IFDC Report

Volume 34, No. 1
March 2009
ISSN 0149-3434

an update on
the work & progress at
IFDC—An International Center for Soil
Fertility and Agricultural Development

www.ifdc.org

Only Urea Plant in Sub-Saharan Africa Reopens in Nigeria as *Notore*

The only urea plant in Sub-Saharan Africa, the previously defunct National Fertilizer Company of Nigeria (NAFCON), reopened and resumed production as Notore Chemical Industries, Ltd., in January. The plant, near the Niger Delta town of Onne on Nigeria's southern coast, will manufacture both urea, the world's most common form of nitrogen fertilizer, and anhydrous ammonia, another nitrogen fertilizer.

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Nigeria's NAFCON plant (above photo), one of the world's largest urea facilities, closed in 1996 and reopened in January, after extensive refurbishment, as Notore (photo below).

Notore Photo

IFDC Develops *FertTrade:*

A New Software to Analyze the World Fertilizer Market

FertTrade is a new analytical software tool that IFDC economists have developed to forecast and evaluate changes and trends in global demand, production, and trade of N, P, and K fertilizer nutrients.

"The fertilizer trade model can evaluate the impact of a diversity of 'what if' scenarios affecting global markets for

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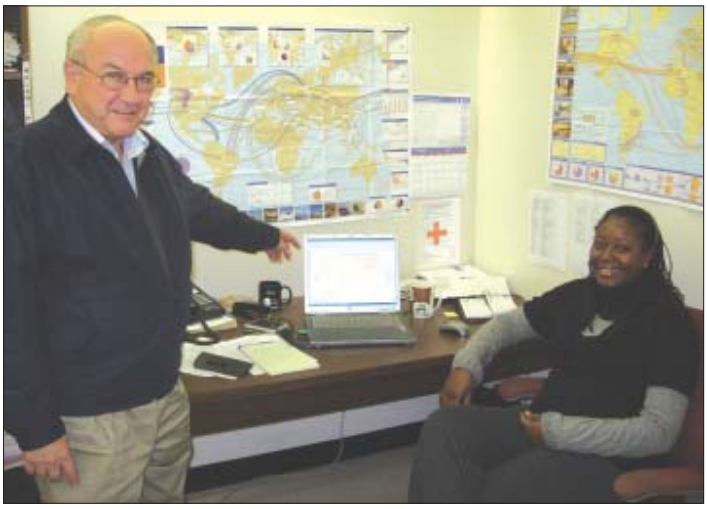

Demonstrating IFDC's new fertilizer trade model, FertTrade, are Drs. Carlos Baanante (left) and Oumou Camara (right), IFDC Economists. FertTrade will help African farmers and agro-dealers access much-needed market information on N, P, and K fertilizers.

In This Issue

IFDC Report

Publisher:
IFDC–An International Center for Soil Fertility and Agricultural Development

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Layout/Design:
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IFDC Report is a quarterly publication of IFDC, Muscle Shoals, Alabama, U.S.A. Telephone: 256-381-6600, Telefax: 256-381-7408, E-Mail: general@ifdc.org, Web Site: www.ifdc.org. 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. A French language edition of the *IFDC Report* is available from IFDC.

IFDC is a public international organization (PIO), governed by an international board of directors with representation from developed and developing countries. The nonprofit 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.

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Only Urea Plant in Sub-Saharan Africa Reopens in Nigeria as *Notore*

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IFDC played a role in transforming NAFCON to Notore (which means "genesis" in local dialects). In 2004, Jorge Polo, IFDC Senior Technical Specialist, served on a mission to study how Nigeria could better meet its need for nitrogen fertilizer. The mission was sponsored by the U.S. Agency for International Development (USAID).

"We considered three possibilities: restoring and restarting the NAFCON facility, building a new plant, or moving a used plant to Nigeria," Polo recalls. "We concluded that the most efficient way to reestablish urea production in Nigeria was to privatize, rehabilitate, and reopen NAFCON and then consider building new units to meet future needs."

The government-owned NAFCON plant, one of the world's largest urea facilities, was built in 1988 and closed in 1996. It was purchased by Notore in 2005 for US $152 million. A $400 million refurbishment program began. Notore is owned by a consortium of Nigerian private investors and both local and foreign institutional investors.

"Notore's acquisition of NAFCON resulted from former Nigerian President Olusegun Obasanjo's initiative to privatize government-owned businesses and focus on developing the nation's agricultural sector," says Onajite Okoloko, Notore Managing Director and CEO.

"The Niger Delta has an abundant supply of natural gas, but about 60% is 'flared,' or burned off and wasted," Okoloko says. Natural gas, a byproduct of the oil drilling industry, is essential for manufacturing nitrogen fertilizer. Onne is near the Atlantic Ocean, which facilitates both the import of natural gas and other raw materials and the export of fertilizer to other African countries.

The Nigerian National Petroleum Corporation signed a 20-year contract with Notore to supply natural gas to run the new plant, according to Dr. Amit Roy, IFDC President and CEO.

"Notore's current production capacity is 1,000 tons per day of ammonia and 1,500 tons per day of urea," says Dr. Maria Wanzala, IFDC Economist and Representative to the Secretariat of the New Partnership for Africa's Development (NEPAD), based in Johannesburg, South Africa. "Estimates are to produce 160,000 tons per year of urea and 500,000 tons per year of NPK."

More than 60% of the annual urea (100,000 mt) and NPK (320,000 mt) production will be sold in Nigeria and the rest, to countries in West and Central Africa. "To ensure effective distribution, Notore will establish a network of 70 major dealers initially in 16 states in preparation of the 2009 production season," says Scott Wallace, IFDC Nigeria Country Representative. "In addition, Notore is looking to partner with the federal government, IFDC, and key states to roll out a targeted fertilizer voucher program this year," Wallace says.

The distribution network will include more than 400 trucks dedicated to transporting fertilizer from the plant to dealers. Notore plans to develop similar networks in other countries that import its fertilizer.

"The African Green Revolution has indeed begun," Okoloko said in a Jan. 8 Reuters article. "Nigeria has once again joined the elite league of industrialized nations that produce fertilizer, a key input in the production of much-needed crops, which will feed its citizens."

IFDC Develops *FertTrade:* A New Software to Analyze the World Fertilizer Market

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N, P, and K fertilizer nutrients through 2025," says Dr. Carlos Baanante, IFDC Economist and leader in FertTrade's development.

"Today's uncertainty about agriculture's capacity to keep pace with rapidly changing demand makes forecasting models, which link such changes with demand for fertilizers, valuable tools for short- and long-term planning of fertilizer production, distribution, and marketing.

"No other trade model can predict fertilizer market trends like FertTrade does."

IFDC will use FertTrade to improve decision making on policy changes and technology

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IFDC Develops *FertTrade:* A New Software to Analyze the World Fertilizer Market

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development and transfer to enhance the performance of fertilizer and agricultural sectors globally, especially in developing countries.

"Use of FertTrade can produce information that will facilitate the efficient trade of 30% to 40% of the fertilizer nutrients produced worldwide, and prevent or minimize shortages and price spikes that may negatively impact fertilizer use and agricultural production," Baanante says.

"Fertilizer demand is derived from, and depends on, demand for agricultural products—food, feed, fiber, and now biofuel," Baanante says. "FertTrade analyzes factors that affect the demand, supply, and trade of agricultural products—which also affect and determine changes in fertilizer demand."

Such factors include country populations and incomes, technological advances in agricultural and fertilizer sectors, climate change, and the demand for biofuels.

Nitrogen Use Efficiency

"About two-thirds of nitrogen applied to crops in developing countries today is lost to the environment through volatilization into the air or leaching into groundwater," Baanante says.

IFDC is using the FertTrade model to forecast the potential impact of developing and adopting improved fertilizer N technologies that will increase the efficiency of nitrogen fertilizer applied to cereals from today's average of 40% efficiency to 60% or higher.

"Such an increase could reduce worldwide nitrogen losses by about 9.3 million metric tons by 2025—a saving of about $10.1 billion in that year," Baanante says. "That achievement in technology development and transfer would reduce annual farmers' expenditures for nitrogen fertilizer by about $4.5 billion, adding significantly to the incomes of millions of cereal farmers in developing countries."

Selling fertilizer in Mali.

Controlled-Release Fertilizers—an Emerging Technology for Food Security

Controlled-release fertilizers (CRFs) are mostly used on high-value crops, but the technology may be adapted for general agriculture in developing countries. CRFs not only increase fertilizer efficiency and crop yields, they also reduce losses through leaching, runoff, volatilization, and denitrification, says Dr. Upendra Singh, IFDC Senior Scientist—Systems Modeling (Soil Fertility). Most CRFs are designed to release mineral nitrogen (N) to the soil over an extended period of time. CRFs have been used, mostly on high-value specialty crops, golf courses, and ornamentals, for several decades. But today's need for more efficient fertilizer use may trigger increased use of CRFs in crops with lower profits in developing countries. CRFs improve N uptake by inhibiting urea hydrolysis, slowing volatilization to the air, inhibiting nitrification, or controlling the rate of N release into the soil. "The terms CRF and slow-release fertilizers, or SRFs, are sometimes used interchangeably," Singh says. "But technically they're different. CRFs are fertilizer compounds that have been coated with materials that reduce their immediate availability in soil in a controlled and predictable manner. SRFs are specific materials such as urea formaldehyde and low-soluble mineral fertilizers."

CRFs, SRFs, nitrification inhibitors, and urease inhibitors all contribute to more efficient N use, reduce nutrient losses, and save time, labor, and energy for farmers.

CRF Technologies Vary

Several fertilizer manufacturers have developed and are marketing CRF products to deliver one or more nutrients at a rate to match the nutrient demand of plants. Many CRFs are modified urea products:

- **Urea-formaldehyde reaction products**—These products include Nitroform (also known as Blue Chip), Urea Form, Methylene Urea, and Nutralene.
- **Sulfur-coated urea (SCU)**—SCU was developed by the Tennessee Valley Authority (TVA) in the 1960s and 1970s. In this process, urea is coated with low-cost sulfur to time the release of nutrients and provide sulfur as a secondary nutrient for plant growth. SCU is used on rice in Japan and other regions where rice is a high-value crop, in home and garden crops, and for ornamental and other expensive non-agricultural plants. SCU has recently been coated with a thin layer of polymer to tailor nutrient release rates. SCU products contain 30% to 40% N.

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Controlled-Release Fertilizers—an Emerging Technology for Food Security

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- **Polymer-coated fertilizers (PCFs)**—These are considered the most technically advanced CRFs in controlling nutrient release and improving efficiency of plant nutrient use. But because production costs are high, PCFs are mostly used for high-value crops. Commonly used brands include Osmocote, Nutricote, Polyon, Meister, and ESN. PCFs usually contain 40% to 46% N.
- **Urease and nitrification inhibitors**—These are additives that reduce N losses to the environment. These products are used exclusively on agricultural crops, especially corn. The most common urease in the United States is Agrotain, marketed by Agrotain. Popular nitrification inhibitors are AgrotainPlus, marketed by Agrotain, and N-Serve, by Dow AgroSciences.

CRF Technology is Increasing

CRF technologies are constantly being improved and new technologies are emerging, Singh says. Some new CRF technologies are waiting to enter the market when environmental and economic conditions are favorable.

CRF technologies in the early stages of commercialization include the following brands: ESN Smart Nitrogen, Stable U, Nurea, Nitamin®, VitAG, Wondergreen, Saxolene, and Super U.

"Most of the new and emerging CRFs are derivatives of poly-coated or encapsulated urea and polymers of urea," Singh says. "But an emerging technology appears promising. It's called 'absorbed technology' or 'absorbed fertilizers' because fertilizer nutrients are absorbed into, and slowly released from, an absorbent material. That eliminates coating, a costly step in CRF production."

Current and Emerging CRFs

Taylor Pursell, President, NFT, Birmingham, Alabama, United States, says, "The primary goals for large-scale agricultural use of CRFs should be to maximize efficiency to promote higher yields at the lowest cost. New technologies such as absorbed fertilizers have the potential to dramatically lower costs compared with traditional CRFs."

Georgia Pacific New Technology—Georgia Pacific, based in Atlanta, Georgia, United States, has developed and is marketing two new liquid nitrogen SRFs based on methylene urea (MU) technology. MU is urea that has been reacted to create short-chain polymers that are broken down by microbial action to release nutrients over time.

"A major advantage of MU technology is that less N is hydrolyzed in a time period, thus reducing volatilization losses," Singh says.

MU has long been considered too expensive for agricultural use. But Georgia Pacific chemists and agronomists have developed a foliar- and a soil-applied MU fertilizer to help farmers use N more efficiently and economically, according to Georgia Pacific's Web site, www.gp.com/plantnutrition.

The foliar-applied fertilizer is marketed as Nitamin® 30L, a liquid 30-0-0 N source with 60% of the N in a slowly available form. The N converts to leaf N over about 2 weeks, often boosting protein content as well as crop yields, according to Georgia Pacific.

The soil-applied MU product is marketed as Nitamin NFusion®, a 22-0-0 liquid N source. It is designed to be blended with a quick-release liquid N source such as urea ammonium nitrate (UAN) to slowly make N available in the right proportions for specific crops.

IFDC scientists have worked with Georgia Pacific to conduct incubation trials to characterize N release over time at various temperatures.

Agrotain International L.L.C—Agrotain is one of the world's largest producers of stabilized nitrogen fertilizers. The company, headquartered in St. Louis, Missouri, United States, markets enhanced efficiency products under the brands of Agrotain, Agrotain Plus, and Super U, Andrew Semple, Vice President for International Sales, told IFDC Focus editors.

Agrotain is an N stabilizer that controls volatility of any urea-based fertilizer, whether granular or liquid UAN. "Agrotain N Stabilizer is available as a liquid formulation and a new triple concentrated dry formula," Semple says. "Both can be added to granular urea or blended into liquid solutions."

The product is well suited for no-till farming, Semple says, and is becoming popular with conventional farmers. No Till Farmers named Agrotain the "Best Product of the Year" for 3 consecutive years.

Triple-action Agrotain Plus is a dry concentrated formulation of UAN. "It contains the ingredients of Agrotain and an additional stabilizing agent that keeps N in the ammonium form longer," Semple says. "The product reduces volatilization, denitrification, and leaching, and is suited for broadcast or surface dribble-based UAN applications. Agrotain Plus showed excellent yield increases in cold, wet growing conditions in the spring of 2008 in the United States."

Super U is a ready-to-use N fertilizer with proven stabilized N. "This product provides impressive levels of N protection," Semple says. "Super U is similar to Agrotain Plus in UAN and provides the same level of control over volatility, denitrification, and leaching. Super U requires no retailer mixing, thus speeding up application in the spring growing season."

Agrotain international products are sold through distributors in at least 68 countries. For more information, go to www.AGROTAIN.com.

Agrium Advanced Technologies (AAT)—Agrium, based in Sylacauga, Alabama, United States, is a leading manufacturer of CRFs and micronutrient fertilizers. AAT's CRF products include ESN Smart Nitrogen, Polyon, and XCU, according to Ben Nelson,

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Controlled-Release Fertilizers—an Emerging Technology for Food Security

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AAT Marketing Manager. The company also markets Duration, Nitroform, Nutralene, and Precise.

"ESN is a CRF made specifically for agricultural crops," says Dan Moroz, ESN Sales Manager. "Through extensive research, we developed the polymer-coating technology to a quality consistency and price that allows farm use."

ESN's polymer coating allows water to diffuse into the granules and dissolve the N. As soil temperature warms, crop growth and nutrient demand increase, Moroz told Focus editors. "ESN provides a steady supply of N for the plants throughout the growing season as the dissolved N solution is released through the polymer coating."

ESN is being used on a variety of agricultural crops across North America, Moroz says.

AAT also produces and markets two other CRFs—Polyon and XCU. Major uses are for turfgrass and other high-value enterprises.

Polyon is a polymer-coated CRF, according to Bryan Gooch, AAT Marketing Manager. "Release rates of Polyon range from 12 weeks to 12 months," Gooch says. "Polyon is available in multiple sizes and fertilizer products such as urea, potash, and NPK."

XCU, a polymer-coated SCU, is AAT's newest commercial fertilizer on the market.

"XCU has a proprietary coating developed from synergies of our polymer- and sulfur-coated products, TriKote and SCU. As a result, we are able to deliver 43% nitrogen, which is the highest concentration available within this product category," Chris Derrick, Technical Products Specialist, reported.

XCU was introduced at the Golf Industry Show in Orlando, Florida, Jan. 31 to Feb. 2, 2008.

Agrotain UAN being loaded into a truck for broadcast application.

Information on AAT's CRF products is at www.agriumat.com.

United Agri Products (UAP) Canada—This company, now owned by Agrium and based in Dorchester, Canada, recently launched a new slow-release N fertilizer marketed as N-Pact. The product is a patented 26-0-0 Triazone Foliar formulation. N-Pact is designed to allow farmers a "more targeted" foliar N application late in the growing season, according to a report in the Oct. 6 *Manitoba Co-Operator*.

"This formulation allows better foliar uptake without the leaf burning often associated with other N fertilizer programs," said Brodie Blair, UAP Product Manager. "Our studies show that N-Pact is 30% more efficient in foliar uptake than other N sources such as urea, nitrate, or ammonia."

N-Pact can be tank-mixed with most other herbicides, insecticides, or fungicides and can be used for fertigation (applied in irrigation water), Blair said.

Analysis and Solutions

Singh says, "CRFs have traditionally been used on high-value crops where control of moisture, nutrient uptake, and other production factors reduce production risks. But in the future, CRFs may play a major role in unfavorable environments such as areas with erratic rainfall where risks of crop failures and nitrogen loss are greater. Where rainfall is scarce, CRF nutrients are 'stored' in the soil until rain comes, then released at controlled rates in synchrony with the plants' demand. Controlled use of N can also reduce leaching losses in areas with too much rainfall."

Dr. Amit Roy, IFDC President and CEO, says, "Economic and environmental conditions will continue to drive efforts to develop even more effective and economical CRF fertilizers.

"This is particularly important when one considers that 60% to 70% of nitrogen applied to crops is lost through leaching into groundwater or volatilization into the air.

"The efficient release of plant nutrients as growing crops need them is also important because CRFs are generally more expensive to produce than conventional fertilizers. Thus, the increased costs must be offset by benefits such as higher yields, more efficient fertilizer use, and less environmental pollution.

"CRF research should be a key component of a badly needed research initiative to develop a new generation of fertilizer products and technologies," Roy says. "It's time for such a venture."

Interview with Dr. Vo-Tong Xuan, IFDC Board Member

Dr. Vo-Tong Xuan, President and Agronomy Professor, An Giang University, Vietnam, was named to the IFDC Board of Directors in October 2007. He has been called "Dr. Rice" because of his expertise in rice production in Vietnam's Mekong Delta. Xuan recently received the first ever Umalie Award, given by the Southeast Asia Center for Graduate Study and Research in Agriculture to recognize individuals who have advanced agricultural development in Southeast Asia.

Vo-Tong Xuan (right), IFDC Board Member, and farmer Vo Van Triem (left) inspecting Triem's rice field in An Giang Province, Vietnam.

What was your role in the remarkable increase in rice production since the late 1960s?

I taught at the University of Cantho in Vietnam, where I mobilized students to introduce better farm management practices to rural farmers. That included new, higher yielding, short-duration rice varieties that were resistant to the brown planthopper, the most prevalent insect pest in the Mekong Delta. Students extended the new rice varieties and knowledge to farmers in areas where brown planthoppers were destroying the crops. Those farmers then became extension agents. We also used the popular radio show "Uncle Tam's Family" to tell farmers about new techniques to produce higher rice yields. This resulted in a still larger farmer extension network.

Farm plots in my country were assigned—not owned. At first, farmers were required to sell all of their rice production to the government. We revised the land law to encourage farmers to plant more and to manage the land better. I tested a "contract" system in which farmers could plant on their assigned plots instead of the collectivized farm and sell rice in the open market after they had sold the required amount to the state. The government implemented this contract system in 1981, and production increased by 33%.

A new land law was passed in 1988, allowing farmers to have land on a long-term contract. This encouraged farmers to manage their land better because the government could no longer reassign it on a whim. In 1989, Vietnam began exporting rice. We exported 1.79 million tons, making Vietnam the world's third-largest rice exporter. Then we became the second-largest rice exporter. In 2008, Vietnam exported 4.8 million tons.

What do you think IFDC's role in global food security should be?

IFDC should strongly communicate how to use fertilizer more efficiently.

High production costs are making it very difficult for farmers to increase their incomes. Farmers often use too much fertilizer, or the wrong type of fertilizer, which not only cuts profits but also harms the environment. Many rural growers do not have the right technology or know the right planting procedures.

IFDC should conduct research to increase the efficiency of fertilizer use in major crops like rice, cassava, sugarcane, and maize. Agricultural technologies like urea deep placement should be extended to farmers. Extension can be done very efficiently through universities.

What is your vision of transferring Mekong Delta rice technology to the river deltas of West Africa?

I'm optimistic about south-south cooperation in which Vietnamese scientists and farmers would share agronomic techniques with counterparts in Africa. We are not afraid of getting muddy. If African farmers can see what Vietnamese farmers have done, they'll know that they can do it too.

What is your vision of fertilizer research in the future?

Fertilizer research is crucial, but it has been neglected in the past. We should guide farmers not only to use mineral fertilizers more efficiently but also to combine them with organic fertilizers.

Emergency Urea Deep Placement Program for Farmers in Cyclone-Ravaged Bangladesh

UDP Technology to Soon Reach 1 Million Hectares

The super cyclone Sidr ravaged Bangladesh, killing thousands—and destroying much of the country's vital rice crop—in 30 of Bangladesh's southern and southwestern districts on Nov. 15, 2007.

With $4.77 million pledged by the U.S. Agency for International Development (USAID), IFDC began implementing the Improved Livelihood for Sidr-Affected Rice Farmers (ILSAFARM) project in December 2008 to help restore rice production. The Bangladesh Department of Agricultural Extension (DAE) is collaborating with IFDC.

In addition to the USAID funds, the project will leverage resources of various stakeholders, including DAE, the Government of Bangladesh (GOB), and the private sector.

Urea Deep Placement

The 2-year ILSAFARM project will help 280,000 Bangladeshi farm families by giving them access to improved technology: urea deep placement (UDP) and the balanced use of fertilizers.

Farmers who use UDP place large urea briquettes into the root zone of irrigated rice. UDP improves nitrogen efficiency as much as 50% while increasing crop yields up to 45%.

"UDP also reduces potential negative environmental effects of urea application," Ishrat Jahan, IFDC Project Coordinator, explains.

"UDP reduces the loss of nitrogen, both through leaching or running off into ground water or volatilizing to the atmosphere."

Before ILSAFARM, Bangladeshi farmers were already using UDP in 160 *upazilas* (subdistricts) with technical assistance from IFDC.

ILSAFARM is now expanding UDP to 35 more upazilas in 8 of the worst Sidr-affected districts; this will cover 140,000 ha of the 384,000 ha of the total rice area.

The GOB estimates that about 1 million ha will be under UDP technology across Bangladesh at the end of the ILSAFARM project.

Sidr's Destruction

Cyclone Sidr affected more than 6.7 million people, leaving about 3,033 dead and at least 34,500 injured, according to reports from the GOB. Sidr destroyed at least 363,346 homes and damaged 815,628 more.

Sidr was most destructive in 12 districts that account for 86% of Bangladesh's total losses in crop production. Damage to the crop sector was estimated to total US $412 million.

The loss of Aman (wet season) rice accounted for 63% of the estimated 1.23 million mt of losses in potential production for all crops. Other crops include pulses, vegetables, and spices.

"The GOB estimated that Sidr damaged more than 1.6 million acres [0.648 million hectares] of crops, involving at least 2.2 million farm families, and killed 462,800 livestock," Jahan says. "That is a huge loss of critical household assets and income."

The ILSAFARM Project

ILSAFARM introduces technology through a market-oriented approach that involves both public and private sector stakeholders, Jahan says. The project demonstrates the profitability of UDP and balanced fertilizer use and builds commercial support systems to ensure long-term productivity increases in the rice value chain.

Within 2 months of implementation, IFDC had established 64 demonstration plots in fields of Sidr-affected rice farmers. Motivational meetings with stakeholders were initiated, training plans developed, and a baseline survey designed.

"ILSAFARM will bring enormous benefits to Sidr-affected farmers—but especially to women farmers or women who are actively involved in farm activities," Jahan says. "Increased rice production will improve their income and thus, their quality of life."

Rice farmer Taslima Begum places urea briquettes into an irrigated rice field in Karnapara Village, Upazila Kalkini, one of ILSAFARM's 71 UDP demonstration plots across southern Bangladesh. Watching are (left to right) Mohammad Tariq Hassan, ILSAFARM Agricultural Specialist, and Rubina Islam, ILSAFARM Gender Specialist.

IFDC Promotes Improved Dairy Cattle Breeds to Increase Milk Production in Kyrgyzstan

The Kyrgyz Agro-Input Enterprise Development (KAED) project promoted improved breeds of dairy cattle to increase milk production through two cattle shows in Karasu and Sokuluk, Kyrgyzstan, in October and December 2008.

"Many Kyrgyz farmers lack proper feed to sustain their herds, which limits milk and meat production," says Dr. Hiqmet Demiri, KAED Chief of Party. "They also lack information on modern techniques to raise cattle."

KAED works to improve feed and care to enhance dairy cattle health and productivity.

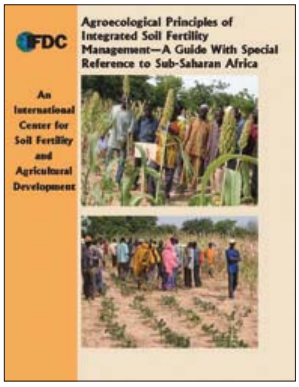
About 130 farmers observed the potential of new breeds and learned modern management techniques for dairy cows at the cattle shows. Seven cows were sold in auctions.

"A cow's breed influences the yield and quality of the milk it produces," Demiri says. "That's why KAED promotes genetic improvement of dairy cows, mainly by encouraging farmers to use artificial insemination and exposing them to improved breeds that private breeders will bring to the Kyrgyz market."

An improved heifer of the milk cow breed Swiss Brown being shown to Kyrgyz farmers during a cattle show in Sokuluk, northern Kyrgyzstan. (Photo credit: Dalil Batyrov, Association of Agribusinessmen of Kyrgyzstan)

KAED organized the cattle shows in partnership with Central Asian Breeding Services, a private enterprise that works with improved cattle breeding centers in Europe and supplies improved breeds to Kyrgyzstan.

Another cattle show will be held in spring 2009 in Issyk-Kul.



IFDC and TSBF Publish Guide to *Agroecological Principles of ISFM*

A new technical bulletin, *Agroecological Principles of Integrated Soil Fertility Management—A Guide with Special Reference to Sub-Saharan Africa,* has been published by IFDC and the Tropical Soil Biology and Fertility Institute (TSBF). The ISFM guide was co-written by Dr. Abdoulaye Mando, Program Leader—Natural Resources Management, IFDC Africa Division; Dr. Marco Wopereis, Deputy Director General (Research), Africa Rice Center (WARDA); and Dr. Bernard Vanlauwe, Senior Scientist/Soil Fertility Specialist, TSBF/ International Center for Tropical Agriculture (CIAT). The bulletin was partly financed by the International Fund for Agricultural Development (IFAD), TSBF, and the U.S. Agency for International Development (USAID).

The bulletin gives soil management practitioners basic information on ISFM and its principles, with tools that include specific frameworks for science-based ISFM application at field and farm levels.

"This guide will increase knowledge and adoption of flexible approaches to development of ISFM technical options to increase productivity and enhance natural resources in Sub-Saharan Africa," says Dr. Amit Roy, IFDC President and CEO.

Order the guide on IFDC's Web site (www.ifdc.org). Request Technical Bulletin T-73. Copies are limited.

IFDC 2009 Training Programs
Nitrogen Fertilizer Production Technology Workshop (with IFA)
Date – June 15–19, 2009 Location – Penang, Malaysia
Decision Support Systems, Experimental Design and Analysis of Data
Date – July 27–August 7, 2009 Location – Ouagadougou, Burkina Faso
Linking Farmers to Markets in Africa
Date – August 10–14, 2009 Location – Arusha, Tanzania
Phosphate Fertilizer Production Technology Workshop (with IFA)
Date – October 19–23, 2009 Location – Marrakech, Morocco
Developing Fertilizer Supply Strategies for the Future
Date – November 2–6, 2009 Location – Capetown, South Africa

IFDC and IFA Offer Fertilizer Production Technology Workshops in Malaysia and Morocco

IFDC and the International Fertilizer Industry Association (IFA) will offer workshops for fertilizer engineers on technologies for nitrogen fertilizer production June 15–19, 2009, in Penang, Malaysia; and for phosphate fertilizers Oct. 19–23, 2009, in Marrakech, Morocco.

"After a very turbulent year in the fertilizer industry, including higher production costs and the global financial credit crisis, it is more important than ever that the industry strives to improve efficiency through use of the latest technologies," says Ramon Lazo de la Vega, IFDC Senior Specialist—Engineering. "These programs will help engineers better understand the fertilizer industry and improve the operation and profitability of their plants."

Both workshops will include interactive discussions with industry experts, visits to fertilizer production plants, and an overview and outlook of the fertilizer industry. Other topics will be economics of the industry; fertilizer chemical and physical specifications and product quality; energy, environmental, and safety issues; and packaging, transportation, and handling.

Registration forms are at http://www.ifdc.org/New_Layout/Training/Training_Calendar/index.html.

COMESA Specialists Partner with IFDC's STAR Program

Two African agri-input trade specialists with the Common Market for Eastern and Southern Africa (COMESA) visited IFDC Headquarters from Oct. 24 to Nov. 1, 2008, to collaborate with the new project Strengthening Trade at the Regional Level in Agricultural Inputs in Africa (STAR). They were Julius Mathende from Zimbabwe, COMESA Regional Agricultural Input Trade Specialist; and Gloria Phiri from Zambia, COMESA Research Assistant.

Discussing progress of the *Abuja Declaration on Fertilizer* are (left to right) Dr. Balu Bumb, IFDC's leader of the STAR project; Julius Mathende, COMESA Regional Agricultural Input Trade Specialist; and Gloria Phiri, COMESA Research Assistant.

COMESA works with the STAR project to improve market access for African agri-input traders and farmers. Other STAR partners are the East African Community (EAC) and the Southern African Development Community (SADC).

STAR's main focus is to create conducive policy environments and strong market linkages through capacity building and market transparency. STAR puts special emphasis on Resolution 2 of the *Abuja Declaration on Fertilizer for an African Green Revolution*, which African heads of state and agricultural leaders wrote and adopted at the Africa Fertilizer Summit in June 2006. Resolution 2 recommends measures: …*to reduce the cost of fertilizer procurement at national and regional levels especially through the harmonization of policies and regulations to ensure duty- and tax-free movement across regions, and the development of capacity for quality control. As an immediate measure, we recommend the elimination of taxes and tariffs on fertilizer and on fertilizer raw materials.*

Under the *Abuja Declaration*, fertilizer should move freely and be treated as a strategic commodity without borders.

Fertilizer use in Sub-Saharan Africa is the world's lowest: only about 8–10 kg per hectare yearly. Farmers in the Green Revolution countries of Asia use 80–250 kg. The Declaration calls for an increase in fertilizer use in Africa to at least 50 kg by 2015.

COMESA, headquartered in Lusaka, Zambia, is a grouping of 19 African states dedicated to promoting regional integration by removing trade and investment barriers. Its members are Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, and Zimbabwe.

COMESA will enter into a customs union in 2009 that removes tariff barriers on member countries and applies a common external tariff (CET) on non-members. The proposed CET is 0% for raw materials, 10% for intermediate goods, and 25% for finished products. This will encourage intraregional trade and the importation of raw materials so that finished products can be produced inside the COMESA zone.

COMESA monitors pricing policies to determine if subsidies are working and if regulatory systems are being implemented properly. COMESA also emphasizes professional capacity building. Sixty-six people took part in a policy workshop on Strengthening Regional Trade in Agricultural Inputs in Africa, in Lusaka, Zambia, in July 2008. The workshop was organized by COMESA and IFDC.

Mathende and Phiri visited Muscle Shoals, Alabama, to learn about IFDC's activities regarding the STAR project. "Seeing is believing," Mathende said. "There is no substitute for being at the project site."

Phiri said, "This trip showed us the range of IFDC resources we can use. We now know who to go to for various types of information." Phiri collects information on fertilizer prices and movement and collaborates closely with IFDC's Market Information Unit.

Mathende said, "The knowledge we gained and the relationships built at IFDC are valuable tools in addressing challenges that confront us in our work. When these challenges overwhelm us, we now know where to seek solutions and advice."

Nobel Laureate Dr. Norman Borlaug Honored at 95th Birthday Celebration

Monsanto Announces $10-Million Beachell-Borlaug Scholarship to Honor Pioneer Rice and Wheat Plant Breeders

Former U.S. Senator George McGovern, 2008 World Food Prize Laureate, Attends to Honor His "Hero"

Leaders in global food security, including former U.S. Senator George McGovern—the 2008 World Food Prize Laureate—joined Nobel Laureate Dr. Norman E. Borlaug and his family to celebrate Borlaug's 95th birthday on March 25 in Dallas, Texas, United States.

During the event, Monsanto Company announced a $10-million grant to establish its *Beachell-Borlaug International Scholars Program*. The scholarships will "support young scientists interested in improving research and production in rice and wheat, two of the world's most important staple crops, through plant breeding techniques," according to a Monsanto press release.

The Monsanto-funded program will be administered for the next 5 years by Texas AgriLife Research at Texas A&M University, which also sponsored the Borlaug celebration. Texas A&M also hosts the Norman E. Borlaug Institute for International Agriculture.

The Monsanto scholarships honor pioneer plant breeders Dr. Henry "Hank" Beachell and Borlaug.

Beachell shared the 1996 World Food Prize for his role in developing IR8, the first high-yielding semidwarf rice variety to be widely grown in the tropics. At that time, Beachell was a plant breeder at the International Rice Research Institute (IRRI) in the Philippines. IR8 is credited with triggering the Green Revolution in Asian rice farming.

Nobel Laureate Dr. Norman Borlaug addressing guests at his 95th birthday celebration. Tables were decorated with "floral arrangements" of wheat panicles.

Photo by Dr. Tom Lumpkin

Borlaug is known as the "Father of the Green Revolution" for his development of the improved wheat varieties that spread rapidly throughout Asia, Latin America, and the Near and Middle East. He was then working with a Rockefeller Foundation program that became the International Maize and Wheat Improvement Center (CIMMYT) in Mexico.

The wheat breeder was awarded the 1970 Nobel Peace Prize for his contributions to world food security. Borlaug also received the Congressional Gold Medal of Honor—the highest civilian honor in the United States—in 2006. He shares that honor with George Washington, Mother Theresa, Nelson Mandela, Thomas Edison, Martin Luther King, Jr., and Elie Wiesel.

Borlaug initiated the World Food Prize—often called the "Nobel Prize for Food and Agriculture"—in 1986 to recognize life-saving achievements that increase the quantity, quality, or availability of the world's food.

Borlaug served on the IFDC Board of Directors from 1994 to 2003.

Borlaug on the "Global Food Monster," World Food Challenges, and the Media's Responsibility

Borlaug spoke of the *global food monster* at the celebration. "The world population is still growing by 85 million yearly," he said. "World population is expected to grow from 6.8 billion today to about 9.4 billion by the middle of this century."

That will require an unprecedented increase in food production despite problems such as global warming and a growing scarcity of water in much of the world, Borlaug told Voice of America.

"We need an approach on all fronts of research to make our soils more productive," he said.

"The media also has a responsibility to inform the world of how serious the world food situation is," Borlaug added.

Borlaug on Seeds

Improved wheat seeds developed by Borlaug and associates are credited with saving more than 1 billion people from starvation.

Borlaug has called improved seeds the "catalyst that ignited the Green Revolution" and mineral fertilizer the "fuel" that powers it.

"But hunger and poverty are *seeds of despair,"* Borlaug said. "Those seeds sow anarchy and terror."

Former U.S. Senator George McGovern Attends

Former U.S. Senator George McGovern appeared at a Mexican dinner the evening of the ceremony hosted by Borlaug's daughter, Jeanie Borlaug Laube, in Dallas.

"Dr. Borlaug has been my hero for years," McGovern said. "Borlaug has done more for humanity—by applying science to agriculture—than anyone in history.

"That's why I came to Texas—to honor Norm and wish him *Happy Birthday*!"

McGovern shared the 2008 World Food Prize with former U.S. Senator Robert Dole for "leadership that has

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Nobel Laureate Dr. Norman Borlaug
Honored at 95th Birthday Celebration
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encouraged a global commitment to school feeding and enhanced school attendance and nutrition for millions of the world's poorest children, especially girls."

McGovern unsuccessfully ran as Democratic candidate for the U.S. Presidency in 1972.

Dr. Ed Runge of the Borlaug Institute and director of the Beachell-Borlaug International Scholars Program said, "We must develop ways to *increase* crop production on the same land area if we want to *preserve* land for other uses such as for parks, wildlife, forestry, and grazing lands into the *future.* That is what Monsanto's Beachell-Borlaug Program is *committed to do* for rice and wheat." Runge, former head of the Texas A&M Soil Science Dept., served on the IFDC Board from 1997 to 2007.

For more information on the Beachell-Borlaug scholarships, see http://www.monsanto.com/responsibility/sustainable-ag/produce_more/beachell_borlaug/default.asp.