

Quality & Yield

Supporting smallholder farmers' decisions on top quality commercial products

- 3 | Farmer-led soybean demonstrations
- 6 | Building laboratory skills and capacity
- 8 | Raising banana income in Western Kenya
- 10 | COMPRO activities in Ethiopia



A word from the project leader..

The last few weeks have seen a great deal of activity in the project. We have witnessed exciting project partnerships taking shape with various private sector stakeholders.

These include MEA limited in Kenya, Notore in Nigeria and Yara-Africa in Tanzania. These partnerships will significantly increase COMPRO II capacity for dissemination of commercial products in these countries. These discussions are also on going with Yara-Ghana, Naseco Seed Company and Africa 2000 Network both in Uganda and other potential partners in Ethiopia. FIPS-Africa, who lead objective 1 of the project continue to facilitate these discussions.

Notably, as a result of these partnerships we are making good progress on dissemination in Kenya with over ten thousand farmers having participated in demonstrations with Biofix for soybean production in the last short rains season. In Nigeria, demonstrations were undertaken in three states using Legumefix for soybean production. There are also on going plans for demonstrations for Teprosyn in maize production in Tanzania during this growing season. In Ethiopia, COMPRO II main partner Ethiopian Institute of Agricultural Research (EIAR) has reported dissemination activities targeting more than seven thousand farmers testing use of inoculant for faba beans and soybean production.

Integrated Soil Fertility Management (ISFM) demonstration kits that include improved seed varieties of soybean and maize, tillage systems, manure application are being tested in Kenya, Nigeria and Tanzania. Dissemination of ISFM information links well with our partners interventions such as the African Soil Health Consortium (ASHC) that supports development of ISFM information products and materials for various audiences.

We continue to make progress across all project objectives covering key areas such as training, quality control and regulation, communications and overall project coordination.

You will find quite a few highlights of these activities in this second issue of 'Quality and Yield'. I ask partners to prepare to share their stories in the next issue that is due in early 2013.

Dr. Cargele Masso (IITA) – Project Leader

Farmer-led soybean demonstrations



VBA, Rhoda Simiyu (right) points out the difference in performance between three plots at one of the demonstration sites

Rhoda Simiyu (above right) is a Village Based Advisor (VBA), in Lukoye village, Khwisero, Western Kenya. She is among FIPS-Africa's network of more than one hundred and twenty VBAs that are currently overseeing approximately one hundred and five farmer-led demonstrations each on use of rhizobium inoculant to improve soybean production among small holder farmers in western Kenya.

"The farmers are very excited by the results of the demonstrations and many of them want to grow soybean on a larger scale using the rhizobium inoculant technologies that we are demonstrating" She explains, while pointing at one of the demo plots in her area. Milton Nandwa, a farmer in Rhoda's area confirms this growing enthusiasm with the outcomes of the demonstrations. "I want to carefully observe the difference in the three plots. From what I am seeing so far, the harvest in the third plot (planted with P fertilizer and Biofix) will be better than the other two plots". Nandwa says he is looking forward to scaling up the planting of soybean with the new approach.

The demonstration plots are spread across a number of districts in Western Kenya. Cargele Masso, project leader of the COMPRO II project, who led the field visits, notes that naturally, there will be differences that are attributable to soil types in general as well as other chemical considerations like the pH levels in the different areas. "Generally, the outcomes in the various demo sites is very impressive. With the right management of the demonstration plots, you can see the differences in performance of the soybean crop very clearly".

FIPS coordinator for western region, Benson Maniaji echoes this observation. "As we visit the various sites, you will notice that in other parts like Bungoma district some of the plots will show remarkably good results due to well managed demonstration plots and the richer soils in those parts," he explains.

In Kiboochi village, Bungoma district, farmer Samson Wanjala and his wife Susan all planted three plots each according to the directions by the FIPS field team. Their plots are perhaps one of the most dramatic examples of well-managed demo plots that show clear results of the treatments with P fertilizer and rhizobium inoculant. "I think you can see for yourself the differences in performance in these plots," Samson Wanjala proudly declares.



FIPS-Africa team of coordinators and VBAs with Cargele Masso (far right), Stephen Butler (background in cap) and Jobkevin Ngunyi (MEA Ltd) (far left)



Part of the team admires the outcomes on farmer Samson Wanjala's demonstration plots

Farmer-led soybean demonstrations



A healthy looking soybean crop in one of the demo sites.

“...the model enables them to reach many farmers...”

Conrad Baraza the district coordinator for these areas is elated at the prospect of confirming these results. “We are instructing the farmers to carefully harvest each plot separately when the soybean is ready so that each harvest can be properly measured to ascertain the actual differences in yield,” he explains. “Samson’s farm and others like this one are going to be very important in convincing farmers about the potential of this technology.”

Margaret, FIPS coordinator, explains that the FIPS model enables them to reach a very large number of farmers through an well-crafted network which includes; a regional coordinator, eight district coordinators, one Village Based Advisor per village, and two sub-VBAs per village. This model has enabled to reach upto 10,000 farmers at any one time. “This is the way we have been able to successfully conduct a large number for demos in this region. This is not an easy task even for big organizations,” she points out. Each VBA is expected to have a multiplication site on their farms of a quarter and acre, as well as a full demonstration set of plots similar to the ones each farmer is developing. Farmer Rose Shisia in Busashi village is very happy with the work of the VBA network.

“They (VBAs) are always there to give us information when on these plots when we need it. You know that for women farmers like me, sometime we are very busy on the farm and can forget some of the information about what we need to do on the plots,” she says.

The field demonstrations on rhizobium inoculant are led by FIPS-Africa, under the COMPRO II project. Objective 1 of COMPRO II anticipates scaled up dissemination effective commercial products that are successfully evaluated. For the Western Kenya demonstrations, the product Biofix, a rhizobium Inoculant produced and distributed by MEA Limited was used in the sites. MEA representative, Jobkevin Ngunyi, who accompanied the team on the field tour expressed satisfaction with the outcomes of the trials. “The results are great. We are looking forward to seeing more farmers adopting the use of Biofix for production of soybean in this region,” he pointed out.



COMPRO II project Leader, Cargele Masso (right) with Joyce Onimu a VBA in Mumias-Butere district, examine a mature soybean crop on one of the demo plots.



A farmer in Bulanda Village, Mumias in his demonstration site

The field tour was conducted in Busia, Bungoma, Ugunja and Mumias-Butere from 11-12 December 2012 and was coordinated by FIPS-Africa. The team included, Cargele Masso (ITA-COMPRO II project leader), Stephen Butler (Stoller - Africa), and James Watiti (CABI- COMPRO II Communications)

Promoting soybean production

Soybean is a potentially important crop for smallholder farmers in Western Kenya. It is higher-yielding than other conventionally grown legumes (beans, cowpea), and can contribute to improved food security and nutrition. Farm Input Promotions Africa Ltd. (FIPS-Africa), within the framework of the COMPRO II project, is currently promoting the inoculation of soybean seeds with a Rhizobium inoculant called Biofix which is produced and marketed in Kenya by Mea Ltd. Biofix is being demonstrated by FIPS-Africa's networks of village-based Advisors (VBA) in eight districts in western Kenya: Bungoma, Kakamega, Vihiga, Butere-Mumias, Busia, Ugenya, Siaya and Mosocho.

The main objective of these demonstrations is to show farmers

- (i) how to grow soybean using improved varieties (SB3 and SB19), and
- (ii) how to increase production using P fertilizer (Minjingu rock phosphate) and Biofix.

Inputs (seed, fertilizer and Biofix) were distributed to conduct 11,935 demonstrations by 341 VBAs using FIPS-Africa's innovative small pack/ whole village dissemination methodology.

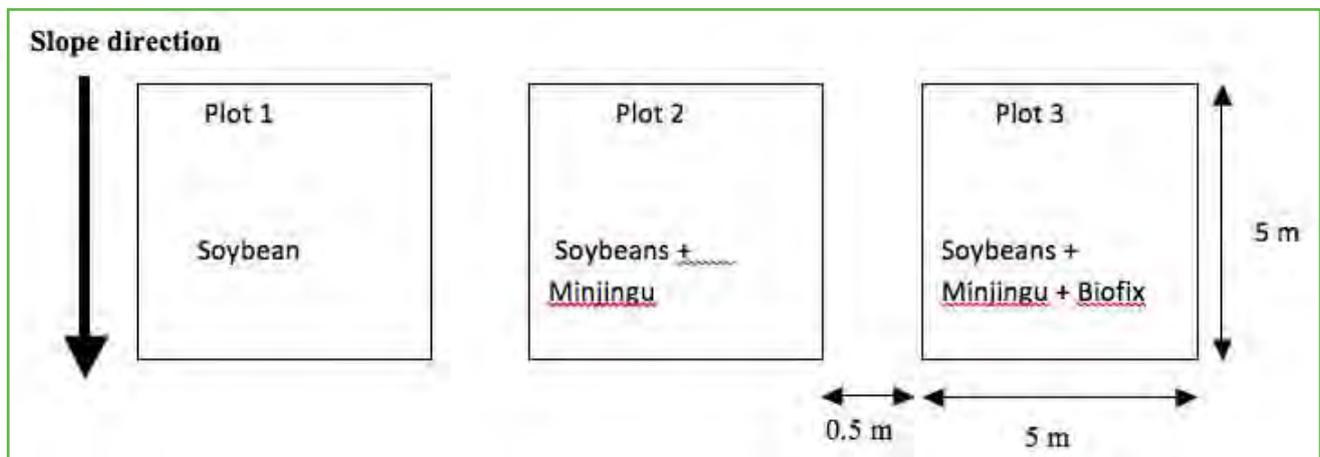
Laying out the demonstrations

Demonstrations are laid out following the protocol shown in figure 1. The demonstration consists of three plots with dimensions of 5m by 5m, with 0.5m spacing between plots.

Seed treatment with Gum Arabic and Biofix; 3g of Gum Arabic is dissolved in 30ml of water and mixed with 1kg of soybean seed. 10g of Biofix inoculant was then added to the seed and mixed well until all seeds were coated uniformly with the inoculant. 1kg of inoculated seed was then divided up equally to be demonstrated by 6 farmers.

Fertilizer application: Minjingu rock phosphate fertilizer (granular form) is applied at a rate of 0.25 kg per plot. The fertilizer was uniformly placed in the furrows in which the seed was planted.

Figure 1: Demonstration layout



Observations

Clear visual differences between the treatments have been observed in most demonstrations. The crop in the Biofix + Minjingu fertilizer treatment is growing the most vigorously, and has the darkest leaf colour indicating that the Biofix is increasing nitrogen fixation (see image below). A sample of demonstrations will be harvested at maturity, and yields measured from the different plots to determine the benefit : cost ratio of the different treatments.

Building laboratory evaluation skills and capacity



The trainees with the trainers just outside the laboratory at IITA, in Nairobi.

COMPRO II trains more laboratory staff from five countries

A ten-day training course on laboratory skills in screening and evaluation of commercial products, took place from 5-15 November 2012 at the IITA campus in Duduville, Nairobi. It was organised by IITA, under objective 2 of COMPRO II project. Participants were drawn from laboratories from four countries namely, Ethiopia, Kenya, Uganda and Tanzania. The laboratories involved were from Makerere University, University of Nairobi, Kenya Plant Health inspectorate (KEPHIS), Ethiopian Agricultural Research Institute (EARI), Sokoine University, Egerton University and IITA which was the training venue.

For Gorreti Aguttu, from Makerere University, the laboratory skills training programme on screening and evaluation of commercial products, was not only timely but also filled a clear skills gap. “Before this training, I had very little exposure to soil microbiology as I mainly worked in a chemistry lab” she explained.

Like most her counterparts in the training she felt that her skills in specialised procedures in soil microbiology were greatly improved after the training. “I learnt a lot in key procedures including how to culture and isolate bacteria, and handling of mycorrhiza, spores extraction and many other procedures. ‘I feel a lot more confident now in this area’ she explained.

“The training also introduced us to new and modern apparatus. In most cases our labs have old apparatus,” noted Rashid Abafita from Ethiopia.

The training was a technical session aimed at improving skills in micro and molecular biology for key laboratory personnel. A key objective of the training was to equip the staff from COMPRO II partner labs in Ethiopia, Kenya, Uganda and Tanzania with basic skills to enable them carry out laboratory evaluation of commercial products.

Key areas covered included nodule occupancy determination through polymerase chain reaction-restriction fragment length polymorphism (PCR- RFLP), estimation of bacteria cells through Malassez slide count, identification of bacteria through Gram staining, Catalase and oxidase test. Extraction of mycorrhiza spores and counting, determination of mycorrhiza infection through staining of roots, slide preparation. The training team consisted of experts including Prof. Sheila Okoth from the University of Nairobi who trained the group on a variety of procedures including, culturing, observation and identification of *Fusarium* and *Trichoderma* and identification of strain sequences through a Basic Local Alignment Search Tool (BLAST). Other member of the training team included three COMPRO II MSc. and PhD candidates.

Commenting on the training, Sammy Mathu, one of the COMPRO I MSc. graduates, who was on the training team said “The opportunity for me to undertake this training for the COMPRO II trainees is also a good refresher for me”. He pointed out that one of the main challenges during the course was the time constraints. “Taking the trainees through all these critical procedures and ensuring that everyone gets adequate exposure in a two-week session is not easy”. He emphasised the need for follow up for the trainees as soon as possible to enable the training team to reinforce the skills learnt.



A trainee, Getahun Mitiku from Ethiopia (EIAR) works on a lab sample during the training.

Gaetna Malekela, a trainee from Tanzania observed that ultimately the training will help to empower labs in the countries to evaluate commercial products, “so that our farmers can benefit from the best information on quality products. Stephen Katende, one of the trainees echoed these sentiments; “there is an urgent need to equip labs in our countries to evaluate products so that mechanisms are established to allow only the best products to reach the farmers”. He further pointed out the need to put in place adequate laboratory infrastructure in order to allow the trainees to put to use the skills acquired. “Most of our labs are not adequately equipped” he said.

“Although one or two countries may have labs that are equipped with modern equipment, the situation is generally the same in our countries” said Mary Atieno Otieno, one of the trainers and a COMPRO II PhD candidate. Decrying the under-investment in agriculture research in general, Mary hoped that COMPRO II can also help demonstrate greater need to investment in agricultural research in countries.

Consolata Mhaiki a trainees from Sokoine University in Tanzania believes that the project will have this kind of effect. “For Tanzania, COMPRO II is also helping us refocus attention on legume fertilizer research that has been inactive for many years,” she observed.

Objective 2 of the COMPRO II project is on continued screening and evaluation of new commercial products, and aims among other achievements, to develop inventories of commercial products, train 10 MSc and 5 PhD level experts in diverse aspects of evaluation and screening, support identification of effective commercial products for dissemination. The full list of trainees and trainers at the workshop is provided below:

- Ng’eno John - University of Nairobi
- Gorreti Aguttu - Makerere University (lab tech)
- Gaetan Malekela - Sokoine University of Agriculture
- Grace Karuiki - Egerton University
- Stephen Katende Serunjogi - Makarere University
- Rashid Abafita - Ethiopian Agricultural Research Institute (EARI)
- Getahun Mitikk - EAIR
- Consolata Mhaiki - Sokoine University of Agriculture
- Grace Kamau - Egerton Univeristy
- Mary Atieno Otieno - IITA (PhD candidate and trainer)
- Sammy Mathu – COMPRO I MSc graduate

Raising banana income in Western Kenya



A banana micro-propagation site on a VBA's farm in Ugunja.

Using tissue culture and mycorrhiza inoculant technology in Ugunja

It is Tuesday morning, 11 December 2012, in Bar Atheng' village in Ugunja in Western Kenya.

Jennifer Onimu, a farmer participating in COMPRO II farmer-led demonstrations proudly displays one of her banana stems that is ready for harvest. "I expect upto seven hundred shillings for this type of bunch" she declares, touching one of the large bunches in her field. Francis Odhiambo, who coordinates FIPS-led demonstrations in this district explains that Jennifer is one of the model Village Based Advisors, who is also a very passionate banana farmer. "We have also set up small banana micro-propagation site on her farm."

He explains as he leads the team to one corner of the compound. These micro-propagation sites are being coordinated jointly with the International Institute for Tropical Agriculture (IITA), Kenya Plant Health inspectorate, and the Ministry of Agriculture. The material is received from the Kenya Agricultural research Institute (KARI)." "In the demonstration plots in this area, we are using Rizatec, a mycorrhiza inoculant to increase banana yield."

Farmer Jennifer Onimu has big plans for her banana project. "My plan is to raise up to two million shillings to buy my own pick up for transportation by the year 2013". She confirms. "When my husband died a few years ago, we experienced a lot of financial problems, but when I started this banana project, with just two suckers, two years ago, I have been able pay school fees for my children quite comfortably". Jennifer, who is also the Villabe Based Advisor in her area, estimates that on an average market day, she can sell bananas worth up to three thousand shillings at once.

Jennifer's neighbour Maria Oremo who is over seventy years of age also with her own banana firm of jokes; "I used to think that ten thousand shillings was a lot of money, but these days I get that kind of money from bananas... I actually feel young again!"



Farmer Jennifer Onimu shows off one of her banana stems that is ready for harvest



New banana shoots in a micropropagation plot. Farmers collect their planting materials from these sites for transplanting to their farms.

The regulatory environment for commercial products



Participants listen to a presentation by Francis Nan'gayo, AATF

“...reflecting on the most critical aspects in target countries...”

The African Agricultural Technology Foundation (AATF) organised a two-day workshop for over thirty stakeholders involved in regulatory agencies from Kenya, Uganda, Nigeria, Tanzania, and Ethiopia. The workshop which took place from 19-20 November 2012, at the Eka Hotel in Nairobi, was aimed at discussing the status of existing policy frameworks and regulation on bio-fertilizers, bio-pesticides and chemical agro-inputs in the COMPRO II target countries.

The workshop was organised as a key part of objective 3 activities of COMPRO II project led by AATF.

The workshop provided an opportunity to reflect on the most critical aspects of strengthening regulatory environments for bio-fertilizers and bio-pesticide in target countries. Participants also identified challenges in implementation of regulations and made proposals on policy interventions to mitigate challenges affecting the regulatory frameworks for these products in the target countries.

Speaking during the workshop, Dr. Francis Nanga'yo (AATF) pointed out that in general, many policy documents on bio-fertilizer and related products remain in draft form in the target countries. “A lot of our policies in this area are draft awaiting approval by top management, a fact that significantly affects our ability to move forward with strengthening the regulatory environments,” he explained.

Other key issues cited included, limited capacity, for surveillance, and lack of accredited laboratories. “Quite often we have situations where laws may exist but remain unclear on product-specific aspects. In other situations, there is weak enforcement or inadequate deterrent measure to control influx of poor quality products into the market,” he further observed.

He pointed out that the under objective 3 of the COMPRO II project, activities aim to support institutionalization of quality control and regulatory mechanisms through, establishing effective collaboration with national agencies. Additionally the project will strengthen institutional capacity for routine quality control analysis of bio-fertilizers and establish a functional independent laboratory that guarantees objectivity and credibility for quality control assessment. Other aims of the project under objective 3 include, ascertaining the status of and participating in policy formulation for bio-fertilizers, and bio-pesticides, and assist institutions with capacity to establish an accreditation system for bio-fertilizers and bio-pesticides at national and/or regional and level.

Dr. Masso Cargele, COMPRO II project leader, noted the significance of the stakeholders' workshop, explaining that implementation of objective 3 of the project, will greatly enable smoother attainment of other objectives because the uptake and use of commercial products by farmers directly depends on stronger and efficient product screening and regulation by government agencies.

During the workshop each country team shared their status on regulatory framework for bio-fertilizer and bio-pesticides. International experiences with regulatory frameworks from Canada and India were shared with participants.



“...a need to share existing protocols...”

COMPRO I was one of the successful projects in the Ethiopian Institute of Agricultural Research as attested by EIAR top management, COMPRO project coordinator and SAC, small holder farmers, agricultural experts and media. Out of many products in three categories, the success story was brought by category one of the products (Rhizobial Products)- on soybean and faba bean. As the project wound up, one of the key next steps was the dissemination of these top quality products in addition to other objectives.

Dissemination Activities in 2012

With the continued support from top management of EIAR, a number of dissemination activities were undertaken in 2012 covering training, inoculant production, and distribution of, inoculants. A lot of these activities leveraged other funding in addition to the planned support under the COMPRO II project.

Training

Dissemination activities were started by giving training for Model Farmers, Developmental Agents (DAs) and Agricultural Experts. The training focused on the use of bio-fertilizers and inoculation techniques for soybean and faba bean growing areas. Faba bean growing zones include, North Shoa, West Shoa and Arsi Zone. The soybean growing zones include Jimma, Illubabure, Assossa and Pawe.

Inoculant production

Small packs of bio-fertilizers for faba bean (FB-10 18 and FB-1035) and soybean (Legume fix and MAR-1495) were produced at HARC lab. Legume fix packs were acquired from UK through IITA facilitation.

Distribution of inoculants

EIAR centers, Agricultural experts and Das participated in the distribution of inoculants. In Jimma and Illubabor zones, 3,500 farmers applied soybean inoculant. In Pawe zone 500 farmers participated in the inoculation programme, while in Assossa zone: 500 farmers inoculated their soybean.

Distribution

- West Shoa faba bean = 200 farmers participated
- North Shoa faba bean = 200 used
- Arsi zone = 2,500 farmers received faba bean inoculants
- A total of 7,400 farmers received inoculants in 2012 cropping season
- Out of 7,500 expected we attained 7,400 which is 98.6% of performance

Screening of new products

Priority crops are chickpea, faba bean, soybean, maize and wheat. There are no companies in Ethiopia producing any of the commercial products. This is why the COMPRO II project is important partly to link us with companies that can supply these products. There is also a need to share existing protocols on commercial products.



“...a need for strengthening and enabling a lab in Ethiopia...”

Quality control issues

There is a need for strengthening and enabling a lab in Ethiopia to the level where it can be accredited to undertake quality control monitoring. Currently the HARC Lab is ready to undertake these tasks for products such as bio-fertilizers.

Standards, rules, regulation and policy brief preparations

The key stakeholders involved in standards, regulations and policies have been identified as follows:

- ESA
- Plant and Animal Health Regulatory Directorate.
- Ethiopia Conformity Assessment Enterprise.
- Inspection and regulatory directorate (MoT).
- Import /Export quality control directorate (MoT).

ESA has indicated readiness to develop standards based on a proposal. This is one of the areas where IITA and AATF in the COMPRO II project will come in very handy.

By Jimma Asendabo

In the news

COMPRO communication strategy unveiled at AATF workshop

The COMPRO II project will soon have a comprehensive internal and external communications strategy. A draft strategy was shared with participants at the AATF workshop on 20 November 2012.

Presenting the outline of the strategy, Mr. James Watiti the senior communications manager at CABI, who is responsible for its development, noted the importance of stakeholder involvement at the onset of the development process. “We have set lofty goals in COMPRO II to reach up to 2 million farmers in addition to reaching policy makers with relevant information on commercial products. We have to have a strategy that can get us there,” he explained.

The communications strategy which is scheduled for finalisation in December 2012 sets out the internal and external communications objectives and activities of the project over the next three years. It is part of the activities under object 4 of COMPRO II project. Objective 4 is led by CABI.

Now available

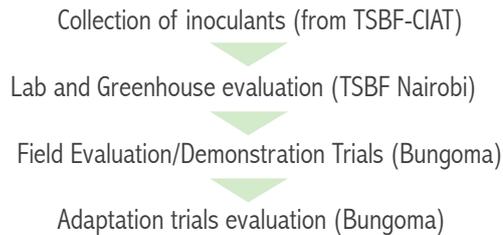
Standard Operating Procedures (SOPS) for evaluation of commercial products and research protocols now on CD. The CD contains a summary of general activities, molecular biology, microbiology and greenhouse technology.

Trainee profile

Name: Collins Otieno Majengo
Gender: Male
Country: Kenya
Institution: Moi University
Research area: Effectiveness of promising commercial bio-fertilizers on soybean production in Bungoma, Western Kenya
Level: Master of Science (soil science)
Role in Compro 1: In-charge of farmer managed trials in Bungoma

Significance of the study:

My work was at adaptation trials as shown in the diagram.



Collins (left) with farmer Pius Mumaraki carrying out biomass assessment at 50% podding on soybean in Bungoma in 2010

My work was to disseminate the best rhizobial and mycorrhiza inoculant to small-holder farmers so that they can also test the inoculants on their farms and make informed opinion about the effective of the inoculants.

Personal Reflection

There is potential for biological commercial products, but there is need for continued evaluation and dissemination of results. Smallholder farmers may benefit from some of these products, on the condition that a good-quality product is correctly applied to the appropriate crop with appropriate soil and crop management.

Publications:

I have presented my field work results in six papers in different international conference proceedings.

Contribute to 'Quality & Yield'

This is the second issue of 'Quality & Yield', a newsletter of the COMPRO II project. In this issue, we begin to get field stories from partners. We have been lucky to be able to highlight a few activities under each key objective of the project.

FIPS-Africa brings us highlights of their work under objective 1 on dissemination commercial products with encouraging results for numerous farmer-led demonstration sites for production of soybean with rhizobium inoculant in western Kenya.

Under objective 2 on screening and evaluation of new products, we highlight the Lab skills training workshop held in Nairobi in November 2012. Reflection by the trainees and their trainers offer very useful insights into the lab capacity issues for evaluation of commercial products in target countries.

AATF sheds light on key aspects in creating enabling regulatory and policy frameworks for bio-fertilizer, bio-pesticides and related products in our countries under objective 3 of the project. Highlights from their stakeholders workshop held form 19-20 November in Nairobi are captured in this issue.

A new communications strategy is near completion under objective 4 of the project led by CABI. Highlights of the strategy and its role in supporting project implementation are captured as well.

Overall project coordination and monitoring continues under objective 5 led by IITA. Read the project leaders message to get a broad sense of progress.

'Quality & Yield' is the newsletter of the COMPRO II project. It is a quarterly publication that highlights key activities and experiences of the project. The next issue goes out in March 2013.

Send your comments and stories as well as request for interview ahead of time to j.watiti@cabi.org and C.Masso@cgiar.org