IFDC

Report

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

Togo—

IFDC Gains African Connection

Since its inception in 1974, IFDC has strived to create a greater presence in its mandate area, the tropics and subtropics. Toward this end, in 1985 the Government of Togo agreed to help IFDC establish a regional center in Africa by providing land for the facility and granting it international immunities and privileges.

Plans are underway for establishing the IFDC-Africa Center; donor support to build the necessary infrastructure and staff is being sought. It is hoped that staff will be posted in that country in 1987. The Lomé Center will have major responsibilities in technology research and development, training, and technical assistance.

A parcel of land (12 ha) near Kpeme and close to the Office Togolais de Phosphate (OTP), at approximately 35-km distance from Lomé, was provided to IFDC by the Togolese Government to build the IFDC-Africa Headquarters. Due to residual effects and wide agroecological variation in the sub-Saharan region, IFDC-Africa has opted not to set up its own experiment station but to work on national and international stations through collaborative agreements. The Government of Togo has also agreed to allow the Center access to experimental sites for agronomic research.

Because the site is located near the Togo phosphate mine, IFDC-Africa will have easy access to a major resource for research and training purposes. Its proximity to port facilities will aid in transporting the building blocks of research such as ammonia; nitric, sulfuric, and phosphoric acids; other fertilizer raw materials; and research equipment. The international airport of Lomé provides regular flights to main hubs for international travel. Moreover, excellent road connections exist with Burkina Faso, Ghana, Ivory Coast, Benin, and Nigeria.

The overall goal of the IFDC-Africa Center is to increase food production by overcoming the constraints to fertilizer use and promote the exploitation of indigenous resources as fertilizer

Togolese officials discuss the establishment of IFDC-Africa Center with IFDC's Managing Director. From left, K. L. Allaglo, Directeur, Direction de l'Institut National des Soils; A. K. Pinto, Ingenier Agronome, Direction de l'Institut National des Soils; Claude Moraitis, Directeur General Adjoint, Office Togolais des Phosphates; and Dr. Donald L. McCune, IFDC.

sources. Specific objectives are to fill the personnel needs of the fertilizer sector, conduct and promote research, and provide technical assistance for sector development.

The future Director of the IFDC-Africa Center, Dr. Paul L.G. Vlek, sees clearly the value of the Center. "By establishing a presence in Africa we can work more closely with each individual country; we now are missing the potential impact that we could have."

During a recent African Workshop held at IFDC Headquarters, the Center gained the endorsement of 21 delegates from 18 African countries. In addition, the concept received the sanction of visitors to the Workshop, including Dr. P.F. Van Burg, Director, Netherlands Fertilizer Institute; Dr. G. W. Cooke, Honorary Scientist at Rothamsted Experimental Station, United Kingdom; and Mr. P. Narayan, Executive Director, the Fertiliser Association of India.

Togolese counterparts and Dr. Donald L. McCune (third from left) conduct the initial surveying for the future site of the IFDC-Africa Center.

"We (the review team of the UNDP mission to evaluate IFDC's research and training programs) wholeheartedly endorse the idea," Dr. Cooke said. "We feel that the Center is a very necessary continuation of IFDC's work in an area of the world that is presently experiencing such devastating problems in food production."■

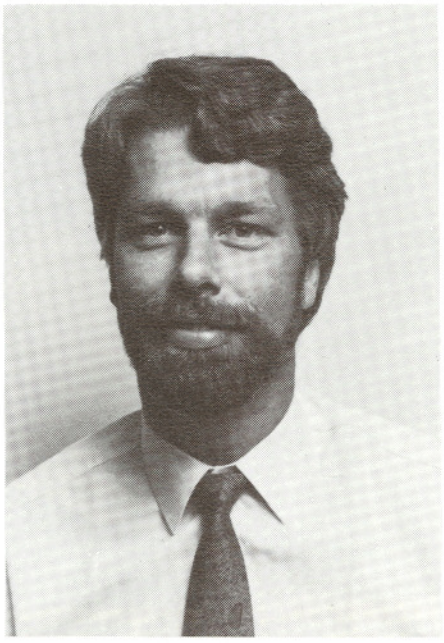
Dr. Paul L.G. Vlek Named Director of IFDC-Africa Center

A soil scientist who has been with IFDC for the past 10 years was recently selected to head the newly formed IFDC-Africa Center, to be located in Lomé, Togo. In early 1987 Dr. Paul L.G. Vlek, who has been Director of the Agro-Economic Division since December 1983, is expected to be posted in Togo, where he will develop and direct the IFDC-Africa Center.

As Director of the Agro-Economic Division, Vlek has been responsible for directing and periodically reviewing research programs on fertilizer in the areas of soil science, economics, sociology, and related disciplines.

During his 10 years at IFDC, Vlek has held various positions in the Agro-Economic Division. Besides serving as Director of the Division, he has held other positions of leadership, including Research Leader, Upland Nitrogen Program, and Research Leader, Nitrogen Program. During 1982 Vlek was on special assignment in South America, Africa, and Asia. The product of this assignment was a monograph, entitled *Micronutrients in Tropical Foodcrop Production*, which was published by Martinus Nijhoff.

During his tenure at IFDC, Vlek has coordinated activities involved in cooperative projects with the International Rice Research Institute, International Center for Agricultural Research in the Dry Areas, International Crops Research Institute for the Semi-Arid Tropics, International Institute of Tropical Agriculture, and Indian Council of Agricultural Research. Vlek has been instrumental in the development of collaborative projects with national programs in Burkina Faso, Cameroon, India, Kenya, Korea, Senegal, and Togo. In addition, he has served as a consultant to the World Bank in Rwanda and Madagascar.



Dr. Paul L.G. Vlek
Director
IFDC-Africa Center

With some 40 publications to his credit, Vlek also serves on the editorial boards of two soil science journals. He is Associate Editor of *Agronomy Journal* of the American Society of Agronomy and Managing Editor of *Fertilizer Research*, an international journal on fertilizer use.

A native of the Netherlands, Vlek received a Ph.D. in soil chemistry and plant nutrition from Colorado State University in 1976. Prior to this he had received M.S. and B.S. degrees in soil chemistry/soil mineralogy and tropical soils/soil chemistry, respectively, from the State Agricultural University, Wageningen, the Netherlands.■

Headquarters—

Agro-Economics Division Under New Leadership

The Agro-Economics Division is now under new leadership; Dr. L. L. Hammond, a soil scientist, was recently named Director of the Agro-Economic Division. The former Director, Dr. Paul L.G. Vlek, has been promoted to Director, IFDC-Africa Center (see page 2).

With IFDC since 1977, Hammond has been responsible for research on phosphorus fertilizer efficiency and management for diverse cropping systems of tropical developing countries. His duties have included independent research and coordination of multidisciplinary international research network activities, primarily in the area of identification of alternative uses for phosphate rock deposits indigenous to tropical countries.

Hammond's service to IFDC, however, began in 1975 when he was posted at the Centro Internacional de Agricultura Tropical (CIAT) in Cali, Colombia, to conduct his Ph.D dissertation research as a part of the Agro-Economic Division's first overseas field research program on phosphates.

Hammond has exhibited a strong commitment to enhance IFDC's contribution within Latin America. During 1980-82 Hammond was again stationed at CIAT, where he coordinated the Latin American Field Research Project on Phosphorus. During 1985 his efforts were instrumental in the establishment of new collaborative research agreements with national institutions in Ecuador, Peru, Bolivia, Colombia, Costa Rica, and Mexico. Hammond was also invited to make a keynote presentation at the 10th Latin American Soil Science Congress held in Colombia in August 1985. His international involvement has not been limited to Latin America, however, as evidenced by his contribution to research projects in both Asia and Africa.

Dr. L. L. Hammond
Director of the Agro-Economic Division

A native of Michigan (U.S.A.), Hammond was educated at Michigan State University, where he received a B.S. degree in soil science; University of Hawaii, M.S. in tropical soils; and Michigan State University, Ph.D. in soil fertility/chemistry. While at Michigan State, Hammond also served as supervisor of the University Soil Testing Laboratory.

Hammond is a member of the American Society of Agronomy; the Soil Science Society of America; the American Registry of Certified Professions in Agronomy, Crops and Soils; the International Soil Science Society; and Sociedad Colombiana de la Ciencia del Suelo.

To his credit Hammond has 30 publications on various aspects of soil science, which have appeared in national and international journals and other publications. ■

Headquarters—

PATENT ACQUIRED ON UREASE INHIBITORS

A patent on cyclotriphosphazatriene-derivatives as chemicals for retarding soil urease activity was recently acquired by IFDC and the National Fertilizer Development Center (NFDC) of the Tennessee Valley Authority. The inventors listed on the patent are Dr. Ramiro Medina, former IFDC Visiting Scientist (now with the Technical University of Munich, Germany), and Jack M. Sullivan, NFDC Chemist. On October 21, 1986, the invention will be assigned the number, U.S. Patent No. 4,618,691.

This patent is the result of a joint project between IFDC and TVA, which was begun in 1983. The project has been partially funded by Deutsche Gesselschaft für Technische Zusammenarbeit (GTZ) since 1983.

Medina conducted his research during 1983-85 as a visiting scientist at IFDC. In May 1986 Norbert Engel, also of the Technical University of Munich, came to IFDC as a visiting scientist to continue the research program on inhibitors. Engel is scheduled to remain at IFDC for a 2-year period, 1986-88.

The principal objective of the present invention is to identify and characterize a group of highly effective inhibitors, which will, when admixed with urea or urea-containing fertilizers, greatly reduce the loss of ammoniacal nitrogen from agricultural soils resulting from the urease-catalyzed hydrolysis of urea.

As background to the subject, it may be well to explain just what an inhibitor is and what it does. First of all, urease is an enzyme that is present in soils. It

transforms urea into ammonia and carbon dioxide. A urease inhibitor prevents or slows this reaction. What has been found out so far is that a urease inhibitor can greatly reduce the loss of nitrogen (ammonia) to the atmosphere.

Laboratory tests indicate that these compounds can be manipulated by chemical substitution to provide varying degrees of inhibition of soil urease activity. This can be considered as a step towards the development of an effective urease inhibitor.■

Indonesia—

10-Year Fertilizer Distribution Plan Completed

With a total area of 2.0 million square kilometers scattered over more than 13,000 islands, Indonesia presents unique problems to the planners of fertilizer distribution.

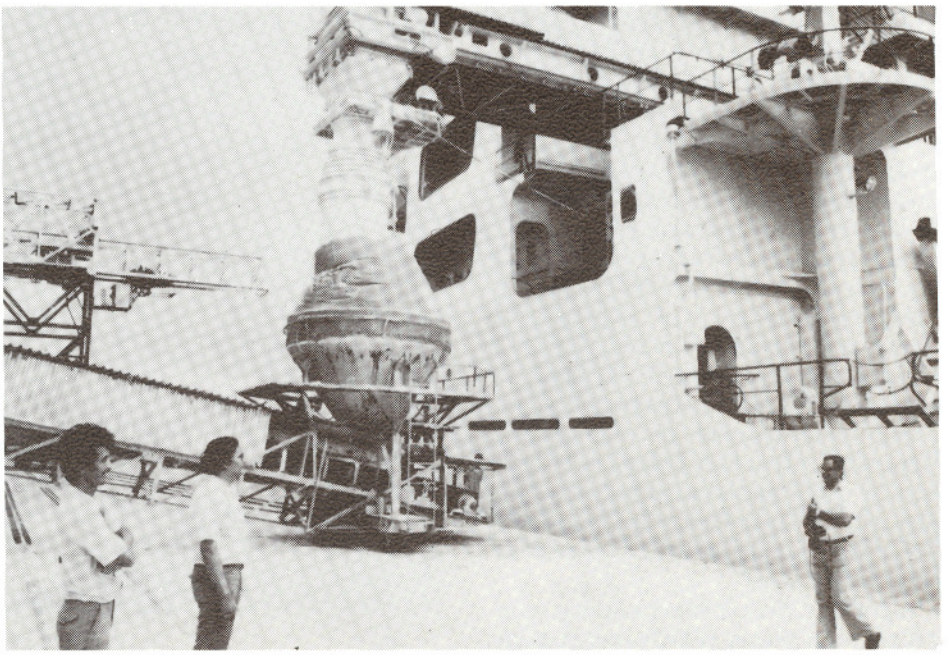
In August an IFDC fertilizer distribution specialist, Dr. W. E. Clayton, completed a year's assignment in Indonesia, where he coordinated a study for P. T. Pupuk Sriwidjaja (P.T. PUSRI), the company that is responsible for all fertilizer marketing in Indonesia.

The study, funded by the World Bank, was undertaken to establish an overall distribution strategy for movement and handling of fertilizer from the various production units or points of import to the consumption areas throughout Indonesia. This project was initiated by the World Bank to establish an overall plan for further extension of the distribution system in Indonesia, which has been developed over the past 15 years with substantial Bank assistance. Over this period, growth in production and use of fertilizers has made a major contribution toward increasing production of food and estate crops.

During 1985, 5 million tons of fertilizer was distributed in Indonesia; the forecast for 1995 calls for over 9 million tons to be moved.

PUSRI has seven specially designed bulk urea carriers, each having a capacity of 7,500 tons, that move urea from production units to bagging stations in principal ports from which the bagged fertilizer is moved by rail and road to inland storage depots in the marketing areas. PUSRI owns nearly 600 rail wagons operating in Java, the principal consuming area in Indonesia.

To conduct the distribution study, an international team was selected and based in Jakarta at the PUSRI offices. The team members made visits to various production units, bagging stations, ports, warehouses, etc., throughout Indonesia.



The ship-to-shore connection for urea discharge. The P.T. PUSRI vessels can discharge at 500 tons per hour.

The study team considered the projections of fertilizer demand over the period 1985-95. To define supply areas, import requirements and export availability, the team considered projected production, and offtake patterns of the principal fertilizers. They reviewed the present operating systems and made recommendations for effective use of the existing facilities. The team also considered alternative methods for future development of the system and made recommendations for extensions incorporating new and improved methods.

The team determined logical supply areas for each production unit and integration into a total system. They determined investment requirements and the financial and economic rates of return for a number of the proposed investments.

A computer model of the overall system was constructed to optimize distribution flows and costs and to assist in the future operation of the distribution system. The linear program, least cost transhipment model was developed as an integral part of the study. The model was used for financial and economic evaluation of project proposals.

The study team recommended organizational changes that recognize the significance of the physical distribution element of the marketing system and improvements in operation to increase efficiency and reduce costs.

According to Clayton, the existing system is confirmed as being generally effective. The team recommended changes in distribution practices and the establishment of an additional bagging station in Java. They recommended extensions and modifications of other bagging stations to handle bulk import of triple superphosphate and potash. The team recommended improved bulk and bag shipping methods and suggested changes in the rail movement pattern and use of unit trains in Java, which will reduce costs considerably.■

Headquarters—

FMMTP Participants See Program as Catalyst for Change

"IFDC is an agent of change—a catalyst for progress in the world of fertilizer technology."

These were the words of Feisal Beig, Manager of the Marketing Division of the Fauji Fertilizer Company Limited of Rawalpindi, Pakistan, during the closing ceremonies of the Fertilizer Marketing Management Training Program (FMMTP). The program was conducted at Headquarters during August 11-September 19, under the direction of Dr. V. L. Sheldon, IFDC Marketing Specialist.

During an interview at the close of the program, Beig gave the program speakers high marks for their presentations. He felt that they gave the participants very useful information.

Another high point of the program for him was the field trips to universities, agricultural research stations in Missouri and Tennessee, phosphate mines and manufacturing plants in Florida, and retail dealers in Tennessee and Missouri.

"We came to know the most salient points of the U.S. fertilizer industry during these field trips," Beig said. "I found them very informative. For example, I learned that fertilizer is often distributed to farmers in bulk in the United States, whereas in my country it is always sold in bags."

A third highlight of the program for Beig was the opportunity of meeting 29 participants from 18 countries and discussing various aspects of fertilizer marketing with them.

"We learned a great deal by comparing notes as to how we tackle the same types of problems," he said. "Despite the fact that I have 15 years' experience in the fertilizer business, I picked up quite a few practical pointers that I can implement in my job. This background will help me sort out my own ideas and determine what is practical."

"Even though we have come a long way in fertilizer marketing in Pakistan, we still want to improve it. This can only be done through studying other systems and participating in programs like this one," Beig said.

Another participant, Festus K. Lomax, Commercial Officer for the Smallholder Rice Seed Project of Suakoko, Liberia, believes that the program will serve as a catalyst to help his country develop a fertilizer marketing system.

"We may need IFDC's help in the future in developing a fertilizer marketing system," Lomax said.

He sees IFDC as an information resource base since his country does not have adequate information to transfer to farmers.

"In my country the link between the factory and the farmer is missing; we need an extension service to provide necessary information to farmers," Lomax said.

The six-week program, which was conducted for the tenth time, focused on integrated marketing concepts, marketing planning, and marketing systems development.

Several types of training activities, including lectures, films, simulation exercises, role play, case studies, and panel discussions, were used during the program. These activities helped the developing-country fertilizer marketing managers understand fully that fertilizer marketing embraces all activities involved in meeting the fertilizer needs of the ultimate consumer—the farmer. ■

Field trips play a very important role in training programs at IFDC. Pictured here, FMMTP participants visit an experiment station in Missouri.

IN MEMORIAM— John M. Hill

On August 9, 1986, IFDC lost an outstanding employee and a very dear friend. On that day John McLain Hill, a Marketing Specialist with IFDC since 1977, died of cancer.

Born in the Philippines in 1926, Hill was characterized by many as a "survivor." He fought an admirable and courageous battle against the dreaded disease that finally claimed his life.

Adversity was no stranger to John Hill; in fact, it intensified his appreciation of life. At the early age of 14 he became a prisoner of war; that experience lasted 4 long years. In 1945 Hill and his brother were rescued from prison and barely escaped death from their captors. A U.S. Coast Guard ship brought them to San Francisco, California, where, luckily, they had relatives. Hill soon enrolled in the University of California at Berkeley.

With a degree in Agricultural Economics, he quickly took up a career in marketing, first in the private sector, including positions with Dow Chemical Company, Tidewater Oil Company, and Esso Chemical Company.

Moving next to the public sector, Hill served in three capacities with the U.S. Agency for International Development (USAID). In Pakistan, Iran, and Turkey, he acted as soils advisor and aid consultant; for this work he received two meritorious awards. Next as Chief of the Agri-Industry and Textile Branch, Hill managed USAID's worldwide procurement of over US $190 million in agricultural commodities. In his last assignment with USAID as Chief of the Agriculture Inputs Branch, he was responsible for monitoring and assisting the South Vietnamese Government and the private sector on agricultural inputs requirements. During his stay in Vietnam, he developed and managed a successful US $25 million fertilizer subsidy stabilization program.

Turning again to the private sector, Hill joined Agrico International as their Marketing Manager for South East Asia. In that capacity, he conducted marketing activities in Pakistan, Jordan, Brazil, and other countries in Europe and Asia.

The last and final rung on John Hill's career ladder was at IFDC in the Outreach Division. At IFDC Hill served as a marketing specialist. One of the first of his many accomplishments was the development of a marketing course for middle-level marketing managers from developing countries. This program was recently conducted again at Headquarters, marking its tenth anniversary—a tribute to John M. Hill.

Beginning in 1979 Hill served for 2 years in Bangladesh as IFDC Chief of Party and Marketing Advisor. Another overseas assignment took him to Nepal where he was management consultant to the Agricultural Inputs Corporation on a World Bank-funded project. In addition, Hill prepared fertilizer studies on various countries, including Bangladesh, Ecuador, Mexico, Nepal, and Zimbabwe. To his credit, Hill has some 20 publications on various aspects of fertilizer marketing.

We at IFDC, his widow Dee, and his many friends in other parts of the world will miss John McLain Hill—his winning smile, the twinkle in his dark eyes, and his pleasant manner.

Recent IFDC Publications

FERTILIZER SULFUR AND FOOD PRODUCTION

This book is the outcome of a major research effort. This research effort results from the recognition of the seriousness of the sulfur problem and its adverse impact on food production as well as IFDC's dedication to the development and transfer of economically efficient fertilizer technology to tropical countries. This study represents a comprehensive analysis of the technical and economic linkages between fertilizer sulfur and food production, and it provides guidelines for future directions in fertilizer sulfur research and public policy.

The project was jointly undertaken by Dr. J. S. Kanwar, Director of Research, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and Dr. Mohinder S. Mudahar, IFDC Economist. Dr. Kanwar spent his 1982/83 sabbatical year at IFDC and participated in this research endeavor. This study is expected to provide needed impetus for national and international research and financial organizations to initiate and finance major fertilizer sulfur research and development programs.

It is hoped that this study will be of major significance to fertilizer researchers, extension agents, manufacturers, planners, and policymakers in their efforts to improve fertilizer use efficiency and alleviate world hunger. The book is published by Martinus Nijhoff Publishers of the Netherlands.

Interested parties in developed countries should order the book from Martinus Nijhoff, Spuiboulevard 50, P.O. Box 163, 3300 AD Dordrecht, the Netherlands. A limited number of copies are available for purchase by developing countries; these may be ordered directly from IFDC by requesting technical bulletin T-28 and sending US $24.00 to the IFDC Purchasing Department, P. O. Box 2040, Muscle Shoals, Alabama 35662.

MANAGEMENT OF NITROGEN AND PHOSPHORUS FERTILIZERS IN SUB-SAHARAN AFRICA

This volume contains the proceedings of a symposium by the same name, held in Lomé, Togo, March 25-28, 1985. Published by Martinus Nijhoff Publishers, the book is edited by Dr. A. Uzo Mokwunye and Dr. Paul L.G. Vlek of IFDC.

The symposium summarized the results of a 3-year project, supported by the International Fund for Agricultural Development. Conducted in collaboration with the International Crops Research Institute for the Semi-Arid Tropics and the International Institute for Tropical Agriculture, this project aimed at assessing the means to remedy soil nutrient deficiencies that constrain food production in the humid, subhumid, and semiarid tropics of Africa.

The objectives of this volume are to assess the role of agriculture in economic development, to determine the role of fertilizers in agricultural development, to analyze the growth and patterns in fertilizer consumption, to identify and analyze the policies needed to expand fertilizer demand, and to evaluate the implications of an import substitution policy for phosphate fertilizer.

Interested parties in developed countries should order this publication from Martinus Nijhoff, Spuiboulevard 50, P.O. Box 163, 3300 AD Dordrecht, the Netherlands. A limited number of copies are available for purchase by developing countries; these may be ordered directly from IFDC by requesting special publication SP-7 and sending US $26.00 to the IFDC Purchasing Department, P.O.Box 2040, Muscle Shoals, Alabama 35662.

MANUAL FOR DETERMINING THE PHYSICAL PROPERTIES OF FERTILIZERS

This manual outlines the methods for determining the physical properties of fertilizer, which include procedures used by IFDC to evaluate commercial and experimental fertilizer products and raw materials. David W. Rutland, IFDC Physical Properties Specialist, prepared the manual.

The physical properties that are included in the manual are critical relative humidity, moisture absorption-penetration characteristics, flowability, chemical compatibility in blends, caking tendency, size analysis, physical compatibility in blends, angle of repose, bulk density, apparent density, true density of solids and liquids, viscosity, granule crushing strength, abrasion resistance, impact resistance, handling strength, sphericity, conditioner adherence, dustiness, surface area, disintegration rate, and porosity.

This publication may be ordered by requesting IFDC Reference Manual R-6 from the IFDC Purchasing Department, P.O. Box 2040, Muscle Shoals, Alabama 35662. The cost of the manual is US $15.00, plus postage.

Upcoming Training Programs

Program	Location	Dates
Headquarters		
Fertilizer Marketing		
Data Collection, Analysis, and Projections in Fertilizer Sector Studies	IFDC/ Other Locations	March 16-April 3, 1987
Fertilizer Marketing Training Program	Nairobi, Kenya	April 27-May 8, 1987
Fertilizer Distribution and Handling Training Program	Europe	June 8-26, 1987
Fertilizer Production and Technology		
Maintenance and Production Management Training Program	IFDC	October 13-31, 1986
Fertilizer Production Training Program	India, Indonesia, Malaysia, and Thailand	February 2-20, 1987
Regional Programs		
Statistics and Economics of Fertilizer Use (in Spanish)	Colombia	November 3-21, 1986
Regional Fertilizer Marketing Training Program	Indonesia	December 8-19, 1986

NOTE: Dates are subject to change.

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

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