

IFDC

A QUARTERLY MAGAZINE

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Foundations: Plant Nutrition

- Healthy Crops: A Foundation for Healthy People
- Motor King Revolutionizes Technology Dissemination
- AWD Offers Irrigation Alternative
- Million Dollar Maize for Babies

IFDC Quarterly Magazine

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FREQUENTLY USED ACRONYMS

- **2SCALE:** *Toward Sustainable Clusters in Agribusiness Through Learning in Entrepreneurship*
- **AFAP:** *African Fertilizer and Agribusiness Partnership*
- **AFO:** *AfricaFertilizer.org*
- **ATDP:** *Agro-Based Industries and Technology Development Project*
- **AU:** *African Union*
- **AWD:** *alternate wetting and drying*
- **CATALIST:** *Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability*
- **C4CP:** *C4 Cotton Partnership*
- **DADTCO:** *Dutch Agricultural Development & Trading Company*
- **FAI:** *Fertiliser Association of India*
- **FAO:** *Food and Agriculture Organization of the United Nations*
- **FDP:** *fertilizer deep placement*
- **FSI:** *Fertilizer Sector Improvement*
- **ha:** *hectare*
- **IFA:** *International Fertilizer Industry Association*
- **IFAD:** *International Fund for Agricultural Development*
- **IPI:** *International Potash Institute*
- **ISFM:** *integrated soil fertility management*
- **MOU:** *memorandum of understanding*
- **mt:** *metric ton*
- **NGO:** *non-governmental organization*
- **NUE:** *nitrogen use efficiency*
- **PPP:** *public-private partnership*
- **PReFER:** *Privatization of Rwanda's Fertilizer Import and Distribution System*
- **SMNs:** *secondary and micronutrients*
- **UDP:** *urea deep placement*
- **USAID:** *United States Agency for International Development*
- **VFRC:** *Virtual Fertilizer Research Center*
- **WAFP:** *West Africa Fertilizer Program*

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HEALTH

A Foundation fo



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r Healthy People

Healthy Crops: A Foundation for Healthy People

Hidden hunger is topping agendas. Once taking the back seat in Millennium Development Goal 1, nutrition now sits at the forefront of the Sustainable Development Goal agenda. According to Dr. Amit Roy, IFDC president and CEO, "There's more to feeding people than filling stomachs. We must help them consume nutritious calories." The Green Revolution's push for better seeds and fertilizers doubled yields in several areas of the world. Farmers are growing more food than ever before. World hunger decreased by 100 million people during the past decade,¹ but hidden hunger still affects another 2 billion.² The first step to building healthy food chains is growing nutritious crops. This challenges us to revolutionize fertilizer technology, moving from Volume to Value.

A Nutrient Revolution

Some estimate over 1 billion people are alive today because of the work of Norman Borlaug and other scientists of his era. The Green Revolution focused solely on crop intensification, growing more food on the same amount of land. This focus is still important. Many farmers struggle to access improved seeds and fertilizer, though the situation is slowly changing. However, we must not overlook that food grown by these producers must be healthy. The world needs a Nutrient Revolution.

IFDC believes a Nutrient Revolution could be achieved in much the same way as the Green Revolution. Food supplies can be fortified with nutrients in the processing stage, such as by adding iron to wheat during milling. But growing nutritious food can begin with feeding crops well. By tapping into already existing input supply systems, new products can be introduced to markets. These innovations can circumvent - or leapfrog - decades-old technologies and practices. For example, zinc-fortified urea could be produced by fertilizer plants already making urea. The product would then follow the same market channels.

"SMN-fortified products aren't the only solution, but we are doing our part in contributing to a nutritious world. The future generations of our planet depend on it."

- Amit Roy, President and CEO of IFDC

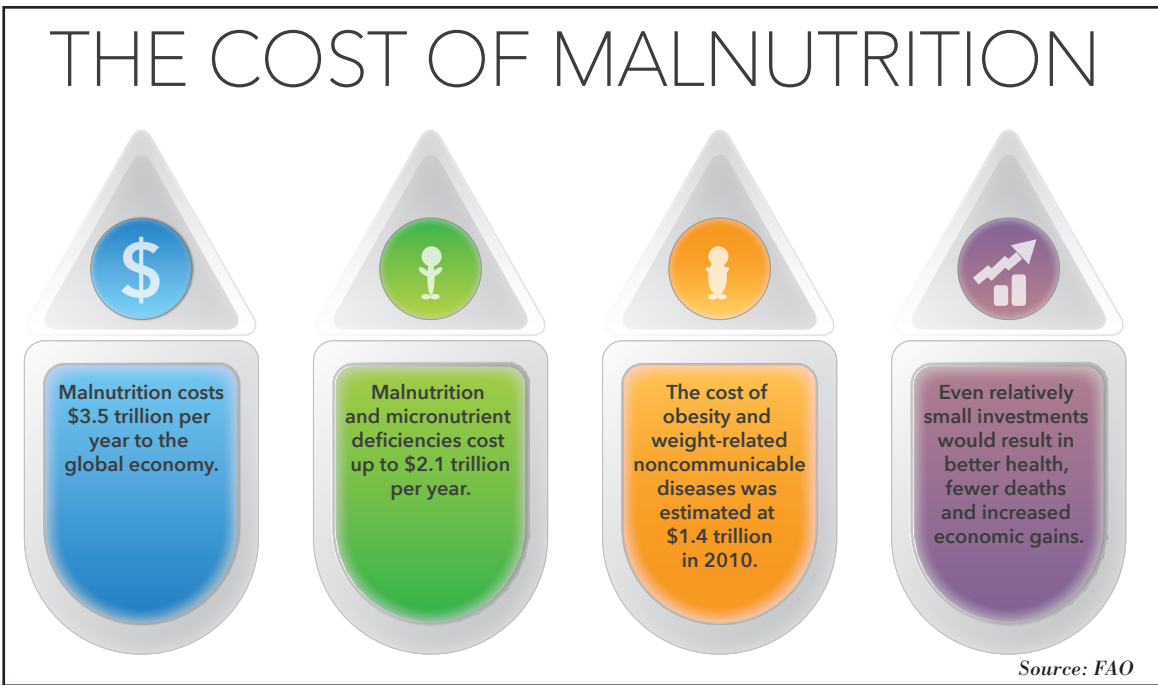
The Virtual Fertilizer Research Center (VFRC) explores several intervention points along the nutrition chain, including fertilizers that deliver micronutrients to the grains of cereal crops. "While this is a complicated process, we believe it is feasible," says Prem Bindraban, executive director of the VFRC. "By utilizing our global team of scientists, we are learning more about plant physiology and micronutrient uptake. This will enable us to find the best way to package micronutrients and get those into farmers' hands," says Bindraban. Research and development organizations must take the first step by discovering appropriate nutrient needs for various crops and locations. Current trials show proper nutrition results from moving beyond the "big three": nitrogen, phosphorus and potassium.

Beyond the Big Three

Nitrogen, phosphorus and potassium represent most of the fertilizer market, having been the norm for more than four decades. Over time, though, this reliance on the big three has mined soils of secondary and micronutrients (SMNs). Plants are hungry for these other nutrients. In trials conducted in East Africa, "yield responses [to SMNs] in general have been significant and in

¹ FAO, IFAD and WFP. 2014. *The State of Food Insecurity in the World 2014. Strengthening the enabling environment for food security and nutrition*. Rome, FAO.

² K. von Grebmer, A. Saltzman, E. Birol, D. Wiesmann, N. Prasai, S. Yin, Y. Yohannes, P. Menon, J. Thompson and A. Sonntag. 2014. *2014 Global Hunger Index: The Challenge of Hidden Hunger*. Bonn, Washington, D.C., and Dublin: Welthungerhilfe, International.



some cases are on the order of 20 to 50 percent,” according to John Wendt, IFDC senior expert in soil fertility management. The catch is SMNs must be provided in the correct combination to the specific crops and locations to realize these yield increases.

IFDC, the VFRC and other organizations conduct research to identify crop and plant needs by region. IFDC trials in East and Southern Africa show the need for fertilizers with higher SMN content. By developing maps and other tools, research organizations lay the foundation for creating new products. Crop- and site-specific nutrient research presents an economically viable solution to nourishing soil, plants and humans. But without channels to get these products to farmers, the technology is practically useless. Industry players have the capability to research and produce fertilizers that address these issues.

Volume to Value

Starting a Nutrient Revolution requires major players in the fertilizer industry to leave the commodity mindset and develop new products that address the full spectrum of nutrition. “These businesses must innovate from volume to value to meet food security challenges,” says Roy. Producing smaller amounts of more efficient fertilizers does not necessarily decrease profits. On the contrary, value-added products proved lucrative for several businesses. The Toros Fertilizer and Chemical Industry in Turkey released zinc-fortified formulations that gave farmers a 10-20 percent increase in crop yields and delivered a necessary nutrient to consumers. Sales increased even though the product was relatively expensive, reflecting its added value. However, the value does not only benefit the fertilizer industry. The global workforce realizes the economic benefits from growing more nutritious food.

Malnutrition costs the global economy \$3.5 trillion per year, according to the Food and Agriculture Organization of the United Nations.³ Investing in nutrition-centered fertilizer research can result in financial growth not only for the agriculture industry but also for the global population. Improving human health is the foundation for a stronger, smarter and more productive workforce.

Healthy crops will support a healthy population. Fertilizer research must move from volume to value. This must be the new status quo. “SMN-fortified products aren’t the only solution, but we are doing our part in contributing to a nutritious world,” says Roy. “The future generations of our planet depend on it.” ●

³ fao.org/zhc/detail-events/en/c/238389/

Reflections from the CEO

Part 2 - IFDC Realigns its Strategy

In just over a decade of existence, IFDC's fertilizer research showed great promise. Success in the lab led to adoption in the field. But overcoming global poverty required more than new fertilizers, so IFDC augmented its approach. The organization began seeing fertilizer as part of a larger economic solution. IFDC implemented projects that strengthened markets to drive sustainable development. In 1991, this holistic market approach solidified a new identity for IFDC when USAID tasked it with fostering the nascent liberalized Albanian agriculture sector.

After the dissolution of Albania's socialist People's Republic in the early 1990s, Albania's farmers struggled to build profitable markets. Arriving in Albania in late 1991, IFDC knew that simply giving away fertilizer would be unsustainable. Instead, a market was created by holding a public fertilizer auction. The would-be dealers were linked to finance options and from there bought and sold fertilizer. This was a turning point for the fledgling agriculture sector and led to the establishment of a dealers' association, imperative for bolstering the economic power of these new entrepreneurs.

"...if approached holistically, agriculture could change the face of growing economies."

The Albania Fertilizer and Agribusiness Dealers Association (AFADA) became "the foundation for Albania's faith in the free market," according to a U.S. Ambassador to Albania. Within a few years, 400 new agribusinesses employed 4,000 Albanians. Albania's agricultural production





rose nearly 8 percent annually through the 1990s and accounted for about half of the nation's GDP, which increased by 20 percent from 1990 to 1995. IFDC knew then that association building plays a key part in reviving agriculture markets and bolstering economies. The tactic breathed new life into IFDC's strategy: if approached holistically, agriculture could change the face of growing economies.

This trend continued through the early 2000s. By then, IFDC had fostered the birth of trade associations across Africa, Asia and Europe. Linking farmers, dealers, retailers and other stakeholders strengthened entire value chains. In Bangladesh, this approach brought great success to IFDC's expansion of urea deep placement (UDP). Partnering with the private and public sectors, IFDC scaled out the technology to more than 2 million farmers who enjoy income increases of 30 percent. In addition, the Government of Bangladesh has saved more than \$65 million in urea subsidies during the past three years.

“When presented with a challenge, IFDC rose to the occasion and exceeded expectations.”

In Africa, the Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship (2SCALE) project represents the mature approach that began in Albania. 2SCALE mobilizes and trains groups of farmers, and it creates the linkages to ensure that all elements for a successful value chain - technology, organizational capacity, market access, credit, extension advice - are in place. By 2016, more than 500,000 farming families will have increased their incomes by 30 percent.

Had IFDC continued only to develop new fertilizers, many farming families may still be growing just enough food for their families and have little left for sale. Instead, their children eat nutritious meals, learn better at school and live without fear of tomorrow. When presented with a challenge, IFDC rose to the occasion and exceeded expectations. In the future, we will continue to do so - until all the people of the world live nourished, productive and profitable lives. 🍌



NGO Replicates UDP in Vietnam

In 2005, CODESPA implemented a fertilizer development program in Vietnam dedicated to increasing crop yields while simultaneously reducing the amount of fertilizer needed. CODESPA accomplishes these goals by adapting IFDC's fertilizer deep placement (FDP) technology to local conditions, improving the lives of farmers across Vietnam. Reaching more than 40,000 farm households, the project has been met with success and still operates to this day.

UDP Gains Ground in Myanmar

As of March 2015, 646 farmers, through IFDC's Fertilizer Sector Improvement (FSI) project, have been trained in UDP technologies utilizing 135 acres of land in Myanmar. Although numbers have been modest so far, the response to UDP adoption in Myanmar is encouraging. Farmers who had never heard of the technology before were quick to conduct trial runs on small areas. The remarkable results in these test areas have sparked UDP interest in farmers for later seasons.



IFDC Recognized for Introducing Hybrid Maize

Recently, the Bangladeshi media recognized IFDC's introduction of hybrid maize into Bangladesh under the Agro-based Industries and Technology Development Project (ATDP) as a key milestone in the current maize sector in the country. Learning from the Fertilizer Distribution Improvement (FDI) II project, some Bangladeshi farmers have diversified their crop portfolio, growing rice and maize, which requires comparatively less water to produce.



Government Extension Agents Make Great Trainers in Bangladesh

Seventy percent of AAPI's farmer trainings are conducted by Department of Agricultural Extension (DAE) Sub-Assistant Agriculture Officers (SAAOs). IFDC uses the training of trainers (ToT) model for SAAOs, who work directly with farmers and build trust with project beneficiaries. In the farmer training programs, lead farmers who used UDP technology are invited to exchange their experiences on best farm management practices, sharing their knowledge and success stories. The SAAOs teach the use of good seeds, soil health maintenance, application of balanced fertilizer and a number of other good agricultural practices such as line sowing, integrated pest management, alternate wetting and drying (AWD) and FDP. This approach yields noticeable results. In one village, farmers only used FDP on five hectares (ha) of land. After only seven batches of farmer training, bringing lead farmers in the program, more than 300 ha of farmland were fertilized using FDP.

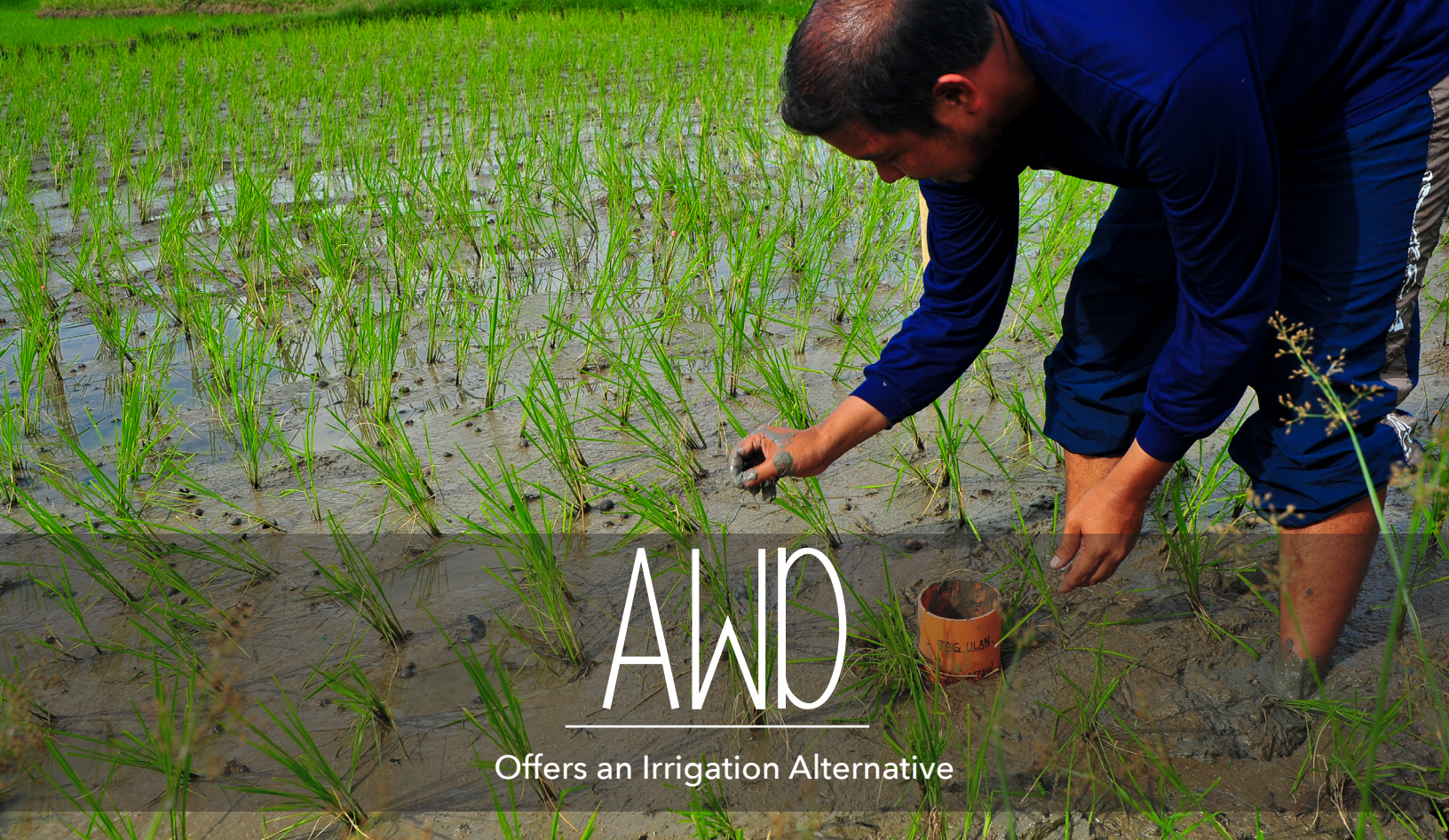


Photo: International Rice Research Institute (IRRI)

Water use efficiency remains a primary concern in Bangladesh. There is an increasing perception among the policymakers and water experts that Bangladeshi farmers use more water than needed for rice production. Irrigation experts have reported that at present farmers are using 3,000 to 5,000 liters of water to produce one kilogram (kg) of rice. By utilizing alternate wetting and drying (AWD) systems, in which farmers rotate the period of days they flood their fields, water use can be lowered by 25 percent without affecting yield. This reduces the cost of irrigation, enabling farmers to afford to judiciously irrigate their rice paddies.

During the past four years, the Accelerating Agriculture Productivity Improvement (AAPI) project has set up several demonstration plots to conduct pilot tests on the use of AWD technology. In these demo plots, 50 percent of the land (2.5 acres) is receiving water as per farmers' practice, while on the other 50 percent of land (2.5 acres), AWD is being practiced.

Preliminary results show that while AWD does decrease water usage in the right conditions, certain variables have a tendency of interfering with the success rate. Under current minor irrigation management systems, three types of irrigation equipment are in use: deep tubewell (DTW) and shallow tubewell (STW) for extracting groundwater, and low lift pumps (LLPs) for lifting surface water either from a river or canal. Depending on the capacity of pumps, each has a different command area. The cost of such equipment is typically beyond the reach of small and marginal farmers. In addition to this, the interval of irrigation varies from region to region and demo to demo due to wide variations in soil texture and structure among different regions.

Research suggests that the water saved through AWD irrigation methods outweighs the challenges. Adoption of AWD technology will progress relatively quicker if the benefits of efficient water use can be effectively demonstrated to the farmers, especially in areas where STW irrigation equipment is owned by a single farmer and where farmers bring their fuel to purchase water according to their need. AAPI is looking forward to identifying such locations for wider adoption of AWD technology. 🍌



IFDC-Founded

Trade Association Flourishes in Bangladesh

In the late 1970s, USAID and IFDC implemented the Fertilizer Distribution Improvement (FDI) I and II projects, which helped the Government of Bangladesh (GOB) privatize fertilizer marketing and distribution in order to improve market efficiency and promote entrepreneurship. The program succeeded beyond expectations. By the time the project closed in mid-1994, there were a number of private sector fertilizer importers: 10,000 wholesalers, 20,000 private dealers and 100,000 retailers. The privatized system was more responsive to markets and farmers' needs, and prices of fertilizers were intensely competitive. As a result of this more efficient marketing system, fertilizer costs to farmers were lowered considerably.

While implementing the FDI II project, IFDC founded an association to advocate for pro-fertilizer policies with the GOB. The goal was to encourage the government to continue implementing the competitive fertilizer marketing system and protect the interest of the local Bangladeshi farmers. After a strenuous effort of counseling with fertilizer importers, wholesalers, dealers and officials of the Ministries of Agriculture, Commerce and Industries, IFDC was able to form the Bangladesh Fertilizer Association (BFA) in early 1994. The BFA began with only 400 members and has now grown to more than 7,000. BFA fertilizer dealers, importers and producers currently serve about 18 million Bangladeshi farm families through 45,000 registered retailers.

Among all current trade associations, BFA is now considered to be the largest trade body of Bangladesh under the umbrella of the Federation of Bangladesh Chamber of Commerce and Industries (FBCCI). IFDC links BFA with various international organizations such as the International Fertilizer Industry Association (IFA), the Fertiliser Association of India (FAI) and the International Potash Institute (IPI). With these strengthened linkages, BFA is gradually stepping into the international arena and has organized a number of international seminars/workshops in cooperation with these organizations. 🍊



UDP

Adoption Leads to Urea Savings in Bangladesh

The Government of Bangladesh (GOB) is supporting IFDC activities for the expansion of urea deep placement (UDP) technology. The Bangladesh Department of Agricultural Extension (DAE) works with IFDC to encourage farmers to adopt UDP to increase crop production, incomes and subsidy savings for the government. Subsidy savings generated by the use of UDP have saved the GOB more than \$65 million in the past three years with large impacts even at the *upazila*, or village, level.

Josh DeWald, director of IFDC's EurAsia Division, and Ishrat Jahan, AAPI chief of party, recently visited the Avoy Nagar *upazila* of the Jessore district. While there, DAE field officials discovered that a substantial quantity of urea had remained unsold at dealers' and retailers' shops during the peak season of urea topdressing in the 2015 *Boro* rice season.

Previously, the DAE officials had requested a specified amount of urea from the Ministry of Agriculture for Avoy Nagar to use in the 2015 *Boro* rice season. Accordingly, urea was allotted to them. However, according to Dipak Kumar Roy, the *upazila* agriculture officer of Avoy Nagar, farmers had applied about 1,311 metric tons (mt) of UDP on 7,600 ha of *Boro* rice land during the past year – significantly less than the planned amount.

Farmers who have adopted UDP technology do not topdress their fields with urea. Also, UDP utilizes approximately one-third less nitrogen fertilizer than broadcast urea. Roy estimated that about 969 mt of urea had been saved in Avoy Nagar solely because the local farmers had adopted UDP technology during the last *Boro* season.

The value of the saved urea from just this one *upazila* (sub-district) in a single season was around \$0.4 million¹, which can be attributed to the overall reduction of nitrogen fertilizer use due to increased UDP adoption. With this knowledge in mind, IFDC and the GOB are continuing to support UDP expansion so that positive results such as these can continue to be replicated. 🍊

¹ The average BCIC urea imported price was U.S. \$416, including FOB, freight and local costs.

esafd briefs



The Privatization of Rwanda's Fertilizer Import and Distribution System (PReFER) project gave more than 3,000 agronomists, extensionists and agro-dealers a manual on establishing fertilizer demonstrations. Published by the Rwanda Agricultural Board, PReFER and IFDC's Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability-2 (CATALIST-2) project, the manual includes national maps of soil nutrients. IFDC also distributed 5,500 fertilizer demonstration kits to government extension staff and non-governmental organizations (NGOs) in Rwanda. The kits contain fertilizers with secondary nutrients, micronutrients and lime, along with familiar macronutrient fertilizers. Due to policy support from PReFER, the Rwandan government's 2015-2016 subsidy program will include fertilizers enriched with the required secondary and micronutrients such as boron and zinc.

IFDC and the Dutch Agricultural Development & Trading Company (DADTCO) signed a public-private partnership (PPP) agreement to expand the market for cassava roots in Nampula and Inhambane, Mozambique. In 2011, DADTCO and IFDC began processing cassava roots produced by Mozambican smallholders into cassava cake. Processing takes place through DADTCO's mobile processing units that bring the factory to the farmer. Cervejas de Moçambique uses the cassava cake to brew Impala Beer. Currently, DADTCO sources cassava from about 6,000 farmers in Mozambique, injecting Mts. 1,000,000 (U.S. \$28,000) per month into the local economy.

The Toward Sustainable Clusters in Agribusiness Through Learning in Entrepreneurship (2SCALE) project created 53 PPPs and strengthened linkages between partners. Each PPP involves multiple agribusiness clusters and hundreds (sometimes thousands) of farmers. Some PPPs involve large numbers of farmers and an integrated package of innovations (for example, new seed varieties combined with market linkages, crop insurance and low interest loans). Others center on a particular technology- or business-related innovation. Notable partners include Heineken in Nigeria and DADTCO in Mozambique. Both are transforming the smallholder cassava sector, providing a huge new market for cassava roots.



IFDC and the Ethiopian Agricultural Transformation Agency (ATA) signed an MoU in March 2015 formalizing joint activities. The aim is to help smallholder vegetable farmers transition from subsistence to market-oriented production. IFDC and ATA work with the Meki Batu farmer union, which supplies vegetables to Addis Ababa. ATA oversees field activities, and both organizations train farmers, create market linkages and develop outgrower schemes. Other activities include disseminating low-cost water pumps for irrigation, promoting mechanization and enlisting horticulture industry experts to overcome specific challenges in production and business development.



IFDC partners with Uplift the Rural Poor (URP) in Uganda to add value to farmers' produce by using standardized potato packaging made from environmentally friendly materials such as bamboo baskets and sisal gunny bags.



Shalem Investments won the EMRC-Rabobank Project Incubator Award at the EMRC Agribusiness Forum in Kinshasa, Democratic Republic of Congo (DRC). Shalem, a sorghum trading and processing firm in Kenya, is a 2SCALE partner.

Two of the five finalists were 2SCALE partners - Shalem and CB Farm Fresh, a Mozambican trading and processing firm. The award, which includes a \$15,000 cash prize, encourages innovation by African agribusinesses. This initiative, launched by EMRC, a Brussels-based international non-profit organization, is co-sponsored by the Rabobank Foundation (Netherlands) and the African Development Bank.

Ruth Kinoti, CEO of Shalem, plans to invest the prize money to expand her sorghum business: "We have the opportunity, we have the farmers - and with support from 2SCALE, we have the business linkages to grow." The company will establish contracts with 14,000 farmers, including at least 10,000 women. All farmers under contract will receive training, technical support and linkages to banks and micro-finance providers.

Shalem already has helped mobilize 320 farmer groups and created more than US \$3.5 million in wealth for small-scale farmers. The Shalem-2SCALE partnership covers a range of activities. Training programs promote new high-yielding, disease-resistant hybrids and improved crop and soil management methods. Using the E-Prod software platform developed by another 2SCALE partner, Shalem is moving from paper-based to electronic recordkeeping and monitoring. Another partner, SoilCares, has begun a large-scale soil-testing program to diagnose nutrient deficiencies in the fields of Shalem farmers.

2SCALE support has helped the company diversify its customer base and its product range. Once an aggregator for a single large buyer, Shalem now serves a range of customers - from food processors to feed manufacturers to development programs. It is also developing new sorghum-based products, including animal feed, and nutritious 'fortified' sorghum flour for low-income families.

"Before we began this partnership, there was hardly any commercial market for sorghum," Kinoti explains. "But now we receive hundreds of inquiries from farmers wanting to join our producer groups. In two years, I am confident that sorghum will become one of the biggest cash crops in this region." ●



Million Dollar Maize

for Babies

GUTS Agro, a food processing firm and 2SCALE private sector partner in Ethiopia, is sourcing maize and soybeans worth \$1.2 million from 2SCALE agribusiness clusters. The company uses the crops to produce baby food that is affordable for low-income customers. The new product “Supermom’s,” a high-protein corn-soya blend for children, will be manufactured for the first time in Ethiopia. Production trials (pictured above) are complete, and the first batch of baby food will arrive in the market later in 2015.

GUTS Agro signed contracts with two farmer unions, Sidama Elto for maize and Hunde Chewaka for soybeans. The firm is paying farmers an advance of \$250,000 to help meet the costs of collection, grading and delivery. 2SCALE will complement the company’s investment with a grant of 1.2 million Ethiopian Birr (\$60,000) for product development, marketing and distribution. 2SCALE and GUTS Agro will test a marketing innovation in which micro-entrepreneurs sell Supermom’s and other GUTS products door-to-door in low-income areas.

2SCALE linked the company with farmer groups and trained farmers and extension staff on post-harvest handling methods to reduce waste and maize storage losses. A “cascade” approach was used, reaching more than 2,600 farmers and 140 government extension agents. Trainees received an illustrated manual, in the local language, describing post-harvest handling techniques. GUTS Agro and 2SCALE jointly produced the manual; more than 5,000 copies have been distributed to farmers.

Technical assistance through 2SCALE has strengthened the supply chain at multiple levels. GUTS Agro has successfully decreased its production costs by increasing the efficiency of its production line and by using technical innovations that reduce the cost of energy. The company now has a strong supply line and an efficient distribution system to reach its target market. 🟡

CATALIST-Uganda Improves Potato Seed Quality

Seed potato quality is essential for healthy crop growth, yields and profitability. But most Ugandan potato farmers rely on selecting small potato tubers from ware¹ potato harvests and saving the seed. They recycle the seed year after year, rendering it susceptible to seed-borne diseases, especially bacterial and viral pathogens. This practice leads to seed degeneration and low productivity. IFDC's CATALIST-Uganda project is introducing better varieties of potatoes with good processing qualities, improving seed quality for existing varieties and teaching proper post-harvest handling methods.

IFDC assisted the Kachwekano Zonal Agricultural Research and Development Institute (KAZARDI) and a private seed potato farmer in the construction of seven seed production screen houses that allow farmers to grow quality seed potatoes more efficiently. With CATALIST support, KAZARDI is cleaning² and multiplying three farmer-preferred varieties of potatoes (Rwangume, Kinigi and Rwashaki) using thermotherapy techniques for virus elimination. The plantlets will form potato-starting planting materials that will be rapidly multiplied through a tissue culture laboratory. So far, 1,017 virus-free plantlets have been generated and are ready for weaning and subsequent planting in aeroponic screen houses. They will then be used to produce clean mini-tubers.

The generated mini-tubers will produce pre-basic seed potato to be given to trained seed potato producers. The producers will multiply it only once and then supply the generated seed to ware potato farmers. This system will reduce the number of seed multiplication cycles, thus minimizing accumulation of seed-borne diseases.

To further improve seed quality, CATALIST-Uganda holds training demonstrations, equipping farmers with the knowledge and skills necessary for selecting healthy plants and managing seed potato gardens. In total, 525 farmer groups completed training in southwestern Uganda. Farmers are also trained in improved post-harvest handling and storage. In addition, IFDC and partner organizations constructed several storage structures. To date, 18 Diffused Light Stores have been built in southwestern Uganda. These facilities provide proper lighting and ventilation for seed potato sprouting. 🍌

¹ "Ware" potatoes are potatoes for consumption, not for seed production.

² "Cleaning" rids seeds from pests and diseases.



nwafd briefs



C4CP Funds Participation of Regional Stakeholders at Global Event

The USAID West Africa C4 Cotton Partnership (C4CP) project funded the participation of 12 cotton sector representatives from the project's four National Advisory Committees and other C4 cotton sector partners at the 13th annual conference of the African Cotton Association held on March 12, 2015, in Cotonou, Benin. The theme was "Cotton Sector: A basis for food security." This event gathered more than 250 global representatives of cotton companies, ginners, marketing companies, firms and producers. C4 participants greatly appreciated the opportunity to learn from the international experience.



Groundbreaking Ceremony Held for Seed Labs

A groundbreaking ceremony was held on March 3, 2015, in Tamale, Ghana, with USAID Ghana mission director Jim Bever, marking the beginning of construction of three seed laboratories, one of which will be located in Tamale. The Feed the Future Ghana Agriculture Technology Transfer project is facilitating the construction and equipping of these seed labs. When completed, the facilities will use international standards to ensure farmers in the northern region of Ghana have access to high-quality seed.

WAFP Promotes Soil Testing Kits

The USAID West Africa Fertilizer Program (WAFP) and its partners hosted a two-day regional workshop to review portable soil testing kits and develop a road map for their efficient use in West Africa. Participants reviewed and demonstrated several commonly used test kits. The 50 participants, representing the private sector, farmer organizations as well as research, extension and soil fertility-related development partners, delivered recommendations for implementing these kits in West Africa.



ATT Project Supports Pre-Season Event

The Ghana Agri-Input Dealers Association (GAIDA), with support from Feed the Future Ghana Agriculture Technology Transfer and the Agricultural Development and Value Chain Enhancement II (ADVANCE II) projects, successfully hosted the 5th Pre-Season Planning and Networking Forum on March 26, 2015, in Tamale, Ghana. Themed "Smart Technologies for Increased Productivity," the event brought together more than 800 maize, rice and soybean value chain stakeholders to interact, plan and establish market linkages for the 2015 production season.



Motor King

Revolutionizes Technology Dissemination

It is a cold and dry evening in Dalung, a rice farming community located in the Kumbungu District of the Northern Region of Ghana. Usually everyone goes to sleep early during this time of year, but the community showed no sign of retiring to bed soon. The chief and more than 200 rice farmers in this community are glued to a documentary describing the benefits of better fertilizer technology.

The Feed the Future Ghana Agriculture Technology Transfer project has adopted an innovative way of disseminating technology to farmers. Video screening equipment is packed onto a tricycle, known as a “Motor King,” which travels from community to community to show documentaries on innovative agricultural technologies.

In only nine days, 1,129 people in the district, including 462 women, viewed a UDP video featured during the dry season. The chief of Dalung, Alhaji Mahama Amidu, was one of seven chiefs who pledged to champion UDP technology in the area. Amidu said that UDP has the potential to ensure food security and increase incomes for farmers and laborers. “To show the way for my community members, I will cultivate three acres of rice and apply UDP technology this dry season. The time has come for us to adopt yield-increasing technologies. We cannot continue with some of our old farming methods. I heard about it on TV, and I am happy we are being introduced to it,” he said.

As part of the project’s efforts to upscale technology dissemination in Northern Ghana, more “Motor Kings” will be made available in the project’s zone of influence to show videos on UDP and other good agronomic practices for maize, rice and soybean, such as integrated soil fertility management (ISFM). Thus far, about 600 rice farmers in the Botanga irrigation scheme are establishing 100 m² demonstration plots on their own fields to compare the results of the UDP technology with their traditional practice. ●



A Win-Win Opportunity

Inclusive Growth for Farmers and Reliable Sourcing for Brewery

Nigerian Breweries Plc, a full subsidiary of Heineken and the leading Nigerian brewery, signed a partnership agreement with Pсалtry International Company Ltd. and IFDC to source cassava locally. The 2SCALE project facilitated the partnership.

This partnership strengthens the cassava value chain in Nigeria and allows small-scale farmers to increase their cassava yields and quality through technical assistance, training and access to finance. This and other 2SCALE PPPs achieve two things at once: efficient sourcing for buyers and reliable markets for farmers. Moreover, farmers participating in the value chain learn to increase yields of cassava and are linked to a market to buy their crops - thus increasing their profit.

2SCALE and Pсалtry have sensitized, mobilized and trained more than 550 farmers. Already, they have supplied more than 32,000 tons of cassava roots to Pсалtry's processing factory. Nicolaas Vervelde, managing director of Nigerian Breweries, said, "As an operating company of Heineken with a long-standing commitment to Nigeria, our company's target is to support local economic development and promote inclusive growth by sourcing agricultural raw materials locally and utilizing them in our operations. Through our partnership with Pсалtry and IFDC, we are taking a big step toward further realizing this ambition."

The agreement is a follow-up to the Memorandum of Understanding signed in June 2014 between Pсалtry, Nigerian Breweries Plc and 2SCALE, a project facilitating the development of PPPs, funded by the Dutch government to spur inclusive agribusiness development in East and West Africa.

The agreement was facilitated by the BoP Innovation Center (BoPInc), one of the partners in the 2SCALE program. 🍌

West Africa Fertilizer Businesses Establish Linkages with OCP

Representatives of 11 West African fertilizer enterprises paid a three-day business visit to the Office Chérifien des Phosphates (OCP) in Morocco. Participants explored opportunities to establish partnerships and networks to increase supply and distribution of fertilizers in West Africa.

Organized by the USAID West Africa Fertilizer Program (WAFP) with support from OCP, the tour forms part of the project's efforts to improve levels of fertilizer consumption in sub-Saharan Africa. Bringing together OCP, a giant producer of primary raw materials for fertilizer production, and blending and distribution companies facilitates appropriate linkages and business deals between actors at the various levels of the value chain to improve regional fertilizer supply.

With a new fertilizer production capacity of 1 million tons per year, targeted at African markets, OCP has indicated its interest in developing and creating new partnerships with West African fertilizer importers and distributors. The tour served to introduce OCP to companies that are interested in forming part of a distribution network for OCP's products in West Africa.

Participants toured OCP's phosphorus production facility in Jorf Lasfar, Morocco, to get acquainted with the processes for mining and processing raw material into diammonium phosphate (DAP) fertilizer products. There were also opportunities for company representatives to have exclusive meetings with OCP officials to discuss possible linkages between their respective companies.

Cherefou Mahatan, head of administration of MANOMA SA of Niger, believed the visit opened the way for fertilizer enterprises in West Africa to expand to their full potential. "This relationship... is a very positive one for the future of the fertilizer industry in West Africa. When managed properly, it will help inject efficiency and reliability along the supply chain and subsequently lead to improved availability of relevant fertilizers for our consumers," said Mahatan.

Post-visit follow-ups have revealed that several of the visiting companies have already begun business partnerships with OCP and are in the process of purchasing fertilizers for distribution in West Africa. 🟡




VFRC

VFRC Advances New Packaging of Nutrients

When mineral fertilizer research and production began in the early 20th century, scientists focused on producing large amounts of product to address nutrient depletion in cultivated soils where fertility and productivity had declined. The Haber-Bosch Process was no exception. It set the stage for an industrial fertilizer revolution. Now the nitrogen fertilizers produced via that process significantly contribute to feeding half the earth's population. But it is a double-edged sword, with fertilizer overuse harming the environment and humans. The Virtual Fertilizer Research Center (VFRC) collaborates with global scientific teams to create fertilizers that provide these needed nutrients but mitigate environmental harm.

"Application of primary nutrients only (i.e., nitrogen, phosphorus and potassium [NPK]) mine soils of secondary and micronutrients (SMNs). This depletion levels off yield potential," says Christian Dimkpa, VFRC research scientist. "In addition, the overuse and poor management of nitrogen results in contamination of water sources and emission of greenhouse gases." In other cases, though, underuse of NPK fertilizers limits yields and intensively mines soil nutrients. This situation, according to the World Bank, is "a scenario for disaster over the long run." Therefore, fertilizer research should move beyond NPK-only fertilizers and, considering crop needs, incorporate other nutrients alongside these primary nutrients.

NPK alone does not guarantee long-term universal yield increases because crops require 14-17 nutrients, depending on the crop. Adding boron, calcium, magnesium, sulfur and zinc and a number of other SMNs will be required to sustain yields. The VFRC researches SMN interactions with crops to identify specific crop needs. "The use of fertilizers should be about feeding the crop and not the soil," argues Dimkpa. Current nitrogen use efficiency (NUE) sits at a low average of 33 percent, with most of the nutrient being lost via denitrification, leaching, runoff and volatilization. Addition of SMNs to widely-used fertilizer formulations - and for specific crops and locations - creates the potential for higher NUE. The underuse of N is a similar story.

"Current fertilizer technology can be very effective if properly used. But we can certainly make future products more efficient."

- Prem Bindraban, VFRC Executive Director

Soils in Africa, Eastern Europe and, to a lesser extent, the Middle East and South America, hunger for not only SMNs but also nitrogen and phosphorus. The impacts of underuse are at first obvious: if crops are not "fed," they will not grow. Over time, the planting of highest-calorie-per-acre crops (such as maize and rice) drain soil nutrients to the point of intense degradation. Application of the primary nutrients and best management practices (such as residue management and legume rotations) proved the foundation for reinvigorating these tired croplands, but optimal yields will only be achieved when SMN needs are met. Many of these nutrients enhance the efficiency of nutrient uptake by plant roots, especially of N and P - ultimately leading to healthier plants and larger yields.

Proper packaging enhances the effects of better uptake and, therefore, lessens environmental harm. Simply, innovative fertilizer packaging means rethinking the form in which nutrients

are encapsulated and presented to plants. Currently, fertilizers are available in prill, granular powder, liquid and briquette forms, among others. Some of these are more efficient than other forms, but the VFRC believes significantly better improvements can be made. "We envision that future fertilizer research will advance from bulk engineering and chemistry to fine bio-nano-chemistry," says VFRC Executive Director Prem Bindraban. While packaging technologies this way may result in higher costs for farmers in the short run, overall, they will use less fertilizer - saving money and reducing fertilizer's environmental footprint. "This strategy may be particularly relevant for micronutrients that are required in small quantities but have high yield effects," says Bindraban.

The VFRC aims to create synergy between research organizations, universities and the private sector to lead the way in future fertilizer research and overcome the challenge of feeding 9 billion by 2050 under exacerbating climate conditions. "Can it be done? Of course," Bindraban notes, "But we must collaborate with a sense of urgency and correct vision. Current fertilizer technology can be very effective if properly used. But we can certainly make future products more efficient."



Featured Blog: Building Foundations for Female Entrepreneurs

3 Female Farmers Who #MakeltHappen

Smallholder farmers face many challenges, not the least of which are depletion of soils and limited access to inputs and profitable markets. Women farmers encounter even more barriers than these, including lack of land ownership and the inability to acquire loans. Women, though facing these hurdles, are a crucial piece in global agricultural development. Development organizations help build foundations to make them strong entrepreneurs.



Empowering women farmers to grow more food – and sell it – increases food availability for 150 million individuals. The work, often unseen and unrecognized, brings the hope of change and prosperity for millions. Facing the task of increasing global nutrition, female farming entrepreneurs can #MakeltHappen. IFDC is committed to partnering with them to build foundations for prosperity.




IFDC believes women farmers are a necessary part of local and global agricultural development. On average, women comprise nearly half of the world’s agricultural workforce. In Bangladesh, the Walmart Foundation Component of IFDC’s AAPI project targets 40,000 women for the use of improved fertilizer technology in their home gardens. These women grow more vegetables, increasing household nutrition and income. The Feed the Future Ghana Agriculture Technology Transfer project works with women’s groups to help them grow more rice to give food security to their homes, communities and their nation.

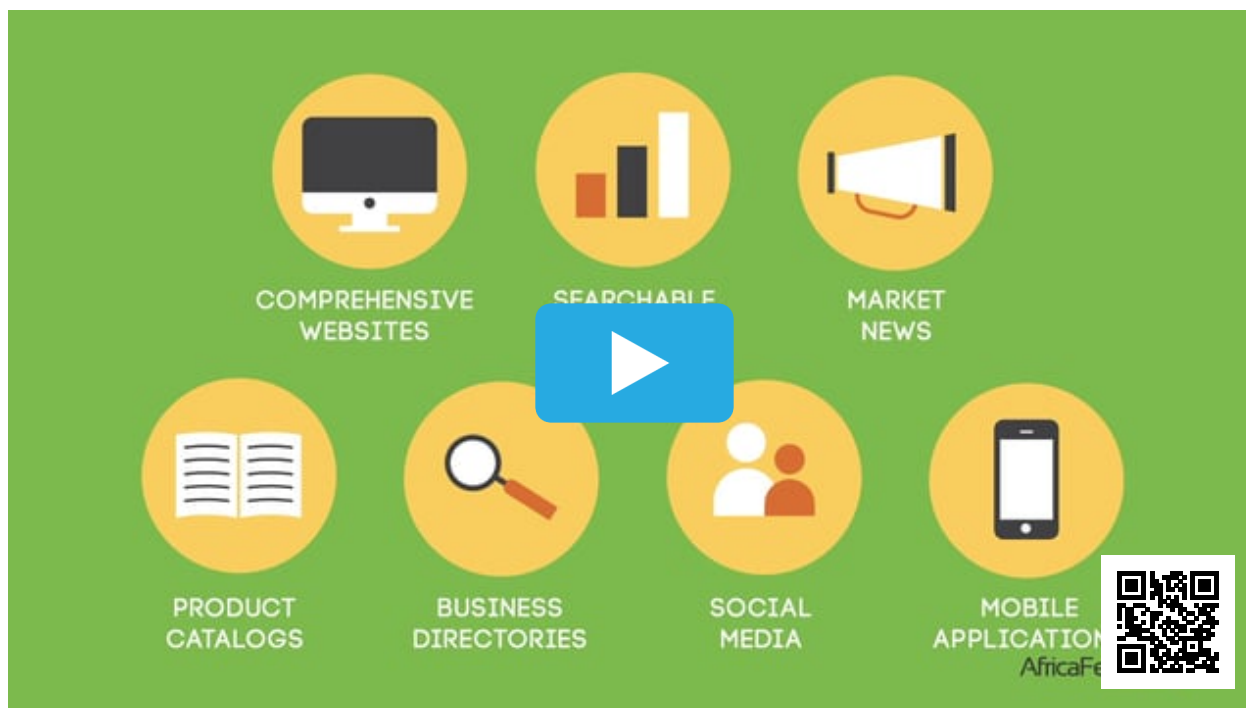
These women entrepreneurs are making a difference. Read the stories of Saly, Ténin and Kadia – three female farmers from Mali – at bit.ly/1Fa1CP9.

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Patrice Annequin: Harnessing Fertilizer Market Information for an African Green Revolution

With 60 percent of the world's uncultivated, arable land, Africa has tremendous potential for substantial increases in agricultural production. To boost food security, the continent needs a vibrant agricultural supply chain and relevant market information. Farmers, business actors and policymakers require statistics on fertilizer trade, production and consumption to inform their strategies and develop a profitable agribusiness sector. However, data on African fertilizer use and markets remain insufficient.

To address this challenge, AfricaFertilizer.org (AFO) launched in 2009, facilitating the exchange of information on soil fertility, fertilizers and good agricultural practices in Africa. AFO brings together the world's most reliable resources and expertise from global leaders in the fertilizer industry and makes the information available in an easy-to-access platform. The initiative equips fertilizer actors with rich resources and market information on fertilizer products, supply and operators.

In 2015, AFO launched a new version of its web portal with expanded features and content. The revamped website addresses a critical information gap - by providing the data needed to develop an informed and powerful response to address Africa's food insecurity.

Features include:

- A fertilizer directory providing a comprehensive listing of agribusiness and fertilizer production companies operating in Africa.
- A searchable database of officially traded fertilizers, with accompanying production capacity data and market prices.
- Data visualization tools to create graphs and see trends, enabling real-time data comparisons and analysis.

IFDC leads AFO in partnership with IFA, the African Fertilizer and Agribusiness Partnership (AFAP), the Food and Agriculture Organization of the United Nations (FAO) and the African Union (AU) Commission. Working with the private sector, research institutions and multilateral organizations, the initiative is dedicated to facilitating the right policy and business decisions to feed the soils that feed Africa's people. ●

PARTING SHOT



In Myanmar, the FSI project brings new technology to rice farmers. In April, the smallholder rice farmers of Hnget Thaik village in the Yangon region harvested rice cultivated with UDP and compared yield results with rice grown using traditional urea application. The new technology demonstrated a 23 percent yield increase.

IFDC and VFRC Board Updates



Margaret Catley-Carlson



Mark Keenum



Steven Leath



Rhoda Peace Tumusiime



Margaret Catley-Carlson, patron of the Global Water Partnership and member of the IFDC board of directors since 2006, spoke at the Connecting Water Resources 2015 conference in March. Her presentation, "Agriculture Futures: Growing more food AND protecting the resource base," addressed the topics of water conservation and increased yields in agriculture.



Mark Keenum, president of Mississippi State University and IFDC board member, launched an aviation program aimed at increasing food security. The program, 2 Plus 2, is a joint effort between Hinds Community College and Mississippi State University. It uses precision agriculture to improve crop yields.



Steven Leath, president of Iowa State University (ISU), gave a keynote speech at a World Food Prize Youth Institute STEM event in April. The event provided over 400 high school students the opportunity to interact with proponents of and professionals in the STEM field. Leath also gave the American Association for the Advancement of Science (AAAS) Charles Valentine Riley Memorial Lecture, which emphasized the economic importance of pursuing a unifying message to make agriculture a national priority in the United States.



Rhoda Peace Tumusiime, Commissioner for Rural Economy and Agriculture at the African Union Commission, spoke at the 11th Meeting of the Partnership Platform of the Comprehensive Africa Agriculture Development Program (CAADP) in Johannesburg, calling for heightened efforts for modernizing African agriculture. At Expo Milan 2015, she spoke on the theme: "Feeding the Planet, Energy for All." Tumusiime has served on IFDC's board of directors since 2010.



Peter McPherson



Juergen Voegele



M. Peter McPherson, president of the Association of Public and Land-Grant Universities (APLU), received an honorary doctorate from the University of Maine. Upon receiving the doctorate, McPherson delivered a keynote address on the role of land grant universities in the 21st century.

McPherson is chairman emeritus of the IFDC board of directors and serves on the VFRC board of advisors.



Juergen Voegele, senior director of Agriculture, World Bank, took part in India's 12th Agricultural Science Congress at the National Dairy Research Institute (NDRI) in February. At the congress, Voegele proposed that India's government develop a policy framework for sustainable farming. He

stressed the importance of increasing productivity among small farmers. In March, Voegele gave a presentation at the Global Forum for Innovations in Agriculture. His talk covered increasing sustainable productivity and achieving food security while simultaneously reducing

the harmful emissions it takes to achieve those goals. Voegele is a member of the VFRC board of advisors.



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2015 International Training Calendar

Nitrogen Fertilizer Production Technology with IFA	Vienna, Austria	June 22-26
Linking Farmers to Markets in Africa	Nairobi, Kenya	July 20-24
Technology Advances in Agricultural Production, Water and Nutrient Management	USA (Alabama, Arkansas, Illinois, Missouri, Tennessee and Washington, D.C.)	August 24 - September 4
Phosphate Fertilizer Production Technology with IFA	Berlin, Germany	October 5-9
Promoting Innovative Composting Alternatives of Agricultural and Municipal Waste	Accra, Ghana	November 2-6
Fertilizer Policy and Marketing Strategies in Africa	Arusha, Tanzania	November 16-20
DSSAT–Decision Support Systems for Agro-Technology Transfer: Assessing Crop Production, Nutrient Management, Climatic Risk and Environmental Sustainability with Simulation Models	Addis Ababa, Ethiopia	December 14-19