

# N2Africa Podcaster no. 44

February & March 2017

## Introduction

At the beginning of March we held the N2Africa annual planning meeting in Mbale, Uganda together with our Advisory Committee. The meeting was held concurrently with the TAMASA (Taking Maize Agronomy to Scale in Africa) project. Participants from both projects were divided among four groups of about 20 people for “learning journeys” in the field. This gave a great opportunity for joint learning about the opportunities and constraints of taking technologies. In this Podcaster we share reports on the workshop and the learning journeys. N2Africa country teams are also busy with planning and we include reports on the Ethiopia and Kenya meetings.

We’ve just submitted our Annual Report for 2016 - we include some highlights below as well as a link to the full report. You’ll also find reports on yield gap analysis of common bean in Ethiopia and Tanzania that have been conducted in collaboration with the Global Yield Gap Analysis team, and a follow up on the problems of soyabean marketing in Ghana that were highlighted in the previous Podcaster. We hope to address some of the issues of marketing through a concerted effort to review and change policies to support legume intensification – so watch this space!

## N2Africa in Malawi – achieving sustainable input supply

Our N2Africa Country Coordinator for Malawi, Lloyd Phipira, introduced me to Fredrick Kawalewale of Agro-Input Suppliers Limited (AISL). This company supplies seed and inoculants to smallholders. Fredrick has been working with N2Africa related to input supply since we began in Malawi in 2010. Given the obvious benefits of rhizobium inoculant with soyabean and the lack of inoculant supply he saw a business opportunity and was prepared to take the risk to set up a company to produce and sell inoculants. Lloyd and others worked together with the government scientists at Chitedze Research Station to get permission for him to take over the inoculant production methods. The inoculants are produced in a small building and a transport container that has been converted into a microbiology laboratory. N2Africa trained two technicians at the IITA Ibadan labs and the inoculants have been widely tested and proved to be effective in increasing soyabean yields in Malawi. In the current 2016/2017 season, AISL sold more than 200,000 packets of rhizobium inoculants in Malawi.

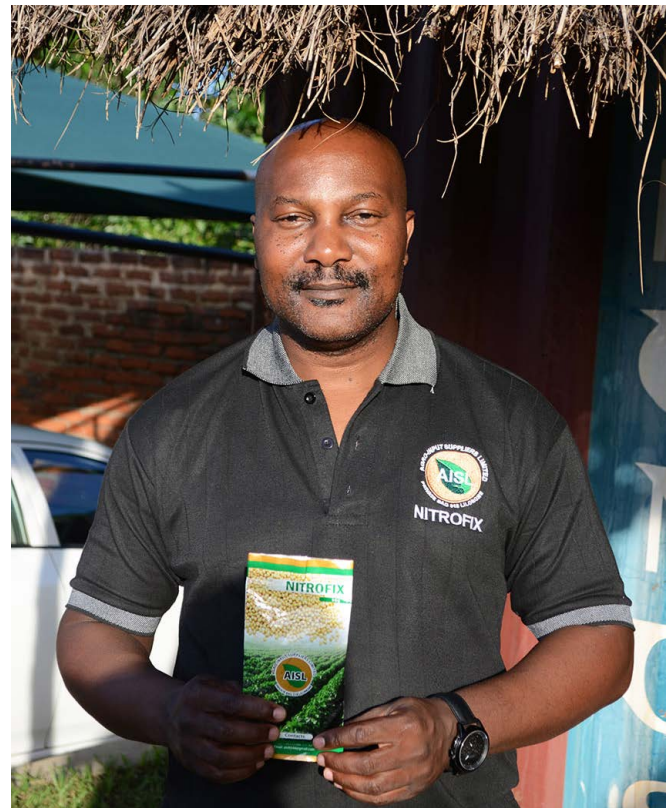
AISL does much more than just selling seed and inoculants – the company assists farmers to establish cooperatives to enable them to engage in purchase and in marketing – and they run their own set of demonstrations. They have also been a major collaborator in multiplying and selling seed of the soyabean variety Tikolore (TGx1740-2F) which was

Theresa Ampadu-Boakye and I both spoke in a ‘virtual symposium’ on the internet which will soon be available for viewing on the Internet. This was the first time I attended a ‘carbon-free’ conference and more than 100 people from all over the world participated. A whole series of talks by experts in the field were made available for people who are unable to afford the costs of travelling to international conferences. It’s really a great initiative and one that we hope to build on in the future. In the same vein, a new MOOC (massive open online course) from the SDG Academy entitled *Feeding a Hungry Planet* just went live. You can still sign up for free, make sure you don’t miss it and please share with students and colleagues! For more details see announcements later in the Podcaster.

I’m just back from a great visit to Malawi where I was hosted by our N2Africa Country Coordinator, Lloyd Phipira. It’s always exciting to see N2Africa in action and visit collaborators and farmers in the field, I have shared some of the insights from the visit below.

I hope you enjoy reading our news – please don’t forget to send in your contributions for the next Podcaster!

Ken Giller



Fredrick proudly holding a sachet of Nitrofix





A demonstration of best practices with soybean variety Tikolore run by AISL in Dedza District

an early product of the IITA-TLII breeding programme in Malawi. This variety is very popular with farmers as it is tolerant to Asian rust and is early maturing. It is also promiscuous in nodulation ability – so that it can form nodules and fix nitrogen without inoculation although its yield is certainly improved when inoculated.

I was able to visit various demonstrations with Lloyd in Malawi including many in Kasungu district where farmers have been successfully trained in seed production for groundnut and soyabean. The simple technologies introduced include double row planting of groundnut and cowpea on ridges – this simple intervention gives much



A demonstration run by CARD in Kasungu District - farmers were readily convinced of the benefits of double row planting of groundnut

better ground cover, nitrogen fixation and yield – and reduces the labour required for weeding. The discussions in Malawi with Lloyd and partners reinforced my understanding that it really takes time before the technologies and the programme become cemented in the private and public sectors – N2Africa has been busy in Malawi since the beginning of 2010 and initiatives such as with AISL are now in place and will play a key role in the sustainable use of legume based technologies in the country. We'll report on this in more detail in forthcoming editions of the newsletter

Ken Giller and Lloyd Phiphira

### A flavour of the N2Africa Annual Planning Meeting and field trip in Uganda

The N2Africa Annual Planning Meeting, held in Mbale from February 25<sup>th</sup> to March 3<sup>rd</sup>, focused on exchanging learnings and experiences throughout all countries in N2Africa over the past year, and gave the opportunity to tailor the planning for the remaining years in the project. For the Tier 1 countries that is only 9 months from the meeting onward and for the Core countries there are still 2 years to go.

Participants were members of the N2Africa Advisory Committee (NAC), Country Coordinators, project staff, Business Development Officers of the Core Countries, a more extended delegation from Uganda and a representative of the TAMASA (Taking Maize Agronomy to Scale in Africa) project.



The group work sessions for Rwanda and DR Congo (left) and Ethiopia, Tanzania and Uganda (right)





Anne Mbaabu contributing on behalf of the NAC (left) and Christian Witt discussing with the Amare Tegbaru, N2Africa Gender Expert (right)

TAMASA focuses on maize, whereas the use of the legumes can help to increase soil fertility in maize-based systems, hence there is a logical interaction between the two projects.

loops across countries, the future use of the collected data, impact studies and policy issues.

The first day of the annual meeting was dedicated to highlights and constraints in 2016 per country, and to capacity building, M&E, data collections, rhizobiology and partnerships. Day two included discussions on data, feedback

In the middle of the meeting week there was a joint fieldtrip with participants of the TAMASA Annual Meeting, which was held at the same venue. The fieldtrip combined the two groups to share knowledge and experience between the two projects. Four different locations (see below) with N2Africa activities were visited in groups of about 20 persons.



Speciose Kantengwa, moderator for the discussions during the Kapchorwa field visit (left) and group photo with the representatives of the Kapchorwa farmer community and the TAMASA/N2Africa delegation (right)



Kapchorwa area, highly populated, with small plots per family





Interactions during the planning sessions (left) and Connie Ayesiga giving extra information on a mobile extension platform in Uganda to interested participants (right)

On day four we summarized learnings and key issues and worked on the revision of the Work Plans for 2017. Day five was for collaboration needed to implement action plans: per country, within N2Africa and with other projects.

All these discussions led to recommendations and new learnings, ideas and priorities plus country specific action

plans for 2017. The action plans now have to be put in practice, working towards leaving a good N2Africa legacy in all participating countries.

Charlotte Schilt, Wageningen University & Research (text and photos)

### Key achievements 2016

- **Capacity strengthening to sustain delivery:** In 2016, a total of 24,172 persons were trained, with a female participation of 47%. In total, 32,717 persons were trained up to 2016. Training topics cut across the whole legume value chain (e.g. execution of dissemination trials, postharvest practices, data collection using tablets, seed production, handling and application of inoculants, herbicides, market standards, gross margin calculations, business plan development, marketing and legume value addition).
- **Entry step for adoption of technologies:** In 2016, a total of 117,313 farmers were reached (49% female) through various dissemination approaches. In total 374,717 farmers were reached up to 2016. In total, 1,685 demonstration and 34,897 adaptation trials were established in 2016 across all countries. The majority of households (41%) were reached through demonstration trials, followed by field days and agricultural shows (34%).
- **Last mile delivery of inputs:** At project level, 53% of the 2016 target (3,045 tons year<sup>-1</sup>) for volume of seed used by farmers was achieved. With regards to inoculants and fertilizers, the project achieved an increase of 47% and 147%, respectively, as compared to 2015. About 62% of volume of inoculant target (25 tons year<sup>-1</sup>) and 31% of the volume of fertilizer target (5,075 tons year<sup>-1</sup>) were achieved. Inoculants were imported and/or produced in all countries.
- **Demonstrated output markets opportunities:** Up to 2016, a total of 119,690 persons (49% female) were

involved in collective marketing and value addition activities. Value addition activities were mainly related to soya-bean and groundnuts and resulted in various high value products, such as soyabean flour, beverages, blend of soyabean flour and other cereals, soyabean cake, groundnut oil and cake.

- **Entry point to reduce drudgery:** In 2016, 16,035 farmers used labour saving tools. About 63% of the 2016 set target (25,375 farmers) was achieved. Most farmers using labour saving tools used herbicides (e.g. 80%). Other tools included threshers, groundnut shellers and planters, amongst others.
- **Quality control for risk-reduction:** Inoculant Quality Control is carried out in ten N2Africa countries. N2Africa supported government institutions such as Sokoine University of Agriculture in Tanzania and Mozambique Agricultural Research Institute in Mozambique with equipment for inoculant quality control.
- **Harvest of agronomic research evidence:** In 2016, various best-bet technology options were analysed and technology packages have been developed and integrated in the dissemination approaches, such as adaptation trials. This enabled farmers to learn, assess and evaluate such technologies for adoption to improve their productivity. The preliminary result of adaptation trials in 2016 showed the relative yield increase (%) of various legumes on N2Africa plots (adaptation trials) as a proportion of the yield on control plots (farmer main field plots). Regarding yield gains, the relative increase ranged

from 6% to 138% across the countries and legumes for N2Africa plots compared to the control.

- **Partnerships as springboard for rapid achievements:** The achievements of N2Africa were realized through Public-Private Partnerships. Up to 2016, 90 partnerships were formally signed with partners, such as agricultural research institutes, universities, local governments, private input suppliers, legume buyers, processors and development partners. In addition to partnerships, other national, regional, and district stakeholder platforms are used to address issues such as coordination and policy issues within legume value chains.
- **Systematic steering and timely learning loops:** Further advances were made in our Monitoring, Learning and Evaluation System over the past year. The focus for 2017 will be on reviewing the M&E strategies of specific partners based on feedback generated in 2016. The developed online analysis tool (e.g. Shiny) will be final-



Session countries presenting their 2016 results

ized for both agronomy and M&E data and made available for use by all stakeholders in 2017.

See for more information: [N2Africa Annual Report 2016](#).

Theresa Ampadu-Boakye, IITA Kenya and Minke Stadler, Wageningen University & Research

### Innovation and systematic change towards achieving impact at scale

- **Leveraging resources through partnerships:** Strengthening existing partnerships (e.g. in the areas of partner relationships, modes of delivery and models of input/output markets) will ensure sustained delivery. Up to 2016, \$122.42 million is leveraged on by N2Africa. This strategy will be pursued in the coming years to achieve impact at scale. The focus for 2017 will be to document processes for achieving the results: 'Identifying what is working well that can be replicated and what is not working well that needs to be corrected or avoided' within the partnerships.
- **Expanding partners and area of coverage:** The outlook for 2017 will be to examine partners' capacity to expand area of coverage and strategize to achieve the final targets. Dissemination approaches, such as use of ICT platforms as adopted by new partners (e.g. GALA, SILT, Farm Radio International in Tanzania, M'Omulumisa in Uganda) will be explored further and adopted in other countries. This will enable the project to meet its set targets for 2017 and beyond.
- **Stimulating private sector participation for input delivery:** The biggest challenge at the beginning of the project which needed to be resolved has been infrastructure, enabling environment to allow private sector participation, capacity of last mile delivery. In 2017, key interventions, such as registration of inoculants, input demand quantification (e.g. by BRITEN in Tanzania), integration of inputs in government input subsidy programs (e.g. Anchor Borrowers Program in Nigeria) and private sector participation in product distribution will be pursued to address issues pertaining to last mile delivery.
- **Linking farmer groups to access output markets:** The focus for 2017 will be to integrate specific interventions, such as building organizational capacity of farmer groups to meet market requirements and addressing country specific output market issues (e.g. policy implications, market requirements, and organizational capacity of farmer groups and modes of aggregation). Furthermore, it will be prudent to focus attention on output market specific partners to ensure market identification, requirements, and negotiations for farmer groups within partnerships.
- **Program management and systematic learning loops:** The focus for 2017 will be on reviewing the Monitoring, Learning and Evaluation (ML&E) strategies of specific partners based on feedback generated in 2016. The developed online analysis tool (e.g. Shiny) will be finalized for use by all stakeholders in 2017. Furthermore, a range of studies will be designed and implemented, using quantitative and qualitative methods to examine the impact of N2Africa and maximize our learning. Finally, national policy opportunities will be used to provide recommendations to governments about best-fit legume technologies, how to increase production and productivity of various legumes and how to stimulate farmers' uptake and use of relevant technologies.

Theresa Ampadu-Boakye, IITA Kenya and Minke Stadler, Wageningen University & Research

## Field learning visits to N2Africa project action sites in eastern Uganda

On 1<sup>st</sup> March 2017, almost 80 workshop participants attended a field learning visit for the N2Africa and TAMASA projects. The learning visit aimed to provide the participants the opportunity of learning about the project implementation progress and through reflections, establish personal and collective learning for better implementation. Moreover, having both projects participants go together on the learning visit, allowed cross learning. The N2Africa project is implemented in eight districts in eastern Uganda, and fall within mainly two contrasting agro-ecological zones of the Southern and Eastern Lake Kyoga Basin covering the low lying rolling plains and the Elgon Farmlands covering the highlands. The low lands are dominated by annual cassava-based farming systems with rice cultivated in valleys. Maize, groundnut, soyabean and to some extent bush beans are integrated in the cropping systems. The perennial coffee-banana farming systems dominate the highlands with maize and common beans being integral components of the cropping system up to the mid-altitude zone.

Project implementation in the region is led by the dissemination partner, Churches Action in Relief and Development (CARD) Uganda in partnership with farmer associations/groups and facilitates linkages to input traders and produce buyers around the focus crops, common bean, soyabean

and groundnut using various models.

From Mbale, the workshop venue, four groups of participants went on a learning visit to one action site Kibuku, Bukedea and Tororo in the low lands and Kapchorwa in the highlands. The different learning visit sites provided an opportunity to learn from farming communities and partners the different models used for dissemination, and access to input and output markets. Producer-collective model is employed by cooperatives in Bukedea, Kibuku with minor differences in strategies, while the the buyer led model is used by AgriNet in Tororo. Surprisingly, these cooperatives don't suffer the common problem of side selling as it is in some regions because of clear guidelines on bulking.

Some learnings from these visits are presentend in boxes.

The first learning visit group went to **Kibuku District** and interacted with the members of Kagumu Area Cooperative Enterprise (ACE) to learn about how to increase access to output marketing through bulking as well as aggregated demand for inputs as means for input access. They apply the producer-collector model and have a store for bulking produce and guidelines for bulking Farmers are mobilised into Rural Producer Organisations (RPOs) and linked to the main cooperative.



The Kagumu ACE bulking centre

### Field visit to Kagumu area cooperative enterprice, Kibuku District

Kagumu Area Cooperative Enterprise (KACE) was established in 2009 and comprises of five Rural Peoples Organisations (RPOs) with a total membership of 600. Leadership is trained in governance and leadership skills by Uganda Cooperative Alliance. The main crops KACE is engaged in are groundnut, soyabean, maize and cassava. Services rendered to members by KACE include capacity building through demonstrations of improved technologies by N2Africa since 2014, providing access to input and output market, improving members' access to finance, linking members to strategic partners including government and development partners, post-harvest technologies and providing bulking services with a permanent store for produce. A credit union (SACCO) was established in 2012 to offer financial assistance to members and non-members in the communities.

Every ordinary member of the cooperative is obliged to sell 20% of his/her produce to the cooperative, while board and committee members have to sell 30%. Members are educated on the benefits of collective selling to reduce side selling. Farmers who are in need of immediate cash are assisted by the cooperative to enable them to store their produce.

New markets are assessed by the market committee, which travels to cities and market centers to source and negotiate markets for the cooperative. The criteria used to determine profitable enterprises are food security, risk, availability of market, availability of technologies and profitability. Enhancing cohesion and confidence of members is achieved through accountability and transparency. For the latter a general meeting is organized once every year for the leadership to account for their stewardship and leaders are trained in governance and leadership skills. The cooperative works on its sustainability by the establishment of strong financial capital to make the cooperative self-financing, by the establishment of better linkages with other partners, through capacity building of its members and by putting up an input supply system.

**Opportunities** for KACE are the management by professionally trained staff, linkage to markets, the permanent store for storage of farm produce, and the existence of the SACCO for financial services to members. **Challenges** are the unreliable market, low production by members to attract large buyers and limited capacity of the cooperative to bulk produce. **Future Plans** consist of the establishment of input supply shops, identification of potential farmers for seed production, establishing a partnership with agricultural research institutions for technology dissemination to the cooperative members, value addition to the produce and linking with more reliable markets.

Samuel Adjei-Nsiah, IITA, Ghana Country Coordinator N2Africa



The second learning visit group visited Basar Integrated Farmers' Association in **Kapchorwa**. The association joined the project in 2013 growing climbing beans with 15 members and rose to 30 members. The group first embraced and popularised diversification of the production systems with newly introduced climbing bean varie-

ties and later in 2015 mobilising other farmers to form the Association and are transitioning to a cooperative to take advantage of collecting marketing of produce but also to specifically tackle the challenge of poor quality inputs seed and fertilisers, and addressing postharvest constraints, in particular storage, pests.



Lead Farmer explaining where and how to plant the common beans and nutritional value of the beans, they ate whatever they harvested and did not have anything left to sell. They plan to grow climbing beans again this season, but the small yield led to a lack of seed and the farmers did not know where to buy new seed. Community-based seed multiplication is therefore a point of action in this area. In addition, the farmers who managed to store seed, saw their seed being eaten by bruchid beetles. Triple-layer, airtight bags (PICS bags) for storage of the beans will be introduced by N2Africa in the coming season. The farmers assured that with larger quantities of seed available, they would plant a larger area with climbing beans. At the same time, the cooperative lobbies for extended cultivation of climbing beans among other farmers in the area. As traders from Kenya are already looking for beans in Kapchorwa district, the farmers hope to increase production volumes and are confident that there will be a ready market to sell their produce.

Esther Ronner, Wageningen University & Research, The Netherlands

#### Diversification of production systems - climbing bean production in the intensively cultivated Mt. Elgon highlands

In the learning visit to Kapchorwa District, beautifully situated on the slopes of Mt Elgon in between the coffee and bananas, we visited Basari Integrated Farmers Association. This association was founded in 2011 and focused on horticultural crops, maize, bush bean and poultry. In 2013, N2Africa started working in the area and introduced the farmers to different climbing bean varieties, inputs and staking methods. Since farmers realized the new varieties and agronomic practices boosted yields compared with their locally grown variety, the association became interested in the commercial production of climbing beans. The number of members increased from 16 to 30, and the association was registered as a cooperative. Their aim is to venture into bulking and collective marketing of climbing beans.

During the visit, we found out that commercial climbing bean production did not take off yet. The farmers grew the improved varieties but, faced with drought, got smaller yields than expected. And as they appreciated the taste and nutritional value of the beans, they ate whatever they harvested and did not have anything left to sell. They plan to grow climbing beans again this season, but the small yield led to a lack of seed and the farmers did not know where to buy new seed. Community-based seed multiplication is therefore a point of action in this area. In addition, the farmers who managed to store seed, saw their seed being eaten by bruchid beetles. Triple-layer, airtight bags (PICS bags) for storage of the beans will be introduced by N2Africa in the coming season. The farmers assured that with larger quantities of seed available, they would plant a larger area with climbing beans. At the same time, the cooperative lobbies for extended cultivation of climbing beans among other farmers in the area. As traders from Kenya are already looking for beans in Kapchorwa district, the farmers hope to increase production volumes and are confident that there will be a ready market to sell their produce.

The third learning visit group visited Koena Farmer's Cooperative in **Bukedea District**, which is made of up of 25 farmer groups. The producer collective model is used in by the cooperative but has emphasised value addition to increase gains from output markets, and has a sales outlet shop located in Bukedea town. They have milling machines

for cassava and maize, have engaged more women and also provide milling services to the community at a fee and for maize portable threshers which can be easily moved around. This cooperative also engages in direct contract farming in production of sorghum for a beer company, Nile breweries.

#### Producer-led model (with some value addition), Koena Cooperative society, Bukedea District

Koena farmers' cooperative is one of N2Africa partners and focuses on groundnut, maize and soybean value chains. It is composed of 247 members from whom the majority are enthusiastic and energetic women. Indeed, empowering women is one goal of the cooperative.

The cooperative was characterized by strong social capital. Composed by members of two religions (Muslims and Christians) speaking 3 different languages, the impression that visitors had is that members are unity towards the common goal of improving their livelihoods through cooperatives.

During the field visit we learned that farmer members of the cooperative are engaged in:

- Value addition with maize and groundnut (processing them into posho and peanut butter). They already provide services to the community through processing equipment but need appropriate technology to scale-up soya and maize products and marketing strategy to tap into opportunities locally with processed products such as posho flour to schools;
- Bulking and marketing of produce particularly with maize and groundnuts. Side selling has been reported as one of bottlenecks often when trying to link farmers to the market using sales arrangements. We learned that the cooperative has adopted a bulking strategy and hence no side sales (1/3 of produce retained and 2/3 marketed through bulking);
- Involved in village savings and this is happening in 14 farmer groups out of the 25;
- The cooperative owns a market outlet shop in Bukedea where posho and butter is being marketed.



Wilson Leonardo, IFDC, Mozambique (Photo: Martin van Ittersum)

The fourth learning visit group visited Agrinet a private business partner, in **Tororo** that employs the buyer led model with a specific quest to mobilise quality produce from the farmers. The company has since 2014 been engaged in soyabean grain from N2Africa farmers even to as far as northern region.

AgriNet a business established in 2008 is a key partner in the marketing segment of the value chain and work through a network of commission buying agents across the country they are a pulling force for increasing production and provide embedded services in especially in post-harvest

handling and business skills and quality improved seed. They process maize and animal feeds with soyabean the company also conducts training in post-harvest handling and facilitates access to improved seed. They face a major challenge in developing sustainable partnerships with producer groups/associations and low volumes of produce due to dishonouring of contracts by producers. How to deal with these were subjects of interest in establishing sustainable partnerships.

Connetie Ayesiga (Business Development Officer) and Peter Ebanyat Country Coordinator, IITA Uganda

### Buyer led model for Improved Market Access of Soyabean in the Eastern Region

During the learning visit to Tororo, we visited AgriNet, a business enterprise that was established in 2008 to fill a gap in the agricultural marketing chain. Their focus is to understand how markets work and being able to manage and /or cope with the market dynamics. For the past 5 years, AgriNet has offered innovative market linkage solutions and services for agribusiness value chain actors including smallholder farmers, traders, and large-scale processors and exporters. It is their ability to keep learning by doing and innovating that sets them apart and progressing. Their flagship products and service include agricultural market intelligence; transaction security service, product marketing, agro-processing and value addition. They work through a network of buying/commission agents across the country and their main activities are buying and selling of grain and processing of animal feeds with maize and soya bean at their plant in Tororo District, situated 60 km South of Mbale.

AgriNet entered a strategic partnership with N2Africa dissemination partners (WVU and CARD-Uganda in 2014 to buy soyabean, and stimulate production, improve post-harvest handling and access output markets in northern and eastern Uganda. It is through this partnership that farmers are able to produce soya with a guaranteed market. And through the partnership, AgriNet has been able to buy over 200 tonnes per year even though their demand was 300 tonnes last year. These volumes were hampered by side selling on the part of farmers but also failure to honour contracts that have led to farmers selling to other buyers.

Since AgriNet was established, over 4000 smallholder farmers have been linked to them for market access across the regions with over 800 direct beneficiaries from N2Africa. These farmers have received trainings in post-harvest handling, improved soyabean seed and assured market for their produce. However AgriNet still faces many challenges that include; Low volume of product from farmers which leads to underutilization of their plant, Low quality of produce, Weak relationship between farmers and AgriNet leading to lack of honouring the buyer agreements and low capital for investment.

Looking into the future, AgriNet envisages being sustainable in 5 years once the farmer-buyer relationship is strengthened. Their target is to market 500 tonnes of produce from the N2Africa farmers this year 2017.

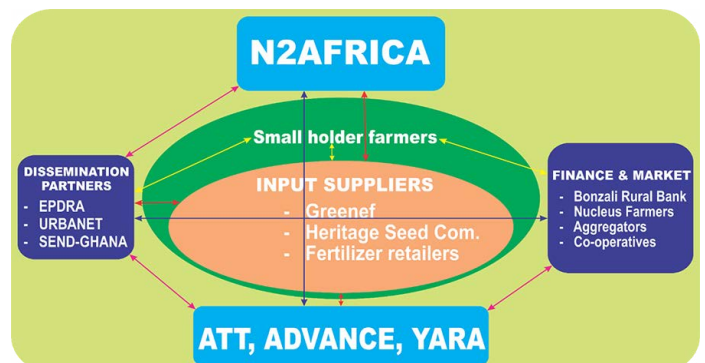
Connetie Ayesiga, IITA Uganda



### Private-Public Partnership improves farmers' access to legume fertilizers in northern Ghana

Grain legume production in northern Ghana is characterized with low yields due to declining soil fertility, inadequate use of farm inputs and lack of good quality inputs including certified seeds, phosphorus fertilizers and rhizobium inoculants.

The international Institute of Tropical Agriculture (IITA-N2Africa) has designed and facilitated a multi-stakeholder partnerships with 14 of its partners with the aim of enhancing technology dissemination and scaling up, building capacity of smallholder farmers and other actors and promoting sustainable input supply and output market.



Diagrammatic representation of input distribution and marketing of soyabean model



						<b>AGRO-INPUT DEALERS</b>	<b>DISSEMINATION PARTNERS</b>
<p>Designed and facilitates the partnerships, provide technical backstopping and build capacities of partners</p>	<p>Provide grants to partners (Greenef and Heritage seed company) in a form of equipment and seed money for soil testing and seed production</p>	<p>Produces and distribute legume fertilizers to agro-input dealers for sale to farmers</p>	<p>Produces and distribute certified seeds to agro-input dealers for sale to farmers, supply foundation seeds and other inputs (fertilizers and inoculants) to legume seed out-growers for the production of certified seeds</p>	<p>Import and distribute inoculants and legume fertilizers to farmers</p>	<p>ADVANCE II Project-Link Nucleus farmers to input and out-put markets, Link nucleus farmers to credit institutions and build capacities of farmers</p>	<p>supply agro-inputs (seeds, legume fertilizers) to farmers</p>	<p>Disseminate technologies to farmers, build capacities of farmers and link farmers to input/output markets and credit institutions</p>

Responsibility chart of the actors in the N2Africa Soyabean-PPPs model in Ghana



Soyabean technology dissemination activities in Yendi, Ghana

**Outcomes and lessons learnt:**

- Multi-stakeholder workshop on sustainable input supply and output markets enhanced and facilitated the design, coordination and implementation of the PPPs;
- Joint on-farm trials with inputs suppliers created awareness of need, demand and market for legume fertilizers (e.g. involvement of YARA in fertilizer trials);
- Farmers access to legume fertilizers enhanced, and market for legume fertilizers in northern Ghana created. According to the manager of YARA fertilizer depot in northern Ghana, sales of legume fertilizer increased from about 15 tons in 2015 to more than 200 tons in 2016;
- General collaboration and Business relationships among the partners strengthened (e.g. Greenef and Heritage seed).

**Conclusion and way forward:**

- Packaging of fertilizers in smaller quantities (e.g. 25 kg instead of 50 kg) to meet the needs of farmers who cannot afford the price of the 50 kg bags;
- Improve on the system of quantification and accuracy of input demand information to enable suppliers meet the demand of farmers;
- Strengthen the capacity of inputs suppliers to meet different demands of their clients.

Samuel Adjei-Nsiah, Country Coordinator Ghana

**Testimony of success on collaboration between YARA and N2Africa through the PPP in northern Ghana**

Our collaboration with N2Africa started when N2Africa through the ADVANCE Project sought to compare the yield of inoculated soyabean with uninoculated soyabean and also with inoculated soyabean and phosphorus fertilizer. YARA therefore decided to develop a nutrition solution for legumes. We however realized that this will not be successful without important actors with similar interest like N2Africa. This is how we started collaborating with IITA.

First, IITA made a request to YARA to make available TSP at its depot in Tamale for trial purposes. However, we decided to include other P fertilizers in the trial. IITA then requested to make TSP available in the retail shops in some farming

communities for sale to farmers for their legume crops. It was not easy for us to accept this request because first TSP is an important raw material for the production of other fertilizers and we also felt that it is an expensive fertilizer and not within the reach of average farmer and finally YARA believes TSP is not balanced enough nutritionally for the legume. However with persistence from IITA through the coordinator, YARA obliged and made available the TSP fertilizers through its distribution channels in some selected locations accessible to farmers. The distribution channels included the following:

<u>Agro-input supplier</u>	<u>Location</u>
Greenef	Tamale and its surroundings
Gumaya enterprises	Central Gonja
Antika	Upper West
AA Zaab	Tamale and its surroundings
Simple Prince	Upper East Region
Moruuk Combine	Yendi and its surrounding

Through this arrangement we were able to sell more than 200 tons of TSP in 2016 compared with less than 15 tons sold in 2015.

Milestones achieved include:

- Farmers are beginning to appreciate legume crop nutrition
- Through the trial it is beginning to emerge that high P alone could not be the solution for legume nutrition. It goes with other nutrients in balanced proportion.

Mr. Mahama Abdul-Rahaman, YARA Marketing Manager

### Soyabean farmers in Ghana face challenges in the sale of their produce

Soyabean has become an important crop in northern Ghana over the past decade, where it is grown mainly by smallholder farmers. It is an important source of edible oil and source of high quality protein for both human and live-stock. The residues after extracting the oil is an excellent source of high quality protein for the poultry, pig and the fish industries where it is in high demand.

Availability of market for the grain between 2005 and 2012 encouraged increased production by smallholder farmers in northern Ghana such that area under production increased from 44,545 ha in 2004 (MoFA, 2005) to 85,938 ha in 2011 (MoFA, 2012). However, since 2015 the market



A woman farmer in Yendi, waiting for market before shelling her soyabean



Bags of unsold soyabean grains in a farmer's store room in Yendi, Ghana

for soyabean grains and products produced locally have been declining rapidly due to the importation of soyabean cake into the country mainly from Argentina, USA, Belgium, Netherlands and Paraguay. In 2015 alone, out of the 27,488 tons of soyabean and soyabean products imported into the country, about 84% was in a form of oil cake (MoTI, 2016). This has forced most of the local processing factories to close down, leading to lack of market for farmers' produce which has hit its lowest price of USD 250 per ton since 2015 compared with the world market price of almost USD 375 per ton. According to the poultry farmers who purchase the bulk of the soyabean cake processed in the country, they prefer the imported soyabean cake over the



locally processed one because of the high oil content of the latter which is not good for the preparation of the poultry feed. All the 10 top processing mills in the country, except one use the mechanical extraction method for oil extraction, leaving substantial amount of oil in the cake which reduces its quality.

Besides, the lack of market for the locally processed soy cake, the processing mills also face a number of challenges. These include frequent breakdown of their machines, infrequent power supply and high cost of power which almost collapsed the industry between 2015 and 2016, supply of poor quality grains by farmers, high taxes and lack of funding.

### N2Africa Ethiopia conducted its Fourth Annual Partners' Review and Planning Workshop

N2Africa-Ethiopia has successfully conducted its Fourth Annual Partners' Review and Planning Workshop during 16-17 March 2017 at ILRI Addis Ababa Campus. The Workshop has provided a National Learning and Experience sharing Platform for N2Africa Ethiopia partners from the four N2Africa target regions; Amhara, Benishangul Gumuz, Oromia and SNNPR. The workshop was conducted under the theme *"Moving forward the legume technology and value chain for sustainable development"*.

Participants for the workshop comprised members of the seven N2Africa initiated Public-Private Partnership Clusters. Multi-actors from the public, private, NGOs and framers' organizations were represented on the workshop. While most participants were from existing partner organizations already mapped into the PPP clusters, new participants from BrazAfric, CropLife Ethiopia and MoA's AGP were included with potential partnership for labor saving tools, legume crop protection services and technology scale up, respectively.

Dr Azage Tegegn, Principal Scientist and Deputy to ILRI's Director General's Representative in Ethiopia, made a warm welcome and opening speech to the Workshop

Sustaining the soyabean value chain in Ghana requires policy intervention to address the numerous challenges faced by the local processors who purchase the bulk of the grains produced by the smallholder farmers.

Samuel Adjei-Nsiah, IITA, Country Coordinator Ghana

#### References:

- MoFA (2005). Agriculture in Ghana, Facts and Figures, Ministry of Food and Agriculture, Accra, Ghana.
- MoFA (2012). Agriculture in Ghana, Facts and Figures, Ministry of Food and Agriculture, Accra, Ghana.
- MoTI (2016). Trade import for 2015. Ministry of Trade and Industry, Accra, Ghana.



Dr Azage Tegegn, while addressing opening and welcome speech to the workshop participants

participants. In his speech, he made remarks on the role of Public-Private Partnerships for agricultural sector development and N2Africa's initiative in this regard.

An introduction to workshop aims, expected outcomes and overview of major project achievements during 2016 was made by N2Africa Ethiopia Country Coordinator, Dr Endalkachew Woldemeskel. In his presentation, he made



Fourth N2Africa Partners' Review and Planning Workshop Participants



“Bus Stop” poster presentations from Jimma by Beza Erko (left) and Pawe by Getachew Yilma and Fitsum Miruts (right) PPP clusters

emphasis on the relative benefits of N2Africa technologies and the multi-stakeholder partnerships in disseminating, knowledge transfer, and input-output market integrations. N2Africa’s experience on multi-stakeholder partnerships using the Public-Private-Partnerships (PPPs) model, to institutionalize and sustain N2Africa legume technologies, knowledge and expertise was added by Tamiru Amanu, Business Development Officer to N2Africa Ethiopia.

With introductory presentations on overall project progresses and overview to the PPP clusters, first round poster presentations were made by cluster leaders following a “Bus Stop” approach. This was made for all the Seven PPP clusters highlighting major achievements, lessons, challenges and opportunities during 2016 cropping season. Participants with different “hats of value chain actors” made round visits to the “Bus Stops”. Highlights of key achievements reported include improved legume technology dissemination, training framers’ and other subject matter specialists, improved legume seed multiplication, support for inoculant supply chain development and farmers access to grain market. It was clear from these poster sessions that multi-stakeholder collaborations through PPP approaches in addressing multiple legume value chain issues has been made possible. However, the need for further synergy among partners for increased impact has been suggested. Challenges include legume disease/pest infestations, poor legume mechanization services and lack of proper input legume market information prediction mechanisms. Increasing grain legume market price has been reported as an opportunity to venture into legume enterprises.

Second round poster presentation session was dedicated for lead firms and legume input suppliers to share their grain sourcing and input business strategies following similar “Bus Stop” approach as the first poster session. Guts Agro Industry and Agricultural Commodities Supply Ethiopia (ACOS) shared their grain market sourcing strategies. Farmers’ Cooperative Unions and individual traders were reported as the major legume grain suppliers. Menagesha Biotech Industry (MBI) for inoculants and Tsehay Farmers’ Cooperative union for chickpea seed also shared their experience and lessons in legume input business. While the agro-dealer and cooperative models are

the major inoculant market outlets for MBI, it is the cooperative model for Tsehay union.

Further to the poster sessions, highlights of N2Africa legume agronomic results with an outlook of 2017 planning has been provided by Birhan Abdulkadir, Field Liaison Officer and Data Manager for N2Africa Ethiopia. This was followed by group breakouts into the seven PPP clusters so as to make quick evaluations of the respective PPPs on the dissemination and business models being followed and make suggestions in the course of future implementations. Group feedback was provided in plenary.

With growing demand for legume labor saving tools, N2Africa is also partnering with BrazAfric for multi-crop threshers and planters, and Knapsack sprayers. Ato Telaye from Brazmart, a sister company to BrazAfric, has made a presentation on potential tools with their possible business models which has nurtured high demand from partners.

A final presentation on key results from N2Africa rhizobiology research, notably, the strain by variety trials across locations by Abere Mnalku from Ethiopian Institute of Agricultural Research. Key results indicated the possibility to identify new rhizobial strains superior to existing commercial elites. In addition, performances of the candidate strains are location and variety specific indicating the possibility for inoculant production targeting specific varieties and locations. The result laid further discussion ground in strengthening common platform for rhizobiology research, registration and sharing for production.

Finally, cluster level planning for 2017 has been facilitated by N2Africa national team. Major focus was given to activities which can ensure sustainability post N2Africa project including strengthening the legume input systems, documentation and sharing of lessons, and liaising with current government agricultural growth initiatives for improved legume technology scale up.

For more information see the [N2Africa-Ethiopia-wikispace](#).

Tamiru Amanu, Dr Endalkachew Woldemeskel and Birhan Abdulkadir, IITA Ethiopia



## Common bean yield potential and yield gaps in Ethiopia and Tanzania

Common bean is an important crop in Ethiopia and Tanzania but the national average yield is small (respectively 0.9, and 0.8 ton ha<sup>-1</sup>; source FAO), indicating that large opportunities exist for intensification of common bean production systems. Assessment of yield potential and yield gaps could help to provide insight in opportunities to increase productivity of common bean. We investigated the water limited potential yield and the yield gap of sole crops of bush bean in the major producing areas in Ethiopia and Tanzania (Figure 1), and up scaled these results to the country level. To investigate this we used the standard protocols of the Global Yield Gap Atlas (GYGA, [www.yield-gap.org](http://www.yield-gap.org)).

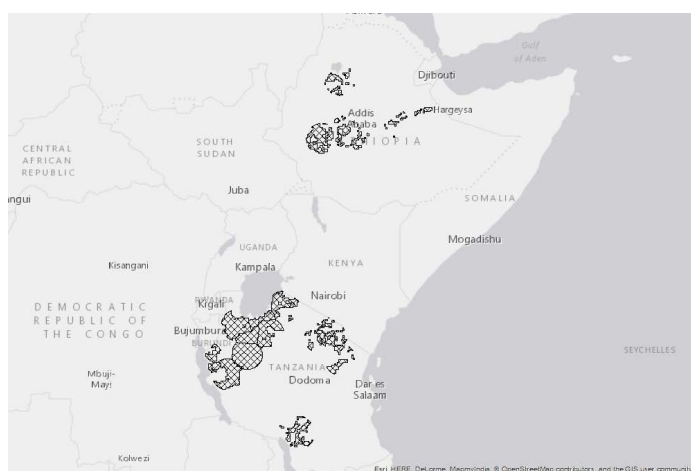


Figure 1. Selected common bean producing areas in Ethiopia and Tanzania for water limited yield and yield gap estimations

Water limited yield potential is the yield with optimal crop growth (i.e. optimal soil management, no nutrient deficiencies, and no yield reductions by weeds, pests and diseases), but water can be limiting. The yield for one region is the weighted average yield of the dominant soil types, and the average of the years 1998 - 2012. The difference between the actual yield which farmers obtained and the water limited potential yield is called the yield gap. To estimate the water limited yield, a generic crop growth model, Simple Simulation Model (SSM) was used. This model uses local weather data and optimal management practices of a specific region to simulate crop potential yield. Information on optimal management practices were collected by N2Africa agronomists or derived from default values in the SSM model. Optimal management practices were for example sowing date and planting density. An optimal plant density of 50 plants m<sup>-2</sup> was used. This value was derived from the portion of the potential yield versus plant density relationship at which simulated potential yield starts to plateau. The selected density falls within the upper range of plant densities used in field experiments aimed at maximizing yields sub-Saharan Africa. In contrast, the average planting density in Ethiopia and Tanzania were respectively 25 and 15 plants m<sup>-2</sup>. Estimation of the optimal sowing date was based on GYGA protocol. This protocol

prescribes that sowing was done when the cumulative amount of rainfall is above a certain threshold value (i.e. 20 mm) within a sowing window. This window is based on information from N2Africa agronomists, and is an average period when farmers generally sow.

For the variety selection in the SSM model, we used generic varieties to simulate the potential yield of the local high yielding varieties. Selection of the generic variety was based on the management information provided by N2Africa agronomists. In Ethiopia, we developed a generic bean variety for the simulation, which had a growth duration that ranged from 90 – 120 days. In Tanzania, we simulated an early and late variety that were suitable for the different regions.

The preliminary results of water limited potential yields of common bean in Ethiopia and Tanzania and yield gaps in Ethiopia, show large differences between the countries. In Ethiopia water limited potential yield was 3.7 ton ha<sup>-1</sup>, in contrast to Tanzania where it was around 2.9 ton ha<sup>-1</sup> (Figure 2). This large difference can mainly be explained by the lower cumulative rainfall during the growing season in Tanzania compared to Ethiopia. Differences in water limited potential yields within the country can largely be explained by differences in growth duration.

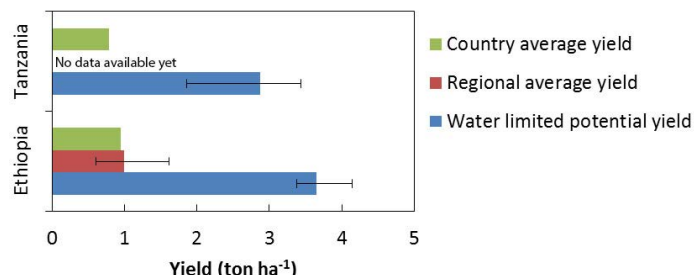


Figure 2. Average water limited potential yield (blue), and actual yield (red) for the selected production regions (Figure 1), and country average actual yield (green) (source FAO) of common bean in Ethiopia and Tanzania. Error bars indicate the range of yield levels among the different production regions in the country.

In Ethiopia, current actual yields for common bean are only 27% of potential yields. Farmers' yields are far below the potential yield, due to suboptimal management practices such as sparse planting. Timing of sowing, nutrient application, and weed management could also be suboptimal. Furthermore, the harvest index simulated by the model for potential yield was very high (e.g. 0.6). This implies that applying appropriate management practices improves crop yield.

There were large regional differences within Ethiopia (Figure 3). In Haramaya and Gelemso, actual yields were around 40% of the potential yield, while in Jimma and Adet, the actual yields were only around 20% of the potential yields (Figure 3). In Haramaya and Gelemso the

smaller yield gap was explained by the high actual yields in comparison to the potential yield. The opposite applies in Jimma where actual yields were small in comparison with the potential. By contrast, in Adet the large yield gap can be explained by the high yield potential in this region due to the long growing season.

Final results of common bean in Ethiopia and Tanzania will soon be available on [yieldgap.org](http://yieldgap.org).

Nanyan Deng<sup>1</sup> & Marloes van Loon<sup>2</sup>

<sup>1</sup> University of Nebraska Lincoln, United States

<sup>2</sup> Plant Production Systems, Wageningen University & Research, The Netherlands

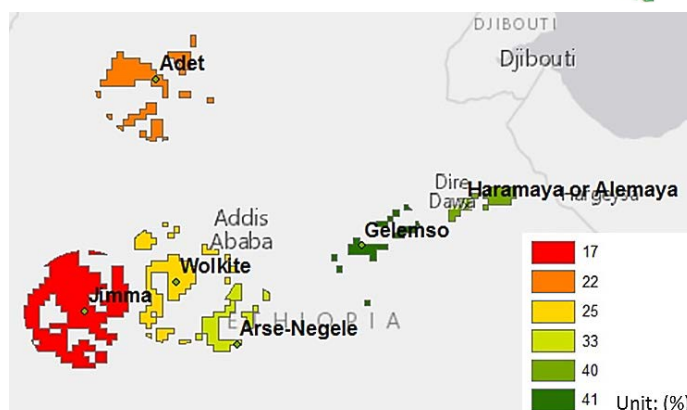


Figure 3. Relative yields (actual yield/water limited potential yield\*100) of common bean in different regions in Ethiopia. Red indicates low relative yield, and green a high relative yield.

### A paradigm shift from grassroots to agribusiness focus in west Kenya

As we enter the final year of N2Africa Phase 2 activities, the outreach team in west Kenya shifts strategically from promotion of BNF technologies at the grassroots level to working more closely with the agribusinesses that produce and market them. This move reinforces the commercial momentum in the delivery of BNF products, particularly inoculants, blended fertilizers and certified legume seed, beyond the project's lifetime. Toward this end, N2Africa and its partners recently launched the One Stop Shop Operation Mechanism (OSSOM, sounds like awesome), a network composed exclusively of agribusiness interests promoting BNF input technology products and legume marketing and processing operations. (See [the meeting report](#)).

OSSOM members include 15 “One Stop Shop” agrodealers; and four input suppliers including MEA Fertilizers Ltd. (manufacturers of BIOFIX inoculants and SYMPAL blended legume fertilizer), SeedCo (producers of certified soyabean seed), Western Seed Growers Association (licensed to produce certified legume seed through out-growers), and Bayer E.A (releasing a new liquid formulation inoculant in

2017). These input manufacturers are located elsewhere in Kenya but have posted product representatives to west Kenya and linkages are being formed between them and OSSOM's input retailers. In addition, OSSOM has established a warehouse specifically handling BNF technology products for its members. Included among OSSOM members were those operating both legume grain marketing collection points; and commercial-scale soyabean processing operations, particularly milling, flour blending, roasted beverage and snack production. Also in attendance were representatives of the Ahero Irrigation Scheme where over 2000 rice farmers are interested in introducing soyabeans into their production systems. This planning meeting and launch signifies a major paradigm shift from grassroots operations, formerly led by the WeRATE Innovation Platform, to agribusiness promotion and “last mile” input delivery as every OSSOM member operates a profitable agribusiness enterprise relating to BNF and legume technologies (see Table).

Contrast between the Farmer Outreach and Agribusiness approaches to technology dissemination in west Kenya

Main Focus	Farmer Outreach	OSSOM Agribusiness
Target	Grassroots groups & their members	Agrodealers & their product suppliers
Mechanisms	On-farm technology tests & field days	Product displays and customer open-houses
Monitoring	Participant lists and farmer feedback	Customer lists and test marketing
Impacts	Informed demand for BNF technologies	Reliable supply of BNF input products



Participants at the launch of the One Stop Shop Operation Mechanism (OSSOM) in west Kenya during March 2017

OSSOM's shift from farmer outreach to agribusiness networking is timely but not without difficulty. Previously grassroots farmer groups were reliably commissioned by WeRATE to conduct on-farm technology tests and farmer field days, and were provided modest incentives to do so; but now OSSOM's agribusiness operators consider BNF technology products alongside other product lines and evaluate them in terms of return on seasonal investment. Also, gender balance is no longer reinforced because we





Josephine Ongoma (OSSOM Manager, left) and Ms. Echessah (MEA Fertilizers Ltd., right) discuss input supply strategy for the newly established OSSOM warehouse

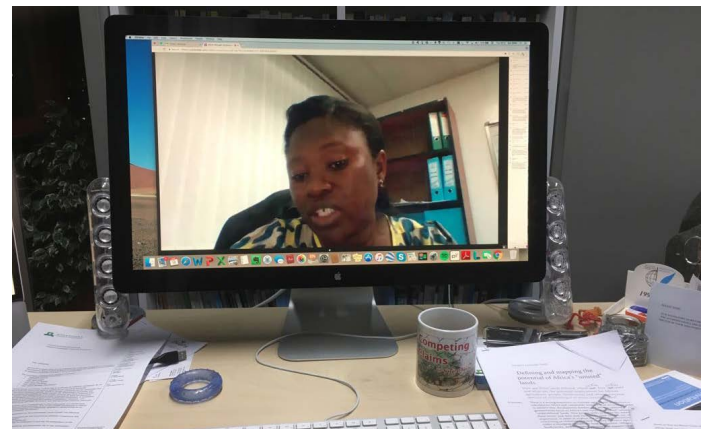
work with business as it stands and are in no position to dictate gender relations to owners and their employees. For example there was only 32% women participation at the OSSOM launch because fewer business operators are female. Compliance with N2Africa M&E requirements is now more difficult because most forms are geared toward grassroots rather than agribusiness participation. And there is always the issue of business competition among members. No matter how friendly, businesspersons will always keep secrets from their competitors and this may likely carry over into their willingness to accurately report sales and price information. But all this notwithstanding, our shift to agribusiness interests seems the best way to ensure a more lasting impact from the N2Africa project as it is more focused upon laying commercial pipelines of proven input products to committed legume producers into the future. Isn't OSSOM awesome?

Paul Woomer, Welissa Mulei and Josephine Ongoma

### Other N2Africa activities

On behalf of N2Africa Theresa Ampadu-Boakye and Ken Giller contributed to the Virtual Symposium “**Nitrogen: At the Nexus Between Food Security and Sustainability**”. About 100 participants worldwide joined.

Ken Giller also presented N2Africa in a WURtalk at Wageningen University & Research for 100 interested people. His lecture, under the subject Nature's Nitrogen, was entitled **N2Africa - When technology escapes the laboratory**. This lecture will be available on the internet soon.



Theresa Ampadu Boakye speaking during the virtual conference

### Related newsletters

- CIAT blog: [Platform for Big Data in Agriculture](#);
- Tropical Legumes III updates: [Strengthening the groundnut value chain in Uganda](#) and [Tropical Legumes III: Strategies for wider reach and deeper impacts](#);
- Soybean Innovation Lab Newsletters : [February](#) and [March 2017](#);
- Africa Soil Health: [OFRA: announcing new book on Fertilizer Use Optimization in Sub-Saharan Africa](#);
- [GALA newsletter no. 2](#);
- ASHC news: [Soybean and the gender agenda...](#);
- Green Ef research results: [What agro-dealers think – a survey from northern Ghana](#);
- SILT Blogs: [Funders visit SILT demo plots and seed growers](#) and [Maximising partnerships to scale-up legume technologies in Tanzania](#);
- IITA Bulletin: [Two more feathers added to IITA's Aflasafe project's cap](#);
- FAO: [Pulses and biodiversity / Les légumineuses et la biodiversité](#);

**And, very inspiring for the next generation:**

- FAO, kids comic: [Pulses contribute to food security](#).

## Announcements

### Feeding a Hungry Planet: Agriculture, Nutrition and Sustainability

I am excited to announce that I am part of the faculty team in this excellent new MOOC. This 7-weeks free online course from SDG Academy has started last week, but you can still participate! [Enroll here!](#)

The e-course highlights Sustainable Development Goal (SDG) 2: end hunger, achieve food security and improved nutrition, and ensure sustainable food production systems by 2030. We explore the pressing challenges around agriculture and food systems, the central role of agriculture in the SDGs, and development pathways towards global food security and sustainable agriculture.

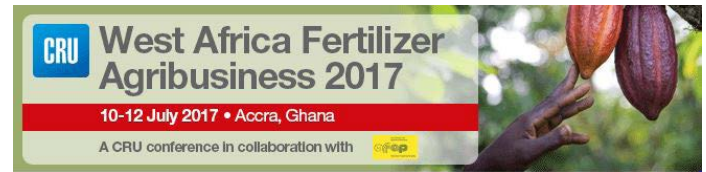
The rest of the faculty team contains 7 other experts from Rothamsted Research, Wageningen University & Research, Cornell University, Tufts University, Johns Hopkins University and Columbia University. Together we will cover topics such as nutrition, sustainable agriculture, and rural development. The e-course features video lectures, interesting readings, a discussion forum to interact with the international community of peer students, and live chat sessions with the faculty and other sustainability leaders.

This MOOC is for anyone interested in agriculture and food, not just scientists.

Enjoy learning, and please share this information widely.

Ken Giller

### West Africa Fertilizer Agribusiness Conference 2017



This conference is a collaboration between CRU Events and The African Fertilizer and Agribusiness Partnership (AFAP). Focus is on demand creation for fertilizer and agribusiness across Africa. In order to achieve this, discussions will take a holistic view of the agribusiness value chain to explore how the public and private sectors can partner to create viable fertilizer markets and boost demand in Africa. (no link available yet. Link to [2016 conference](#) for impression).

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The Podcaster is published six to eight times per year – we look forward to receiving news and contributions – particularly from partners. Please send in contributions well in time. Contact address for this newsletter is: [N2Africa.office@wur.nl](mailto:N2Africa.office@wur.nl)

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