

Report

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

A Message From the New Managing Director

Dr. David B. Parbery took up his duties as IFDC's new managing director at the beginning of February. He comes to IFDC after serving with Luminis, Pty., Ltd., University of Adelaide, Australia, where he was engaged in the commercialization of University technology for the past 5 years. Prior to that he held a variety of international development positions with the World Bank in Asia and Latin America for more than a decade.



Photo by Charles Butler

Dr. David B. Parbery
IFDC Managing Director

Dear friends and colleagues:

My tenure as IFDC's Managing Director is off to a good start. The past two and one-half months have been busy, productive, and satisfying. My wife and I have received a very warm welcome to the Shoals area.

After meeting with IFDC staff and learning of each division's operations and activities, I met with key officials of the National Fertilizer and Environmental Research Center (NFERC [formerly NFDC]) of the Tennessee Valley Authority (TVA). Included in those talks were Charles H. Davis, Vice President of NFERC, and William F. Willis, Chief Executive Officer, TVA. TVA and IFDC are

investigating ways in which the two organizations can work together more effectively.

During the month of March I visited IFDC-Africa in Lomé, Togo. Initially, I was briefed on the programs already underway by that Division. In addition, we visited various project sites and field stations in Togo, Niger, and Burkina Faso. Collaborating institutions such as the International Crops Research Institute for the Semiarid Tropics (ICRISAT)—Niger and relevant national ministries were contacted. After returning to Lomé, I attended the Africa Division's Program Committee Meeting. To learn more about IFDC's relationship with Togo, I met with the Minister for Foreign Affairs, Yaovi Adodo (also an IFDC Board Member); the Director General and staff of Office Togolais des Phosphates (OTP); the Minister for Rural Development; the Rector of the University of Togo; and a former Minister of Rural Management.

In early April, IFDC's Deputy Managing Director, Dr. Paul J. Stangel, and I were in Washington for the presentation of the review team report of the U.S. Agency for International Development (USAID). The report was quite favorable to IFDC.

In early May I am scheduled to visit the suggested site for the proposed Africa Center for Fertilizer Development in Zimbabwe. A stopover is scheduled at the Egyptian Fertil-

izer Development Center, which is being assisted by the United Nations Industrial Development Organization (UNIDO) and IFDC.

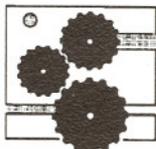
En route to Africa, I shall meet Dr. Paul L.G. Vlek, Director of IFDC-Africa, and with him visit the offices of the Food and Agriculture Organization (FAO) of the United Nations in Rome to discuss the IFDC/FAO relationship and proposed joint activities. Also, before departing Europe, we shall visit donors in Holland and Germany. Dr. Vlek is leaving IFDC in June to take up a new assignment at a German university.

Looking to the future, we should know later in the year whether IFDC will be invited to join the Consultative Group on International Agricultural Research (CGIAR), and under what conditions. During 1989 IFDC was reviewed by the Technical Advisory Committee to the CGIAR, and meetings are being held this year to decide on the restructuring of the CGIAR.

David B. Parbery

In this Issue...

Message from the New Managing Director	1
IFDC Offers Facilities for Graduate Student Research	2
Venezuelan Research Chemist Studies Her Country's Phosphate Rock	2
Venezuelan Chemical Engineers Complete Phosphate Study	2
Chinese Scientist Conducts Modelling Research	3
Agronomist/Systems Modeller Leaves IFDC	4
Bangladesh Bankers Attend Program on Commercial Credit	4
Fertilizer Marketing Training Program Conducted	6
Training Program Conducted on Finance for Nonfinance Managers	5
New Staff Members	7
Recent IFDC Publications	7



Headquarters—

Venezuelan Research Chemist Studies Her Country's Phosphate Rock

A visiting research chemist from the Central University of Venezuela, Maracay, Venezuela—Mireya Salas Castillo—recently completed a 3-month training program on the characterization of phosphate rock from two newly discovered deposits in her country.

Salas investigated the use of Monte Fresco and Navay phosphate rock through direct application or processing to alternative fertilizer products by partial acidulation and compaction technology. This research is important to Venezuela since the Government is interested in replacing the imported phosphate rocks for the PEQUIVEN fertilizer plant with indigenous rocks.

Because the reactivities of these two phosphate rocks are too low for direct application, modifications of the rocks were needed. Salas worked

on the partial acidulation of these phosphate rocks using sulfuric and phosphoric acid and also the compaction of the rock with diammonium phosphate at a 1:1 P_2O_5 ratio.

Using these products, she conducted short-term soil incubation studies. Her research showed that the amounts of available phosphorus in the soil, which was treated with the modified phosphate products, were significantly increased as compared with unacidulated phosphate rock. Agronomic evaluation of the modified phosphate products will be conducted by Salas in Venezuela.

Mireya Salas Castillo, Visiting Research Chemist from the Central University of Venezuela, conducts experiments on her country's phosphate rock.

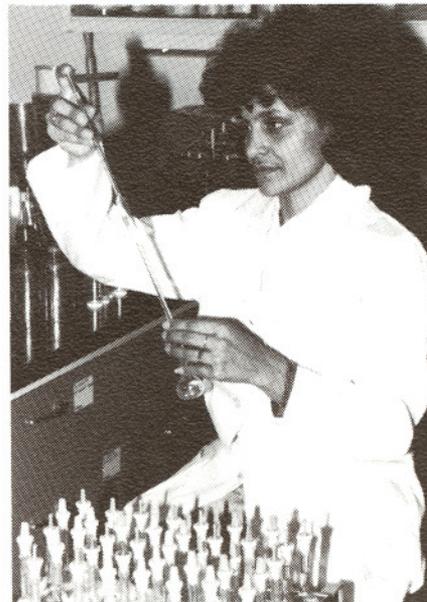


Photo by Charles Butler

Headquarters—



Venezuelan Chemical Engineers Complete Phosphate Study

IFDC recently completed a test program for producing NPK fertilizers containing Riecito phosphate rock from Venezuela.

Four IFDC staff members: Jose Ramon Lazo de la Vega, Special Project Engineer; George W. Bolds, Pilot Plant Operations Coordinator; Bobby W. Biggers, Research Chemist; and Robert C. Bosheers, Engineering Research Technician, worked with three Venezuelan engineers—Jose Rafael Castillo from the Instituto Venezolano Tecnológico del Petróleo (INTEVEP) and Edgar Soto and Edgar Bohorquez from Petroquímica de Venezuela (PEQUIVEN)—to study alternative strategies for the manufacture of various NPK products through wet-type granulation.

The NPK fertilizers are currently manufactured by PEQUIVEN in their fertilizer granulation plant located at Moron, using ammonia, sulfuric acid, phosphoric acid, and standard potassium chloride (KCl) as raw materials. Of these raw materials,

phosphoric acid and KCl are imported, and the ammonia and sulfuric acid are locally produced.

One of the strategies to produce NPK products, which is being considered by INTEVEP, is to feed ground Riecito phosphate rock (a local deposit) into the drum granulator to replace about 15%-20% of the imported P_2O_5 in their formulations with P_2O_5 from the rock. By using locally available phosphate rock, Venezuela will save part of the foreign exchange that at present is spent on importing phosphoric acid.

The feasibility of this option was confirmed through IFDC tests. Operating parameters were defined through tests in IFDC granulation facilities. The IFDC report is being studied by Venezuelan authorities for essential implementation of the strategy in their existing facility at Moron.

Newsbrief—

IFDC OFFERS FACILITIES FOR GRADUATE STUDENT RESEARCH

The facilities of IFDC are available for graduate students who wish to conduct research on fertilizer technology, use, and efficiency for tropical and subtropical agriculture.

This research can be carried out at the Center's Headquarters' facilities in Muscle Shoals or at its regional center in Togo, West Africa.

IFDC has excellent research facilities for conducting studies in soil fertility, soil chemistry, and crop modelling. The primary areas of research at IFDC include nitrogen and sulfur fertilizer use and the use of indigenous phosphate rock in developing countries.

Several graduate students have conducted research at IFDC while completing their graduate requirements in tropical agriculture at various universities. For example, Ephraim Govere, a Zimbabwean Ph.D. student from



Headquarters—

Chinese Scientist Conducts Modelling Research

A visiting scientist from the Rice Research Institute of the Guangdong Academy of Agricultural Sciences, the People's Republic of China, is conducting a research program in crop modelling at IFDC Headquarters.

"For the past 7 years, I have been employed by the Rice Research Institute," says Wan Xia. "I am now involved in research work on computer application in the agricultural sciences. My current research project there relates to the computer simulation model for high-yielding rice culture."

The recipient of a B.S. degree in plant physiology from Shunyixian University came to IFDC to study under Dr. Douglas C. Godwin, IFDC Agronomist/Systems Modeller, and Dr. Upendra Singh, IFDC Systems Modeller/Soil Scientist, and to en-

hance her knowledge and experience in modelling rice growth.

"My primary work at IFDC concerns the rice model," she says. "I hope to be able to modify the model for local conditions. In addition, I will use existing literature data and future experimental results from China to test the Crop Evaluation Through Resource and Environment Synthesis (CERES) rice model. Another objective of my work is to become proficient in carrying out long-term simulations for risk analysis and in applying a systems approach for agrotechnology transfer."

The rice model is just one of the crop growth simulation models that have been developed by scientists at IFDC in collaboration with others at Michigan State University, the U.S. Department of Agriculture, International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT), and many other research organizations. These models can predict impacts of such factors as daily weather, soil properties, crop characteristics,

and management practices on agricultural production. They can be used to extrapolate research findings from one region to another and, thus, mobilize a vast amount of experimental data.

The crop models have potential for studying various production problems such as land suitability, fertilizer and crop varieties, irrigation, and yield forecasting. Thus, the simulation models allow the testing of assumptions about the value of economic inputs like water, fertilizer, and differing crop varieties.

In essence, the CERES models can potentially help policymakers and farmers minimize their risks and increase crop yields. The crop models complement and make more effective the costly and time-consuming field experimentation traditionally used in agricultural research. By using these models scientists like Wan Xia can generate information to help government planners, extension agents, and farmers make desirable choices.

Pennsylvania State University, is presently conducting research on his country's Dorowa phosphate rock at IFDC Headquarters. Previously, Kokoasse Kpomblekou, a Togolese student pursuing a Master's degree at Tuskegee University, conducted research on the use of Togo phosphate rock at IFDC. In the near future a Ph.D. student from Mali, Amadou Gakou, who is enrolled in Auburn University, will arrive at Headquarters to conduct research on Tilemsi Valley phosphate rock.

Prior to the graduate students' arrival, funding should be identified from either the cooperating university, IFDC projects in progress at the time, or other donors. Those parties interested in conducting graduate research at IFDC should contact Dr. David B. Parbery, IFDC's Managing Director, so that collaborative arrangements between the university, IFDC, and other appropriate parties can be formalized.



Photo by Charles Butler

Wan Xia, Visiting Scientist, and Dr. Upendra Singh, IFDC Agronomist/Systems Modeller, test the performance of the CERES rice model using Brazilian data.



Headquarters-

Agronomist/Systems Modeller Leaves IFDC

After a 9-year tenure with IFDC, Dr. Douglas C. Godwin, IFDC Agronomist/Systems Modeller, returned to his native Australia on March 1 to assist his father with the operation of their family farm in Dubbo.

For the past 8 years Godwin has been involved in a successful, collaborative relationship between IFDC, Michigan State University and IBSNAT. Godwin was responsible for incorporating nitrogen subroutines into existing crop models. When new models were created, Godwin worked closely with the developers, assisting them in constructing the model's nitrogen components. For example, Godwin assisted the modelling group at the University of Florida when they began incorporating nitrogen routines into their grain legume models. He worked closely with IBSNAT and the Florida group on weather generators and risk analysis programs.

Most recently Godwin worked on the CERES-Rice model. With his colleague, Dr. Upendra Singh, Systems Modeller/Soil Scientist, Godwin has completely rebuilt this model to accommodate flooding, transplanting, and differences of nitrogen behavior in flooded soils.

Before leaving IFDC, Godwin was presented a special award by his colleagues in the modelling field. Michigan State University, Univer-



Photo by Charles Butler

Dr. Douglas C. Godwin, IFDC Agronomist/Systems Modeller (third from left), receives a special plaque of appreciation for his contributions to the modelling field. Looking on, from left, are Dr. Dennis H. Parish, Director of the Agro-Economic Division (IFDC); Dr. Joe Ritchie, Professor of Soil Science, Michigan State University; and Dr. Jim Jones, Professor, Agricultural Engineering, University of Florida.

sity of Florida, University of Hawaii, U.S. Department of Agriculture/Agriculture Research Service, the IBSNAT Project, and IFDC presented Godwin a plaque as a "special commendation for his contributions in helping to take agricultural research and development into the information age and for his dedicated service in developing crop simulation models." Dr. Joe Ritchie, Professor of Soil Science, Homer Nowlin Chair,

Michigan State University, commended Godwin on his "cooperative spirit that served as the key to hold it (the project) all together." Dr. Jim Jones, University of Florida, credited Godwin for contributing much of the "synergism that has evolved in the modelling group."

Godwin plans to remain available to IFDC through a series of short-term consultancies as the need arises.

IFDC Training Programs



Headquarters-

Bangladesh Bankers Attend Program on Commercial Credit

Since Bangladesh has moved from government-controlled distribution of fertilizer to a privately run system, that country's bankers are assuming a greater role in making credit available to supply fertilizers to the country's agricultural sector.

Recognizing the need to strengthen Bangladeshi in-country distributor,

wholesaler, and dealer credit systems in order to reduce constraints in fertilizer sector development, IFDC organized a 4-week training program on the "Administration of Commercial Credit for Fertilizer Dealers in Bangladesh." The program attracted 15 participants from 6 private banks in Bangladesh. R. S. Giroti, IFDC Training Administrator; Dr. Loren E. Ahlrichs, IFDC Marketing Specialist; and Z. R. Kazi arranged and conducted the program.

The Bangladesh Government began phasing out its own fertilizer

distribution methods in 1987 by allowing private dealers to buy directly from factories, thus reducing prices and increasing the availability to farmers throughout the nation.

For more than 10 years IFDC has had representatives posted in Bangladesh; three of the Center's staff are presently located in Dhaka. The IFDC technical assistance team has assisted the Government with its transition from public to private-sector marketing of fertilizers.

As the number of private distributors and dealers continues to grow, the banks are being called

upon to provide loans to the distributors and retailers to purchase fertilizer and support their operations, according to Ahlrichs. This may well be the prototype for the privatization of the fertilizer sector in many other developing countries, especially in Africa and Asia.

During lecture sessions conducted by IFDC staff and representatives of the World Bank, several U.S. universities, the International Minerals and Chemical Company, and several Alabama banks, the bankers gained insight into the financing of the agricultural sector as a whole and the risks involved in financing marketing and farmers' operations by banks. After gaining many new ideas regarding financial systems during lectures at Headquarters, the Bangladeshi bankers traveled to several locations in Missouri, Kansas, and California to observe credit systems in operation.



Photo by Charles Butler

Charles S. Conklin, President of the First National Bank, Florence, Alabama (U.S.A.), addresses the participants in the training program on the "Administration of Commercial Credit for Fertilizer Dealers in Bangladesh."



Singapore— Training Program Conducted on Finance for Nonfinance Managers in the Fertilizer Sector

"The successful development and growth of the fertilizer sector in developing countries require many skills in production, procurement, distribution, and marketing as well as appropriate sectorial policies. It also requires development of financial skills for nonfinancial managers to provide strength to their technical capabilities for both improved decisionmaking and effective communication with financial personnel."

This is the way Ian Gregory, IFDC Marketing Specialist, expressed the rationale for a new IFDC training program recently conducted in Singapore. The program was designed to familiarize the participants with the fundamental concepts, approaches, methods, and techniques used by accountants and financial controllers with special emphasis on management information for the fertilizer industry.

Ten participants from 6 countries—India, Indonesia, Saudi Arabia, Sri Lanka, Western Samoa, and Zambia—attended the 2-week program.

Besides Gregory, who served as the program's manager, other IFDC speakers included John H. Allgood, Market Analyst; R. S. Giroti, Train-

ing Administrator; Dr. Dennis H. Parish, Director of Agro-Economics Division (formerly Director of the Outreach Division); and Catalino C. Yaptenco, Marketing Specialist.

Outside speakers included Dr. H. R. von Uexkull, Director, Potash and Phosphate Institute/International Potash Institute, Singapore; and Luis T. Villa-Real, Administrator, Fertilizer and Pesticide Authority, Philippines.

Some of the program topics included a review of the financial characteristics of the fertilizer sector



Photo by John H. Allgood

The participants and leaders of the training program on "Finance for Nonfinance Managers in the Fertilizer Sector" visit the FPM fertilizer plant in Johore, Malaysia. In this photo, they are observing the plant's bulk-blending and bagging operation.

and the principles of financial management, working capital management and the significance of cash flow, budgeting and financial control in fertilizer production and marketing, and financial planning.



Singapore-- Fertilizer Marketing Training Program Conducted

Thirty participants from 12 countries attended a Fertilizer Marketing Training Program conducted by IFDC in Singapore during December 4-15, 1989.

The participants, representing the public, private, and cooperative sectors, were from Bangladesh, India, Indonesia, Lebanon, Malaysia, Norway, Pakistan, Saudi Arabia, Singapore, Sri Lanka, Western Samoa, and Zambia.

The program followed the typical format of IFDC's 2-week marketing programs, including classroom-type lectures, case studies, the Alpha marketing simulation exercise, field trips, and country presentations by the participants.

The program manager, J. H. Allgood, IFDC Market Analyst, has only praises for the participants. "The participants were extremely knowledgeable, industrious, and enthusiastic," Allgood says.

Besides Allgood, the IFDC faculty participating in this program included D. Ian Gregory, Marketing Specialist; R. S. Giroti, Training Administrator; Dr. D. H. Parish, Director, Agro-Economic Division (formerly Director, Outreach Division); and C. C. Yaptenco, Jr., Marketing Specialist.

The guest speakers included Ms. Vivien Hoon, General Manager, International Commodities Export Corporation, Asia Pte., Ltd., Singapore; L. Villa-Real, Executive Director, Fertilizer and Pesticide Authority, Philippines; Dr. H. Von Uexkull, Director, Potash and Phosphate Institute/International Potash Institute, Singapore; and Alain Vaes, Team Leader, Fertilizer Advisory Development and Information Network for Asia and the Pacific, Thailand.

One of the presentations given by Villa-Real concerned the privatization of the Philippine fertilizer mar-

ket. As Villa-Real pointed out, "In 1986 . . . the biases against agriculture including fertilizer monopolies and direct government intervention in the trading of agricultural inputs were dismantled. In May 1986, following the decision of the new Administration to liberalize the imports of fertilizer not produced in the country, the Fertilizer and Pesticide Authority relinquished procurement controls such as the determination of import requirements, allocation of import volumes and the conduct of tenders."

Villa-Real highlighted several favorable effects of the import liberalization program. For example, upon the implementation of the decontrol program, the difference between the price paid by farmers for fertilizer and the import cost dropped to US \$42.60/ton and reached a low of US \$28.98/ton in 1988; this is compared with a price margin of US \$116.30/ton in 1985.

Second, farmers as a whole have

responded favorably to the import liberalization program as total fertilizer usage has consistently been more than the amount used prior to privatization.

Third, the impact on crop production has likewise been positive. In fact, the import liberalization of nitrogen fertilizers in 1986 led to a significant increase in the yield of rice. Prior to import liberalization, average rice yields were 2.42 mt/hectare, compared with 2.64 mt/hectare, during the period, 1986-89.

Finally, according to Villa-Real, the "free enterprise" environment led to the free interplay of market forces, which enabled distributors, dealers, and retailers to purchase their requirements at the lowest possible prices and on the most advantageous terms. However, because of deregulation, the substantial profits that had characteristically been enjoyed by fertilizer marketers have been trimmed down.



Photo by R. S. Giroti

Zia Mahmood Minhas of the Fauji Fertilizer Company, Rawalpindi, Pakistan, makes an "Alpha" presentation on behalf of his working group in the Fertilizer Marketing Training Program held in Singapore.

New Staff Members

Maurice O. Klein— Special Project Engineer

A former process engineer with the Potash Corporation of Saskatchewan Mining Ltd., Maurice O. Klein, was recently hired by IFDC as a special project engineer. At IFDC Klein is responsible for developing a research program related to potash and micronutrients from the production aspect. Also, he is conducting research on the environmental impacts of fertilizer production.

Employed by the Potash Corporation for 10 years, the Canadian professional engineer was responsible for improvements in the production of potash fertilizers with emphasis on crystallizer circuits. He assisted in the design of process modification and provided continuous technical assistance to the operation.

Klein has conducted several projects in potash research. In addition, he has assisted with the startup of potassium sulfate production plants, coordinated the installation of a multipurpose pilot-plant crystallizer, and designed and sized peripherals for a pilot-scale crystallizer.

The Canadian engineer has a Bachelor of Applied Sciences degree from the University of British Columbia.

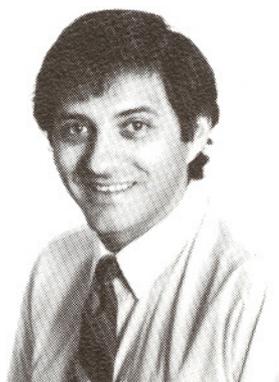


Photo by Charles Butler

**Maurice O. Klein
Special Project Engineer**



Photo by Charles Butler

**Catalino C. Yaptenco, Jr.
Marketing Specialist**

Catalino C. Yaptenco, Jr.— Marketing Specialist

Catalino C. Yaptenco, Jr., who recently joined IFDC as a marketing specialist, is involved in training programs and fertilizer sector studies. He worked for more than 21 years in the fertilizer and agricultural chemical industry in the Philippines, first with Esso Standard Fertilizer and Agricultural Chemical Company and then with Planters Products, Inc. He has directed the planning and development of technical, sales promotion, sales service, and credit service programs for a national marketing organization serving 600 dealers and over 150 direct accounts. He has represented the Philippine Government and his company in marketing conferences in India, South Korea, Thailand, Taiwan, and Japan.

Yaptenco earned a B.S. degree in agriculture from the University of the Philippines and an M.S. degree in soil science from the University of Hawaii on a Rockefeller Foundation Fellowship, while he was on the faculty of the U.S. Peace Corps Training Center.

Recent IFDC Publications

Soil Fertility and Fertilizer Management in Semiarid Tropical India

These proceedings contain the papers presented during a colloquium held at the International Crops Research Institute for the Semi-Arid Tropics during 1988. The colloquium was organized to bring together scientists having firsthand knowledge and understanding of the problems related to soil fertility in the Indian semiarid tropics.

The publication is not limited to agronomy but also includes an assessment of the social and economic factors affecting soil fertility management. A section on the manage-

ment of fertilizer nutrients other than nitrogen in the semiarid tropics of India demonstrates the prerequisite of nutrient balance for increased yields. Also included is a description of a simulation model that can guide further research and make recommendations based on results already available.

To order this publication, interested parties should address their order to the IFDC Purchasing Department and request Special Publication-SP-11. The cost for U.S. customers is US \$20 and US \$30 for overseas customers.

Production of Granular NPKs in Ammonium Phosphate Plants

This technical bulletin, authored by James J. Schultz, IFDC Fertilizer Production Specialist, contains data and recommendations, which represent the distillation of a broad international base of experiences and results collected and formulated over a number of years. The bulletin covers the plant design and operating parameters required for producing agglomerated compound (NPK) fertilizers, especially urea-based and other temperature-sensitive and hygroscopic granular products. The plant design and operating criteria described in this bulletin can serve

as a check list to help guide those involved in the planning and design of new NPK projects or the modification of existing units.

In ordering this bulletin from the IFDC Purchasing Department, please request Technical Bulletin T-36 and include US \$4.00 for U.S. addresses and US \$7.50 for overseas addresses.

Venezuela Fertilizer Subsidies and Agricultural Production

This publication presents an analysis of the Venezuelan fertilizer subsidy and an estimation of its impact on the performance of the agricultural sector. The study attempts to isolate and measure the impact that fertilizer subsidies have had on the overall improvement of the agricultural sector, specifically on crop production and crop productivity. The paper identifies and

estimates the impact of agricultural credit, crop prices, fertilizer prices, and crop areas on fertilizer use and crop productivity. In addition, a methodology that is useful for this type of analysis and the data needed for its application are presented.

This publication, authored by Dr. Adolfo Martinez, IFDC Agricultural Economist, is available as Paper Series, P-11, from the IFDC Purchasing Department. The price for U.S. addresses is US \$4.00 and overseas, US \$7.50.



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.

Marie Thompson
Editor

P.O. Box 2040
Muscle Shoals, AL 35662, U.S.A.
Phone No. (205)381-6600

TWX-810-731-3970 IFDEC MCHL

DAVID B. PARBERY, Managing Director

BOARD OF DIRECTORS, JOHN A. HANNAH, Chairman Emeritus; David Hopper, Canada, Chairman; Yaovi Adodo, Togo; Eliseu Roberto de Andrade Alves, Brazil; Anton Amberger, Federal Republic of Germany; Hiram Grove V., Chile; Samuel Muchena, Zimbabwe; Pratap Narayan, India; Christian Pieri, France; Bukar Shaib, Nigeria; Pieter van Burg, the Netherlands; Robert E. Wagner, U.S.A.; Joe Wheeler, U.S.A.; William F. Willis, U.S.A.