



# N2Africa Podcaster no. 16

September and October 2012

## Introduction

It's hard to believe it comes around so fast, but N2Africa has just entered the fourth and final year of the project. How to increase the uptake of the best N<sub>2</sub>-fixing legume technologies in this last stage of the project was a major topic of discussion at the N2Africa Leadership Team and Steering Committee meetings held in Nairobi in October. This was a great opportunity for Jeroen Huising to get to know the N2Africa team and establish himself as Project Coordinator. You can read more about some of the outcomes in this edition of the Podcaster, along with a wide range of news from different countries. The first article reports of the recent conference on integrated soil fertility management in Nairobi, where N2Africa had a very strong representation.

It was an exciting conference with more than 250 participants that provided an ideal forum to showcase the diversity of work conducted through N2Africa, and to learn from other ongoing initiatives. Further, you'll find reports from the work in Liberia and Sierra Leone funded by the Howard G. Buffet Foundation, plus a report from a workshop just held in Tanzania to establish new partnerships. And of course more news items.

The next podcaster will be coming soon – ahead of the Christmas break – so please send your contributions soon!

Ken Giller

## N2Africa representation at the Integrated Soil Fertility Management in Africa: from microbes to markets Conference, Nairobi 2012

From 22-26 October, for the first time and all the way (from microbes to markets), the world of Integrated Soil Fertility Management (ISFM) was captured in six themes: Starting with (1) advancing plant-microbe interactions we then moved to the field scale in (2) enhancing BNF in smallholders and to a broader level of (3) exploring options for intensification and diversification of farming systems and (4) identifying bottlenecks for implementation of ISFM. In combination with (5) commercializing breakthrough technologies and (6) building capacity in ISFM these themes allowed for a true exploration of ISFM. The conference incorporated the 14th meeting of the African Association of Biological Nitrogen Fixation.

in Ethiopia. M. Walangululu et al. found a varied response to inoculation in soyabean on degraded and fertile soils in Congo. Moving away from rhizobia, promising results were presented from Mozambique, where different row and plant spacing of groundnut (variety Nametil) increased yields tremendously (Henriques Colial et al.). However, Frederick Baijukya et al. showed that varieties with the highest potential for BNF do not always fit into the cropping system or do not have the desired traits. Therefore, the process of selection should be interactive. Yet, a very positive point was made by Paul Woomeer et al., who illustrated how well soyabean enterprise has taken root among Kenyan smallholders, who cooperated and bulked their produce after a successful harvest, and were able to compete with the imported soyabeans. Sticking to markets in the end, Admire Katunga looked into competitiveness of shelled groundnut in Malawi.

The N2Africa contributions to the conference in the form of posters or oral presentations really covered this wide range of ISFM issues. Only looking at Zimbabwe, five posters took us on a journey, starting in the fields, where rhizobia strains were tested (Tatenda Kainga et al.), and where responses of common grain legumes to the application of different fertilizer amendments were studied (Talkmore Mombeyara et al.). From the field level, we moved to the farmers themselves, by looking into socio-economic factors affecting legume production (Sobonginkosi Dunjana et al. – see poster on the next page) and factors that determine soyabean market participation (Byron Zamasiya et al.). Isaac Chabata et al. presented an analysis of the dissemination of new techniques by assessing the commonly used Lead Farmer approach.

One point that became very clear throughout the conference which was stressed in Ken Giller's keynote using many examples from N2Africa is that there are no one-size-fits-all or silver bullet solutions for ISFM and that we have to move from best-bet solutions that are adapted to some situations to best-fit solutions specifically adapted to the local situation. The presentation from Esther Ronner et al. showed that major lessons drawn from N2Africa focus on local adaptation and tailoring of techniques. But also outside N2Africa this paradigm shift has already set off, as became clear from many presentations, such as the work from Jens Aune (Norwegian University of Life Sciences), who showed that local adaptation of seed priming and micro-dosing of fertilizer techniques for millet and sorghum farmers in Mali resulted in high adoption.

Contributions from other countries also dealt with a wide range of topics. Starting in the lab, bio-prospecting for elite strains of rhizobia in Kenya was presented by Maureen Waswa. In Malawi, environmental drivers of diversity in soyabean-nodulating-rhizobia in un-inoculated soils were determined (Mary Parr et al.) and Endalkachew Wolde-Meskel showed the enormous diversity of native rhizobia

Perhaps we should consider ISFM as basket full of locally adapted Important Strategies for Farmers to produce More (in the words of Bernard Vanlauwe). Together with other



N2Africa - Putting nitrogen fixation to work for smallholder farmers in Africa  
**A Socio-Economic Analysis of the Factors that Affect Legume Production among Smallholder Farmers in Zimbabwe**

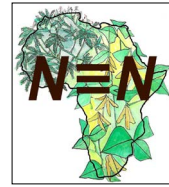
**Sibonginkosi Dunjana<sup>1\*</sup>, Paramu L. Mafongoya<sup>1</sup> Jackqeline Mutambara<sup>2</sup> & Judith de Wolf<sup>3</sup>**

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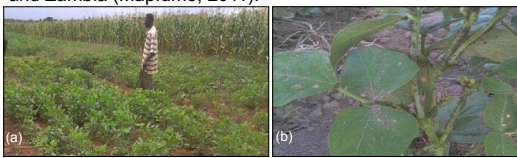
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### Introduction

- ❖ Biological nitrogen fixation (BNF) has been recognised as key in replenishing soil fertility
- ❖ Investing on BNF has been justified on the basis that the technology utilises legumes which in turn provides grain protein and improves household food security (Kanonge *et al.*, 2009)
- ❖ Despite these benefits, legume production remains low with maize accounting for 60% or more of the cropped area in Malawi, Zimbabwe and Zambia (Mapfumo, 2011).



Pic 1: (a) shows poor legume (soya bean) field in contrast with good maize crop and (b) shows poor legume crop attacked by a disease.

- ❖ As a result, there is need to understand how the cultivation of legumes is determined by the social, economic, institutional and biophysical factors

### Objective

- ❖ To identify factors that determine Zimbabwean smallholder farmers' decision to cultivate legumes

### Methodology

- ❖ Carried out in four districts differentiated by agro- ecological potential and market access

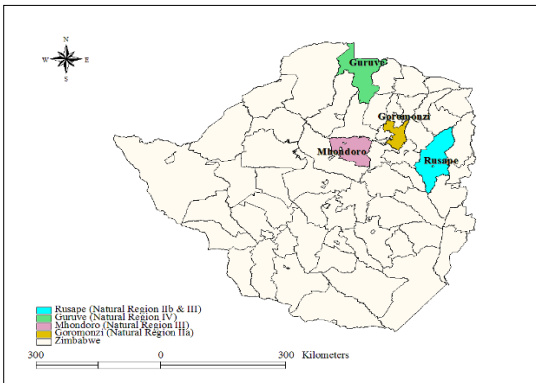


Fig 1: Zimbabwean map showing study sites

- ❖ Conducted four focus group discussions per district (2 female and 2 male groups) with 15 participants per group

- ❖ Carried out six case studies per district

- ❖ Direct observation on case study participants

### Results

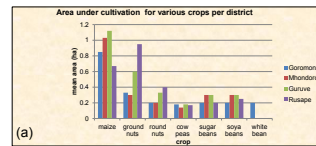


Fig 2: Mean area under maize and legume production

- ❖ Intense production of legumes was recorded in Rusape while other in other districts legume production remains low

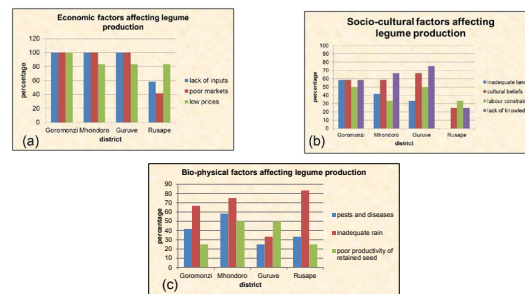
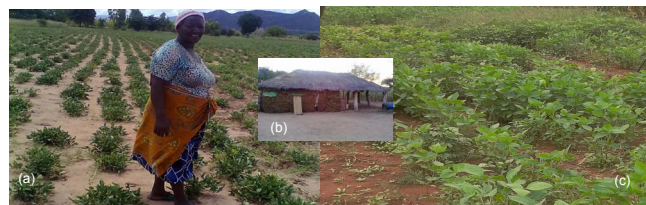


Fig 3: Shows factors affecting legume production in each district: (a) economic, (b) socio-cultural and (c) biophysical.

- ❖ Economic factors like lack of inputs, poor markets and low prices were outlined as major factors inhibiting intensive legume production

- ❖ Legume production was higher in Rusape where there is a contract farming scheme for groundnuts and bambara nuts that availed inputs and competitive market prices



Pic 2: (a) 1 hectare under bambara nut cultivation in Rusape, (b) shows ground nut bumper harvest in Rusape (c) shows a small plot under soya bean cultivation in Goromonzi.

### Conclusion

- ❖ To increase the area under legume production, efforts should be channelled towards addressing economic factors affecting legume production. Interventions like contract farming that avail inputs and markets should be initiated by both the government and the private sector.

### Acknowledgements

Gratitude goes to the grant maker CIAT (N2Africa project) for availing funds for this study, the University of Zimbabwe Faculty of Agriculture personnel for the technical support and to the farmers for sharing their information.

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techniques presented at the conference, legumes add to the basket of options from which farmers can choose to produce more and maintain their soil fertility. But a full basket only is not enough: the contents of the basket should be accessible to farmers as well. Teresah Wafullah addressed this aspect, by telling the story of MEA limited (Kenya), where inoculants and legume specific fertilizer blends are produced and marketed in small packages. Although the inoculants do not yet meet the quality standards (Stanley Kisamuli et al.), such private sector initiatives should be supported to make available ISFM technologies work for African farmers.

Greta van den Brand and Esther Ronner

### Honing in on Dissemination and Delivery (D&D) as a research theme

The recent leadership team and steering committee in Nairobi (October 2012) was a pivotal one. As N2Africa heads into its fourth year, pressing issues revolve around a) ensuring key research questions have been addressed comprehensively; and b) accelerating delivery and dissemination—so that farmers can make informed decisions and reap the benefits of improved legume technology.

In terms of the latter—delivery and dissemination (D &D)—N2Africa has been structuring what is usually considered

#### Some more impressions of the conference from the N2Africa participants:

- “The ISFM conference was interesting and full of so many new intriguing ideas and well informative presentations” – Tatenda Kainga, University of Zimbabwe
- “Research on ‘on-farm’ should not be for the researchers’ curiosity and nothing more. Farmers should be informed about the technology so that they walk the technologies and innovations for them to benefit in terms of increase in yield of the produce. I propose that few representative farmers should be invited in such conferences because they can learn a lot from different researchers.” – Maureen Waswa, University of Nairobi
- “The organizers gave more opportunities for students (good idea)” – Henriques Colial, Agricultural Research Institute Mozambique (IIAM)

an implementation theme into a strategic research one. An inventory D+D of models used in the project was synthesized at the October 2012 meeting. It distinguishes among ‘inputs’ to which N2Africa is facilitating farmer access: that is, inoculant, seed, mineral fertilizer, and also separates out the production phases and delivery phases. For instance, for inoculant alone, N2Africa is assessing five different production models and seven delivery ones.

This explicit synthesis of ‘lessons learned’ from using the varied D&D approaches is an unusual one. It aims to help partners decide what approaches to promote in the future, and where (in which contexts). In some cases, quantitative cost-effectiveness analysis will be effected; in other instances, a strong qualitative assessment will add insight. Issues, of scale, speed, type of farmer served/engaged, type of knowledge imparted, sustainability will all be key. Some of the lessons might be ‘positive’ ones; some negative. In all cases, the project will gain some learning into what has potential to serve as a good dissemination mechanism’ and how the actual implementation affected the relative success.



Impression from the meeting in Nairobi



Country representatives of “old” and “new” N2Africa countries, steering committee members, camera team and research team leaders attending the meeting looking at raw video footage that will be used for films on the website



This pioneering spirit of N2Africa to ‘compare and contrast to find the best fit’ pervades the project. Farming systems are variable, as are those of market and service delivery.

### Exploring opportunities for N2Africa in Tanzania

After workshops in Ethiopia and Uganda earlier this year, Tanzania was the last country under the newcomers to be visited. On 6 and 7 November, a workshop was held in Morogoro, with the objectives of exploring the opportunities for extension of N2Africa to Tanzania, identifying suitable legume niches and developing a ‘roadmap’ for N2Africa activities in the country. The workshop was organized by Wageningen University and IITA, and participants ranged from government organisations (Ministry of Agriculture, Uyolet and Naliendele Agricultural Research Institutes), to the Nelson Mandela Institute of Science and Technology, international organisations (USAID – Feed the Future, McKnight Foundation, Catholic Relief Services - CRS), and the private sector (Minjingu Fertiliser Company).

With such a broad spectrum of potential partners and a range of ongoing initiatives around legumes, the workshop started with an inventory of relevant projects currently taking place in Tanzania where N2Africa could link up. Next, the most important legume crops in Tanzania were identified, after which we discussed for which of these legumes the N2Africa project would be able to generate the largest potential for change. Jointly, soyabean, common bean (including climbing beans) and groundnut were selected as the major legumes for the initial stage of the project, while technical and agronomic support could be given to other projects on cowpea and pigeonpea. Geographically, N2Africa will focus on the Southern Highlands (with all three legumes) and on the Northern Highlands (especially for the introduction of climbing beans).

The second day of the workshop was centred on the development of a roadmap for N2Africa in Tanzania. For 2013, proposed activities included seed bulking, a baseline study (including rapid appraisals of the current role of legumes in farming systems, agronomic management practices, problems of soil fertility/ pests & diseases, etc.), establishment of partnerships with major NGOs for dissemination,

### Biological Nitrogen Fixation - N2Africa in DR Congo “ from despair to hope”

#### Summary

The Howard G. Buffett Foundation (HGBF) grant is strengthening and extending N2Africa activities in South and North Kivu Provinces of the East of DR Congo. The targeted provinces face persistent food insecurity due to poor or inadequate crop production systems, despite agriculture being a major activity of the population. Interestingly, both partner NGOs and small-scale subsistence farmers involved in N2Africa – HGBF in DR Congo expressed satisfaction, and projected a strong potential to move the agricultural sector from “*Despair*” to “*Hope*”.

Research has to address this variability head on—and systematically!

Louise Sperling



and the start of participatory demonstration trials. A direct link was already established with the CRS project ‘Soya ni Pesa’ (Soyabeans are Money), which starts at the end of 2012 in the Southern Highlands of Tanzania. N2Africa will support this project by providing training on agronomy and inoculation (carried out by John Mukalama, CIAT Maseno) and secured the import of inoculants, so that commencing soyabean farmers can directly benefit from this technology.

We look back at a fruitful and inspiring workshop, which can best be summarized by the words of Dr Hussein Mansoor (Deputy Director of Research & Development, Ministry of Agriculture, Food Security and Co-operatives), said during his statements while closing the workshop: “Unlike most projects, you came with an open book and we have all designed this project together. The road map we have developed has come from our contributions. I thank you all for your inputs and we look forward to working together on this important initiative in the coming years”.

And so do we!

Esther Ronner, Freddy Baijukya, Ken Giller

#### N2AFRICA – HGBF in DR CONGO

The Ruzizi plain of South Kivu and Rutshuru/Masisi areas of North Kivu DR Congo are major agricultural zones with extensive agricultural land and human capital to enable sustainable agricultural development. Farmers often use poorly yielding plant varieties, with major crops such as cassava, maize, sorghum, beans, etc. The introduction of legume-based, mixed cropping systems (i.e. main crops intercropped with soyabeans or bush beans) has a great potential to enhance crop production, both through the additional legume grain and through enhanced soil fertility through atmospheric N<sub>2</sub>-fixation into the soil. Benefits



Cassava and soyabean intercropping



Demonstration trials for maize and soyabean intercropping

through the HGBF grant. As a result, the number of farmers involved in the dissemination campaign for the upcoming farming season has doubled from 500 households per partner NGO to 1000 households each. Partners and farmers are excited about the cropping systems and rhizobium inoculation, and they pledged to use the innovative rhizobium technology in subsequent farming seasons. In addition, the introduction of soyabean in the Ruzizi area is much acclaimed as an important innovation in their cropping systems.



Soyabean demonstration trials

in enhancing production were achieved through agronomic activities (i.e. demonstration trials) and dissemination activities (i.e. distribution of high yield crop seedlings to farmers via partner NGOs).

### **PARTNERSHIPS**

We engaged in partnership with local NGOs to facilitate hands-on training of small-scale subsistence farmers and dissemination of the alternative mixed cropping systems. One of the strategic partners is Women for Women (W4W) International W4W that is operational in both South and North Kivu Provinces, and focuses activities on women, particularly those from post-conflict areas. The NGOs group the farmers into different action sites, ensure demonstration and training for setting up trials, data collection, monitoring and evaluation.

### **Early results**

Enhanced crop production/productivity improves the income of subsistence farmers, particularly female farmers who are mostly involved in subsistence agriculture. Thereby, mitigating gender inequality by bridging the income gap between men and women, as well as improving their livelihood.

### **APPRAISAL OF N2AFRICA – HGBF IN DR CONGO**

The partner institutions and small-scale subsistence farmers are positive about the extension of N2Africa activities in the Ruzizi plain of South Kivu Province DR Congo



IITA & CDC inspect soyabean seeds multiplied by CDC for dissemination

### **N2AFRICA OUTLOOK**

- The availability of rhizobium inoculum – possibility of producing local inoculum.
- Partners and farmers are expecting more training to consolidate the gains made in light of the N2Africa project and to expand the technology to other farmers.
- Partner institutions are anticipating creating a farmers' cooperative group for soyabeans farmers, facilitate postharvest technology, price stabilization and the marketing of produce.
- Women for Women are very interested in the innovative N2Africa rhizobium technology and wish to continue



CDC presents abandoned facility to be rehabilitated for processing of soyabeans

with dissemination after the passage of N2Africa project. Hence, they wish to have their staff (engineers and facilitators) trained by IITA on the mixed-cropping system and rhizobium technology.

- Postharvest technology development for produce is anticipated, i.e. soyabeans (CDC already has an abandoned facility for processing grains, and as a result of the positive impact of N2Africa, CDC is considering alternative sources of funding to rehabilitate the facility for oil production from soyabeans. CDC is hopeful

that the postharvest transformation will ensure sustainability of the innovative legume-rhizobium based cropping systems and pull subsistence farmers out of their current state of “Despair to Hope”.

- By Christopher Ngosong<sup>1</sup>; Despines Bamuleke<sup>1</sup>; Rehani Jumaine<sup>2</sup>; IITA–HGBF DR Congo  
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### 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.

N2Africa aims to provide smallholder farmers in Africa with opportunities to produce, utilize, and market protein-rich varieties of soyabean, 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 the Sierra Leone Agricultural Research Institute (SLARI). Wageningen University (WU) in the Netherlands provides backstopping support.



### Expected benefits

Soil fertility can be improved with the use of specific varieties of grain legume crops. Soyabean seeds are inoculated with rhizobia before planting to increase their inherent ability to fix nitrogen gas from the air and make nitrogen 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, helping to sustain yields of other crops.

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

The N2Africa Project partners 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 trials have been established for soyabean, cowpea and groundnut at various sites in the country.

One location is Sumbuya, 6 miles from Bo, southern province. According to the site’s SLARI Field Supervisor Mohamed Nyoniyo, planting of four soyabean varieties is under way to enable scientists to determine appropriate practices for best yields.

Another trial planted at the site features cowpea variety testing and pest control. The site's SLARI entomologist Mr. Augustine Mansaray explained "We want to see which varieties perform well under spraying and non-spraying regimes". The trials will also enable SLARI researchers to 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. This site also hosts a groundnut trial with new varieties, 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.



A soyabean inoculant and basal fertilizer trial is located at Serabu on the Bo-Kenema highway in the Kenema district, Eastern Province. Inoculated soyabean plants looked greener, indicating a prospect for high yield; Soyabean plants in plots without inoculum looked pale indicating poor future yield.

### Impressions

Sierra Leoneans are very familiar with the cultivation of cowpea and groundnut, but soyabean cultivation is new. Soyabean 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 swathe 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 soyabean, cowpea and groundnut needed for future distribution to farmers associated with partner MAFFS, NGOs and the private sector. Another soyabean 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 clearly 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 soyabean 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.

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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)

## It was worth the ride: A Transcription of Partner's Visit to N2Africa Liberia Project Site

"You'll enjoy seeing the N2A legume trial in Lofa County", I was told. It's in the northeast, close to the Sierra Leone border only 240km from Gbarnga in the center of the country where I was staying. It was the (very) rainy season and the narrow dirt road, the only route to these parts was heavily wash boarded, potholed and blocked in a number of places by large transport trucks efficiently excavating extremely deep ruts in the muddy surface as they tried in vain to force a way through. Engineer battalions from the UN force worked hard to keep the road open. Finally after 12 hours of bouncing, sliding travel we reached Foya where one of the project trials is located.

Despite its relative isolation from the capital, Monrovia, Lofa County is often referred to as the breadbasket of Liberia and a major producer of rice, the main staple in the Liberian diet. Almost 85% of Liberia's rural households are farmers and most practice shifting cultivation on poor acid soils, cultivating for two or so seasons and then fallowing for 6 to ten years. Some minor legume production currently



Challenging roads to Lofa trials sites



John, Franklin Henries (Agronomy coordinator N2Africa Liberia) inspect trials in Lofa

occurs (peanut and cowpea), but more widespread use of improved legumes and the potential introduction of soya could lead to improved soil fertility, a reduction in the length of fallows reducing land consumption by shifting cultivation, improved household incomes and nutrition.

The trial in Foya compares groundnut and cowpea local varieties with improved cultivars and soyabean under both no input and added superphosphate. Although only in its early stages, the trial shows the marked improvement of improved over local cultivars and the benefit of superphosphate. Small Liberian farmers currently make little use of purchased inputs but if the increased yields can result in improved household incomes many can benefit from the technology.

It was very much worth the painful ride...

Dr. John Fitzsimons, an Associate professor SEDRO, Dept. of Plant Agriculture Ontario and Agriculture College University of Guelph, Canada



N2Africa Farmers – Willidu Foya, Lofa County



N2Africa Baseline survey training group photo

## Greenhouse commissioning and commencement of greenhouse work in Zimbabwe

On the 2nd of May, 2012, a commissioning ceremony for the renovated greenhouse was held at the Soil Productivity Research Laboratory (SPRL) in Marondera. The renovations were funded by N2Africa and implemented by Blackpuck (pvt) Ltd.

A total of 15 participants attended this event representing N2Africa, CIAT, the Ministry of Public Works, Blackpuck and the Chemistry and Soil Research Institute (CSRI) from the Department of Research and Specialist Services (DR&SS).

There was a tour of the greenhouse and participants were shown how the greenhouse works with Mr. Zaka from Blackpuck explaining the repairs and replacements that had been done to the greenhouse. After a full inspection by participants, the greenhouse was then officially commissioned by the Public Works Director for Mashonaland East, Engineer Maruvara.

SPRL has since started using the greenhouse. Pot experiments on evaluating isolated rhizobia strains for soyabean



SPRL staff working in the renovated greenhouse

and common bean were setup in May 2012. These experiments will guide the rain-fed field experiments to be done under the rhizobiology objective from November where the top 5% strains will be evaluated for N<sub>2</sub>-fixation.

Akinson Tumbure





### Announcement Pedometrics 2013 conference in Nairobi

We received the announcement that The International Center for Tropical Agriculture (CIAT) and the World Agroforestry Centre (ICRAF) will be co-hosting the Pedometrics 2013 conference in Nairobi, Kenya.

Pedometrics is the application of mathematical and statistical methods for the study of the distribution and genesis of soils.

The call for papers is now open and abstracts can be submitted at <https://sites.google.com/a/cgxchange.org/pedometrics2013/>.

### Announcement First International Conference on Global Food Security

The First International Conference on Global Food Security, that will take place from 29 September till 2 October 2013 in Noordwijkerhout, The Netherlands, aims to deliver state-of-the-art analysis, inspiring visions and innovative research methods arising from interdisciplinary research.

Join this exciting opportunity to ensure that the best science is garnered to support the emergence of the Sustainable Development Goals.

Achieving global food security whilst reconciling demands on the environment is the greatest challenge faced by

The conference objectives include:

- To showcase innovative research on the mathematical spatial and temporal modelling of soil through interactive discussions and technical sessions, with specific examples from the tropics!
- To encourage the recognition of results from pedometric analyses on informing management decisions and public policy!

For more information see the [flyer](#)

mankind. By 2050 we will need to feed 9 billion people. The urgency of the issue has led to huge scientific strides forwards; making it difficult to keep up with the rapidly expanding volume of scientific research.

Aim is to better understand economic, social, biophysical, technological and institutional drivers of current and future global food security.

We hope to welcome you next year to the First International Conference on Global Food Security - see <http://globalfoodsecurityconference.com/>

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