

Report

Headquarters—



Agronomist From Zimbabwe Studies His Country's Phosphate Rock

IFDC research on Zimbabwean phosphate rock, being conducted at Headquarters, is identifying more appropriate phosphate fertilizers that will be agronomically and economically effective in crop production in Zimbabwe.

A recent greenhouse maize experiment using Dorowa phosphate rock from Zimbabwe has shown that compacting the rock with triple superphosphate (TSP), urea, and potassium chloride resulted in a phosphorus fertilizer source that was equally as effective as single superphosphate (SSP) mixed with urea and potassium chloride in increasing dry-matter yield of maize on an acid soil. Dorowa partially acidulated (50% sulfuric acid) phosphate rock mixed with urea and potassium chloride was 75% as effective as SSP. Finely ground Dorowa phosphate rock mixed with urea and potassium chloride did not perform any better than the control.

This experiment, conducted in an IFDC greenhouse, is part of a 2-year study being carried out by Ephraim M. Govere, Visiting Soil Scientist from

Zimbabwe. The work is part of Govere's doctoral program in agronomy at Pennsylvania State University. His research activities at IFDC include greenhouse and laboratory soil incubation experiments.

"The objective of the greenhouse experiments is to determine the effectiveness of nonconventional Dorowa phosphate rock-based fertilizers in promoting phosphorus uptake by and growth of plants," says Govere.

There are two main objectives for the laboratory soil incubation experiments. The first one is to characterize the dissolution and to develop a model to describe and predict the dissolution of nonconventional Dorowa rock-based fertilizers in Zimbabwean soils. The effect of fertilizer materials and soil properties on crop response will be investigated.

The second objective is to characterize and study the transformations of phosphorus from nonconventional Dorowa phosphate-rock based fertilizers and their relationship to phosphorus availability. Six agricultural soils were shipped to IFDC from Zimbabwe to be used in Govere's laboratory experiments.

Dr. S. H. Chien, IFDC Soil Chemist, and Dr. R. H. Fox of Pennsylvania State University advise Govere in his research. According to Chien, the field data being collected by Dr. H. Ssali, IFDC Soil Scientist stationed in Zimbabwe, will be used to test the models that will be developed from Govere's research work.

Research of this type is very important for African countries like Zimbabwe. Some Zimbabwean agricultural soils are very deficient in phosphorus.

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Ephraim Govere, Visiting Scientist from Zimbabwe, examines a maize experiment involving the use of fertilizers produced from Dorowa (Zimbabwe) phosphate rock.

However, Zimbabwe, like many other African countries, has phosphate rock deposits.

Use of conventional, water-soluble phosphorus fertilizers such as SSP and TSP has been limited primarily by

their high cost. Although direct application of finely ground Dorowa rock is the most economical means to use the rock, its agronomic effectiveness is rather poor due to its low reactivity. Thus, it is necessary to seek alterna-

tive phosphorus fertilizers, such as partially acidulated phosphate rock and compacted fertilizer materials, which are both agronomically and economically effective in crop production in Zimbabwe. ■

Headquarters—

McCune Marks Another Milestone

IFDC's creator and developer, Dr. Donald L. McCune, is marking another milestone in his 39-year professional career—a journey that eventually focused on the goal of increased food availability in the less-developed countries of the tropics and subtropics.

As of February 1, 1990, McCune will be turning over the reins of IFDC's management to Dr. David B. Parbery (see additional story on page 3).

Throughout his 15+-year tenure as IFDC's Managing Director, McCune has guided the Center as it helped to serve the fertilizer needs of the less-developed countries. Under his directorship, IFDC has trained more than 3,000 people from approximately 100 countries in fertilizer production, marketing, and use. According to McCune, "The bottom line is that your impact is only effective and permanent if you have trained people."

Talking with some of the Ohio native's long-time colleagues, one can gain insight into the reason for the successes in McCune's career. Travis P. Hignett, former Special Consultant to the Managing Director, has summed up McCune's personality well.

"Dr. McCune always exhibited a contagious enthusiasm, which he translated into vigorous action," Hignett said. "He always had some project that he was excited about and usually for a good reason."

Throughout his tenure as IFDC's



Dr. Donald L. McCune
IFDC's Founder and
First Managing Director

Managing Director, McCune has been a catalyst for change. As Hignett said, "He didn't necessarily tell people what or how to do something; he told them what the problem was. Once an employee was impressed with the importance of the work, he was inspired to do the work. Dr. McCune's greatest strength was that he always inspired people to do their very best."

McCune's creative character has

been exemplified in the roles that he has played in successfully developing experiment stations in Indiana and Chile, in creating and directing an international staff for the National Fertilizer Development Center of the Tennessee Valley Authority and in developing and directing IFDC.

The effectiveness of his organization's activities can be observed in countries such as Bangladesh, Brazil, Colombia, India, Mali, and Venezuela, to name a few. These countries have received technical assistance in determining methods of using their natural resources in fertilizer production and identifying management practices designed to improve fertilizer efficiency.

In the final analysis, the effectiveness of McCune's work is manifested in the stature that IFDC and its multidisciplinary staff have attained as a valuable source of impartial information on international fertilizer research and development.

In McCune's words, "Our clients in the developing countries accept and trust us and rely on our judgment as honest brokers."

His successor at IFDC faces a number of challenges into the next decade, according to McCune. Some include the increasing environmental concerns, the continued phosphorus research, and the continued effort to feed more hungry residents of the world's developing countries. IFDC's mission is far from complete. ■

Australian Tapped to Lead IFDC Into the 1990s

An Australian international development specialist has been tapped to lead IFDC into the 1990s.

Dr. David B. Parbery, international development specialist from Australia, has been appointed Managing Director of IFDC. Selected by the Center's Board of Directors, Parbery will succeed Dr. Donald L. McCune on February 1, 1990. McCune, who is retiring, founded IFDC and has directed the Center since October 1974.

The Australian native likes "initiating things, enjoys innovation, and takes pleasure in seeing new ideas coming to fruition."

Parbery brings to the job a broad spectrum of experience—ranging from research scientist to director of international development with several organizations. This experience spans a period of some 37 years.

For the past 5 years, Parbery has been Managing Director of Luminis Pty., Ltd., the technology transfer company of the University of Adelaide, Australia. At Luminis, Parbery was highly successful in commercializing a varied range of technology developed by the University of Adelaide. The range of specialties covered the fields of agriculture, the physical and biological sciences (especially medicine and dentistry), and engineering.

Prior to that appointment, he served in various capacities with the World Bank in Asia and Latin America for more than a decade.

Preceding this period, he founded and/or served as the managing director of three other organizations: the Agricultural and Industrial Development Corporation Ltd., the Kalbilli Pastoral Co. Pty. Ltd., and the Australian Potash Research Institute—all of which were headquartered in Canberra, Australia.

For a period of 11 years early in his career, Parbery worked as a research scientist in agronomy, while associated with a number of scientific organizations and universities. Included



Dr. David B. Parbery
IFDC's Second Managing Director

among these were the Australian Commonwealth Scientific and Industrial Research Organization (CSIRO), the Malayan Pineapple Industry Board, the University of Missouri (U.S.A.), and Cornell University (U.S.A.).

Having first been educated in Australia, where he received a B.S. degree in biology at Sydney University, Parbery ventured to the United States for the remainder of his education. At the University of Missouri, he completed an M.S. degree in agronomy and at Cornell University, he received a Ph.D. in agronomy and development economics.

Along the way a number of individuals have influenced the molding of the man who will soon take over the reins of IFDC. First, at Missouri the chairman of the Agronomy Department, Dr. Albrecht, stimulated Parbery's thinking through his writing about health and nutrition being related to soils. Later at Cornell another professor, Dr. Bradfield, stirred Parbery to "deal with the issues." Associations with mentors like Bradfield caused the newly appoint-

ed IFDC managing director to be "concerned and interested in feeding the world and easing poverty and starvation." His stay at Cornell proved to be a very satisfying period for Parbery for it was during this time that he gained more international exposure and contact, especially while serving as President of the One World Club, the international organization of Cornell. An "internationalist at heart" Parbery became quite "fired up about internationalism."

During his career, Parbery has lived and worked in the United States for approximately 14 years (on an intermittent basis) and approximately 7 years in Asia. Throughout his professional life he has worked in 20 different countries.

The newly named IFDC Managing Director has 32 research articles and reports to his credit; in addition, he has prepared over 100 feasibility, appraisal, and review reports for various international development agencies.

His curriculum vitae lists five organizations in which he holds membership. They are the Australian Institute of Agricultural Science, the American Society of Agronomy, the Council for Agricultural Science and Technology (U.S.A.), the Technology Transfer Society (U.S.A.), and the Australian and New Zealand Solar Energy Society.

Parbery says that he is impressed with the progress of IFDC and its excellent reputation within the international development community. In his words, the "Center has made significant contributions toward reducing world poverty and increasing agricultural production through the introduction of fertilizer technology to developing countries, using where appropriate their indigenous resources."

In summarizing his aspirations for the future, Parbery says, "I look forward to extending and broadening IFDC's mandate by building on the substantial base already created under Dr. McCune's leadership." ■



Saudi Arabia—

Prefeasibility Study Shows Potential of Phosphate Rock

A study recently completed by IFDC showed that phosphate rock from the Al-Jalamid deposit of northern Saudi Arabia can be beneficiated to a commercial-grade concentrate by calcination and flotation processes. This concentrate can be subsequently converted into phosphoric acid and diammonium phosphate that meet international specifications.

Under an agreement between the Governments of Saudi Arabia and the United States, the U.S. Geological Survey (USGS) contracted with IFDC, through TVA, to conduct mineralogical studies of four ore types, followed by beneficiation and fertilizer production tests. The

project team, consisting of USGS, Jacobs Engineering and IFDC, completed a prefeasibility study to evaluate the development potential (technical and economic) of the Al-Jalamid phosphate deposit for fertilizer production.

"Prior to this 1-year study it was shown by others that this material could only be beneficiated by calcination," says Dr. A. H. Roy, Acting Director of the Fertilizer Technology Division and the project's leader. "However, IFDC was able to show that the flotation route could also be used successfully. The advantage of using the flotation process is that the capital investment is lower; thus, the over-

all production costs would be lower."

In addition to Roy, those IFDC staff members who participated in this project were: Jerry Clemmons, Chemist; Dr. Talaat A.B. Lawendy, Minerals Engineer; and Steven J. Van Kauwenbergh, Mineralogist/Petrographer.

"The availability of high-grade phosphate products on the international market is diminishing," says Roy. "With the projected increase of world population and requirements for food, new deposits are needed to supply the fertilizer requirements. Thus, the Al-Jalamid deposit is one of the potential deposits of the coming decades."

The prefeasibility study was accepted by the Saudi Arabian Ministry of Petroleum and Mineral Resources.

"It is possible that additional testing and a more detailed analysis of the material will be requested in the future," Roy says. ■

Togo—



Second Annual Meeting of the African Fertilizer Trade and Marketing Information Network

The second annual meeting of the Fertilizer Trade and Marketing Information Network (AFTMIN) was conducted in Lomé, Togo, during November 15-17.

Forty-one participants, speakers, and observers registered for the second meeting; 21 countries were represented. Four donor agencies, the U. S. Agency for International Development, the Canadian International Development Agency, the European Economic Community, and the Dutch Government, were represented.

The meeting focused on ways to reduce the costs of fertilizer imports and marketing. Besides alternative supply systems in sub-Saharan Africa, "fertilizer imports financed by bilateral or multilateral donors" was chosen as the second item because fertilizer aid, either as balance-of-payments support or as part of structural adjustment programs, constitutes an important source of fertilizer supplies to sub-Saharan Africa.

The presentations on alternative supply systems included: "West Euro-

pean Fertilizer Market and Its Significance for Sub-Saharan Africa," by H. Koops, Hydro Agri; "Alternative Supply Strategies: The Principles," M. T. Frederick, IFDC; "Saving Costs by Local Bagging in Africa," Mr. Groenlie, Norsk Hydro; "Investing in Fertilizer Facilities in West Africa," G. Polley, National Fertilizer Company of Nigeria; and "Economic Implications of Fertilizer Specifications," M. André, IFDC.

Dr. Balu Bumb, IFDC Economist, gave a presentation on "The Role of Fertilizer Aid in Fertilizer Supplies in Sub-Saharan Africa." He highlighted the role of fertilizer aid in fertilizer supplies in sub-Saharan Africa. He indicated that in many countries fertilizer aid accounted for 50%-100% of fertilizer imports. He also identified various constraints on aid-financed fertilizers and suggested several measures like donor coordination, adequate local funding, and a proper national fertilizer policy to improve the efficiency of fertilizer aid.

Two country presentations on fertilizer aid were given by B. G. Tabe of

Benin and S. K. Dapaah of Ghana.

Two working group sessions focused on alternative supply strategies and guidelines for efficient execution of fertilizer aid programs. The session on alternative supply strategies covered the following topics: local production using imported and indigenous raw materials; regional cooperation in tendering; regional cooperation on specifications to increase competition; bulk import and local bagging; bulk import with local blending and bagging; and counter trade.

The working group on fertilizer aid discussed the following issues: regional cooperation; multi-year commitment, donor coordination, national fertilizer policy, and donor-recipient cooperation.

The main conclusions of these discussions were: (1) Regional and sub-regional cooperation among countries should be promoted to take advantage of bulk purchasing and lower costs. (2) To promote the flow of information, recipient countries should cooperate with IFDC through AFTMIN in providing accurate information about different aspects of the fertilizer sector

in African countries.

(3) A 3-year commitment by donors will facilitate planning of fertilizer imports in the recipient country.

(4) The recipient country should arrange meetings of all of its donors and determine optimum quantity and type of fertilizer products likely to be available from donors.

Many countries in sub-Saharan Africa do not have a well-articulated fertilizer policy and, therefore, do not attach the required priority to the fertilizer sector. The research institutions like IFDC should help in this area by doing good quality research and by training national staff. To improve political perception about the importance of fertilizer impact in sustaining agricultural growth and



Dr. Balu Bumb (left), IFDC Economist, discusses fertilizer aid issues with Mr. J. Van Driel, Landbouw-Economisch Instituut, the Netherlands.

providing food security, the U. N. agencies like the Food and Agriculture Organization and the African regional institutions should also be used. The

national fertilizer policy should address issues dealing with agronomic needs, pricing policy, research and extension, and marketing and distribution. ■

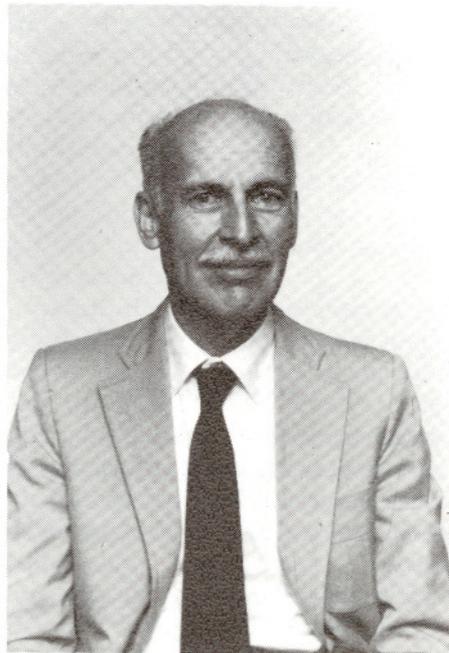
Headquarters—

Chilean Native Appointed to Board

In the mid-50s and early 60s, Dr. Hiram Grove served as the Chilean Head of the Forage Plants Research Project, which was supported jointly by the Ministry of Agriculture and the Rockefeller Foundation. His Rockefeller counterpart at that time was Dr. Donald L. McCune, now IFDC's Managing Director. Together they helped to establish the two main agricultural experiment stations of those days in Chile. When McCune left Chile in 1962, he left Grove in charge of directing the Central Experiment Station.

Thirty years later—in October 1989—Grove attended his first meeting of the IFDC Board of Directors, to which he was recently appointed.

For the past 10 years, Grove has served as Director of *Agricultura Tecnica*, the journal of the National



Dr. Hiram Grove, Chile
IFDC Board Member

Agricultural Research Institute or INIA. He also serves as editor of INIA's annual reports and other national publications.

Grove's first association with INIA came with the formation of the Institute in 1964 when he was selected to continue as Director of the Central Experiment Station that became INIA's La Platina Experiment Station. The previous year he was commissioned by the Ministry of Agriculture as a member of the committee formed to study the creation of INIA. In addition, Grove served as the National Head of the Extension Specialists Group of INIA from 1970 to 1979. INIA's work focuses on crops, animal production, soils and irrigation, and extension.

For approximately 5 years Grove was a professor of forage crop

production at the University of Chile's School of Agronomy.

First educated at the University of Chile where he received the *Ingéniero Agrónomo* degree, Grove acquired an M.S. in agronomy at the University of California (U.S.A.) and a Ph.D. in physiology and ecology from Purdue University (U.S.A.).

Grove has several awards to his credit. One of the most outstanding

of these is the "Francisco Rojas" award, given by the Chilean Agronomists' Association in recognition of his distinguished career in the public sector.

Grove hopes to be able to contribute to IFDC and its programs. With his 45 years of experience in agricultural research and development, it is certain that his expectations will materialize.

In Grove's words, "I feel very honored to serve on the IFDC Board, and I am very impressed with the important contribution that the Center is making to the development and use of fertilizers. The opportunity to help the people of developing countries with their food production is very stimulating." ■

In Memoriam—Travis P. Hignett

When Travis P. Hignett died on December 29, 1989, IFDC, the fertilizer world, and his many acquaintances around the globe suffered a tremendous loss.

As a former Special Consultant to Dr. Donald L. McCune, IFDC's Managing Director, Hignett went about his work in a quiet, unassuming manner. Those who knew him well though were aware of his quick wit and photographic memory.

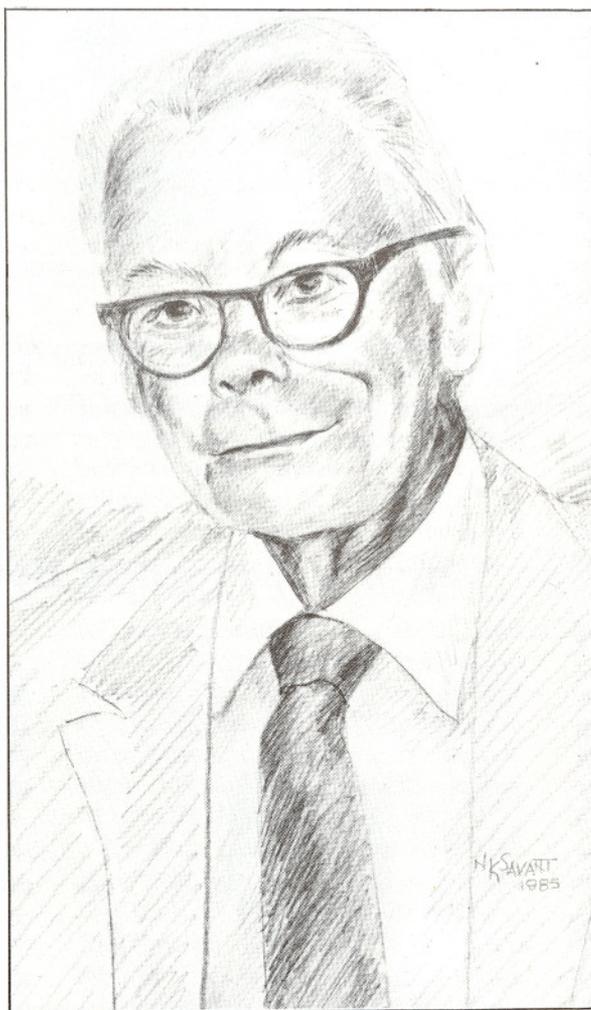
Hignett was the product of the Iowa countryside. The son of a minister, he grew up in several Iowa towns.

Upon receiving an A.B. degree from Drake University (Iowa), he was employed as a chemist with the U.S. Department of Agriculture and later by a group called Research Associates in Washington, DC.

After a 9-year stint in the nation's capital, Hignett began a 35-year career with the Tennessee Valley Authority (TVA) in Muscle Shoals, Alabama. At TVA Hignett participated in and led a variety of projects for which he received worldwide recognition. His tenure at TVA culminated in the position of director of the Division of Chemical Development of the Office of Agricultural and Chemical Development.

When IFDC was established in 1974, Hignett was employed as a special consultant to the managing director.

Besides conducting and directing developments that led to the evolution



Travis P. Hignett

of the chemical fertilizer industry, Hignett devoted much time to putting his ideas and results into writing, with approximately 150 publications to his credit.

His most famous publication was the update of the *Fertilizer Manual*, the first and only manual of its kind. The 400-page manual describing the

major processes for manufacturing fertilizer is used by fertilizer technologists throughout the world.

To his credit, Hignett had 15 patents involving fertilizer technology.

Hignett was acclaimed by his peers as the "Father of Fertilizer Technology" and received several awards. In 1969 the Fertiliser Society of London awarded him the Francis New Memorial Medal. In 1972 he received the Honorary Member Award from the National Fertilizer Solutions Association. In 1980 Hignett received the first Merit Award of the American Chemical Society's Division of Fertilizer and Soil Chemistry. In 1986 the Fertilizer Industry Round Table, of which Hignett was a founding member, awarded him its first Outstanding Service Award.

We at IFDC, his widow Kathleen, and his many friends in other parts of the world will miss Travis Hignett. We will miss his positive, helpful spirit; his humanitarian concern for others; his willingness to share his tremendous wealth of information on fertilizer technology; and his practical answers to perplexing problems in fertilizer development and use.

At the request of his wife Kathleen, memorials may be made to the Travis P. Hignett Fund at IFDC. This fund was established in 1987 by the IFDC Century Club and is designated to be used "to provide fellowships to aspiring developing-country scientists and engineers who wish to study or conduct research projects at IFDC." ■

Training Activities



Headquarters—

Training Program on Technical Management of Fertilizer Production Units

"We were enriched with better technical knowledge to manage sophisticated fertilizer plants more effectively. This program has also helped us gain a better exposure to new technological areas and we are also benefitted with mutual interaction with the participants. As a whole, this program was quite useful, and it has met its objectives. . ."

This was the way that S. M. Singh, Superintendent of the Urea, Melamine and Bagging Unit, Gujarat State Fertilizers Company, Ltd., of Vadodara, India, summarized the impact of the training program on "Technical Management of Fertilizer Production Units," which was conducted at IFDC Headquarters and in

Baton Rouge and New Orleans (Louisiana) during October 16-November 3.

This training program, conducted under the direction of Jorge R. Polo, Senior Project Analyst, was attended by 22 participants from 9 countries, including Bangladesh, Brazil, Costa Rica, India, Indonesia, Korea, Pakistan, Republic of China, and Venezuela. R. S. Giroti was the program administrator.

The primary objective of this program was to increase the participant's knowledge and skills in managing various production activities in fertilizer plants. These activities include general operation, maintenance and engineering management, cost optimization, plant modifications, product

quality control, safety, and waste management.

Interviews with the participants revealed that the objective of the program was accomplished. For example, Carlos Gonzales, a process engineering leader with Petroquimica de Venezuela S.A. (PEQUIVEN) of Venezuela, was very favorably impressed with the program.

"In our jobs, we specialize on a particular facet of fertilizer production; this program helped us to broaden our thinking," says Gonzales. "This program gave us an excellent opportunity to learn and refresh and share with people from other fields. The quality of the speakers was outstanding; they all have excellent reputations in their particular fields." ■

Togo—



Fertilizer Supply Options and Constraints in Developing-Country Agriculture

As an outgrowth of the 1986 Workshop on Fertilizer Sector Development, conducted at Headquarters, and to further strengthen the information database on fertilizer supply in Sub-Saharan Africa, IFDC recently conducted an intensive training program to examine the options for fertilizer supply in the region.

This program was conducted during November 21-24 at IFDC's regional office in Lomé, Togo. J. J. Schultz, Fertilizer Production Specialist, served as the program's manager. In addition to Schultz, Dr. B. L. Bumb, Economist; Dr. W. E. Clayton, Transportation/Distribution Specialist; and M. T. Frederick, Engineering/Training Coordinator, assisted with the presentation of this training program.

According to Schultz, the objec-

tives of the program were to provide an unbiased examination of the fertilizer supply options and constraints; to improve awareness and understanding of the problems; to identify some of the policies and strategies needed to overcome the constraints; and to better equip the participants for the tasks that they face when formulating viable national strategies for the cost-effective supply and use of fertilizer.

Twenty-four participants from 17 countries attended the program. One participant was from Portugal, five from Sri Lanka, and the remainder from African countries.

Schultz attributes the apparent success of the program to "the blend of technical aspects of supply and distribution with the in-depth discussions of the practical policy issues that often constrain the proper im-

plementation of the available technology."

There was a high level of participation in the program by the attendees. In Schultz' words, "because of the relatively high level of participants' skill and experience, it was possible to fully integrate them into all discussions. Thus, fully one-third of the time was devoted to hearing the views, ideas, and experiences of the participants." ■



Guatemala—

Training Workshop—Supplying Quality Multinutrient Fertilizers in the Latin American and Caribbean Region

Guatemala City, Guatemala, was the site of a new training workshop conducted by IFDC during October 10-13. The subject of the workshop was "Supplying Quality Multinutrient Fertilizers in the Latin American and Caribbean Region."

The workshop was hosted by Fertilizantes Quimicos de Guatemala (FERQUIGUA), a local bulk blender and compaction-type NPK granulator.

Seventy-five delegates from 20 countries attended the workshop. This number included 17 invited speakers from the Caribbean Region, Europe, and the United States.

According to the workshop brochure, the objective of the workshop was to "examine the present status of multinutrient fertilizer production technologies and identify future trends and needs with particular reference to the quality and costs of the products currently marketed."

In addition, the workshop examined the complementary role that

granulation processes, particularly pressure-roll compaction, can play in expanding the opportunities for, and the feasibility of, bulk blending. The practical aspects of raw material supply, plant design and production technology, prescription mixing, production economics, and farm-level use of fertilizer were discussed.

The following broad topics were addressed: (1) the current and projected role of fertilizers in the region; (2) relating fertilizer products to farmer needs; (3) a review of fertilizer supply options for the region, including raw material sources; (4) unique features of bulk blending in the region; (5) technical/economic aspects of bulk blending and pressure-roll compaction and other granulation methods; and (6) examples of the complementary role of granulation in a bulk-blending supply system.

"FERQUIGUA, our host, provided a very well-organized tour of one of their blending plants and their compaction/

granulation plant," says J. J. Schultz, the workshop manager. "They also took the group to several farms near the plant site to see the growing of tobacco, grapes, and melons."

Schultz was assisted in implementation of the workshop by R. S. Giroti, Training Administrator, and J. R. Lazo de la Vega, Special Project Engineer.

According to Schultz, the delegates, in general, expressed the feeling that IFDC "through its global experience and its international and multidisciplinary staff could most effectively meet the region's need for a number of focused technical meetings."

The delegates encouraged IFDC to continue to develop its role in the region and suggested that the Center convene another workshop in 1990 with a program agenda focusing on fertilizer supply and marketing with special emphasis on dealer development and training. ■



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