiversity, and the reduction of greenhouse gases.

Participation in the SPAAR Meeting in Rome

During December 4-5, IFDC participated in the meeting of the Special Program for African Agricultural Research (SPAAR), hosted by the International Fund for Agricultural Development (IFAD) in Rome.

Those agencies interested in funding agricultural research in Africa received a good introduction to the new program initiatives that the African Centre for Fertilizer Development (ACFD) and IFDC-Africa have designed to remove soil infertility and nutrient supply management as major constraints to increasing agricultural productivity in sub-Saharan Africa.

From its initial vantage point in Lomé, Togo, where IFDC established its first African base, the center is tackling the challenges of increasing agricultural productivity in west Africa through the development of more effective and sustainable nutrient supply systems. At a second vantage point—Harare, Zimbabwe—ACFD, an initiative of the Organization for African Unity, is focusing initially on the crop production challenges of southern Africa and will later include nutrient and land management-related programs in east and eventually all of Africa.

To realize the goals of this blueprint for Africa will require the commitment of a dedicated group of 5-10 donors who will collectively provide financing at a level of US\$11.3 million per year. IFDC is dedicated to placing these centers and the national agri-

cultural research systems with which they interact on a firm scientific and fiscal footing so that at some time in the future these organizations may stand on their own with backing from a new group of predominantly African supporters, managers, and scientists.

New Opportunities in Eastern Europe and the Former Soviet Union

As a result of political and economic reforms in Eastern Europe and the former Soviet Union, IFDC's opportunities for providing technical assistance in these regions are expanding. For further details on these activities, please see articles (elsewhere in this issue) on projects in the former Soviet Union and Albania.

Renewal of DGIS Grant

The Netherlands Ministry for Development Cooperation (DGIS) recently renewed the grant for the Africa Fertilizer Marketing Research and Information Project, based at IFDC-Africa. This 3-year project focuses on the transfer of knowledge and the development of human resources primarily in West Africa.

The project calls for the conduct of country studies to be carried out in cooperation with local authorities and to ensure that the recommendations will receive sufficient followup. Constant monitoring of the results forms an essential part of the project activities. The project, while concentrating on the nutrient management and supply needs of the countries in West Africa proposes to extend the African Fertilizer Trade and Marketing Information Network and to cover almost all countries in Africa. IFDC is most appreciative of this grant to support its activities in Africa.

Paul J. Stangel

Recent IFDC Publications

IFDC recently released its 1990 Annual Report. This report is organized around five themes: the environment, sustainable development of indigenous nutrient resources, human resource capacity building, development of information management systems, and the development of policies that encourage sustainable agricultural development.

To receive a complimentary copy of this publication, please request IFDC-S-14.

Ghana—

Support System Developed to Help Guide Development of Rational Fertilizer Policies

As part of a 5-year fertilizer policy project, IFDC and the International Food Policy Research Institute (IFPRI) are developing a fertilizer policy support system for Ghana and Mali to aid in the development of rational fertilizer policies in these countries.

With funding from the U.S. Agency for International Development, the IFDC/IFPRI policy project was initiated in 1987. As conceived, the project recognized that few African countries have a clear set of policies to help ensure that fertilizers play their proper role in attaining the goal of food security. The emergence of a fertilizer sector in sub-Saharan Africa created a need to establish clear policies that will facilitate the adoption of fertilizers.

In this project, three countries—Ghana, Mali, and Malawi—have been selected for in-depth studies and the creation and/or strengthening of a fertilizer policy unit within each country. The function of the policy unit is to provide relevant information to guide government policy choices and to provide a vehicle for in-country capacity building to ensure fertilizer and other agricultural input policy

analysis capability in the future.

At the center of this policy unit is a data base and information system, which systematically identifies, classifies, retrieves, maintains, and permits analysis of the different data required for the design and analysis of government policies that promote fertilizer use and efficiency in agro-environments such as those prevailing in sub-Saharan Africa countries, such as Ghana and Mali. The data base, which has been developed by an experienced data base programmer, W. Ziering, and Dr. Julio Henao, IFDC Biometrician, contains the following modules: fertilizer nutrient data; product data; land and agricultural development indicators; marketing indicators; fertilizer recommendations and management; crop management and nutrient balance; population, nutrition, and demographic indicators; and references complementing the data.

"The fertilizer policy support system is developed for the collection, maintenance, analysis, and dissemination of detailed fertilizer information," Henao says. "The information is location-specific, time-specific, and

product- or commodity-specific. The locations include districts, agricultural regions, agroecological zones, soil types, and aggregate data for the whole country. Most of the information will be collected annually. The key products are fertilizers that could be represented by nutrients and fertilizer products and crops represented by food and cash crops."

The system is now being implemented with collaboration of national institutions in Ghana and Mali. The collaborating institution in Mali is the Institut d'Economie Rurale (IER) of the Ministry of Agriculture and in Ghana, the Institute of Social, Statistics, and Economic Research (ISSER) of the University of Ghana at Legon. Both institutions participate with the respective ministries in the evaluation of policies and in the execution of research and development projects in the agricultural sector.

The main purpose of the fertilizer policy support system is to provide the information, data, and indicators for fertilizer policy decision purposes and to support information for policy-related activities. The long-term objective is to facilitate the organization and the operation of agricultural database systems in the countries and to promote the use of information through a network with other collaborating countries.

Denmark—

IFDC Participates in UNIDO Conference on Ecologically Sustainable Industrial Development

During October 14-18, 1991, James J. Schultz, IFDC Program Manager, Environmental Assessment Program, attended the UNIDO Conference on Ecologically Sustainable Industrial Development (ESID), held in Copenhagen, Denmark. Attended by 600 delegates representing most of the member countries of the United Nations, the Conference consisted of technical sessions that examined five industrial sectors: pulp and paper, alumina, leather, phosphate fertilizers, and plastics and plastic waste recycling.

The Conference was formally opened by His Royal Highness, Crown Prince Frederik of Denmark. Keynote

addresses were given by the Director General of UNIDO, the Executive Director of the United Nations Environment Programme, and the Secretary General of the United Nations Conference on Environment and Development.

The IFDC paper, entitled "Phosphate Fertilizers and the Environment," which was coauthored by Schultz; D. I. Gregory, IFDC Marketing Specialist; and Dr. O. P. Engelstad, Consultant, provided the basis for a case study that was debated during the session on phosphate fertilizers. In presenting this paper, Schultz briefly summarized the case study and highlighted the main environ-

mental issues.

"Fertilizer is one of the major inputs that enables adequate food production and maintenance of soil fertility on a sustainable basis," Schultz says. "There is no doubt that without fertilizers sustainable agriculture required to feed the world's growing population cannot occur, and the most critical issue is not to stop fertilizer production but to try to find ways to maintain ecologically sustainable production at the industry level."

It has always been crucially important to identify the criteria for ecological sustainability in industry and agriculture. In many respects,

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Soil Fertility Workshop Draws Delegates From Eleven African Nations

Twenty-two participants attended the Workshop on the Soil Fertility Restoration Project (SFRP), held at IFDC-Africa in Lomé, Togo, on October 3-8, 1991. The delegates to the Workshop were from Benin, Burkina Faso, Cameroon, Côte d'Ivoire, France, Ghana, Mali, Morocco, Niger, Nigeria, Senegal, and Togo.

The SFRP was established in 1987 to study the agronomic and socioeconomic viability of using fertilizers and soil amendments to restore and maintain soil fertility and is funded by the U.S. Agency for International Development, the World Bank, the Research Institute for Tropical Agriculture (IRAT, France), the Rockefeller Foundation, the American Phosphate Foundation, and the World Phosphate Institute.

The theme of the Workshop was "Fertilizer Use at the Village Level: Constraints and Impact." Various workshop presentations prompted lively debate and discussion. The agronomic research was presented by Dr. Edward R. Rhodes, IFDC-Africa Agronomist; the various socioeconomic aspects of the project were reviewed by Dr. Konadu Acheampong, IFDC-Africa Junior Sociologist, Dr. Carlos A. Baananate, IFDC Economist, Dr. Denis M.P. Pouzet, IFDC-Africa Agricultural Economist, and Dr. Thomas P. Thompson, IFDC

Rural Sociologist. Dr. Daniel Pierre, IFDC-Africa Soil Scientist, discussed the issue of nitrate content in well water.

During a field trip to Naki-Est, one of the two research villages in Togo, all of the participants met a large group of farmers participating in the project and visited trial sites.

Through this Project, the potential of fertilizers to increase and sustain crop production and farm incomes and to serve as a critical resource investment is being assessed in three West African countries and ecologies: the humid forest zone of Ghana, the savanna zone of Togo, and the Sahelian zone of Niger.

In each of these countries and ecological zones, "experimental" and "control" villages were selected in areas where soils were impoverished and deficient in phosphorus. Farmers in each of the "experimental" villages purchased fertilizers through a village revolving fund and were advised on how to best use available organic materials for restoration of soil fertility.

SFRP researchers are closely monitoring and evaluating the agronomic and socioeconomic consequences of these fertilizer interventions on the soil, land use patterns, and farmers' welfare. Detailed baseline farm surveys have been prepared in each study area and continuous documentation of soil fertility and socioeconomic changes are being made.



(Photo by Dr. Thomas P. Thompson)

K. Abalo, the Togolese SFRP Collaborator, and Dr. Uzo Mokwunye, Director of IFDC-Africa, speak to a group of Togolese farmers who are participating in the SFRP project.

(Continued from page 4)

the scientific, financial, and political community has not been fully challenged to address the question of quantifying the complex relationships of these issues. They include: (1) the transfer and execution of ESID technology; (2) the coupling of agronomic needs with more environmentally benign phosphate production technologies; (3) securing financial resources to implement ESID; (4) removal of restrictive fertilizer product legislation that inhibits implementation of ESID; (5) coping with the heavy metal content of certain phosphate products; (6) effective

management of process wastes and byproducts associated with the phosphoric acid-based products; and (7) improving agronomic efficiency to help mitigate the impact of the increased cost of ESID.

Several recommendations emerged from the conference regarding phosphate fertilizers. A few of these were:

1. The international community should take initiatives to convene a working panel of experts from industry, national and international regulatory bodies, and the scientific community to draft proposed minimum environmental

compliance standards for the phosphate fertilizer production sector.

2. Industry and process-specific engineering and operational technology that is designed to achieve ESID should be communicated to producers in developing countries.
3. An implementation timetable should be developed on a national basis to attain ESID consistent with the availability of capital and the operation of the industry in a competitive, yet sufficiently profitable manner.

IFDC Engineer Assesses Production of Urea Briquettes

As part of a joint agreement between IFDC and the Indonesian Fertilizer Producers Association (APPI), an IFDC engineer recently reviewed and assessed the production of urea briquettes in conjunction with Indonesian counterparts. During October 1-18, 1991, J. Ramon Lazo de la Vega, Special Project Engineer, visited Indonesia to conduct this assessment.

Since 1982 the Agency for Agricultural Research and Development, the Ministry of Agriculture (Indonesia), and IFDC have collaborated on the agronomic evaluation of urea supergranules in transplanted rice. Initial funding for this project came from the former Australian Development Assistance Bureau (ADAB). In 1986, to identify a scheme to supply USG to Indonesian rice farmers, IFDC, AARD, the Centre for Soil Research, and the Metal Industries Development Centre tested a village-level Chinese-made briquetter and demonstrated the technical feasibility

of producing 1-g oblate-shaped USG or urea briquettes by using prilled urea, urea fines, or urea dust as a feedstock.

Although, in principle, some USG were made for brief intermittent periods, modifications of the machine were required to improve its overall performance and operating life. Subsequently, in 1987 the Chinese briquetter was modified and its improved production performance demonstrated at the annual review meeting of the Fertilizer Efficiency Program in Indonesia. This successful urea briquette production demonstration and the improved agronomic performance of deep-placed urea briquettes prompted the Government of Indonesia to requisition hundreds of locally fabricated urea briquetters to be operational by the end of 1992.

In his recent review, Lazo de la Vega examined the operation of various examples of briquetting machines made in Indonesia to evaluate their condition and performance. These

briquetters are based on a further developed and improved version of the MIDC/IFDC briquetter, which is a modification of the village-level briquetter manufactured by the Chinese.

In addition, the IFDC engineer identified possible design and operational problems and established a modification and testing program for implementation by APPI. He reviewed the fabrication procedure for the machines that are now in use to evaluate the design and construction of these units.

The engineer recommended that a new generation of briquetters be developed to allow the successful completion of the project and to be able to achieve the goals and targets set by the Government of Indonesia, that is, to produce urea briquettes for application on paddy rice so as to increase rice yield, improve nitrogen efficiency, and reduce air pollution. The existing briquetters could be used for workshops and training exercises.

The recent IFDC 3-week training program on Financial, Economic, and Environmental Impact Analysis of Fertilizer Sector Projects attracted participants from Côte d'Ivoire, India, Indonesia, Pakistan, Thailand, and Venezuela. Some of the program participants and program leaders pictured here are on a field visit to an IMC phosphate mine in Florida (U.S.A.). They are standing inside the digging bucket of a phosphate dragline.



(IMC Photo)

Honduras— Fertilizer Efficiency in the Tropics Training Program Conducted for Farm Cooperatives

With funding from the U.S. Agency for International Development (US-AID), IFDC conducted a 10-day training program to prepare extension agronomists of the Union de Cooperativas de Servicios Agropecuarios (UNICOOP) in plant nutrition, soil fertility, efficient fertilizer use, and crop productivity enhancement so that they may train and assist cooperative member farmers. The program in Fertilizer Efficiency in the Tropics was cohosted by the Fundacion Hondurena de Investigacion Agricola (FHIA) in La Lima, Honduras, during October 7-18, 1991.

UNICOOP consists of 12 cooperatives with a membership of 5,519 farmers cultivating about 11,000 acres, mainly coffee. Twenty participants, primarily agronomists,

IFDC Participates in Study of Food Sector of Former Soviet Union

At the request of the World Bank IFDC recently participated in a study of the food sector of the former Soviet Union. During December 6-21, 1991, Dr. Paul J. Stangel, IFDC President and Chief Executive Officer, participated in a World Bank mission that assessed the current problems, potential for privatization, and investment opportunities in the agriculture sector of the republics that comprised the former Soviet Union, which now is called the Commonwealth of Independent States (CIS).

According to Stangel, three major challenges face the five states--Russia, Ukraine, Belarussia, Kazakhstan, and Uzbekistan--that account for the majority of fertilizer production and use in the Commonwealth of Independent States. These challenges include (1) finding ways to reverse the drop in production and use of fertilizer that has prevailed since 1988 and ensuring that the fertilizer sector remains competitive in both domestic and international markets; (2)

attended this program. The program concentrated on instructing the participants on the best fertilizer practices for the main crops in Honduras and the preparation of materials for farmer training.

Besides the program manager, Gildardo Carmona, IFDC Research Associate/Greenhouse Supervisor, and Dr. L. A. Leon, IFDC Soil Scientist outposted to the Centro Internacional de Agricultura Tropical (CIAT) in Cali, Colombia, the faculty consisted of the following members of the FHIA staff: Dr. Adolfo Martinez, Deputy Director; Dr. Denis Ramirez, Head of the Vegetable Program; Julio Romero, Research Associate—Soybean Program; Dr. Arturo Suarez, Head of the Agricultural and Chemical Laboratory; Alexis Matute, Head of the Communications Unit; and Julio Guillen, Research Assistant—Plantain Program.

Some of the topics that were covered during this program included soil classification and properties, plant nutrients and fertilizers, soil

finding ways to reduce the estimated 20% loss in fertilizer that occurs from the producer to the user; and (3) assisting the states with their efforts in the privatization and commercialization of the fertilizer sector.

Stangel found four additional challenges confronting the fertilizer sector. These include poor crop response to fertilizer applications, current inability of the official distribution system to meet farmers' needs, breakdown of the official fertilizer procurement and distribution system, and lack of incentive to manage collectives as a commercial enterprise.

The Governments of most of the CIS have decided to shift from a centrally planned economy to a decentralized market-driven economy; however, five basic elements need to be in place if a privatized fertilizer marketing system is to perform according to expectations.

"First, there should be strong evidence that ample and multiple-source supplies of fertilizer can be main-

analysis and fertilizer experiments, tropical crops fertilization, and materials for farmer training.

According to Carmona, the unique aspect of this training program was the "train-the-trainer" segment. "We were fortunate in having the expertise of the FHIA staff to assist with this portion of the training program," he says. "Their input added a valuable dimension to this training experience."

Adding a practical sideline to the program was a 1-day visit to the La Fe Experimental Station Headquarters of the Honduras Coffee Institute. "This field trip emphasized coffee fertilization—rates, sources, methods, and time of application," Carmona says. "We also observed other agronomic practices such as soil conservation, weed control, new varieties, and coffee bean processing."

tained at all times in the system," Stangel says. "Second, primary supply points should be either well located directly in or very near the key demand areas or there should be sufficient infrastructure in place to ensure ready and rapid movement of fertilizer product to areas in sufficient quantities to meet peak periods of demand. Third, there should be in place a well-developed dealer network that is competitive and knowledgeable in the proper use of inputs. Fourth, there should be sufficient incentives in the system to attract entrepreneurs already skilled in sound business management or who are willing to learn these principles. Finally, a management information system should be implemented to monitor the changes taking place in the market and allow for the development of proper policy options."

"There are four policy options that the Government(s) might consider over the next 6 months to ensure an orderly transition to a more competitive and eventually privatized fertilizer sector," Stangel says. "First, the managers of fertilizer production units could be provided incentives to at least maintain present production levels and possibly increase production in the near future, thus ensuring adequate supplies to meet domestic needs and also the export market and thereby generate badly needed foreign exchange. Another option is the establishment of a private, independent, competitive group of wholesalers that ensures timely and equitable movement of fertilizer in accordance with market demands. The creation of a major retail market for fertilizer and other agricultural inputs that is competitive, sensitive to market forces and becomes increasingly privatized is another policy option to be considered. An effective monitoring system should be established to accurately and quickly identify market conditions in the subsector and also ensure that products are being delivered according to acceptable standards."

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International Fertilizer Development Center 1992 Training Calendar

Program	Dates	Location	Fees
Phosphate Fertilizers and the Environment (Workshop)	March 23-27	Tampa, Florida, U.S.A.	700
Efficient Marketing of Fertilizer and Other Agri-Inputs	May 11-22	Nairobi, Kenya	1,200
Computer Simulation of Crop Growth and Nutrient Management	June 16-29	Honolulu, Hawaii, U.S.A.	1,400
Advances in Fertilizer and Irrigation Technology	June 8-27	California, Arizona, Louisiana, Kansas, Missouri, U.S.A.	1,800
Agroeconomic Evaluation for Development of Fertilizer Recommendations (in Spanish)	July 6-17	Valencia, Venezuela	1,200
Efficient Marketing Management for Fertilizer and Other Agri-Inputs	August 3- September 4	Muscle Shoals, Alabama and other locations, U.S.A.	2,475
Plant Nutrient Management for Sustainable Agriculture	September 14-25	Muscle Shoals, Alabama and other locations, U.S.A.	1,200
Technical Management of Fertilizer Production Units	October 19- November 6	Muscle Shoals, Alabama, and other locations, U.S.A.	1,800
Fertilizer Marketing	December 7-18	Jakarta, Indonesia	1,200

Program dates and locations are subject to change.
Fees do not include travel expenses or living expenses.

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