IFDC

Volume 12, No. 1
March 1987

ISSN 0149-3434

Report

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

Distinguished Speaker

Headquarters—

Haldore Hanson Addresses Century Club

During a recent visit to IFDC, a world-renowned agricultural research administrator predicted that the People's Republic of China will achieve far-reaching advances by the year 2000.

Dr. Haldore Hanson, Director-General Emeritus of the International Maize and Wheat Improvement Center (CIMMYT), made the projections when he addressed the IFDC Century Club during its ninth Annual Banquet. The banquet was held March 17, 1987, at the Ramada Inn in Sheffield, Alabama, U.S.A. The Century Club is a support group composed of IFDC staff and community leaders of the Shoals area.

A former Associated Press correspondent and later State Department officer in China, Latin America, and Asia, Hanson is an experienced observer of China and its people.

By the beginning of the next century, he predicted China will attain three of its major development targets : (1) the production of 480 million tons of grain, more than double the present grain output of the United States and four times the present output of the Soviet Union; (2) control of its population below 1.2 billion (the principal goal in the one-couple one-child campaign conducted since 1979); and (3) increased per capita income to $800, compared with the present $300 (an enormous achievement for a country the size of China).

Turning his attention to the benefits of technical assistance by international agricultural research centers, Hanson presented the Chinese viewpoint of what they gained from the centers. Four primary areas of benefit given were: (1) access to the world's collection of plant germplasm, (2) the latest advances in agricultural technology, (3) the best available breeding materials for genetic control of insects and plant diseases, and (4) training and continuing education for scientists. ■

Dr. Haldore Hanson
Director-General Emeritus, CIMMYT

Collaborative Project

Headquarters—

UNDP Conducts Review of Biological Nitrogen Fixation Project

Inoculants carrying bacteria that allow legumes to fix nitrogen from the atmosphere are usually applied in developed countries as a moist peat mixture. This technology, however, is inappropriate for many tropical countries lacking peat sources and refrigerated storage for agricultural inputs.

A United Nations Development Programme-sponsored team reviewed in February the joint CIAT/IFDC/BTI nitrogen project and found that a viable inoculant having a shelf life of at least 4 months has been developed using phosphate fertilizer and freeze-dried *Rhizobium*.

Review team members included Dr. Gudni Hardarson, Food and Agriculture Organization of the United Nations/International Atomic Energy Agency; Dr. Fernando Munevar, Colombian Institute of Agriculture; Dr. Peter Graham, University of Minnesota; and Dr. Lloyd Frederick, U.S. Agency for International Development (USAID).

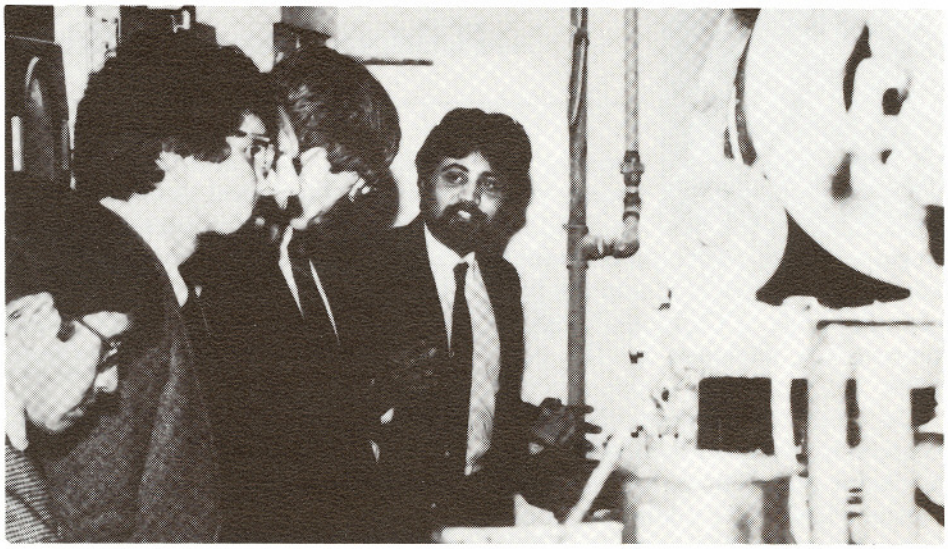
IFDC staff members making presentations on their research were Dr. A. H. Roy, Special Project Engineer, and Dr. L. J. Youngdahl, Crop Physiologist.

The objective of the project, being conducted in collaboration with the Centro Internacional de Agricultura Tropical and the Boyce Thompson Institute, is to provide viable inoculant to encourage symbiotic production of nitrogen and other nutrients (phosphorus and potassium), with and without seeds.

The review team recommended that field testing of these inoculants be expedited in Colombia as soon as possible. The team also advised that further studies should be conducted with various strains of *Rhizobium* to confirm that the results are not strain specific.

Two new experiments were added to the agenda for the remainder of the project. They will concentrate on: (1) the effect on *Rhizobium* survival of opening and incompletely using a bag of fertilizer containing inoculum and (2) the evaluation of the effects of high temperatures on *Rhizobium*, including its ability to form nodules.

Suggestions for the second phase of the project included the conduct of an economic and marketing study and survival studies in soil (See also "Marriage Between Bacteria and Plants Studied," *IFDC Report*, March 1986, p. 3).■



Dr. A. H. Roy (right), IFDC Special Project Engineer, explains the operation of the laboratory-scale granulation unit to (from left) Dr. Fernando Munevar, Dr. Gudni Hardarson, Dr. Lloyd Frederick, and Dr. Peter Graham.

Washington, D.C., U.S.A.—

HANNAH RECEIVES LIFETIME ACHIEVEMENT AWARD

"Educator, policymaker, implementer of diverse programs . . . an outstanding example of lifetime achievement," were the words used by USAID Administrator Peter McPherson, to describe Dr. John A. Hannah recently.

Hannah, who is Chairman of IFDC's Board of Directors, received the Lifetime Achievement Award—one of the Fourth Annual Presidential End Hunger Awards—during the World Food Day celebration, conducted by USAID in Washington, D.C.

These awards are sponsored by USAID with the assistance of the End Hunger Network, a nonpartisan, nonsectarian coalition of more than 100 national and international organizations committed to ending world hunger.

Dr. John A. Hannah
Chairman, IFDC Board of Directors

McPherson cited Hannah for moving the "U.S. university system toward assisting agricultural development throughout the world."

During his 5-year administration of USAID, Hannah led the Agency to "commit to sustained support of the international agricultural research centers," according to McPherson.

Another of Hannah's significant achievements came during his tenure as executive director of the World Food Council when he spearheaded the development of the International Fund for Agricultural Development.

In his response, Hannah stated his belief that the "most difficult problem the world faces is how we are going to feed the hungry people, particularly those in countries where they cannot produce enough food to feed their own."

He reminded his audience that "What the world is going to be like . . . wherever you live, will be determined by how we try to overcome that basic problem."■

Africa Center Update

Headquarters—

IFDC—Africa Center: The Togolese Perspective

In the interview that follows, two Togolese officials discuss some of their ideas regarding the potential impact of the IFDC-Africa Center, recently established in Togo. The officials are Mr. Komi D. Adzomada, Directeur de Cabinet, Ministère de l'Aménagement Rural, Government of Togo; and Dr. K. L. Allaglo, Directeur de l'Institut National des Sols, Lomé, Togo.

Q: *In your opinion, what will the IFDC-Africa Center mean to the average farmer in Africa? to the people as a whole? to the agricultural sector? to the economy of Africa?*

A: (Mr. Adzomada) In terms of the farmer, the Center will help him have better yields than he is getting now. Research on the soils and the types of fertilizers needed for each particular kind of soil will help the farmer obtain greater yields. In terms of the countries, the Center can test our phosphate rock deposits and assist in finding ways to use these deposits in fertilizer production. This, in turn, will improve the countries' economies.

(Dr. Allaglo) Ghana and Togo have already done much in the way of agricultural development. However, this technological development has stayed in each separate country and not spread to the surrounding countries. IFDC's arrival in Africa will unite all of the countries to share their technology. Therefore, technology will be transferred to other countries, and economic benefits will result from this shared technology.

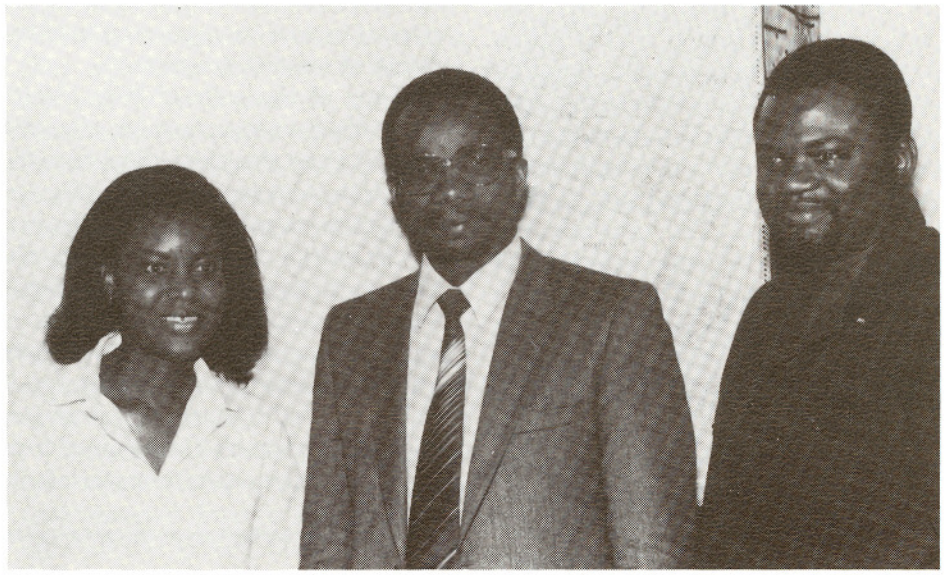
Q: *What role do you see the Center playing in the training component?*

A: (Mr. Adzomada) The IFDC Center will help to train agricultural experts so that they can give farmers the latest information on fertilizer use. This will help to transfer the technology to the farmers. The end product will surely be food self-sufficiency for many African countries.

(Dr. Allaglo) We have all heard the expression, "Seeing is believing." Most farmers don't really believe until they see for themselves the results of fertilizer use on their crops. By demonstrating the benefits of chemical fertilizer use, the Center will allow the farmer to see for himself what fertilizer will do—how it will increase his yields.

These and many other issues will need to be addressed as the new Center is developed. Dr. Paul L.G. Vlek, Director of the IFDC-Africa Center, was officially stationed in Togo as of April 1, 1987, to begin developing and directing the activities of the Center.

Funds for the new Center have been received from the United Nations Development Programme, the International Development Research Centre, the World Bank, Rockefeller Foundation, and the Kellogg Foundation. In addition, the Dutch and German Governments have indicated their early support, and discussions are underway with Finland, Denmark, France, the U.S.A., and others that are expected to result in cooperative projects and/or the provision of additional staff to be stationed in Africa.■



(From left) Rosemary Cubagee, IFDC Economist/Statistician; Komi D. Adzomada, Directeur de Cabinet, Ministère de l'Aménagement Rural; and Dr. A. K. Allaglo, Directeur de l'Institut National des Sols, Lomé, Togo. While at IFDC, Cubagee is conducting market situation studies of selected African countries for the Office Togolais des Phosphates, Lomé, Togo.

◄ *Announcement* ►

ESTABLISHMENT OF TRAVIS P. HIGNETT FUND

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

The Club considers this an appropriate 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 play an important role 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 will be used to provide fellowships to aspiring developing-country scientists who wish to study or conduct research projects at IFDC. The Century Club has pledged US $500 to be used as seed money to help establish the Fund and challenges Mr. Hignett's friends throughout the world to match the Club's contribution either individually or as small groups.

Anyone wishing to make a donation to assist the Century Club in this effort should make his/her contribution payable to the "IFDC Century Club" and designate 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**

Network Activities

Togo—

Network Conducts Fifth Annual Workshop

Since it was established in 1983, IFDC's West African Fertilizer Management and Efficiency Network (WAFMEN) has expanded both the scope of its work and the number of participating nations.

During February 4-6, the members of this network met in Lomé, Togo, to discuss the past season's results and to plan for the upcoming 1987 season. Organized jointly by the Ministry of Rural Management, Republic of Togo, and IFDC, with support from the International Development Research Centre, the meeting brought together 42 delegates from 15 West African nations. The network continues to expand, and welcomed to the meeting were M. F. Sylla (Guinée), Mama Kone (Mali), and Dr. A. Kogblevi (Benin), scientists from nations that are joining WAFMEN for the first time.

In his opening address S. Kortho, Minister of Rural Management, Republic of Togo, emphasized both the extreme fragility of West African soils and the need to adapt technology developed through agricultural research to fit the needs of the African environment. "Only the development of these technologies and their widespread implementation will allow us to achieve true progress in the fight against underdevelopment," he said.

Acting in his role as agronomy research coordinator of the new IFDC-Africa Center, Dr. A. U. Mokwunye said, "We at IFDC note with deep gratitude that every nation in continental West Africa from Senegal to Cameroon is today a member of the Network. We appreciate the fact that you and your supporting institutions have given real meaning to the word 'collaboration.'"

After individual presentations of research results, general discussions were held among the member delegates concerning problems encountered in the past season and possible new directions for research. Significant interest was created by the work of Dr. A. Bationo, IFDC Soil Scientist stationed in Niger, regarding the finding of a significant positive effect of crop residue incorporation on crop response to fertilizer application. Optimal crop residue management will become critical to establishing and maintaining high fertility of the fragile soils of West Africa. Studies of its effect on long-term crop yields in coordination with fertilizer use were therefore incorporated into the trials of several programs.

Many of the soils of West Africa generally have low phosphate fixation capacity, and therefore phosphate fertilization can have a positive effect on yields for several years after the season of initial application. Thus, the economic benefit of phosphate fertilizer can be spread over a number of years. This important aspect of phosphate fertilizer economy and use is being studied by most collaborators within the network. Data gained from a variety of phosphate materials including phosphate ores from West Africa will provide valuable information regarding the long-term benefits of phosphate use to the farmer.

It was decided that the nitrogen program should continue its emphasis on optimizing the efficiency of the fertilizer urea. Urea dominates the West African network market because of its high analysis and dominance in world trade. However, the efficiency of various forms of nitrogen, particularly urea, varies greatly depending on how and when these forms are applied to the soil as well as upon the rainfall patterns during the growing season. Network trials, some employing the isotope ^{15}N, will continue to focus on optimizing nitrogen management to obtain maximum efficiency. Data collected in these trials will be used as a basis to establish a maize/nitrogen modeling program designed to understand and predict nitrogen fertilizer response across the West Africa region.

Future network activities will be organized through the new IFDC-Africa Center in Lomé, Togo. ■

Pakistan—

Agriculture in Transition

As is the case in many other developing countries, Pakistan agriculture is now in a state of transition. The nation's farmers, already producing exportable surpluses of rice and cotton, have recently increased production of wheat and sugarcane sufficiently to allow the nation to become self-sufficient in those commodities as well.

In addition, the country seems ready to synchronize further increases in production of such basic commodities as rice, wheat, sugarcane, and cotton with domestic requirements and the comparative economic export potential for each of these crops. These shifts will cause a change in the types and quantities of fertilizer required by agriculture.

In a recent interview, Dr. Amir Muhammed, Chairman of the Pakistan Agricultural Research Council, provided a Pakistani viewpoint of the changing agricultural and fertilizer picture.

According to Muhammed, five main challenges are presently confronting Pakistan's fertilizer sector that directly affect its agricultural sector.

First, because fertilizer use efficiency is quite low on most crops, research needs to be organized to investigate fertilizer use in Pakistan by different agroecologies and cropping systems. In particular, supplying micronutrient requirements and adding organic matter for saline and alkaline soils must be coordinated very carefully.

Second, technologies leading to the reduction of extensive fertilizer nitrogen losses through volatilization, leaching, and immobilization of applied phosphatic fertilizer through fixation are urgently needed.

Next, with more intensive land use, native levels of potash will probably be depleted and become a limiting factor under many cropping patterns. Research is needed to determine potash requirements of the soil.

Fourth, because Pakistan imports much of its phosphatic fertilizer, the country should vigorously increase domestic production of phosphate fertilizers and, where feasible, base that production on indigenous raw materials.

Finally, since organic matter use in Pakistan is very low, its importance has to be emphasized to the growers, and on-farm methods for its production and conservation must be developed.

According to Muhammed, "The most crucial development to meet these challenges will be the organization of an integrated research system that will allow the Federal Government to do basic research as well as coordinate the overall effort. This effort involves a partnership with appropriate institutions in the provincial governments and private sector, especially the fertilizer manufacturers and distributors."

Along with others, Muhammed believes that Pakistan has a variety of opportunities for diversification of its future agriculture.

"Because the country needs to export agricultural products to earn much-needed foreign exchange, its agricultural system must be diversified to include those commodities that will capitalize on Pakistan's natural advantage in terms of environmental conditions, market requirements, and special farming skills," he said. "To find substitutes for imports, local production (especially of oilseeds, milk, and meat) should be encouraged. By capitalizing on its natural advantage, Pakistan can shift to producing fruits and vegetables in different parts of the country, provided efficient post-harvest processing and marketing can be organized. Because marketing difficulties and a sharp decline in prices are causing problems with traditional exports, such as cotton and rice, land areas allocated to these crops need to be diverted to some others like edible oilseeds to save foreign exchange."

In closing Muhammed outlined Government's legitimate role under deregulation of fertilizer.

"The Government of Pakistan (GOP) has deregulated prices of nitrogen fertilizer only," Muhammed said. "Farmers must be assured that they can get fertilizer at the proper time and at economical prices, considering the overall agricultural economy and prices of agricultural commodities. The Government, therefore, must regulate prices and ensure availability through a dealer network, covering even the difficult-to-reach areas. To avoid wastage, the Government also must ensure efficient use through soil test-crop response correlation."

(Editor's note: Dr. Amir Muhammed is also a member of IFDC's Board of Directors.)■

In mid-1986 Dr. Paul J. Stangel, Deputy Managing Director, participated in an in-depth study of the Pakistan fertilizer sector. This study was part of a mission conducted by the FAO Investment Center and financed by the Asian Development Bank. The study was undertaken to identify the economic benefits of a US $150 million bank loan to the Government of Pakistan to finance fertilizer imports for 1987-89. Stangel's role in the mission was to examine the issues confronting the fertilizer sector that the GOP will have to address as it moves toward a less regulated fertilizer sector but one that is still sensitive to the needs of a changing and increasingly more diversified agriculture. In short, the GOP will have to integrate the fertilizer policies with those of agriculture even more closely than it has in the past.

Training Program Highlights

Colombia—A training program on the ***Statistical and Economic Analysis of Fertilizer Use*** was conducted at the Centro Internacional de Agricultura Tropical (CIAT) in Cali, Colombia, during November 4-21, 1986.

Twenty-two participants from Colombia, Costa Rica, Dominican Republic, Mexico, Paraguay, Peru, and Venezuela attended the program.

The program's primary objective was to improve the participants' skills in the techniques required to collect, process, analyze, interpret, and report primary data obtained from fertilizer experiments, farm surveys, and various secondary sources.

The participants used practice exercises to develop their skills in such procedures as analysis of variance, regression analysis, production functions, and time series analysis.

Evaluation forms completed by the participants at the end of the program indicated that 95% rated the program either "excellent" or "very good."

The program manager was Dr. Adolfo Martinez, IFDC Agricultural Economist, posted at CIAT. Other staff members contributing to the program were Dr. Julio Henao, Biometrician; Dr. C. A. Baanante, Economist; Dr. J. A. Ashby, Sociologist; and Dr. L. A. Léon, Soil Scientist.

Brazil—Two staff members, M. T. Frederick, Chemical Engineer, and G. W. Bolds, Pilot-Plant Operations Coordinator, presented a specialized training program on ***Fluid Fertilizers*** for Petroleo Brasileiro, S.A. (PETROBRAS) in Rio de Janeiro, Brazil, during November 24-29, 1986.

PETROBRAS had requested the program because of its interest in becoming prepared for the eventual emergence of the fluid fertilizer industry in Brazil.

Fourteen representatives of both the research and production sectors of PETROBRAS attended the program, which covered the production of both solutions and suspension fertilizers, addition of secondary and micronutrients, methods for product evaluations, and application techniques.

Indonesia—The seventh annual ***Regional Fertilizer Marketing Training Program*** was held in Jakarta, Indonesia, during December 8-19, 1986. Cosponsor of the program was the Assosiasi Produsen Pupuk Indonesia.

Some of the subjects covered in the program were marketing planning and research, demand forecasting, distribution systems and management, pricing, and promotion.

The 33 marketing managers, attending the program, were from India, Indonesia, Korea, Nepal, Nigeria, Pakistan, Western Samoa, Saudi Arabia, and Sri Lanka. They participated in a variety of activities such as simulation exercises, case studies, role play, discussions, and field trips. Films on salesmanship, marketing, soils and fertilizers, and management were used as sources of discussion.

The manager of this program was Dr. V. L. Sheldon, Marketing Specialist. Other staff members making presentations included Dr. D. H. Parish, Director of the Outreach Division; R. S. Giroti, Training Administrator; N. D. Le, Chemical Engineer; and J. H. Allgood, Personnel Officer. Visiting speakers were R. Coster from the Fertilizer Advisory Development and Information Network for Asia and the Pacific, Thailand; Perry Bosshart from the Potash and Phosphate Institute/International Potash Institute, Singapore; and A. G. Vaes from the Food and Agriculture Organization of the United Nations, Jakarta. Five speakers from Indonesia served as resource persons.

India, Thailand, Malaysia, and Indonesia—A 3-week ***Fertilizer Production Training Program,*** covering a wide range of production technologies, was conducted during February 2-20, 1987. The venue for this program included several localities including Madras, Bombay, and Vadodara, India; Bangkok, Thailand; Kuala Lumpur and Johor, Malaysia; and Palembang and Gresik, Indonesia.

The presentations and discussions covered a variety of topics. Some of the subjects were: trends in fertilizer industry development, fertilizer

(From left) J. J. Patel (India), Djoko Subagio (Indonesia), Sayed Rabi (Jordan), Sutarno (Indonesia), R. K. Khamkar (India), and I. B. Rana (India) listen intently to a presentation during the Fertilizer Production Training Program.

production technology, basic engineering concepts, planning a new fertilizer complex, new technologies for NPK production, fluid fertilizers, bulk blending of fertilizers, and urea-based NPK fertilizers.

Fourteen persons from India, Indonesia, Jordan, and Malaysia attended the program, which was cosponsored by the Fertiliser Association of India, the Chemical Company of Malaysia and FPM, the Thai Central Chemical Company, and the Assosiasi Produsen Pupuk Indonesia.

Field trips to selected fertilizer plants illustrated a wide range of relevant technology. Among those installations visited in India were Madras Fertilizers, Ltd., E.I.D. Parry, Ltd., Rashtriya Chemicals and Fertilizer Factory, Gujarat State Fertilizer Co., and Gujarat Narmada Valley Fertilizer Co. In Thailand the participants toured the Thai Central Chemical Co. In Malaysia they visited the Chemical Company of Malaysia Berhad and FPM; in Indonesia P.T. Pusri Sriwidjaja and Petrokimia Gresik were on their itinerary.

M. T. Frederick, Chemical Engineer, served as Program Manager; he was assisted by R. S. Giroti, Training Administrator, who served as program comanager. Several highly qualified specialists from organizations in India, Thailand, Malaysia, and Indonesia also made presentations.

Headquarters; Nashville, TN; and Washington, D.C. (U.S.A.)—A training program in ***Data Collection, Analysis, and Projections for Fertilizer Sector Studies*** was conducted for the third time during March 16-April 3, 1987, at Headquarters and other U.S. locations.

The 3-week program dealt with the latest techniques of data collection and analysis through lectures, discussions, and "hands-on" activities using microcomputers. To gain a practical viewpoint, field trips were arranged to various agencies and organizations involved in fertilizer sector data collection, analysis, and projections.

Seventeen economists/planners from Brazil, Burma, India, Jamaica, Jordan, Kenya, Nigeria, Pakistan, Yugoslavia, and Zambia took part in the program.

Dr. Dennis H. Parish, Director of the Outreach Division, was program director; assisting him were R. S. Giroti as program coordinator and J. H. Allgood as market analyst. Dr. E. M. Wilson, Deputy Assistant Secretary, U.S. Department of Agriculture, and M. T. Kelley, Deputy Assistant Secretary, U.S. Department of Commerce, addressed the participants. Making presentations were officials from the Bureau of Census, Bureau of Mines, Tennessee State Department of Agriculture, the Fertilizer Institute, the Sulphur Institute, and the National Fertilizer Development Center/Tennessee Valley Authority. Dr. G. M. Desai of the International Food and Policy Research Institute, Dr. S. Zarqa of the Food and Agriculture Organization of the United Nations, and C. Sahai of the Fertiliser Association of India were members of the faculty.■

Ms. Regina Harris (left), IFDC Marketing Research Assistant, looks on as Philip Ndungu Nyanjui, Assistant Planning Officer, Ministry of Agriculture, Kenya, inputs information on a microcomputer.

Upcoming Training Programs

Program	Location	Dates
Headquarters		
Fertilizer Marketing		
Use of Microcomputers for Fertilizer Sector Personnel	IFDC	*
Fertilizer Marketing Management	IFDC/ Other Locations	August 10-September 18, 1987
Statistical and Economic Analysis of Fertilizer Experimental Data	IFDC	September 21-October 9, 1987
Fertilizer Production and Technology		
Maintenance and Production Management	IFDC Other Locations	October 12-30, 1987
Fertilizer Use Efficiency		
Soil Testing and Soil Fertility Management	IFDC	July 27-31, 1987
Regional Programs		
Regional Fertilizer Marketing	Nairobi, Kenya	July 13-24, 1987
Modern Techniques in Fertilizer Distribution and Handling	Europe	June 8-26, 1987
Fertilizer Use Efficiency in the Tropics and Subtropics (in Spanish)	Cali, Colombia	November 9-27, 1987
Regional Fertilizer Marketing	Manila, Philippines	December 7-18, 1987

NOTE: Dates are subject to change.
*This program will be offered upon request throughout 1987.

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

IFDC Report

Published Quarterly by the
International Fertilizer Development Center

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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