

N2Africa Podcaster no. 15

July and August 2012

Introduction

For many of us – both in southern Africa and in Europe - July and August are the time of year to escape from work and email, though for our colleagues in East and West Africa cropping seasons are in full swing. It has been a busy period of interaction with both the Bill & Melinda Gates Foundation and the Howard G Buffet Foundation as we go through reporting rounds. The narrative report that covers the main activities over the past year is available on the N2Africa website if you would like to read it. N2Africa is moving into the final year of the first four-year phase of funding, while at the same time we are ramping up activities to reach even

larger numbers of farmers than in the past seasons.

We look forward to meeting many of you at the forthcoming conference on Integrated Soil Fertility Management ISFM conference (www.isfmafrica2012.org) that will take place between 22-26 October 2012. N2Africa partners will present a number of papers and posters at this conference which includes the biennial meeting of the African Association of Biological Nitrogen Fixation (AABNF) and promises to be an excellent meeting and discussion place.

Ken Giller

Julieta Mario and her mother Carlota Sabonete – Leading N2Africa Farmers in Mozambique

Julieta Mario comes from a long line of good women farmers, and manages her farm in Magige Village, Gurure Province, together with her mother Carlota Sabonete – still an active farmer. As with most of the country, Gurure was badly affected by Mozambique's long civil war; like other farmers, Carlota was happy to resume farming when peace was finally achieved nearly 20 years ago, passing her knowledge and skills on to her daughter. Julieta, who supports her seven children alone after the death of her husband in 2000, began growing soybean in 2008, and displays a superior knowledge of soybean production. During the 2011/12 growing season, Julieta received improved soybean varieties, inoculant and SSP fertilizer from N2Africa. She quickly identified the newly released (in Mozambique) variety TGx1908-8F as excellent soybean material, noting that it germinated quickly and developed a good canopy cover, which she says helped to shade the soil and conserve moisture. This was critical to the crop's survival during a long mid-season drought which hit Gurure – normally blessed with good rainfall – in 2011/12. Julieta harvested a good soybean crop from her N2Africa demonstration trial, and was so pleased with the increased yield in the plot receiving inoculants and SSP that she said she would be willing to buy the inputs, if they were made available to her, next season. She knows it is important to return the crop residues to the soil, rather than burning them, as so many of her neighboring farmers do. With her soybean



From left to right: Four of Julieta's children, her mother Carlota, Anne Turner, Julieta and Nelito Rosario of N2Africa Team-Mozambique harvest, Julieta is able to make money to help pay her children's school fees, clothing and medical care – much more money is to be made with soybean than other crops such as maize and beans, she says, since the price for soybean is very high in Gurure. Julieta's daughters, who help with the farming, are learning about N2Africa technologies as well, and we hope they will use this knowledge to become even better farmers than their mother and grandmother.

Anne Turner and Nelito Rosario

Latest Exposure

We recently submitted, (on time!), a progress report to the Bill and Melinda Gates Foundation. As it said in the introduction, the report is, "the product of the countless hours spent by Field Liaison Officers, Agronomists, Rhizobiologists, Research Assistants and students in African fields, farms and laboratories: and a testament to the support of our numerous in country partners and smallholder farmers with which we are all privileged to work." This was our month 30 report.

Liberia, Sierra Leone and North Kivu and the Ruzizi plains in DRC to the Howard G. Buffet Foundation. Here we are able to extend the work and learning of the project, with their support.

Both reports will be available through our website soon.

Our thanks goes to everyone who has been interested in and supported N2Africa around the globe.

We have written separately about our first progress in

Alastair Simmons

Monkey Business

We would appreciate some feedback from you, the readers of the Podcaster; about what goes well, what goes not so well and what we could do better in our communication. To keep you better informed about the 'Putting nitrogen fixation to work for smallholder farmers in Africa'.

You will receive soon an email from the online "Survey Monkey". It will not take much time to respond to the questions and your responses really will help our understanding. Thank you.

Alastair Simmons, N2Africa Communication, Knowledge and Project Management Officer

Malawi's President Joyce Banda meets N2Africa

N2Africa-Malawi participated in the launch of USAID-funded project "Integrating Nutrition in Value Chains" (INVC) on 12 July 2012, an event which also marked the



President Banda, together with the USA Ambassador to Malawi, viewing products made from soybean by the Malawi N2Africa Farm Liaison Officer, Gloria Kasongo

100th day in office for the new president, Her Excellency Joyce Banda. Since INVC will be promoting soybean production and consumption for improved livelihoods and nutrition, N2Africa exhibited some of the soybean technologies being promoted in Malawi; from why and how to use inoculants to household level production of soybean food products (soy milk, protein-fortified flour and snacks). President Banda visited our stand, and was interested to learn that so many food products could be prepared from soybean. President Banda also expressed her concern that despite the efforts of so many projects to promote soybean in Malawi, productivity levels are low. The Malawi N2Africa team needs to strive hard to better and more widely disseminate our soybean production technologies during the upcoming 2012/13 season....otherwise we may risk being called to the State House with some explaining to do...

Gloria Kasongo and Anne Turner

Ilse de Jager introducing a new discipline into the N2Africa project

Ilse de Jager has recently joined the N2Africa project team at Wageningen University to conduct a literature study on the nutritional benefits of legume consumption at household level. As a nutritionist, she entered a new world of crops and farming. Talking about the uptake of nitrogen already resulted in some confusion, as it was referred to the uptake by the plant and not by the body. But it is exactly these two worlds we need to combine to understand N2Africa's impact on nutrition. Ilse completed an MSc in human nutrition and health at Wageningen University, with a focus on malnutrition in developing countries. Her past research within the TELFUN program, carried out as a master thesis in India, focussed on the combined effect of consuming a mungbean based meal (which is relatively high in iron) and guava (which is high in vitamin C) on iron status and nutritional indicators of rural Indian schoolchildren. Ilse's study will focus on the following research questions:

- What are the nutritional values of cowpea, groundnut, soybean, common bean, chickpea and pigeon pea?
- What is the significance of the nutrients present in legumes for the human body, and how do they affect the health of humans?
- Which factors influence the bioavailability of the nutrients (antinutrients present in legumes, preparation methods, combination of foods consumed, nutritional

status)? How do they influence the bioavailability and to what extent?

- Is there evidence that increased nutrition security at household level, increases labour productivity?
- Which indicators can be measured to show the effect of the activities of N2Africa on nutrition security at household level?

Preliminary results indicate that, as we all know, legumes are an important source of protein in resource-poor settings, particularly among plant-based diets. The protein content of legumes is generally between 20% and 30% of energy. A serving of legumes (about 90 grams) provides about 15% of the recommended daily allowance (RDA) for protein for a 70-kg adult. Although legumes are recognized as being high in protein, the quality of bean protein is often underestimated. Two factors influence protein quality: the protein's digestibility and its amino acid composition. Proteins must be digested before they can provide amino acids. This depends on the protein's source and other foods eaten with it. Animal protein is highly digestible (90 to 99 percent) but plant proteins are less digestible (70 to 90 percent for most). The protein quality of most beans is reasonably good, although their overall value is reduced somewhat by their low digestibility. When people are deprived of protein, energy or both, the result is protein-energy malnutrition



Ilse eating mungbean based meal together with the Indian schoolchildren in the TELFUN project.

(PEM) and leads to the syndromes of marasmus (chronic protein-energy malnutrition), kwashiorkor (acute protein-energy malnutrition, also known as 'hunger belly') or a mixture of both. PEM most often strikes early in childhood and is one of the most prevalent and devastating forms of malnutrition in the world, afflicting one of every four children worldwide. Besides an excellent source of protein, legumes are also an important source of minerals and vitamins. Ilse will further research the significance of these nutrients for the human body (iron, zinc, vitamins B) and the quality of the nutrients in legumes. For example, the bioavailability of these minerals and vitamins are limited by the presence of antinutrients (compounds that interfere with the absorption of nutrients) in legumes, such as phytate. However, traditional household food-processing and preparation methods can enhance the bioavailability by decreasing the content of antinutrients and increasing the content of compounds that improve bioavailability.

Ilse de Jager

N2Africa Project Offers Hope For Sierra Leone Farmers

Something beyond the traditional farming experience in Sierra Leone is being introduced to let farmers benefit from grain legume crops. The common practice upon which the farming of these crops had been centred lacked maximum productivity and did not focus on nutritional and economic values. With the introduction of the N2Africa Project, however, those setbacks and disadvantages will soon become an experience of the past.

University (WU) in the Netherlands and the Sierra Leone Agricultural Research Institute (SLARI).

EXPECTED BENEFITS

Under N2Africa Project soil infertility can be halted and reversed with the use of specific varieties of grain legume crops. In a novel research approach, the legume seeds are treated with biological inoculants before planting to increase their inherent ability to trap nitrogen gas from the air and make that gas available to crops in the a form that they can take up . When the nitrogen rich residues of the crop are returned to the field, it helps to improve soil fertility, thereby reducing huge yield losses caused by deteriorating soils.



Moreover, the legume provides additional nutritional and economic benefits. Soybean, for example, can be processed into soy-milk, soy-cheese, and infant weaning foods (e.g. Bennimix); the crop is an excellent source of vegetable oil; soybean cake is an excellent livestock feed especially in the poultry industry; soybean is also used to nutritionally fortify gari and other cassava products.

N2Africa is a multi-country project funded by The Howard G. Buffett Foundation and the Bill and Melinda Gates Foundation to provide smallholder farmers in Africa with opportunities to produce, utilize, and market protein-rich varieties of soybean, cowpea, common beans and groundnut. These varieties are reported to be very suitable for improved nutrition of families, wealth creation (e.g., through market linkages with food/baby foods and livestock/poultry industries) and can be part of biological methods to improve soil fertility. In Sierra Leone the project is implemented by the International Institute of Tropical Agriculture (IITA), in close partnership with Wageningen

The N2Africa Project will partner with the Ministry of Agriculture Forestry and Food Security (MAFFS), NGOs and the private sector (e.g. Sierra Akker, Bennimix) to provide increased opportunities for food security and income generation to smallholders in line with both public and private sector needs.

TRIALS

N2Africa field trial programs have been established for soybean, cowpea and groundnut at various sites in the country.

One of the site locations is at Sumbuya, 6 miles from Bo,

southern province. According to the site's SLARI Field Supervisor Mohamed Nyoniyo, planting of 4 soybean varieties is under way to enable scientists to determine appropriate planting dates for best yields. The relevant information will be passed on to potential farmers.



Another trial planted at the site features cowpea variety testing and pest control. The site's SLARI entomologist Mr. Augustine Mansaray explained that 6 varieties are on trial to determine which of the varieties performs well. "We want to see which varieties perform well under spraying and non-spraying regimes," he said. The trials will also enable SLARI researchers to know and later recommend appropriate time to plant the new varieties introduced by IITA from Nigeria. The early planting cowpea trials were being harvested at the time of the site visits.

There is a soybean trial at Serabu on the Bo-Kenema highway in the Kenema district, Eastern Province. The trial exercise here involves the application of a biological inoculum together with fertilizer on one plot of soybean, and another plot without inoculum but with fertilizer. Soybean plants in plots with inoculum looked greener, thereby indicating better nurture and inevitably a prospect for high yield in the future; Soybean plants in plots without inoculum looked pale indicating under-nourishment and probably a poor future yield.



The Sumbuya site also has a groundnut trial with new varieties introduced by IITA, planted at four different locations, with and without fertilizer. Another trial plot with groundnut variety Samnut 23, 22 and JL24 24 was observed at Old Mosongo near Njala. Because of rodent infestation and heavy downpour of rain, the plants were not doing very well. The Samnut 23 and 22 are expected to be harvested

between 110 and 120 days; whilst JL24 will be harvested between 91 and 110 days.

IMPRESSIONS

Sierra Leoneans are very familiar with the cultivation of cowpea and groundnut, but soybean cultivation is a new experience. Soybean production will therefore require closer scientific guidance in order for the country to realize the expected benefits from the crop. This is assured by IITA, SLARI and WU scientists.

A large swap of land at the Njala University at Makonde (Moyamba district, Southern Province) is cropped by SLARI



as a seed multiplication site to produce quality seeds of soybean, cowpea and groundnut in quantities needed for future distribution to farmers associated with partner MAFFS, NGOs and the private sector. Another soybean and groundnut multiplication site is established at Mange (Port Loko district, Northern Province) by the private sector partner Sierra Leone Agriculture.

During field visits Dr. Braima James (IITA Country Representative in Sierra Leone), was visibly impressed with the performance of the seed multiplication plots and field trials. "N2Africa project is clearly responding to needs IITA partners have expressed over the years, especially in national efforts to increase wealth creating opportunities for farmers"

Dr. Michael Johnny (Farm Liaison Officer, N2Africa Project) and Ms Edna Bangali (Research Technician of the project) joyfully expressed their appreciation of their collaboration with SLARI scientists on the project. In the words of Dr. Johnny "We are very satisfied with the progress so far. We are expecting that subsequent collaboration with Government, NGO and private sector partners will help beneficiary farmers to fully take up cultivation of soybean and the other grain legume crops as a business."

With N2Africa Project, smallholder farming of food grain legumes is now poised for a revolution leading to greater productivity and economic gains.

George S. Khoryama (freelance journalist in Sierra Leone. He accompanied IITA and SLARI staff in N2Africa field activity monitoring visits 17 to 20 August. His observations form the basis of this report)

Role model farmer shows a way for adoption of legume technologies in Western Kenya

Irene Ngochi is a farmer from Emakhunje Village in the densely populated Emukhaya district of Western Kenya. Farm sizes in the district range from as small as 0.05 ha to 1 ha, with the majority (70%) of households owning 0.20 ha. Irene's household owns an average farm of 0.25 ha. At the age of 50 years, Irene has developed a very positive attitude on planting soybean and climbing beans. *"I used to plant soybeans sometime back but I stopped because I did not know how to use it and the yield I got was very small. I did not know that mineral fertilizers would increase yield neither did I know that soybean has so many products and by-products"* narrates Irene. It was until the last short rainy season that Irene participated in soybean and climbing bean variety evaluation activities organized by the N2Africa agronomy team. She also attended a training on

soybean processing organized by Dr. Josephine Ongoma, the N2 Africa Node leader for the soybean Cluster covering Butere, Mumias, Emukhaya and Khwisero. *"I visited the soybean and climbing bean variety trials in Butere and it was so fascinating. The soybeans looked uniform and with many pods. I saw tall beans staked like tomatoes with many pods ten times our normal beans and I decided this is the way to go"* smiles Irene.

The variety trials and training on soybean processing motivated Irene to grow climbing beans and soybean and she discussed with her husband who allowed her to use a quarter of their land to grow these crops. She also hired 0.1 ha from the neighbour to grow more soybeans. Irene approached the N2Africa outreach team and managed to convince it to become a satellite farmer. She was given a test pack of 2 kg of soybean seed, 2 kg of Sympal fertilizer and 20 g of BIOFIX inoculants to try on a 20x10 m plot. She also decided to source 0.25 kg of climbing beans and 5 kg soybean seeds from the N2Africa Agronomy team to plant on her extra land. *"Because I did not have Sympal and BIOFIX to use on the hired land, I decided to use farm yard manure instead"*, explains Irene. More interesting was to see how she established climbing beans. Climbing beans were not planted uniformly in the plot but under young trees spread over her farm. The reason she give is lack of staking materials.

Irene reports that she has harvested 370 kg of soybean from her quarter acre and 30 kg of climbing beans. *"This yield is extremely high in our village and the whole district, considering the poor fertility of our soils and the legume varieties we use"* reports Irene. *"I plan to sell 250 kg of soybean which will give me at least KSH 12,5000; enough to cover a lot of my family expenses"*. She says that after learning the processing and utilization of soybeans into different products (like milk, yoghurt, beverage, crunches, chapatti, soycorn blend), soybean now has become an important component of her family's meals. Irene heads a women self help group with more than 60 members and she has inspired it to grow legumes in an improved way. *"We plan to expand the area under soybean and climbing beans, and put legume production on our development agenda. I believe this would be a solution for our small pieces of land"* comments Irene with a charming face. She prays that knowledge and equipment on soybean utilization are extended to more farmers, as well as extension services for a wider adoption of legume technologies.

Wycliffe Waswa, John Mukalama and Freddy Baijukya



Irene poses for a picture on 0.1 ha plot she hired to grow soybean



Irene points to climbing bean trailing on one of the trees in her farm

Link to New Agriculturist: Perspective Ken Giller

See this link <http://www.new-ag.info/en/view/point.php?a=2711> for a short 'Perspective' piece on how our thinking about approaches to helping farmers choose

options within N2Africa can be more broadly applied to other approaches.

Ken Giller



Conference announcements

1. The World Soybean Research Conference IX.

This conference will take place February 17 – 22, 2013 at the Durban International Convention Centre in Durban, South Africa. This year's theme is "From China to Africa – Can research close the gap between soy production and increasing global demand?"

The abstract submission deadline has just passed (was August 31), but the conference may be interesting for other visitors too. For more information see [the website](#).

2. Sixth International Legume Conference.

The 6th International Legume conference will be taking place in Johannesburg from 6-11 January 2013. Theme of the conference is "Towards a new classification system".

The conference registration is currently open and will close on 31 October 2012. More information can be found at the [conference website](#).

TechnoServe Edition 9 of the Boletim Soja

The Soya team from TechnoServeInc sent us their [Boletim Soja no. 9](#) in Portuguese.

The Podcaster is published 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

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