

Report

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

Eastern Europe—

IFDC's Crop Modelers Help Albanians Map Out a Brighter Agricultural Future

Albania is making rapid progress in its transition from an isolationist, centrally planned economy to a market economy. Democracy is now firmly established, inflation is being brought under control, foreign investment has begun, and agricultural and industrial production is increasing. Nevertheless, Albania is still one of the poorest countries in Europe, with a gross domestic product of about US \$400 per capita in 1992.

Albania has good potential for rapidly reaching much higher levels of productivity and income if it quickly takes measures to stabilize the economy and establish the institutions and infrastructure needed to support markets. Most of that response can only come from agriculture. Albania's lowlands are fertile; rapid yield gains can be made if incentives encourage private economic growth and investment.

Part of the answer to the challenges faced by Albania lies in the development of an agricultural management information system. In addition to its efforts in agricultural input dealer development and credit infrastructure support, IFDC is assisting Albania by introducing that country's policymakers to technology that is available to help them assemble the information needed to derive viable solutions to particular problems.

Recently a team of IFDC scientists, which included Dr. Philip K. Thornton, Senior Systems Model-

ing Scientist; Dr. Walter T. Bowen, Systems Modeling Scientist; Dr. Julio Henao, Senior Biometrics Scientist; and James E. Brink, Geographic Information Systems Technician, visited Albania to show that country's agricultural sector personnel some of the modern information technology tools that are available and to demonstrate how such tools can be used to provide information that helps people make better decisions.

Prior to their departure for Albania, the scientists assembled a prototype crop model Geographic Information System (GIS) at IFDC Headquarters. This prototype covered four of the most intensive agricultural regions of Albania—Lushnja, Fier, Korca, and Shkodra. Weather data for the four regions were assembled from a variety of sources. Maps of soil types were prepared, and corresponding soil profile characteristics for use with the crop models were estimated from profile descriptions provided by the Institute for Soil Studies in Tirana.

The prototype system can be used to do the following:

- Produce soil and agroclimatic maps for the whole country.
- Run the CERES-wheat crop simulation model for the regions of Lushnja, Fier, Shkodra, and Korca.
- Map sales regions for individual dealers so that demand projections can be made for their target markets.

The IFDC scientists made six presentations throughout Albania, which were attended by approximately 300 people. The following format was used in each demonstration:

- An introduction on the need for information to make decisions; information management; the tools that can be used such as GIS and the area sampling frame (ASF); what crop simulation models are and what they can do.
- The wheat model was then run using the decision support system for agrotechnology transfer (DSSAT) software, and a nitrogen fertilizer response curve was derived. Costs and prices were added to show the difference between the agronomic and the economic optimum using a graphical interface, and the influence of different costs and prices was easily assessed.
- Strategies were established in the DSSAT to investigate agronomic options suggested by the participants.
- The crop model GIS system was then shown, and the fertilizer demand program was demonstrated.

The presentations were made at the IFDC office and the Ministry of Agriculture in Tirana, at the Wheat Research Institute in Lushnja, at the Palace of Culture in Korca, and at the Agricultural University of Tirana in Kames. All demonstration material was translated into Albanian. The IFDC scientists were interviewed by Radio Korca, and

IFDC Report

Publisher:

International Fertilizer
Development Center

Editor

Marie K. Thompson

IFDC Report is a quarterly publication of the International Fertilizer Development Center (IFDC), Muscle Shoals, Alabama, U.S.A. Telephone: 205-381-6600, Telex: 810-731-3970 IFDEC MCHL, Telefax: 205-381-7408. Unless otherwise noted, printed material published in the *IFDC Report* is in the public domain and may be freely reproduced. Source acknowledgment and a copy of any reproduction are requested. Subscriptions are free. French- and Spanish-language editions of the *IFDC Report* are available from IFDC.

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 increasing and sustaining food and agricultural productivity in developing countries through the development and transfer of effective and environmentally sound plant nutrient technology and agribusiness expertise.

IFDC President and Chief Executive Officer:

Amit H. Roy

Board of Directors:

David Hopper (Canada),
Chairman
Joe Wheeler (U.S.A.), Vice
Chairman
Yaovi Adodo (Togo)
Anton Amberger (Germany)
Eliseu Roberto de Andrade
Alves (Brazil)
Hiram Grove V. (Chile)
Pratap Narayan (India)
Christian Pieri (France)
Bukar Shaib (Nigeria)
Robert E. Wagner (U.S.A.)

Change of Address:

To avoid missing copies,
allow six weeks for change of
address. Send details to:
IFDC Report, P.O. Box 2040,
Muscle Shoals, Alabama
35662, U.S.A.

their presentation to the Ministry of Agriculture, attended by the Minister and Vice Minister of Agriculture, was described on national television.

"We urged the participants in the seminars to think of the computer as a plot of land on which we could design and run experiments," Thornton says. "This approach encouraged good audience participation. The members of the Albanian Fertilizer and Agricultural Input Dealers Association (AFADA), most of whom are trained agronomists, eagerly suggested agronomic strategies that were subsequently evaluated using the computer model."

A number of possible applications of the prototype model were illustrated. For example, the model can provide information on the "best-bet" fertilizer schedule for a particular location so that the mean monetary return is high while minimizing the risks of poor returns. Likewise, yield projections for the season in progress can be developed using historical weather data. Using typical fertilizer costs and grain prices, these results can be plotted in terms of gross margin, net return, or profit. Such information can be used to assess regional production levels and to highlight the locations that are highly suitable for wheat production. The prototype system can also be used to estimate the on-farm demand for nitrogen fertilizer, using assumptions that the user can easily change. This type of information can be used by the fertilizer dealer to estimate the peak demands for nitrogen fertilizer that he must try to meet in an effort to match supply and demand for fertilizer.

Over the coming months, the prototype model GIS will be further developed to give nationwide coverage. The Ministry of Agriculture is using an area sampling frame (ASF) method developed and introduced by IFDC that allows national estimates of crop areas

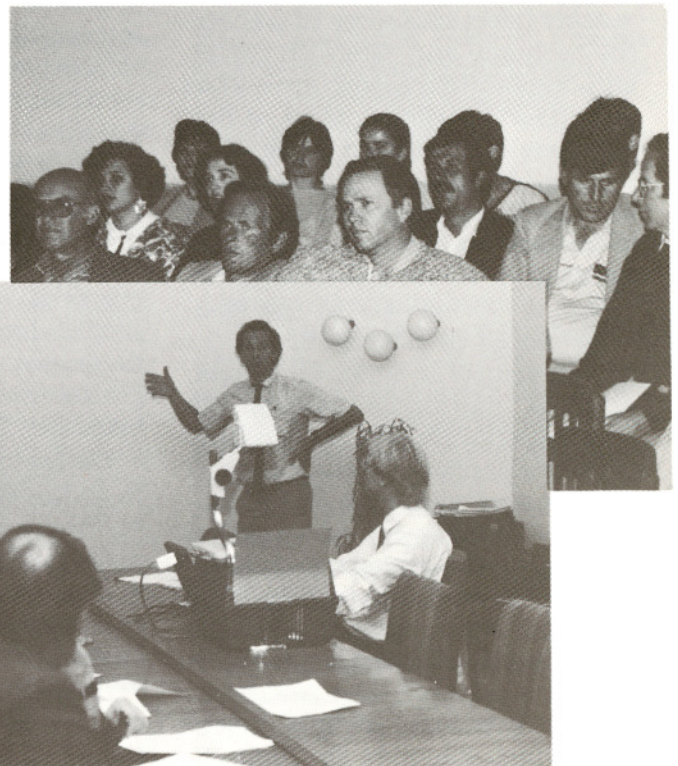
Dr. Philip K. Thornton, IFDC Senior Systems Modeling Scientist, makes a point during a presentation on crop modeling to a group of Albanian decisionmakers.

and yields to be estimated from a comparatively small sample of field plots. Production and socioeconomic data have been collected through surveys using the ASF and will continue to be collected in the future. The GIS will be linked to these databases, allowing the data collected to be mapped and analyzed using the system.

Two field trials were planted at the University of Tirana and the Agricultural Research Institute in Lushnja; these trials are being run by Albanian scientists. These experiments are generating data sets for validating CERES-wheat.

"The formation of a multidisciplinary team of Albanians trained in the use of the crop models and GIS that could feed relevant and timely information to policymakers is a critical activity over the next few months," Thornton says. "To satisfy this need, training courses are being planned for 1994. The situation in Albania offers a unique opportunity for attempting to do something radically different and innovative in terms of information provision for decisionmakers throughout the agricultural sector. The demonstrations were helpful in fostering support among Albanians for these activities, and the Albanians themselves are keen to develop the prototype to its full potential."

Photos by James E. Brink



IFDC Scientist Conducts Sustainable Agriculture Study in Uruguay

Using computer modeling that allows for agronomic, economic, and environmental considerations of farm productivity on a long-term basis, an IFDC Soil Fertility Scientist/Biometrician Dr. Walter E. Baethgen is conducting a research project to assess the sustainability of several agricultural production systems. This project is conducted in collaboration with La Estanzuela Experimental Station of the National Agricultural Research Institute (INIA) of Uruguay.

One of the most valuable long-term agricultural experiments in Latin America is located at La Estanzuela Experimental Station, INIA. This 30-year ongoing experiment has been yielding very valuable information on soil and crop management strategies for the region. The INIA experiment evaluates the long-term effects of seven cropping systems with different crop and pasture sequences. Each one of these crop sequences is established in large plots (0.5 ha) and is replicated three times. The results of this research have evidenced the advantages of including legume pastures in rotation with agricultural crops. This practice leads to maintaining soil fertility, lower required fertilizer inputs, higher crop yields, and more stable economical results.

Baethgen recently began collaborating with Dr. Alejandro Moron and other staff members of the INIA Soils Department to determine soil carbon, nitrogen, and phosphorus mineralization rates; crop residue decomposition rates; and soil organic matter fractionation studies. These determinations are intended to produce information on "soil quality" indicators, i.e., parameters that can be related to the soil's ability to support sustainable agricultural production systems.

The IFDC scientist is also using these research results to calibrate and validate CENTURY, a soil organic matter and nutrient dynamics simulation model. The CENTURY model was developed by the Natural Resource Ecology Laboratory of Colorado State University, another of IFDC's collaborators. The

CENTURY model simulates the long-term dynamics of carbon, nitrogen, phosphorus, and sulfur for different plant-soil systems.

"The performance of the CENTURY model to predict the soil organic matter evolution of the 30-year INIA experiment was excellent," Baethgen says. "The model simulated the variations in the soil organic carbon and total nitrogen for three contrasting cropping systems: (1) continuous crops without fertilizers, (2) continuous crops with nitrogen and phosphorus fertilizers, and (3) a system in which pastures containing legumes are grown for 3-4 years, followed by 3 years of crops."

Once the CENTURY model has been tested, calibrated, and validated, it may be used for several applications. For example, it can be used to predict the plant nutrient availability in the soil at any given time of a crop sequence and assist in the fertilizer recommendations. It can also be used to evaluate the long-term ability of the soil to sustain agricultural systems with different crops, crop sequences, fertilizer inputs, tillage methods, strategies for soil erosion control, etc. The model can also be used to continuously monitor the evolution of soil properties associated with "soil quality" in existing production systems.

"The CENTURY model can also be linked to other models such as the International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) models that are capable of

simulating the development and growth of several crops in a detailed fashion," he says. "These models can also be used in conjunction with Geographic Information Systems to build decision support systems that can be extremely powerful tools for local or regional planning."

Currently, Baethgen is calibrating and testing the CENTURY model in pasture-based systems of Central Brazil (the Cerrados). The Cerrados, covering approximately 200 million hectares in Brazil, is a key region for the country's agricultural development. There are presently 10 million hectares being planted to crops, and the area is expected to increase dramatically in the near future. It is also the region with the best opportunities for alleviating some of the agricultural and environmental pressures on the Amazonian region as a result of population growth and migration.

The CENTURY model can be used in the Cerrados to assist in the definition of soil and crop management strategies that can be adopted to avoid soil degradation problems and result in sustainable production systems. The model would provide information to avoid soil degradation problems and result in sustainable production systems. CENTURY model runs would indicate a few strategies with the best opportunities that would thereafter be tested under experimental and/or farmers' conditions.

Alternating annual crops with multi-annual pastures is a key component of sustainable production systems in southern South America. In the foreground are Dr. Alejandro Morón, INIA-La Estanzuela, and Dr. Walter E. Baethgen, IFDC. In the background is a 30-year-old field experiment where IFDC and INIA-La Estanzuela are collaborating on sustainability research.



Photo, courtesy of INIA

Three Teams Provide Short-Term Technical Assistance to Bangladesh under Fertilizer Distribution Improvement (FDI-II) Project

Study Reveals Impact of Subsidy Removal—IFDC recently completed a study on the impact of fertilizer subsidy removal in Bangladesh. The study team was composed of Dr. Carlos A. Baanante, Director of the Research and Development Division; Dr. Julio Henao, Senior Biometrician; and Ms. Xia Wan, Data Analyst.

Since Bangladesh gained its independence in 1971, fertilizer subsidies have been an important component of that country's Government policy on fertilizer pricing. However, as fertilizer use expanded, the cost of the subsidy to the country became increasingly greater and more difficult for the Government to afford. Fertilizer subsidies are no longer required; they have served their purpose by expanding the adoption of fertilizers and acquainting farmers with fertilizer use. Fertilizer use has contributed to an almost doubling of crop yields in the past 30 years. Fertilizer subsidies were gradually reduced and finally withdrawn on all fertilizers in 1992. The Government has benefited from the subsidy reductions and shall benefit even more in the future from the complete removal of the subsidy.

The main objectives of the study were to assess the impact of the fertilizer subsidy removal on fertilizer use, food-grain (paddy) production, and farm income and to forecast fertilizer demand for the period 1993-96. In order to achieve these objectives, statistical and economic analyses were conducted.

In conducting their study the team members performed the following tasks: (1) estimated the functions of crop response to fertilizer for the Aman, Boro, and Aus crop seasons; (2) calculated fertilizer rates that maximize farmers' profits for current and alternative levels of fertilizer/crop price ratios; and (3) estimated changes in fertilizer rates, crop yields, and farmers' profits that

are associated with changes in fertilizer/crop price ratios resulting from the subsidy removal.

The study revealed some interesting findings:

1. Based on an assumed 30% increase in the fertilizer:crop price ratio, the decline in fertilizer use by farmers who reduce production costs to increase profit margins is estimated to be 3% or less, depending on the season and crop variety.
2. Even if fertilizer prices were to increase by 60%, the projected decrease in yield would be less than 2%.
3. Profits and value:cost ratios of nitrogen and phosphorus are lower for local varieties in the Aman season, with top profits accruing to farmers cultivating high-yielding varieties during the Boro season.
4. In relative terms, farmers' profits associated with fertilizer use are expected to decrease by less than 5% after the subsidy removal if fertilizer/paddy price ratios increase by 30% or less.
5. If prices of fertilizers were to increase by 30%, then there may be a slight decrease in demand for urea, triple superphosphate, and muriate of potash; however, if prices were to increase by 15%, only the sales of triple superphosphate will be adversely affected while urea sales will continue to increase and muriate of potash sales will remain at the 1992 level.

The findings of this study suggest that any negative impact of the subsidy removal on fertilizer use and sales could be easily offset by improved management practices and the expanded cultivation of high-yielding varieties. The removal of fertilizer subsidy will continue to benefit the Government of Bangladesh by reducing expenditures, but, more importantly, it will promote a better allocation of resources and, in the long run, a more efficient and productive agriculture.

The successful implementation of policy reform to privatize the distribution and marketing of fertilizers, including efforts to promote competition and increase efficiency, will ameliorate the effects of the fertilizer subsidy removal on farm-level fertilizer prices. Effective competition at the wholesale and retail levels of fertilizer marketing will promote the cost effectiveness of fertilizer delivery systems, and farmers will pay lower fertilizer prices. Thus, in Bangladesh, the more efficient fertilizer marketing system that is emerging will, by and large, offset the impact of the fertilizer subsidy removal on fertilizer prices.

IFDC Develops New Pricing Strategy for Bangladesh Chemical Industries Corporation (BCIC)

—An IFDC Production/Marketing Specialist, T. Alan Nix, recently developed a new pricing strategy for BCIC that will help alleviate their problems with inventory control and farm-level supply. This strategy is now in the testing phase, and the results thus far have exceeded expectations. The adoption of this new variable pricing strategy by BCIC is a key to improving the efficiency of fertilizer marketing in Bangladesh. Developing this type of strategy is a part of the continuing maturation of the Bangladesh fertilizer market and should aid both BCIC and the private sector as they work in harmony to satisfy the fertilizer-related needs of all farmers in Bangladesh.

In early 1993 the Bangladesh urea supply and price situation was unsatisfactory. Urea prices at the retail level reflected supply shortages and reached record high levels. The main bottleneck in the system is linked to the delays by distributors in procuring urea from BCIC factories. During the high demand months, the factories were unable to meet distributors' demand for urea due to delivery limitations at

the factory. Export activity at BCIC also restricted supplies in the domestic market. This very undesirable situation motivated IFDC to search for a solution to the problems related to urea marketing.

A market-oriented marketing plan, including a variable pricing strategy for urea, is the most logical solution for the current and anticipated problems in urea marketing. Since fertilizer marketing in Bangladesh is now a competitive, open-market system, it is logical that BCIC adopt a market-oriented approach to fertilizer marketing. This requires that BCIC adopt a fully commercial approach to pricing and physical distribution.

The proposed variable pricing strategy is designed to encourage distributors to equalize monthly lifting from the BCIC urea factories. If properly executed a variable pricing strategy should help BCIC to ensure urea availability, minimize factory disruptions due to excess inventory problems, and improve BCIC's cash flow position. The variable pricing strategy should encourage early off-season sales that will, in effect, shift some of the distributor demand. Thus, some of the storage function will be transferred from BCIC's factories to the distributors.

By shifting some distributor demand to the low demand months, variable pricing should benefit the farmers by increasing the availability of urea during the high demand months. In a market-driven economy, as supply and availability increase at the distributor level, farm-level prices should decrease.

Making urea more available should result in increased use. To a point, increased fertilizer use will result in increased crop production. Thus, variable pricing fits well into the Government's policy of promoting increased crop production.

Under the new pricing strategy, urea prices will be determined annually. A monthly price list, for the entire crop year, will be announced

early each year and remain valid for the duration of an entire crop year.

By issuing a monthly price list on an annual basis, BCIC should decrease the distributors' concerns about unannounced price changes. Offering price discounts during low-demand months should make it financially attractive for distributors to purchase and store urea in anticipation of demand. Variable pricing should also decrease the pressure on the transport system during high-demand months. Shifting demand to low-demand months will shift some of the transport function to these months.

In order for the variable pricing strategy to be successful, BCIC should avoid frequent changes of announced issue prices and discontinue the sale of small quantities of fertilizer. Frequent price changes lead to BCIC's competing with its own customers, which may disrupt private-sector trade. Small-quantity sales are costly and result in delays in the delivery process.

A variable pricing strategy will reflect the seasonality of domestic demand. Variable pricing will benefit not only the fertilizer distributors, retailers, and BCIC but, more importantly, it will be of great benefit to the nation's farmers by ensuring the availability of urea on a timely basis and at competitive prices.

The BCIC will implement the variable pricing strategy, and IFDC will actively encourage distributors to cooperate in the program. IFDC will also provide quarterly reports on BCIC sales, in-country stocks, BCIC revenues, and wholesale and domestic retail-level prices. These reports will be reviewed by the Ministry of Agriculture, the Ministry of Industry, and the private sector. These entities and IFDC will meet quarterly to assess the impact of the variable pricing strategy on distributor operations, BCIC costs and rev-

enues, and fertilizer availability and prices at the retail level.

IFDC Consultant Develops Guidelines for Bangladesh Fertilizer Association—Dr. Robert Munson, an IFDC Consultant, recently developed the guidelines for a national fertilizer association for Bangladesh. The Association has been formed, and all registration and approval procedures with the Government of Bangladesh are now in the final stage.

The Government of Bangladesh recognizes the importance of its country's fertilizer marketers' developing their own capability of dealing with certain issues, e.g., market monitoring and intelligence, liaison with the Government on fertilizer and agriculture-related issues, distributor training and technology transfer, and dealer/farmer education on fertilizer use. A well-organized fertilizer association can be an effective force for developing those important capabilities and representing the mutual interests of the fertilizer sector on many critical issues related to continued fertilizer development and improved marketing. Furthermore, formation of the Association is another key step in the institutionalization of private-sector fertilizer marketing.

The Bangladesh Fertilizer Association will be a self-operating, non-profit organization established by and on behalf of the fertilizer sector and agribusiness firms in Bangladesh. As a nonprofit entity, the activities and policies of the Association will be determined by its members, directed by an elected Board of Directors. The primary purpose of the Association is to advance the continued development of the fertilizer sector in Bangladesh, in general, and to improve fertilizer supply, distribution, marketing, and use for increased agricultural production.

Dutch Publication Contains Two Chapters by IFDC Staff

IFDC Scientist Coauthors Chapter on Environmental Effects of Fertilizer—A report entitled *The Role of Plant Nutrients for Sustainable Food Crop Production in Sub-Saharan Africa*, which will be presented to the Ministry of Foreign Affairs of the Netherlands, contains a chapter authored by Dr. R. Dudal, Professor, Soils of the Tropics, Institute for Land and Water Management, Belgium, and Dr. Bernard H. Byrnes, IFDC Soil Fertility Scientist. The editors of the report are Dr. Willem Prins and Dr. H. Van Reuler of the Nutrient Management Institute (NMI).

The chapter by Dudal and Byrnes is entitled "Effects of Fertilizer Use on the Environment." In this chapter, Dudal and Byrnes emphasize that increased use of fertilizers is needed in sub-Saharan Africa to increase food production, reduce extensive use of marginal lands, and reduce depletion of soil nutrients—a major cause of environmental damage resulting in desertification, rapid soil erosion, and deforestation. However, the authors point out that "adoption of fertilizers has several important impediments, including lack of incentives, high risk, lack of infrastructure, deficient marketing capabilities, poor farmer education, and land tenure problems."

Dudal and Byrnes warn that increased use of fertilizers without proper management practices could cause environmental damage through nitrate contamination of groundwaters and soil acidification. Nitrogen fertilizer management to prevent nitrate leaching is difficult in much of sub-Saharan Africa because of the highly weathered soils and the highly erratic and intense rainfall events.

However, the authors counter this warning with a solution to the problem: good fertilizer and crop management practices. They reiterate that the "environmental consequences of continued low use of fertilizers are more inevitable and devastating than those anticipated from increased use of fertilizers."

The scientists point out that by increasing the yields on the better lands, fertilizers can reduce the amount of encroachment onto more

marginal lands that are susceptible to erosion or other production constraints. The area of land under cultivation can be reduced so that deforestation and desertification can be reduced if the reserved land is maintained with plant cover, which provides wood, wildlife habitat, and protection from soil erosion.

According to Dudal and Byrnes, the intensification of agricultural production in the industrialized countries has resulted in great economic and social benefits, but it also has had its environmental costs. Modern production methods, based on high capital investment and purchased inputs, imply high costs not only in monetary terms but also in the form of groundwater pollution, eutrophication of surface waters, and emission of "greenhouse" gases. As a result, concern has arisen about the harmful effects of "agrochemicals" derived from crop production agriculture.

The term "agrochemicals" is misleading because it lumps mineral fertilizers with insecticides, fungicides, and herbicides, which are biocides. Fertilizers are much more benign, and they are essential for plant growth. This distinction would help to avoid public misperception regarding the application of "agricultural chemicals." Furthermore, the term "mineral fertilizers," meaning manufactured fertilizers, is preferable to "chemical fertilizers" because all nutrients are "chemical," whether they are of synthetic or organic origin.

Two IFDC Economists Coauthor Chapter on Fertilizer Supply and Use in Sub-Saharan Africa—Another chapter entitled "The Use and Supply of Fertilizers in Sub-Saharan Africa" was written by Henny Gerner, Economics Scientist and Data Base Manager, IFDC-Africa, and Gene Harris, Senior Marketing and Economics Specialist. This chapter gives an overview of the fertilizer sector in Sub-Saharan Africa, including the demand (growth levels, fertilizer use by crop, and returns to farmers from fertilizer use), the supply (developments in fertilizer production and reforms in fertilizer marketing systems) and finance, with special emphasis on the share of fertilizers procured with donor assistance vis-

à-vis commercial imports. Most of the data used in this paper were collected through the 20 national correspondents of the African Fertilizer Trade and Marketing Information Network (AFTMIN), a network coordinated by IFDC-Africa in Lomé, Togo.

In their chapter, Gerner and Harris state that in 1990 fertilizer use in Sub-Saharan Africa amounted to 8.4 kg per ha. Within Sub-Saharan Africa great differences exist, ranging from 1.1 kg per ha in Central Africa to 14.6 kg in southern Africa. Six countries (Nigeria, Zimbabwe, Kenya, Sudan, Ethiopia, and Zambia) account for about three-quarters of total fertilizer use in Sub-Saharan Africa.

Annual fertilizer consumption in Sub-Saharan Africa increased 3.4% over the period 1975-90, but in the second half of the 1980s growth stagnated. In many countries subsidies on fertilizers have been abolished through the implementation of structural adjustment programs. Farmers often complain that fertilizers have become too expensive for use in food crop production. Slightly more than half of the fertilizer consumption in Sub-Saharan Africa is used on cereals, particularly on maize.

Fertilizer production in Africa is located in regions where raw materials and/or sources of energy are locally available. The main fertilizer-producing countries in the Sub-Saharan region are Nigeria, Zimbabwe, and Senegal. Whereas fertilizer production increased in the late 1980s, fertilizer imports decreased to 80% of the total consumption. Many countries rely on aid support to finance their fertilizer imports, but the part of aid-financed fertilizer imports diminished to one-third in 1990. Therefore, many countries depend more and more on their own foreign exchange for fertilizer imports. There is a need to develop national procurement and marketing structures.

Parties interested in obtaining copies of the Dutch publication should write the Dutch Association of Fertilizer Producers (VKP), P.O. Box 4432260 AK, Leidschendam, The Netherlands.

Tenth Annual WAFMEN Meeting Conducted in Benin

The tenth annual research planning meeting of the West African Fertilizer Management and Evaluation Network (WAFMEN) was held in Cotonou, Benin, during April 5-8, 1993. WAFMEN, established in 1983, is an institutional framework focusing on promoting sustainable agricultural production in West Africa through collaborative research and information exchange on fertilizer use technologies among agricultural scientists in the subregion.

Initiated by IFDC on a relatively modest scale, the network today counts as members 19 National Agricultural Research and Extension Systems (NARES) in 14 West African countries—Benin, Burkina Faso, Cameroon, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Dr. Andre Bationo, IFDC Soil Scientist, based at the Sahelian Center of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Niamey, Niger, is the present WAFMEN coordinator.

Specific objectives of WAFMEN include the following:

- * To contribute to the development of sustainable agriculture in West Africa, through collaborative research on fertilizer use technology, in particular those initiatives that encourage integrated use of indigenous resources, such as phosphate rock, to reduce nutrient constraints on crop production.
- * To facilitate technology transfer to farmers through on-farm verification trials and various farmers' participatory approaches.
- * To contribute to better scientific cooperation among scientists and institutions in the subregion, through periodic conferences and symposiums to review the state of agricultural research and extension in the respective member countries of WAFMEN.
- * To foster appropriate development of both human and institutional capacity in the subregion through workshops, seminars, and onsite visits.

Within the past 10 years, programs that have been implemented under WAFMEN have accomplished the following:

- * Crossed language and cultural barriers separating francophone and anglophone West Africa;
- * Established working partnerships among scientists, extensionists, and small limited-resource farmers to conduct farmer-managed research and extension;
- * Developed methods for countries in the region to use indigenous sources of plant nutrients—thus improving soils, increasing productivity, and conserving scarce foreign exchange.

These programs have resulted in:

- * Better understanding of ways to increase agricultural yields;
- * Expanded farmer access to improved and more environmentally sound production technologies;
- * Increased income through off-farm employment opportunities.

At the meeting in Cotonou, WAFMEN members elected a four-member steering committee. This committee includes: Dr. T. Arokoyo, Deputy Director, National Agricultural Extension and Research Liaison Service (NAERLS), Nigeria, Chairman; Dr. S. Owusu-Bennoah, Senior Lecturer in Soil Science, University of Ghana; Mme. Aminata Badiane, Soil Scientist, Institut Senegalaise de Recherches Agricoles (ISRA), Senegal; and V. Agossou, Soil Scientist, Centre d'Agro-Pedologie (CENAP), Benin.

During the WAFMEN meeting scientists from IFDC-Africa and those from national agricultural research systems presented results of trials conducted at both experiment stations and on farmers' fields. The last 2 days of the meeting were reserved for planning the research program for the next cropping season. IFDC-Africa scientists worked

Through WAFMEN, IFDC-Africa is facilitating technology transfer to farmers through on-farm verification trials and various farmers' participatory approaches.

with the delegation from each national institution to draw up the protocol for the next season's trials. There are two unique features of this exercise. The first is that no two institutions operate an identical research agenda. Each institute's workplan is tailored to conform to the priorities of the institute. This makes it easier for the institute's management to identify with and support the research agenda. The second feature is that because both research and extension workers are present during the planning of the research program, the linkage between research and extension is strengthened. It is thus the joint responsibility of both the research worker and the extension worker to obtain the farmer's input in the design of the trials. The annual meetings provide a great opportunity for interaction between members of the different national institutions as well as between network members and staff of IFDC-Africa including those working in such other disciplines as fertilizer marketing and fertilizer policy.

During this meeting it was decided to look for means to organize in 1994 a symposium on exploitation and management of natural resources for sustainable agriculture in West Africa.

Photo by M. Terry Frederick



International Fertilizer Development Center
P.O. Box 2040
Muscle Shoals, Alabama, U.S.A. 35662

Headquarters—

Training Program Affords Wider Perspective of Marketing of Fertilizers and Other Agri-Inputs

Diogenes E. Perez R. of the Dominican Republic, Ramakrishna Acharya of India, and Cyrille Nimpagaritse of Burundi gained a wider perspective of all aspects of marketing by attending the Training Program on Marketing of Fertilizers and Other Agri-Inputs, conducted by IFDC during August 2-September 3.

"I feel that I will be more valuable to my company as a result of attending this training program," Perez says. "I will be able to help my company realize greater profits now because of what I have learned."

Perez's work is concerned with providing technical assistance to farmers; this work involves soil testing, extension, teaching, and research. In addition to his technical background, he now feels that he has a better understanding of marketing.

Acharya gained a wider perspective of the fertilizer industry—supply and demand on the world market. He feels that this will help him in analyzing and solving problems that he faces in his job.

"The highlight of the program for me was the visits to farms; I found it amazing that one farmer, with 7-8 workers, could manage a 1,000-acre farm," Acharya says. "The information that I gained on mechanization and bulk blending will be very valuable to me."

The third participant, Nimpagaritse, found this training program to have very current and specific application in his work. "My company is preparing to import fertilizer; during this program I met people whose countries produce the fertilizer that my country needs," Nimpagaritse says. "I now know where the fertilizer is that I need and the prices. This information is very helpful to me."

The nineteen participants who attended the program were from seven countries—Albania, Bangladesh, Burundi, Dominican Republic, India, Indonesia, and Nigeria.

Besides the nineteen IFDC staff members serving on the program faculty, thirty-six guest speakers from universities, commercial establish-

ments, and other research centers afforded the participants insight into their experiences in marketing. Serving as program managers were Loren E. Ahlrichs, IFDC Senior Marketing Specialist, and Gene Harris, Senior Marketing/Economics Specialist. Mr. R. S. Giroti, Coordinator, Human Resource Development Unit, served as program administrator.

The primary topics of this training program included the role of agribusiness and farm-input marketing in the developing countries; government policies and agri-input marketing; training and development of farm input dealers; financing and credit for agri-inputs marketing; international fertilizer procurement; and environmental concerns.

On the field trips to the Midwest and Florida, the participants saw firsthand how fertilizer and other agri-inputs are marketed.

International Fertilizer Development Center 1994 Training Calendar

Program	Dates	Location	Program Fee (US\$)
International Study Tour on Fertilizer Distribution and Handling	February 7-25	India, Singapore, and Indonesia	1,800
International Study Tour on Advances in Fertilizer and Irrigation Technology	June 6-17	Various locations in the U.S.A.	1,500
Challenges of Marketing Fertilizer and Other Agri-Inputs in Fertilizer and Irrigation Technology	August 1-26	Muscle Shoals (Alabama - U.S.A.)	2,500
Computer Simulation of Crop Growth and Management Responses	August 8-19	Gainesville (Florida - U.S.A.)	1,400
Marketing of Fertilizers and Other Agri-Inputs for Africa	October	Togo	1,200
Marketing Fertilizers Through Restructured Commercial Channels	November	Jakarta (Indonesia)	1,200

Program fees do not include travel and living expenses. Program titles, dates, location, and fees are subject to change.

For additional information, please contact Mr. R. S. Giroti, Coordinator, Human Resource Development Unit, IFDC.

Recent IFDC Publications

1993 IFDC Publications Catalog

The 1993 *IFDC Publications Catalog*, IFDC-G-1, is now available, free of charge. All publications, reprints, and slides released by IFDC are listed in the Catalog. To order a copy of the latest catalog, please write to the IFDC Purchasing Department.

Plant Nutrient Management for Sustainable Agriculture, Abstracts

A new publication, edited by Dr. Bernard H. Byrnes, IFDC Soil Fertility Scientist, presents abstracts of lectures that were presented at an IFDC training program, Plant Nutrient Management for Sustainable Agriculture. This program was conducted during September 14-25, 1992, at IFDC Headquarters. The price of the publication is US \$4.00 for U.S. addresses and US \$7.50 for non-U.S. addresses. To order a copy of this publication, please request IFDC-SP-19; the order should be addressed to the IFDC Purchasing Department.

IFDC Annual Report, 1992

The *IFDC Annual Report, 1992*, is now available, free of charge. Interested parties may obtain a copy by writing to the IFDC Purchasing Department and requesting IFDC-S-16.