



IFDC

A QUARTERLY MAGAZINE

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Foundations: Soil Fertility

- Soil: The Great Connector
- 2SCALE Builds New Dairy Partnerships in Kenya
- Balanced Nutrition Research
- VFRC Activities Address Soil Health

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FREQUENTLY USED ACRONYMS

- **2SCALE** - Toward Sustainable Clusters in Agribusiness Through Learning in Entrepreneurship
- **AAPI** - Accelerating Agriculture Productivity Improvement
- **ABC** - Agribusiness Cluster
- **AFAP** - African Fertilizer and Agribusiness Partnership
- **AGRA** - Alliance for a Green Revolution in Africa
- **CATALIST-2** - Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability
- **DADTCO** - Dutch Agricultural Development & Trading Company
- **DAE** - Department of Agricultural Extension
- **FAO** - Food and Agriculture Organization of the United Nations
- **FDP** - Fertilizer Deep Placement
- **FSI** - Fertilizer Sector Improvement
- **FTF USAID ATT** - Feed the Future USAID Agriculture Technology Transfer
- **GHG** - Greenhouse Gas
- **IFPRI** - International Food Policy Research Institute
- **ISFM** - Integrated Soil Fertility Management
- **MoU** - Memorandum of Understanding
- **PPP** - Public-Private Partnership
- **QDS** - Quality Declared Seed
- **SMNs** - Secondary and Micronutrients
- **TAP** - Touch and Pay
- **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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SO

The Great



DIL Connector



SOIL

The Great Connector

In *The Unsettling of America: Culture and Agriculture*, Wendell Berry calls soil the “great connector of lives...without proper care for it we have no life.” If people intend to prosper, they must first invest in their soil. Without healthy soils, there are no healthy crops – and no healthy people. Since the early 20th century, soil health has been a recurring issue for global nutrition. In 1898, Sir William Crookes gave an alarming inaugural speech before the British Academy of Sciences. He warned that Earth’s soils could not grow enough food and mass starvation would be the norm as early as 1930. But scientists rose to the occasion to heed Crookes’ warning. They developed new tools and technologies to help farmers grow more food. Thomas Hager, author of *Alchemy of Air*, positions Crookes’ call as the catalyst for the invention of mineral nitrogen fertilizers, which enrich soils and currently keep about 2 billion people alive.

▲
Photo: Burundian farmers learn ISFM techniques at a demonstration plot.

In the late 20th century, the United Nations Food and Agriculture Organization (FAO) estimated that by 2050 the earth’s population would rise to 9 billion. The subsequent escalation in food demand will require massive increases in productivity on land with degraded soils. Rapid urbanization compounds the problem. Farmers, looking for dependable work, leave their farms for the city. The city grows and uses the land that once grew food for other purposes. Our current challenge is to strengthen the soils that are left to us. But how?

“Soil, in a sense, is a living thing.”

– Amit Roy, IFDC president and CEO

One approach is integrated soil fertility management (ISFM). ISFM is a strategy that combines use of improved seeds, fertilizers and organic amendments (such as manure) to replenish lost soil nutrients. This strategy has proven successful for more than 250,000 farmers in the Great

Lakes Region of Central Africa. It has boosted soil health to grow more crops and - when linked to favorable markets - increased incomes by 20 to 50 percent.

One part of the ISFM approach is the addition of secondary and micronutrients (SMNs). IFDC trials in East Africa illustrate that crops and soils respond well to SMNs. Though the green revolution increased use of primary nutrients (nitrogen, phosphorus and potassium), farmers have not replenished SMNs in the soil. IFDC's semi-autonomous research unit, the Virtual Fertilizer Research Center (VFRC), is working closely in these trials to create datasets that include soil and crop needs by region. This dataset will provide researchers with accurate knowledge to help farmers apply the right nutrients to the right crops.

"Soil, in a sense, is a living thing," says IFDC president and CEO, Amit Roy. "As such we must approach its health as we approach human health: balanced nutrition is imperative." There are organisms in the soil that help plants grow better. Often though, unbalanced fertilizer applications can kill these organisms. The VFRC has released several reports that are unlocking new knowledge about the "living" state of soil.*

"This is not a success story - not yet. It's a call to action."

Further, IFDC is engaged in a public-private partnership (PPP) with NFT industries to develop "seed core" fertilizer technology that utilizes micronutrients in simple fertilizers. This technology features urea granules with micronutrient cores that increase micronutrient content in soil. This technology will be an affordable way for farmers to increase yields and meet requirements of crops.

Now is the time for other organizations and governments to rally innovations that can both nourish the soil and the people who depend on it. Current technology will not cut it. Nearly 1 billion people still experience chronic hunger. The scientific leaders met the challenge head-on in the early 20th century, and now we too must overcome the barriers to global nutrition. The ability of public and private organizations to develop new ways to nourish the soil in the next 35 years will determine whether or not the additional 2 billion inhabitants of Earth live fulfilled lives. This is not a success story - not yet. It's a call to action. 🍌

*** VFRC Reports Relating to Soil Health**

All reports are available at www.vfrc.org/research/vfrc_reports.

2013/1: *Following the Path of Nutrients in the Leaves*. Renu Pandey, Vengavasi Krishnapriya and Prem S. Bindraban.

2013/4: *Early Growth, a Vital Stage for P Uptake*. A.L. Smit, M. Blom-Zandstra, A. van der Werf and Prem S. Bindraban.

2014/1: *Beneficial Organisms for Nutrient Uptake*. Nina Koele, Thomas W. Kuyper and Prem S. Bindraban.

2014/2: *Eliminating Zinc Deficiencies in Rice-Based Systems*. A. Duffner, E. Hoffland, T.J. Stomph, A. Melse-Boonstra and Prem S. Bindraban.

2014/3: *Se Fertilization: An Agro-Ecosystem Approach*. G.H. Ros, A.M.D. van Rotterdam, G.D. Doppenberg, D.W. Bussink and Prem S. Bindraban.

2015/1: *Beyond N and P: Toward a Land Resource Ecology Perspective and Impactful Fertilizer Interventions in Sub-Saharan Africa*. R. Voortman and Prem S. Bindraban.

2015/2: *Nanoscale Micronutrients Suppress Disease*. A. Servin, W. Elmer, A. Mukherjee, R. De La Torre-Roche, H. Hamdi, J.C. White and C. Dimkpa.

Reflections from the CEO

Part 1 - Foundations for Success

IFDC was founded in 1974 to boost fertilizer production and use in the tropics. The Green Revolution, though massively effective in Pakistan and India, has been slow to impact sub-Saharan Africa. Our mission and structure aimed to develop fertilizer products suited to match the particular soil and climatic conditions of the tropics.

While fertilizer was the fuel for agricultural transformation, including in the developing world, in the 1970s these countries only consumed 26 percent of total usage globally. For yields to increase, these areas needed to use more fertilizer. The challenge was greater than simply handing over tons of fertilizer; the tropical soils and crops needed supplies specifically designed for them. The initial focus was to improve the use efficiency of nitrogen fertilizers and develop affordable phosphate fertilizers, such as mined phosphate rock that could be applied directly to the soil.

“When solving a problem, we try to benefit the farmer directly.”

Urea (nitrogen fertilizer) tends to be inefficient in the tropics. Typically, rice produced under flooded conditions uses only 30 percent of what is applied in the field – so farmers are prone to use more than necessary. Because of this, fertilizer could cost rice farmers a fortune. Some farmers, trying to save money, broadcast too little on their fields, depriving the rice and



soil of nutrients. Our goal was to help smallholders increase use efficiency, thereby reducing losses and earning more money. We began by researching the effects of coating urea and changing its physical form. This research has achieved tremendous success over the years, leading to climate-smart technologies such as urea deep placement (UDP). Our nitrogen program is still making great strides.

Phosphorus fertilizer also presented a challenge because the tropical soils' composition in South America and sub-Saharan Africa fixed available phosphorus from water-soluble phosphorus fertilizers, thus drastically reducing its availability to plants. When solving a problem, we try to benefit the farmer directly. Our scientists looked for ways for farmers to directly apply locally available phosphate rock to their soils. This method would make phosphorus accessible and affordable for smallholder farmers. Our research shows that this is a sustainable possibility, and we are continuing to learn more about making this approach economical for farmers.

The early structure of IFDC was like an "assembly line" for developing these technologies and taking them to farmers. Three divisions worked together to get new fertilizer innovations out of the lab and into the field.

Most projects began in the Agro-Economic Division, which identified farmer needs and envisioned efficiency-increasing solutions. The Fertilizer Technology Division made these ideas into reality. Part of this division's work was solving technical and economic issues related to new production technologies. Finally, the Outreach Division rolled out the knowledge and products, taking them to farmers, engineers and other agriculture professionals.



“The early structure of IFDC was like an ‘assembly line’ for developing these technologies and taking them to farmers.”

This structure gave way to great success in IFDC's first decade. But by the mid-1980s, political environments and agricultural technology were changing and advancing rapidly. The time came for IFDC to make its first major realignment, a move that would define the organization's impact for the next 30 years. 🍊

GHG Research Garner Interest

Interest in IFDC's greenhouse gas (GHG) research continues to grow. Recently Dr. Upendra Singh presented findings at USAID Washington. In October, Dr. Yam Gaihre presented the research during the 4th International Rice Congress in Bangkok, Thailand, which was attended by over 2,000 delegates, rice scientists and industry players from all over the world.



UDP Featured in Bangabandhu Agriculture Awards

In December, Prime Minister Sheikh Hasina of Bangladesh awarded two farmers for outstanding work related to UDP technology at the Bangabandhu Agriculture Awards, Bangladesh's most prestigious recognition in the agricultural sector. Prime Minister Hasina also spoke briefly on the benefits of UDP at the ceremony.



AAPI Organizes Workshop for Seed Companies

The AAPI project organized a workshop with private sector seed companies to encourage the use of fertilizer deep placement (FDP) in quality seed production, and to advocate for the promotion of FDP by seed retailers during seed marketing. Combining FDP with improved seeds can enhance crop production for farmers.



USAID Representatives Visit AAPI Project Sites

During the first half of November, two United States Agency for International Development (USAID) teams consisting of officials from Washington, D.C., and the Bangladesh Mission visited various Accelerating Agriculture Productivity Improvement (AAPI) project sites. Among other activities, the teams observed demonstration plot crop cuts and interacted with briquette shop owners as well as farmers who had adopted UDP.

TWCU Hosts Granular Fertilizers Production Training in Thailand

In November, the Training and Workshop Coordination Unit (TWCU) organized an international workshop on Granular Fertilizer Production in Bangkok, Thailand. Forty-eight industry professionals attended this year's training. Participants gained knowledge of the fertilizer industry's latest technologies and enjoyed the opportunity to network with peers.





briquetting machine

Brings Hope of Higher Yields in Myanmar

For the first time in the history of farming in Myanmar, a new tool that vastly improves agricultural practices will be readily available to the USAID-funded Fertilizer Sector Improvement (FSI) project areas. With the help of IFDC and USAID, two local entrepreneurs have obtained UDP briquetting machines from Bangladesh. These machines will be used to produce and sell the advanced fertilizer technology to rice farmers to produce higher yields. Rice makes up a majority of the nation's agriculture industry and is its main commodity.

Designed by scientists at IFDC, the briquetting machine takes prilled nitrogen fertilizer and compacts it into a 1- to 3-gram briquette of urea. This briquette is then placed by either hand or handheld applicator between every four rice plants 7-10 cm into the ground. The briquettes stay in the ground for the remainder of the season and supply all the necessary nutrients for the plant to grow. UDP was designed as an alternative to the traditional broadcast spreading of urea fertilizer three times per season. This practice is highly inefficient, resulting in high nitrogen runoff and GHG emissions.

Chris Milligan, USAID/Burma mission director, said that USAID and IFDC are training farmers in this technology to improve their well-being. By using UDP, farmers use less fertilizer and acquire higher rice yields. Grahame Hunter, FSI chief of party, said that the briquette machine will produce urea briquettes and provide a better fertilizer to help farmers boost yields and reduce GHG emissions. "The machines are imported from Bangladesh. We did 11 UDP trials in the monsoon season including in Thanlyin. The results showed incremental yield. This will support small-scale farmers," Hunter added.

As demonstrated by farmers in Bangladesh - through IFDC's AAPI project - the technology, when used with rice, results in an average 20 percent increase in yield compared to broadcast fertilizing. Since UDP technology is still relatively new to Myanmar, several trials were implemented during the monsoon season in Thanlyin. The results showed an incremental increase in the yield of the rice. Plans are underway to continue implementation of the project to the Yangon, Bago and Ayeyarwady regions as well as expand into Mandalay, Sakhaing, Shan and Rakhine in the coming years. 🍌



Brings Technology Package to Farmers

On Nov. 6, 2014, IFDC and Advanced Chemical Industries (ACI) Ltd. signed a memorandum of understanding (MoU) to promote the packaging of two yield-enhancing technologies: FDP and improved seeds. IFDC and ACI are collaborating to improve farmers' access to this technology package across parts of the AAPI project area. The MoU was signed by Ishrat Jahan, AAPI chief of party, and Dr. F.H. Ansari, executive director of Agribusiness, ACI Ltd.

The MoU promotes the packaging of yield-enhancing technologies in AAPI Feed the Future (FTF) zones. Since its inception, the USAID-funded project has been promoting the use of FDP, a fertilizer technology that, when made with only urea (thus known as UDP), increases rice yields while reducing nitrogen pollution. AAPI and ACI Ltd. will work together during the 2014-2015 *Boro* season to establish demonstration plots to show farmers the benefits of using quality seed along with UDP. Pending success of the joint activities, the partnership could expand to implementation beyond the 2014-2015 *Boro* season.

Urea deep placement is currently used by an estimated 2 million Bangladeshi rice farmers. The technology offers a host of benefits including decreased fertilizer use, increased yields and fewer greenhouse gas emissions. As UDP has been expanding to other crops - often at the suggestion of smallholder farmers - with positive results, AAPI hopes to expand this success to seed farming. According to Josh DeWald, director of IFDC's EurAsia Division, "The idea is to work with seed companies to use FDP for quality seed production on their own seed farms; and, down the line, to get to the point where seed companies are promoting FDP use with their seed retail operations." 🍌

▲
Photo: Ishrat Jahan, AAPI chief of party, and Dr. F.H. Ansari executive director of Agribusiness, ACI Ltd., sign the memorandum of understanding.

Goals of the MoU

1. Ensure balanced use of fertilizers and improved seed varieties for key crops, particularly through jointly demonstrating and marketing improved seeds and improved fertilizers in the areas where both ACI and AAPI are present.
2. Jointly conduct demonstrations of FDP and UDP, coupled with improved ACI seed varieties for crops and soils, for farmers in preparation for the 2014-2015 Boro season, both through direct training and through use of one another's inputs in demonstration plots where applicable.
3. Promotion through ACI dealers, distributors and retailers to conduct demonstrations for educating farmers on fertilizer use and improved seeds, and for recommending optimal seed-fertilizer combinations for clients.
4. Develop, through visual presentation, leaflets and other product promotion on the use of FDP/UDP and improved ACI seeds for particular crops.

Fertilizer Retailer Increases Sales with UDP

Md Akkas Ali Mia sells fertilizer at his agribusiness shop in Matira, where farmers often receive agricultural advice from Moktar Hossain, a sub-assistant agricultural officer (SAAO) from Bangladesh's Department of Agricultural Extension (DAE). When Hossain mentioned a new urea fertilization technique called UDP, some of the farmers wanted to try it right away, while others waited slightly longer. Before long, Ali had a new business: selling urea briquettes to local farmers.

Now, UDP brings many farmers to his shop. Ali tells them about the benefits of UDP and asks them to spread the word. As these farmers began seeing the higher yields, they told others to visit Ali's shop. Working with Hossain and other SAAOs, Ali's sales quickly increased as more and more farmers witnessed the benefits of the new technology. "The SAAOs played the biggest role in popularizing [UDP] in the remote villages in my union. The farmers want to use [the technology] because they benefit from applying it, and we also make good profits," said Ali. As his first stocks of urea briquettes sold quickly, Ali became closely acquainted with briquette producers who regularly provided supplies to him as demand grew for the technology.

Agro-dealers' cooperation with the DAE and AAPI is one of many reasons why more than 2 million Bangladeshis are now using UDP. Ensuring that these entrepreneurs know and are excited about the technology increases not only the availability of the product but its adoption among farmers. Ali is glad that the AAPI project works with fertilizer retailers. He thinks more farmers will use UDP as more retailers increase briquette availability.

Besides the higher income, Ali's greatest reward is hearing the success stories of farmers. He believes that momentum will increase. "It takes time to influence and change farmers' behavior and outlook, but they always give me good feedback for recommending UDP." Ali projects that this next season will be his biggest yet, hoping more farmers learn the benefits of adopting the fertilizer technology.



Cassava – An Exciting New Market for Rwandan Farmers



The Kinazi Cassava Plant, Dutch Agricultural Development & Trading Company (DADTCO) and IFDC are strengthening the cassava value chain in Rwanda by bringing the factory to the farmer and creating a guaranteed market. Kinazi and DADTCO are introducing mobile units that process the highly perishable roots close to growers. Farmers can connect with financial institutions and access high-quality planting materials through IFDC's CATALIST-2 project, funded by the Netherlands Embassy in Rwanda and the Swiss Agency for Development and Cooperation.

10,000

rice farmers in Kenya are expected to benefit from a partnership between IFDC and ARM Mavuno to introduce FDP. **FDP is an improved fertilization method that can increase rice yields by more than 15 percent.** IFDC is promoting FDP in 19 countries worldwide. ARM Mavuno manufactures urea briquettes for deep placement and supports farmer field days and training.

International Training Highlights Agricultural Market Data

"This training program has enlightened my way of thinking about MIS and how beneficial it is to farmers' profits and food security achievement." – participant in the IFDC workshop *"Agricultural Market Information Systems (MIS) and ICT Platforms Across the Value Chain."* More than 60 trainees from 22 countries attended the five-day program in Arusha, Tanzania. Held in collaboration with the Technical Center for Agricultural and Rural Cooperation (CTA) and Eastern Africa Grain Council (EAGC), the workshop emphasized the importance of agricultural market data.



Twelve farmer organizations in Burundi have become official maize suppliers for the FAMMAF plant, which processes yellow maize flour. Before partnering with local growers, FAMMAF imported maize from Uganda and Tanzania. IFDC's CATALIST-2 project facilitated the market relationship and trained farmers to store their maize using PIC bags, which keep the maize fresh and safe from insects for up to three years. CATALIST-2 introduced farmers to an "inventory credit system," in which agricultural commodities are stored until market prices increase. The stored crops are used as collateral for loans from banks or micro-finance institutions.



Shape and Lead is an online community (<https://shapeandlead.bidx.net/>) connecting small and medium enterprises, cooperatives, financiers, mentors and coaches active in the agricultural sectors of Rwanda, Burundi and the North and South Kivu provinces of the Democratic Republic of Congo. Pictured above is Emmanuel Musabyimana, an entrepreneur in potato seed storage in Rwanda. Musabyimana won an award for his innovation during the Shape and Lead Agribusiness Challenge 2014. Shape and Lead is an initiative of the CATALIST-2 project and Agri-ProFocus.



qualified seed training

Benefits Tanzanian Farmers

In Tanzania, smallholder rice farmers often use indigenous seeds saved from previous seasons' harvests to plant their fields for the coming season. As these seeds are used over several generations, they become prone to various diseases and lose their potency. Weak and damaged seeds lead to lower yields than what could be produced. To combat this, the USAID Feed the Future NAFKA Staples Value Chain Activity provides training to seed producers in rural areas of Tanzania. This project trains seed farmers to become Qualified Declared Seed (QDS) producers and certified seed producers. Once qualified, these farmers can grow and sell their seeds to national distribution companies or to neighboring farmers, which in turn grants more access to quality seeds to smallholder farmers across the country.

Chetu Omari, a farmer involved in the program, decided to qualify as a seed producer. In conjunction with better farming practices such as using FDP along with the qualified seeds, Chetu noticed an increase of six times what she was producing earlier. In her first year as a QDS producer, Chetu sold 2.3 tons of QDS harvested from her one acre of land to 105 farmers in her village. From the one acre, she earned 2.3 million Tanzanian shillings (\$125.30) per acre, after which she graduated to a certified seed producer and entered into a contract to sell directly to a national seed company. She has tripled seed production and appreciates the security of a guaranteed market, saying, "I can testify that there is a significant difference between farming in the improved way and farming in the old way."

Currently, NAFKA has certified 91 seed producers, of which 47 percent are female. These seed producers have vastly improved the economic opportunities for farmers, while also creating market access to high-quality seeds. The newly certified producers have sold 34 metric tons of QDS and 240 metric tons of certified seed, increasing productivity for Tanzanian smallholder farmers. 🌱

2SCALE Builds New Dairy Partnerships in Kenya

The Toward Sustainable Clusters in Agribusiness Through Learning in Entrepreneurship (2SCALE) project is facilitating partnerships between dairy farmers, milk processors and seed companies in Kenya. Eldoville Dairies Ltd. and Morani Ltd. source raw milk from rural smallholder farmers and process it into cheese, yogurt and whey. Eldoville plans to increase milk intake rates 14-fold once its new factory is completed later this year. To meet increased demand, 2SCALE is assisting farmers to double production through proper husbandry and feeding.

One of the primary challenges for smallholder dairy farmers is shortage of fodder. 2SCALE has connected hundreds of Kenyan farmers with Advanta and Barenburg seed companies, which offer hybrid forage crops. The new crops will not only increase milk production, but also improve milk quality and animal health. More than 300 farmers have received training, and 106 farmers have established demonstration plots to increase the rate of adoption of the new varieties.

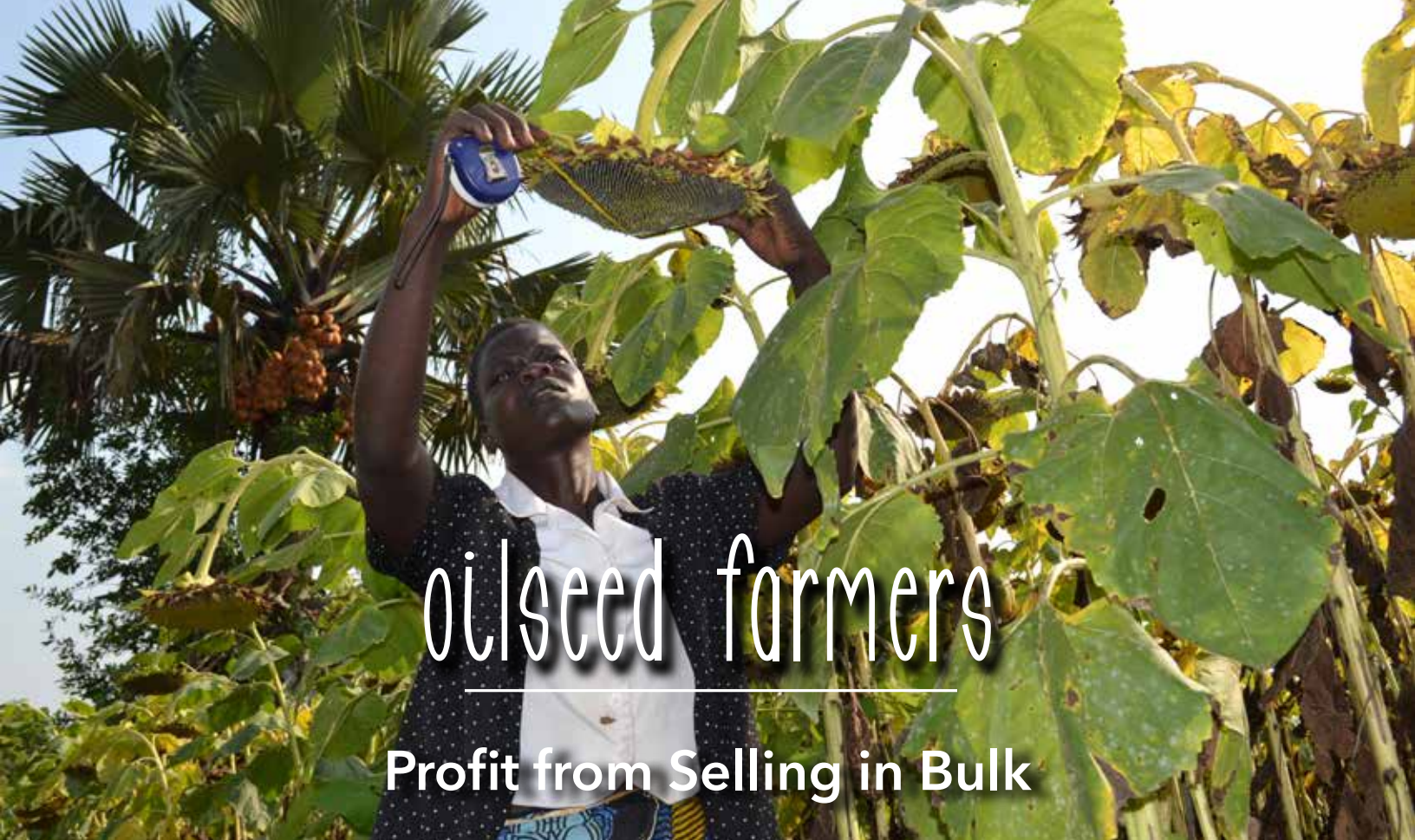
E-PROD Business Solution

2SCALE has provided a paperless solution to agribusinesses that work with large numbers of farmers. The E-PROD software package records and analyzes data in order to monitor deliveries, enable timely payments, ensure accurate record keeping and track production patterns. For example, the software generates periodic reports by individual farmers or producer groups, and calculates payments based on quantity supplied, loan repayments and other parameters. A notable innovation is the ability to make payments based on milk quality – specifically butterfat and protein content, which are critical in cheese making. Higher-grade milk earns higher prices from processors.

Whey Cool

Eldoville Dairies is introducing a new product: flavored cheese whey known as Whey Cool. The objective is to develop and widely market the nutritious new product for low-income families. To improve the quality and storability of Whey Cool, IFDC linked Eldoville with a Dutch technical expert through PUM Netherlands senior experts. PUM utilizes experienced technical staff to work as voluntary short-term consultants to strengthen the industry in developing countries. PUM is supported by the Confederation of Netherlands Industry and Employers. 📍





CATALIST-Uganda is empowering nearly 7,000 oilseed farmers organized into 270 farmers' groups in the Lango sub-region of northern Uganda by strengthening their organizations. These farmers face many challenges, including poor input supply systems and unequal power relations. As organizations, these farmers lack a strong voice to negotiate with traders and other actors in the value chain. These issues cause smallholder farmers to have little access to crop finance suited to their needs and keep them from participating profitably in the value chain.

In response, CATALIST-Uganda's support to farmer cooperative networks is providing avenues for farmers to address these challenges. Most importantly, the project is facilitating interactions among the value chain actors and promoting market information sharing. Efforts such as encouraging bulking of oilseed have resulted in great benefits for farmers.

For example, the 756 members of Acwec Omio Cooperative, with support from the project, bulked a collective total of 236 metric tons of oilseed at the end of first the season in 2014. Taking the bulk to market, members bargained for prices 30 percent higher than the prevailing farm gate prices. As a result, the farmers earned an estimated 70 million Uganda shillings (\$27,000).

Willy Okot, a project officer with the cooperative, reported that farmer interest in bulking has increased following the benefits observed by those who are already selling in bulk. However, he noted that some farmers, wanting immediate cash, choose not to participate in bulking. With their addition, though, the cooperative could realize greater potential. To encourage these farmers to participate, the cooperative offers several incentives: input credit, crop finance and transport of produce to bulking centers.

Through such well-designed and appropriate interventions, the CATALIST-Uganda project continues to empower more smallholder farmers through strengthened engagement in the value chain. Organizing as farmer networks gives cooperative members stronger voices and collective bargaining power with traders. These efforts are one step in ensuring fair return, food security and employment opportunities for smallholder farmers, their families and the communities - resulting in improved incomes and livelihoods. 🍌

CATALIST-Uganda is supported by the Kingdom of the Netherlands' Ministry of Foreign Affairs.

GES-TAP Reached Half Million in 2014

More than 500,000 farmers registered for subsidized fertilizer and seeds through IFDC's Growth Enhancement Support (GES) Touch and Pay (TAP) pilot program, ending in 2014. TAP technology simplified the process of enrollment and redemption in the GES scheme, a comprehensive initiative of the Nigerian government to boost the nation's agriculture sector. Designed by Consult Hyperion, TAP works with devices powered by the Android operating system and does not require a network connection. Farmers and enrollment staff "tap" their registration cards to store information on the device. The program brought 100 agro-dealers closer to farmers and employed 500 new GES field staff in 2014. TAP was funded by the United Kingdom Department for International Development (DFID).



IFDC Contributes to Policy Efforts in Ghana

In February, IFDC, with a team of experts from Michigan State University, the International Food Policy Research Institute (IFPRI), the African Fertilizer and Agribusiness Partnership (AFAP) and the Regional Network of Agricultural Policy Research Institutions, Zambia (ReNAPRI), undertook an extensive study in Ghana to provide information that will guide the government of Ghana on its soil fertility and subsidy policy.

WAFP Holds Consultative Forums

The USAID West Africa Fertilizer Program (WAFP) organized two West Africa Fertilizer Stakeholder Forums in Lomé, Togo, and Abidjan, Côte d'Ivoire, in October and November 2014. The forums brought together nearly 200 key public and private fertilizer sector industry players to deliberate and forge strategic partnerships. Forum participants delivered recommendations relating to each of the thematic areas that were discussed.



Motor King Brings UDP Documentary to Farmers

The Feed the Future USAID Agrotechnology Transfer (FTF USAID ATT) project in Ghana has begun bringing a UDP documentary to several communities in that country. Projection equipment is loaded into the "UDP Technology Dissemination Van," a Motor King outfitted with a trailer, which has brought the videos to nine communities. The sessions are held at night for maximum attendance and audience participation. The showings aim to increase farmer knowledge and interest in UDP technology.



farmers benefit

from DEBPEA Project

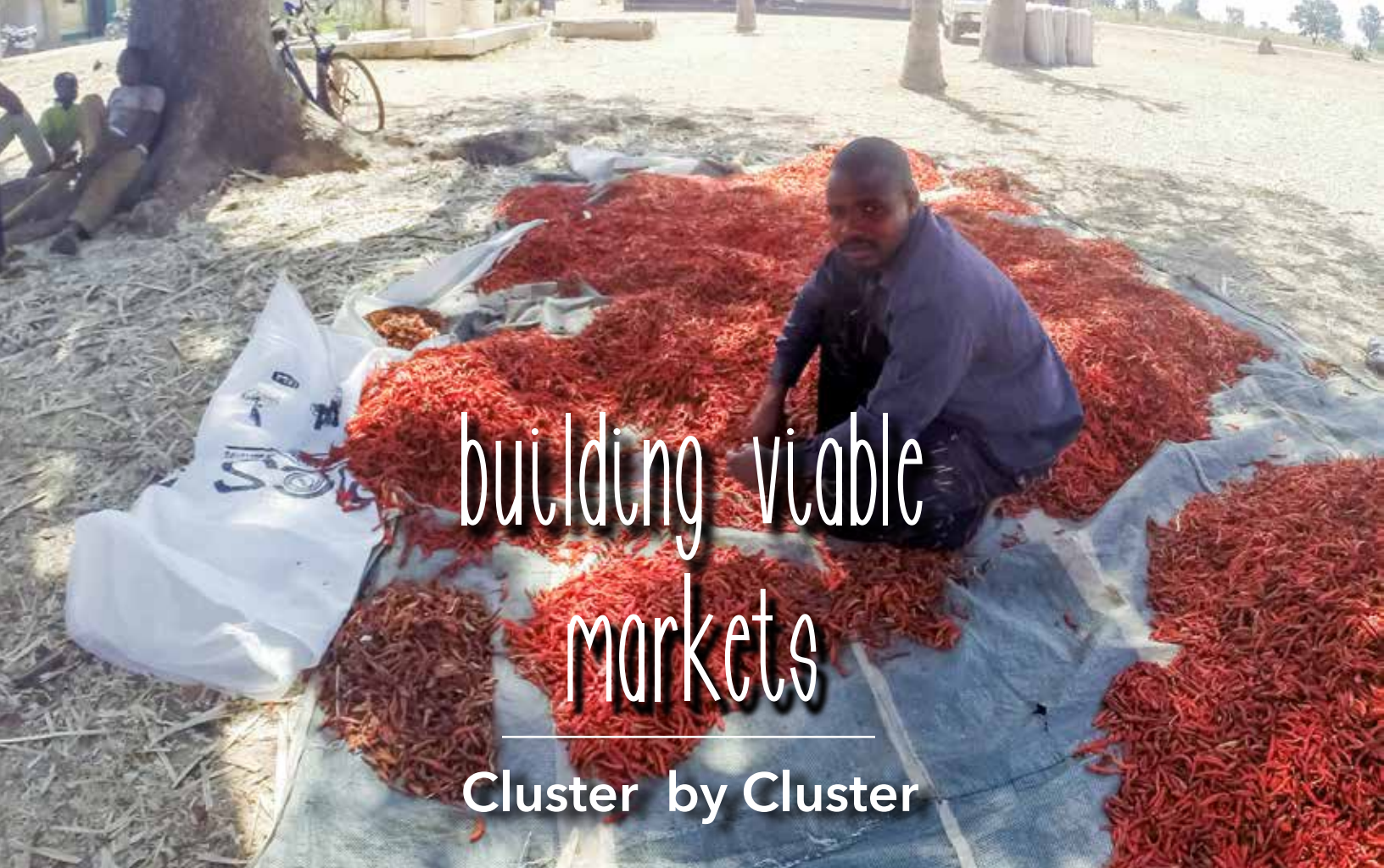
"In truth we are not poor ..." It is the deep cry of the heart for Ténin Koné, widow and head of household of 11 people, including six teenagers. Ténin is a member of Jigi Cooperative (Hope) of the Defina community, where IFDC's Grassroots Development of Agribusiness Clusters (DEBPEA in French) project supported development of an agribusiness cluster (ABC) for fonio, a grain mostly grown in regions of West Africa. After a long, meditative pause, Ténin picked up a clod of dirt, effortlessly crushed it in her fingertips and sighed: "See, really, it is our land that became poor."

Just like Ténin, thousands of smallholder farmers face the burning question of soil impoverishment, of access to inputs on time and, more generally, of sustainable land management and access to market information.

In the course of 2012, Ténin increased her yields by 260 percent. Increased productivity is not enough; better sales drive development. Networking with Agribusiness Development Company (AID-SA), which had previously provided her (and the 38 members of Jigi) quality seed and fertilizer, Ténin now sells fonio to a business partner for 50 percent more than before.

From 2010 to 2014, the DEBPEA project strengthened Ténin's capacities - and those of 25,700 other producers - on ISFM and other agricultural practices. These farmers are part of a portfolio of 91 ABCs covering 28 agricultural products. At the producer organization and corporate member level of the ABC, training has focused on technical and organizational issues, business strategies, quality standards and the development of business plans.

By December 2014, DEBPEA had impacted more than 200,000 rural households across Mali, with 86 ABCs becoming operational. Over half of these are now autonomous or trending toward empowerment. ●



Bako John is a member of the Pampaida Chile Pepper Cluster in Ikara LGA, Kaduna state. He has worked as a farmer for nearly 20 years. John cultivates chili pepper, maize, sorghum and soybeans. He claims that chili pepper is becoming his strongest crop. Good agronomic practices and favorable market forces have enabled bountiful returns.

Since 2012, when John joined the chili pepper cluster to enhance his productivity and market network, he has benefited from a series of agronomic and business trainings delivered by IFDC through the 2SCALE project. In addition to the trainings, 2SCALE linked John and all other members of the cluster to AACE Foods, a spice processing company, providing a guaranteed market.

In April 2014, John was selected along with 99 other farmers from the cluster to receive a loan from LAPO micro-finance bank. Each of the 40 cooperatives in the cluster developed the criteria used in the selection of the farmers who received the loan. "I appreciated the loan I received because it helped me to purchase the right input at the right time," John stated. This boosted his productivity during the season, enabling him to repay his loan. AACE Foods helped the farmers pay their loans. In return for receiving chili peppers from the farmers, the company helped repay the cluster's loan over a period of eight months to LAPO.

According to Aliyu Habila, chairman of the cluster, "The repayment structure is client-friendly, and this made the terms acceptable." He further stated that some of the members had already completed the direct repayment process to LAPO micro-finance bank.

The trainings on good agronomic practices, access to credit facility, access to quality inputs and, most importantly, the availability of a guaranteed market increased the farmers' production, lowering their risks. Affirming this, John observed that, despite his field flooding in 2014, he was still able to harvest a bumper yield of 540 kilograms of chili pepper – a feat not easily possible without the help of 2SCALE. 🍌

Nurturing Agriculture: From Culture to Business

To Maryam Hassan, farming is culture. Maryam is a 44-year-old woman from Tsamiya village in Markarfi LGA, Kaduna state. She became engaged in agriculture as a child, accompanying her parents to their family farm to help weed and prepare the land for planting. Now Maryam is married, with five children and is doing what she knows best – farming.

In May 2014, Maryam learned about the Nigeria Agro-Input Support (NAIS) project through an agro-dealer in her village. He convinced her to participate to improve her knowledge on new farming methods. Under the NAIS project, Maryam was selected as a lead farmer, and has introduced more than 200 women to the project. Since then, she and her colleagues participated in several agricultural training programs delivered by NAIS. These trainings taught her how to better use pesticides and herbicides.

Maryam donated one-eighth of her farm to serve as a demonstration plot, showcasing to farmers the results obtained from good agricultural practices. Her colleagues were amazed that she harvested five bags of maize from such a small portion of land. They could not believe that she did not need to weed throughout the planting season because she used the right type of herbicide. According to Maryam, “I have always thought I had to spray my farm field three to four times to get rid of weeds, which used to be a major problem for me. Now I know better.”

Last year, Maryam harvested six bags from her 1.2-hectare farm, meaning that she will more than triple her yields in the next season. “I am looking forward to using all the good agronomic practices that I have learned on my whole farm field. This will increase my yields and profits, making farming my business.” 🍌





Video: Six Pieces of the Innovation Puzzle

IFDC sees innovation as a whole picture. Let's not limit ourselves to one issue. More is at stake. Over the last couple of months, the IFDC Perspectives blog featured six pieces of the innovation puzzle. Watch them come together in our latest video: <http://bit.ly/6PiecesVideo> If you have not yet read the blogs, start here: <http://bit.ly/6PiecesBlog>

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John Wendt: Balanced Nutrition Research at IFDC



► *Photo: John Wendt, IFDC senior expert in soil fertility management (right), discusses IFDC projects with Rob Groot, director of Donor Relations.*

In most countries in sub-Saharan Africa, only fertilizers containing nitrogen, phosphorus and potassium (N, P and K) are available to smallholder farmers. However, yield increases due to these fertilizers are often modest. In 2012, IFDC's projects in east and southern Africa initiated complete soil analyses in their regions of operation. Results from all countries - Rwanda, Burundi, Uganda, Zambia and Mozambique - show wide-scale deficiencies of multiple SMNs to be the norm rather than the exception. The entire country of Ethiopia was similarly mapped, supported by Ethiopia's Agricultural Transformation Agency.

Consequent field trials designed to identify response to different nutrients show that the secondary nutrients sulfur, calcium and magnesium and the micronutrients zinc, boron and copper are the most common nutrient deficiencies. Yield responses in general are on the order of 20 to 50 percent. The research also shows that in order to realize optimal response, all deficient nutrients must be addressed in combination. Failure to include any one deficient nutrient can severely limit the response to others. Supplying all deficient nutrients in combination is the "balanced nutrition" approach.

IFDC has collaborated with national agricultural research and extension services to evaluate balanced nutrition on a number of crops. The entire countries of Rwanda and Burundi have been mapped on a macro scale for all nutrient deficiencies through the CATALIST-2 and PAN-PNSEB projects. Response trials in these countries show that yields of rice, beans, maize, potato and wheat are dramatically increased. It is now national priority in both countries to make balanced fertilizers available to smallholder farmers, and to support these fertilizers with subsidies previously reserved for NPK fertilizers.

To achieve this, IFDC has engaged regional fertilizer suppliers and blenders. A balanced nutrition workshop in Johannesburg, South Africa, was conducted in October 2014.

“[T]o realize optimal response, all deficient nutrients must be addressed in combination.”

The 60 attendees represented fertilizer blenders, representatives of national agricultural research institutions, policymakers and fertilizer suppliers. A similar workshop will take place in Abidjan, Côte d'Ivoire, in April 2015. Large-scale demonstrations of balanced fertilizers are underway in Rwanda and Burundi to further validate response and create farmer demand. Balanced blends provided by regional blenders are also being evaluated in Mozambique and Zambia. Research continues to find optimal ways of delivering SMNs. Added nutrients result in added costs to farmers, so it is important to keep these costs as low as possible. Micronutrient fertilizer coatings, foliar products and very low rates of dolomite (to supply calcium and magnesium) all show promise.

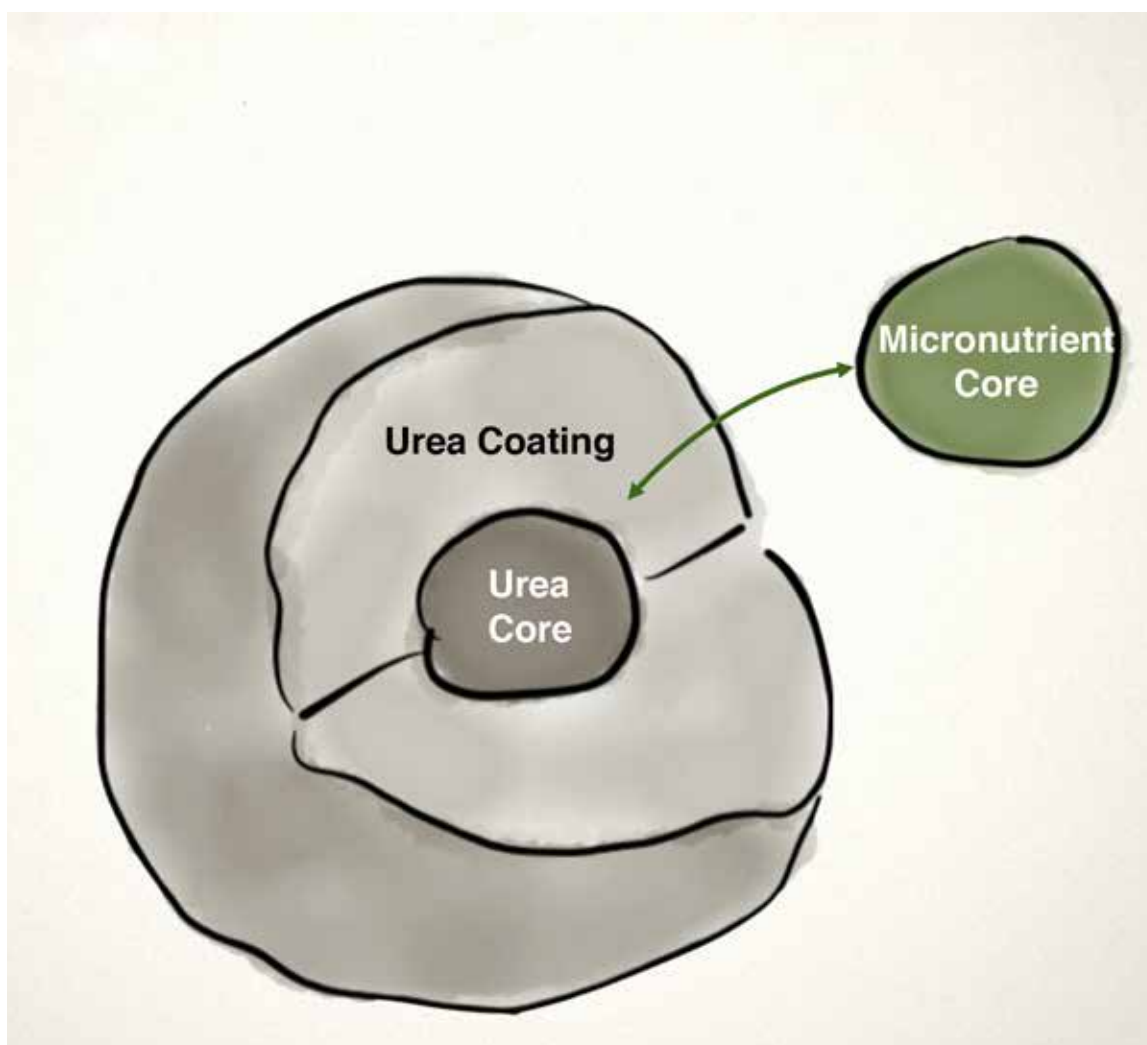
Our ultimate objective is to make balanced fertilizers available to all African smallholder farmers to dramatically increase yields, food security and return on fertilizer investments. The balanced nutrition initiative will require careful documentation of successes and a well-considered strategy to realize its potential. 🍌

Seed Core Technology Combats Zinc Deficiency

In many developing nations, the food grown and consumed comes from nutrient-deficient soils. If fertilizer nutrients are added to the soil, they are mostly primary nutrients (N, P and K), as fertilizers containing SMNs are often not accessible or affordable. Over the years, agricultural practices have resulted in nutrient withdrawals exceeding nutrient inputs and nutrient “stocks” indigenous to the soil. For example, zinc, a micronutrient necessary for human health, is one of several micronutrients often deficient in the world’s soils. It is estimated that out of the more than 7 billion people in the world, 2 billion women and children suffer from zinc deficiency, putting many, especially children, at risk for diarrhea and life-threatening dehydration.

To combat this problem, IFDC and NFT Industries engaged in a PPP to develop micronutrient “seed core” technologies. “The goal here,” says Taylor Pursell, CEO of NFT Industries, “is to make an affordable product that yields nutritious crops from soils that were once micronutrient-deficient.” Once introduced into the soil, the micronutrients are absorbed by the plants and hopefully concentrated in the grain or edible fruit in a form that can be absorbed by the human body. According to IFDC President and CEO Dr. Amit Roy, “If we can grow healthy and nutritious plants, we can grow a healthy world.”

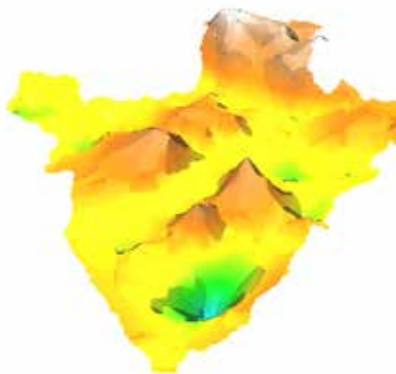
Research and development for the technology is currently focusing on a zinc seed core, with initial trial results displaying a 20 percent increase in yields. This technology is unique in that it does not incur any additional production costs, as it utilizes the same technology used to make urea granules. It is expected that farmers will be able to easily access the fertilizer by utilizing the already-established global urea distribution channels. 🟡



VFRC Activities Address Soil Health



The Virtual Fertilizer Research Center (VFRC), together with its mother organization IFDC and the International Soil Reference and Information Center (ISRIC)-World Soil Information, held a training in Rwanda on database management for geo-spatial analysis. The training coincided with work by IFDC soil scientists in East Africa identifying micronutrient needs of crops in different locations in that region. Tests have shown that when micronutrient fertilizer blends match soil and plant needs, yield increases of 30 to 70 percent or more can be achieved.



The VFRC is aiming to create a database of results from IFDC's farm trials. By compiling a database, the VFRC and other organizations can extract the information to identify best nutrient practices for locations and crops across East Africa and develop various tools to disseminate through IFDC. For example, several hundred bean trials have been executed by IFDC in Burundi across varying soil types. The database can be queried to create maps that show yield and nutrient responses to certain micronutrient applications and to demonstrate what factor explains the response, like the soil type, weather conditions or farm management practices.


These maps are unique. They address micronutrients and can be used to demonstrate best nutrient practices for specific areas. However, because the availability of micronutrients to crops is dictated by soil factors that sometimes constrain their uptake by plants, "the challenge," says Prem Bindraban, executive director of the VFRC, "is packaging micronutrients in a way that makes them usable by the plant, not harmful to the soil, safer for the environment, affordable for farmers and beneficial to farm livelihoods." Evidence from research suggests that packaging nutrients in nanoparticulate forms results in improved uptake by plants, and this is one of the avenues being pursued by the VFRC.

"Soil is not lifeless. It is a living medium," says Bindraban. According to recently released VFRC Reports, some strains of bacteria and fungi living in the soil can facilitate root uptake of nutrients, such as phosphorus and iron, an important micronutrient for plant growth. According to Bindraban, "The over-application of primary nutrient fertilizers, for example, could make the soil too acidic, reducing or negating the benefits of these organisms." The creation of the database will bring the VFRC and other organizations one step closer to developing novel fertilizer solutions that benefit soils, crops and humans alike. 🍌

The VFRC reports can be found at http://www.vfrc.org/Research/VFRC_Reports.



PARTINGSHOT



Healthy soil is the foundation for a nutritious world. To celebrate this essential component of our food system, IFDC hosted the #ShowUsYourDirt photo contest in recognition of the International Year of Soils. Participants were asked to share photos depicting the soil in their area or photos that demonstrate proper soil management practices.

The winner of the contest is the Kenya Feed the Future Innovation Lab and Quest Agriculture Ltd. Above, a technician collects soil samples from a vegetable patch to test for pH. Quest Agriculture's INTENSE innovation involves on-site soil testing and customized fertilizer recommendations for improved productivity and environmental sustainability.

Photo courtesy of Kenya Feed the Future Innovation Lab/Quest Agriculture Ltd.

IFDC and VFRC Board Updates



Margaret Catley-Carlson



Agnes M. Kalibata



Rhoda Peace Tumusiime



Marco Ferroni



Margaret Catley-Carlson, member of the UN Secretary General's Advisory Board on Water and Sanitation, was a keynote speaker at the World Water-Tech North America Summit in Toronto. She discussed "Water Security and the Global Water Agenda." As a Program Advisory Member of the International Centre for Integrated Mountain Development, Catley-Carlson visited Northern Pakistan to learn firsthand about the implications of accelerated glacial melt on mountain agriculture and the safety of mountain communities. She has been a member of the IFDC board since 2006.



Agnes M. Kalibata, IFDC board member since 2008, was recently named president of the Alliance for a Green Revolution in Africa (AGRA). Kalibata attended the Africa Forum on Inclusive Economies in Nairobi, Kenya, where she stated: "Without transforming the agriculture sector and investing in it, rapid and inclusive growth in Africa will remain a tall order." In February 2015, Kalibata met with **Rhoda Peace Tumusiime**, African Union (AU) Commissioner for Rural Economy and Agriculture and IFDC board member. The two leaders discussed AGRA and AU collaboration to transform African agriculture.



"Agriculture must be prioritized," said **Rhoda Peace Tumusiime**, AU Commissioner for Rural Economy and Agriculture, during the 24th AU Summit held in Addis Ababa, Ethiopia. Tumusiime announced the AU strategy and roadmap for fulfilling the 2014 Malabo Commitments on Agriculture. She stated that the strategy will lead to food security on the continent. Tumusiime has been a member of the IFDC board of directors since 2010.



Marco Ferroni, executive director of the Syngenta Foundation for Sustainable Agriculture (SFSA), hosted and gave an introductory keynote presentation during the SFSA Symposium on "Scaling Up Smallholders' Adoption of Technology." The event focused on the forces and mechanisms that drive adoption of agricultural technology innovations. **Amit Roy**, IFDC president and CEO, gave a presentation on climate-smart fertilizer technology.

IFDC News

IFDC is now a member of the FAO Global Soil Partnership. The Partnership's mandate is to improve governance of the earth's limited resources in order to guarantee healthy and productive soils for a food-secure world. The UN has declared 2015 the International Year of Soils.



**GLOBAL SOIL
PARTNERSHIP**



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2015 International Training Calendar

Bringing Balanced Fertilizers to the Market: Opportunities and Constraints (French Edition)	Abidjan, Côte d'Ivoire	April 13-17
Fertilizer Policy and Marketing Strategies in Africa	Arusha, Tanzania	May 4-8
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 Management, Technology Promotion and Logistics	Jakarta, Indonesia	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