

INSIDE THIS ISSUE



DR. FINA OPIO
ASARECA new
Executive Director
Page 2



ENDURING CROP
Pearl millet for harsh
conditions
Page 7



PREMIUM PRICES
Investing in fruit trees
and processing
Page 10



POTATO SEED
Spreading quality
planting materials
Page 11



CONTROLLING DEADLY BANANA WILT DISEASE

A team of scientists from Uganda, Tanzania, Kenya, Rwanda and Burundi, supported by ASARECA, is working with farmers and local communities to control the deadly disease, Banana Xanthomonas Wilt (BXW), which is affecting Banana.

ASARECA gets new Executive Director



Dr. Fina Opio, Executive Director ASARECA

Dr. Fina Opio is the new Executive Director of the Association for strengthening Agricultural Research in Eastern and Central Africa (ASARECA). She assumed office on 1st March 2013. ASARECA covers 11 countries - Burundi, D.R. Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, South Sudan, Sudan, Tanzania, and Uganda. It brings together scientists from member countries to work on common problems in agriculture. Problems that would be difficult to deal with if each country worked on its own.

Dr. Opio replaces Dr. Seyfu Ketema, who has been at the helm since 2002. She is the second Executive Director and the first woman to take up this position, rising from manager of the Staple Crops Programme in the same organization. She holds a PhD in Plant Pathology; masters in Crop Science; and a bachelor in Agriculture. She brings over 20 years of experience in research, management and advisory work on technologies, policies, strategies, programmes, and projects that focus on agricultural and rural development and food security in

Eastern and Central Africa.

She takes office at a time when countries in Eastern and Central Africa are less able to meet the food needs of their people. "Poverty, food insecurity, malnutrition are advancing threats. We can curb these threats by effectively rallying our human capital and infrastructure to increase agricultural production and open up markets," Dr. Opio said on her first day in office. "I pledge to pursue the ASARECA spirit of collective action to overcome challenges that member countries cannot face on their own."

She has her job well cut out. Her first task is to guide the organization in a change process that positions ASARECA to better address dynamic challenges to agriculture such as climate change, erratic food prices, and elusive pests and diseases.

Prior to joining ASARECA in 2007, Dr. Opio was Director of the National Crops Resources Research Institute (NACRRI) of the Uganda National Agricultural Research Organization (NARO). She

counts, among her achievements at NACRRI, the creation of partnerships with various International Research Centers and Universities which led to infrastructural developments such as the Biotechnology and Tissue Culture laboratories and Screen houses. She served as an advisor to Uganda government and on many boards and councils.

These include Executive member, Uganda National Council of Science and Technology; Task Force for Agricultural Extension for the design of Uganda's National Advisory services Programme (NAADS); chairperson, Vitamin A for Africa steering committee; member, Advisory Panel for Rothamsted International, UK; and member, Board of Trustees for the International Center for Tropical Agriculture (CIAT).

Dr. Opio is a Fellow of the Uganda Academy of Science and the African Academy of Science. She has published over 25 papers in international scientific journals and over 40 papers in conference/workshop proceedings.

► From cover page

The disease is the most serious threat to the banana sector in Eastern and Central Africa. It was first reported in 2001 and has since spread to all main banana growing countries causing serious losses in yield.

How the disease is spread

Insect transmission, the use of contaminated tools, and infected planting materials are key drivers of the epidemic. Insects transmit the disease over short distances through male buds. Healthy plants are infected when the bacteria is carried by insects from oozing peduncles to fresh cushions on the peduncle from which male flowers/bracts have recently burst open. The incubation period for the bacteria ranges from 2-3 months. During this period, infection can also be spread from the contaminated plant to other plants using pruning tools. This type of spread is responsible for keeping infection on a field for years, even for farmers who are actively using recommended practices. Once a field gets infected, there are more infected plants than can be observed with the human eye.

Symptoms of BXW

Common symptoms on the fruit include discoloration and premature ripening and blackening of the fruit leading to rotting. There is also wilting of the bracts and shrivelling of the male buds. Symptoms on the leaves include a gradual wilting and yellowing of the leaves. Internally, yellow-orange ooze excreted from a cut corm is a sign that BXW is present. Expression of the symptoms is influenced by the particular cultivar infected and how the disease has been transmitted.

Efforts to control BXW

There have been efforts to control the disease with varying levels of success across the region. This has led to the creation of the project to out scale BXW control in Eastern and Central Africa. The project harnesses experiences in disease control and rehabilitates severely affected fields in the most affected areas in the six countries to get back to production levels experienced



COVER PHOTO: Adopting BXW control measure brought this smile

before the disease struck.

Hotspots

The countries where the disease is prevalent are Uganda, Tanzania, Kenya, Rwanda, Burundi, and DR Congo.

Rehabilitating affected fields

Working with farmers, community leaders, and local politicians, completely destroyed fields are rehabilitated. Neighbouring communities and those from far are mobilised using lessons learnt from rehabilitated and replanted fields to scale out BXW control. Leaders from the communities and the local government, supported by extension workers and the project, are trained to use available technologies to control BXW.

The technologies

Scientists are promoting a number of proven and cost-effective measures of controlling the disease, and of replanting banana fields that are affected by the disease. If farmers use these measures, they can increase their yields in a short period of time.

Control measures

- Disinfecting farm tools
- Suspension of using cutting tools in infected fields



Banana completely destroyed by BXW

- Destroying sick plants to remove the source of the disease,
- Early male bud removal – using a forked stick to remove the 'male' bud of an infected banana when the banana fingers are maturing
- Single stem removal – This method involves the cutting of the affected corms from the mat leaving the remaining corms to continue to grow and give healthy bunches.

In order to rehabilitate infected banana fields, farmers need to:

- Wait for at least 3 months before replanting the banana field

► Continued on page 4

►► From page 3



Mr. Shaban Mkulila explains the process decapitation

- Plant “disease free” planting materials
- Use single stem removal

Infected banana fields can be rehabilitated using single stem removal and they don't need to be replanted. The field gets back to production in at least 6 months after starting the process. There is also continued protection against cultivar erosion and environmental degradation. When combinations of the above measures were used in Uganda there was a big reduction in the occurrence of the BXW disease within the first 6 months.

The proportion of farmers who managed to control the disease increased from below 5% to over 60% within 15 months, and banana production recovered to between 2.5% and 30% across 4 hotspots in Uganda. Farmers are also being trained to practice decapitation of preferred varieties as one of the means to rapidly increase availability of planting materials for rehabilitating orchards at low cost.

Managing weeds

During this period, weeds should be controlled by herbicide spray or hand pulling. This is because hoes can also spread BXW through the roots.

Achievements

Banana production is being revived in more areas far from project areas because of the availability of information and technologies. This has led to the improvement of banana yields, sales, and household income. The ecological integrity of rehabilitated areas is being restored especially in hilly areas.

For more information and BXW related stories, visit our website at www.asareca.org or email the Project Team Leader on jkubiruba@kari.go.ug or contact the national research organisation in your country.

Promoting banana juice processing innovations



Look out for banana juice on supermarket shelves

Work is underway to refine and validate technologies developed in the just concluded ASARECA project; “Improved banana processing technologies for market and income generation in Rwanda”.

The new initiative under the project; “Validation of Protocols for processing selected fruit and vegetable products in Rwanda and Tanzania,” is being implemented in the Southern and Eastern provinces of Rwanda. The lead partner is COPROVIBA, a cooperative producing banana wine.

Expanding banana innovations

The project is meant to enhance and upscale banana innovations and technologies produced in the previous project so as to add value to banana in Rwanda. The project is identifying and developing market opportunities for the banana juice by ensuring it gets quality certification.

Quality test

Other than refining, validating the processing technologies and innovations, the project is planning to place banana juice into strict quality, safety and nutrition analysis as steps to attain a quality certificate from the Rwanda Bureau of Standards.

To extract juice that can pass this test, ASARECA in conjunction with COPROVIBA, are training farmers and small scale processors to produce, commercialise and promote quality banana juice. Other actors of the banana value chain are also being trained on banana production, processing and marketing.

The project is providing COPROVIBA minimum food analysis equipment.

Ensuring that livestock gets adequate feeding even in drought

Until the close of 2012, ASARECA implemented projects which produced and tested several technologies and innovations to improve livestock productivity and marketing in Ethiopia, Kenya and Tanzania.

Mitigating crisis

Important outputs with a potential to mitigate crises in Arid and Semi-arid areas were realised in projects on livestock early warning systems; increasing availability of feed using native vegetation; prosopis based early warning plans; and reseeded with adapted range grass species; water harvesting and irrigation; feed conservation; the forage chopper and nutrient blocks; manure management and nutrient recycling; among others.



Nutritious feed blocks good for livestock

Scaling out

To ensure, these initiatives make impact in the region, ASARECA decided to scale them out to communities that did not participate in the earlier initiative and communities in other arid and semi-arid livestock production regions

through the new project; Up-scaling Feed Packaging and Conservation Innovations for Drought Management in Pastoral Systems of Eastern and Central Africa. Through this project, ASARECA and partners are also improving natural resource management and food security.

The project is building capacity of major actors in the pastoral and agro-pastoral system to anticipate, mitigate and promote resilience mechanisms to ensure quick recovery after severe droughts.

Empowering farmers to effectively respond to climate change

Semi-arid areas in the Eastern and Central Africa (ECA) suffer high climate variability. The erratic nature in the onset, quantity, distribution and cessation of rainfall tells this story almost every year.

Hard to make farming decisions

This is a major constraint to decision making by smallholder farmers on when to start preparations, planting and estimating quantities or seed and crop.

Yield decline

It is no surprise that ECA countries are facing steady yield decline. In Sudan, a decrease in sorghum yield/acre under rain fed agriculture is evident and Ethiopia realises only a third of its growth potential. Over all, a 10% decline in maize production by 2055 across the continent has been predicted.

Response farming

The current ASARECA project; "Enhancing the adaptive capacity of smallholders to climate variability through response farming innovations," is an attempt to mitigate this effects. Led by the Kenya Agricultural Research Institute (KARI), this project is underway in seven ASARECA member countries Kenya, Ethiopia, Madagascar, Sudan, Eritrea, South Sudan and DR Congo.

Bringing options on the table

The project is out to investigate and bring to table management options to better manage climate induced risks and promote tactical decision making in selecting and using improved technologies by smallholder farmers. It also seeks to build the capacity of farmers and other support agents to assess the risks and opportunities associated with variable climatic conditions and manage

them through better planning. The project will develop communication systems to make relevant climate information readily accessible to farmers and establish advisory systems to develop and disseminate locally relevant climate information for agriculture.

In Kenya, the project is developing and testing a system for timely generation and dissemination of agro-advisories to farmers and extension agents. In Ethiopia and Madagascar, the emphasis is on validation of the approach under a range of agro-ecological and socio-economic conditions. In DR Congo, Eritrea, Sudan and South Sudan the work is focusing on collecting required climatic and crop production data, analysing the data for variability and potential impacts on the locally relevant agricultural systems among others.

Promoting sorghum, legume interaction for better yields

ASARECA is spearheading efforts to enhance the use of sorghum-legume innovations by smallholder farmers in the semi-arid areas of Eritrea, Sudan, Kenya, Tanzania and Uganda.

Creating synergies

This is in response to low production caused by different stress factors, coupled with climate variability. The project; Sustainable intensification of sorghum-legume system to improve livelihood and adaptation to climate change in Semi-Arid areas of Eastern and Central Africa (ECA), is applying integrated approaches that create synergies between natural resource management and crop breeding.

Exploiting legume cereal interactions

Efforts are already underway to develop a cropping system and value-chain innovations that are resilient to unexpected variabilities and stresses, taking advantage of local knowledge and institutions. The sorghum, cowpea, greengram and lablab interdependencies are being exploited to increase productivity. By integrating the actors across and within the input-supply, production, sale/storage, and marketing stages of the value chain in these locations, the project promoting synergies and reducing transaction costs, resulting into large increases in yield, production, profitability and competitiveness for dryland cereal crops.



Reaping the benefits of cropping sorghum with legumes



Striga undermines sorghum yield

Taking fight against striga a notch higher

A new ASARECA project to evaluate Striga and drought resistant varieties is under way in Kenya, Eritrea, Tanzania, Uganda, Rwanda and Sudan.

Getting into the genes

Launched early this year, the project is addressing the urgent need to develop technologies to discover genes responsible for resistance to Striga. Work has started to screen for Striga resistance in wild relatives of sorghum. The research is also exploring incorporating drought tolerance into the striga resistant lines using genetic engineering approaches. This is partly riding on an already existing maize transformation platform at Kenyatta University.

Adding value to sorghum

The new project is also evaluating the nutritional and technological properties of Striga resistant and drought tolerant sorghum lines for industrial/commercial use. This project comes on the heels of a just concluded ASARECA project: 'Fighting Striga: deploying resistance genes to boost sorghum productivity in Eastern and Central Africa, which generated more than 150 Striga resistant lines. These are some of the lines which have been made available for evaluation and subsequent dissemination of the technologies in the east African region.

Why fuss about striga

Crop losses due to Striga are a major

source of food insecurity and poverty among smallholder farmers in Eastern and Central Africa. Striga, a group of parasitic weeds, is second only to drought as a factor reducing the yield of staple food crops in Africa. Although research on Striga in Africa has a long history, efforts to promote Striga management have had limited success among smallholder farmers.

A number of Striga control measures have been suggested but most of these methods developed through conventional approaches have been of limited value to subsistence farmers. Control measures such as chemical fertilizers, herbicides or cultural practices have had limited success.

The development and utilization of Striga-resistant crop varieties holds the best promise of combating and reducing the effect of this noxious weed on sorghum yields. Striga management strategies need to meet the twin objectives of immediate yield increase while reducing the level of the parasite's seed in the soil.

Sites

Two sites for multi-locational trials have been chosen in each participating country. They were chosen basing on the importance of sorghum in the target locations and by matching environmental conditions of the target sites with the environmental requirements of the Striga and drought resistant lines.



Pearl millet is the most enduring crop against drought

Investing in the pearl of the drylands

ASARECA and partners are in the process of developing and delivering a cropping system and value-chain to enhance the production of the pearl millet in the arid and semi arid lands of the sub-region.

To achieve this, ASARECA is investing in enhancing genetic resources and in addressing post harvest, utilization, input delivery and marketing constraints in the arid and semi arid lands of Eritrea, Sudan, Kenya and Tanzania in the project; Pearl millet innovations for improved livelihoods in drought-prone areas of Eastern and Central Africa (ECA).

Exploiting genetic resources

The project is informed by prior knowledge that increasing grain production alone is not enough. The main constraints to pearl millet production in semi-arid areas include limited exploitation of genetic resources, low seasonal rainfall with extreme variability, poor soil fertility due to nutrient mining and erosion, limited availability of improved varieties, diseases and pests. Other challenges include post harvest handling, storage, processing and utilization and marketing.

Improved varieties

However, there is potential for improvement in pearl millet production if

improved varieties, agronomic methods including water and soil conservation could be harnessed. These have not been available to the small scale farmers who are the sole producers of pearl millet in the semi-arid areas.

Creating synergies

Given the stresses and variability of the rain fed dry lands that are further exacerbated by climate change, a different approach is needed, one that adapts to environmental variability and risks, rather than assuming that homogenization will occur.

The arid giant

Pearl millet is the world's hardiest warm season cereal with great potential for ensuring food security in marginal areas because of its suitability to the extreme limits of agriculture. It is perhaps, the most successful cereal and a major source of energy for the poor farming communities in Arid and Semi Arid Lands.

Endorsed by ASARECA

It is for this reason that ASARECA stakeholder meeting in June 2010 in Addis Ababa, Ethiopia endorsed pearl millet as the crop that is most suitable for the semi arid areas. In Eastern and Central Africa (ECA), pearl millet (together with finger millet) and sorghum rank third in importance among staple crops.

Upscaling new highland maize varieties in Ethiopia

ASARECA has been supporting five Eastern Africa countries of Burundi, Ethiopia, Kenya, Rwanda, and Uganda to acquire well adapted, early generation inbred maize lines and other source materials developed by CIMMYT. The countries have also been supported to acquire varieties from the Ethiopia.

Good varieties available

Through these efforts, well adapted and desirable highland genotypes have been identified by scientists from the National Agricultural Research Systems in the sub-region. In the process, Ethiopia released three hybrids (AMH800, AMH850 and AMH851) and one open-pollinated variety (Hora) targeted for the highland zones. These varieties have showed high performance for grain yield and other agronomic traits and have been welcomed by farmers.

Expanding the reach

The current ASARECA project; Upscaling recently released maize varieties in Ethiopia, is meant to reach more farmers in more target areas in the highlands of Ethiopia. To achieve this, the project is creating awareness of and demand for these varieties among seed growers and farmers. The highland zone in Eastern and Central Africa ranks second in maize production and is generally characterized by high rainfall, cool seasonal temperatures and high population density.

Low yields

Maize production in the highland areas has been characterized by low yields due failure to adopt new improved varieties and appropriate management practices. Until recently, there has been little attention to the development of appropriate maize production technologies for these agro-ecological zones. On the other hand, development of highland maize varieties for high yield has been increasingly gaining interest.

Burundi research gets injection of young well-trained scientists

Hungry for well-trained scientists to drive agricultural research, the Burundian Government has deployed fresh Msc. scientists returning from various universities in East Africa to priority research positions.

Until 2008, the researchers; Nepomusecene Ntukamazina, Michelin Inamahoro, Fulgence Niyongabo, Cyrille Mbokihankuye and Gloriose Habonayo, were only junior researchers with first degrees, who could only do as much as their exposure could offer.

The situation has since changed. ASARECA in 2008 sponsored a total of 34 young mid-level scientists from Eastern and Central Africa to undertake leadership and mentorship training; and an array of masters' degree courses. These included Plant Breeding, Soil Science, Agricultural Information and Communication Management, Research Methods, Range Management, Agricultural Extension, and Breeding in various universities.

Through the project, Strengthening Capacity for Agricultural Research and Development in Eastern and Central Africa (SCARDA-ECA), ASARECA and partners placed the students in acclaimed universities in and the region. They were selected from Sudan, Burundi and Rwanda. These countries were chosen after an institutional assessment of the National Agricultural Research Systems (NARS), indicated that lack of adequate human resource capacity was a major weakness in delivering research outputs. The scientists successfully completed their courses and in 2010, returned to their countries early 2011 and are making a priceless contribution. ASARECA has started the process of following them up to see what contribution they are making. In a three part series, which started with a follow up with Rwanda, we published amazing revelations on how the scientists have been embraced. In this second part, we highlight the remarkable performance of the scientists in Burundi.

Nepomusecene is managing Euro 5 million project

Ntukamazina joined ISABU in 2007 after attaining the equivalent of Bachelors of Science degree from the University of Burundi in 2006. He was appointed a research assistant.

In 2009, Ntukamazina was sponsored under SCARDA to undertake a Masters of Science in Research Methods at Jommo Kenyatta University of Science and Technology in Nairobi, Kenya.

This offered him the opportunity to interact closely with celebrated science lecturers from within JKUAT and from outside Africa.

On returning to ISABU in December

2011, He was appointed the in-country representative of the Bean Innovations project, funded by ASARECA in July 2012. In September 2012, he was appointed to assist the Director General in managing the research component of a five-year programme funded by the Belgian and the Burundian governments.

The component worth Euro 5 million, covers research, infrastructure, equipment and foundation and breeder seed development. This particular assignment has placed him to work with a team comprising the Director General, two technical experts, and other support staff. "I plan, coordinate and facilitate scientists to implement activities under this project. I have developed tools to



facilitate the programme to take off, disbursement of funds and monitoring and evaluation," Ntukamazina explains.

Gloriose is making a huge contribution to ISABU

Gloriose Habonayo did a Masters of Science in Crop science and specializing in agronomy. During her time at Sokoine University, she was exposed to senior scientists and academicians. When Habonayo returned to ISABU in 2011 she was involved in the fruit and legume research, crop livestock integration activities. She is actively contributing to protocol

elaboration on improving the quality of organic manure and improving bean production using highly nutritious weed, *Tithonia diversifolia*.

This weed is available in large quantities in Burundi and is useful in maize and bean production because it is rich in nitrogen, calcium and potassium. She is also involved in training extension staff.





Michelin heads the national biotech labs

When Michelin Inamahoro returned to Burundi in 2011 after completing a Master of Science in Plant Breeding and Seed Systems at Makerere University, she was appointed the Head of the National Biotechnology laboratories and Screen houses. Besides, she was allocated funds under a project funded by the Belgian technical corporation to collect samples of potato countrywide. She also got additional funds from Becca in Kenya to characterize samples of Taro (colocase) countrywide for diseases and other

stress factors. "I have initiated research activities in the laboratories to come up with disease free coffee varieties. I have already set up banana experiments in the laboratories and I am in the process of evaluating CIP potato varieties, CIP1, CIP2, CIP3 and CIP9 for disease free Irish potato seed," Inamahoro explains. "Besides I have evaluated sweet potato varieties and produced plantlets and handed over to the potato programme of my Institute."

The journey to this flourishing career started in 2008 when Inamahoro was selected to do a Masters degree under SCARDA. Inamahoro undertook research on the topic: "Characterization and Genetic Mapping of Root Development and Resistance to *Radopholus Similis* in a Segregating Diploid Banana Population".

"I got some equipment and skills in micro and macro propagation of banana, Irish and sweet potato," she asserts. Today, Inamahoro manages 45 staff at the laboratory centre and others spread out in other centres throughout the country.

Cyrille leads climate change programme

Mbokihankuye was in 2011 appointed to lead a new programme on climate change, funded by the Belgian Technical Corporation. This follows his exemplary performance in the evaluation of cow-pea tomato and cabbage varieties in semi arid areas for drought tolerance. Prior to this new assignments, Mbokihankuye had just returned (in 2010) from studies at Sokoine University of Science and Technology where he undertook research on; the effects of pruning of selected determinate tomato lines on yield and quality.

Prior to accessing the SCARDA scholarship, Mbokihankuye was a junior researcher at IZABU working on fruits and vegetables. "Sokoine University provided me an excellent biotechnology laboratory, research fields and the post harvest laboratory, which helped me to



carry out analysis of samples," he notes. Today, besides, leading the climate change programme, Mbokihankuye is also working on African Indigenous vegetables project assisting farmers in Kibitoke west, 100 km from Bujumbura and Mawha Station 80km west of Bujumbura to produce quality vegetable seeds and linking them to the market.



Fulgence heads rice research

Niyongabo worked in ISABU from 2006 to 2008 as a simple researcher. In 2008, he was selected under SCARDA to pursue Msc. in plant breeding and seed system at Makerere University in Uganda.

This exposed him to a well equipped Biotechnology laboratory at the university and at the National Crop Resources Research Institute (NACRRI) in Uganda.

His thesis on; Determining variety of rice pathogen in Uganda to determine the resistance of genes inherited from parent to progenies generated after crosses of parents, prepared him to work on the rice programme in Burundi.

When Niyongabo returned to IZABU in 2011, he was appointed team leader for rice research for IZABU. As a leader, he is charged with collaborating with other research entities such as the International Livestock Research Institute in Burundi, and the University of Burundi with which he shares knowledge and varieties.

"I consider myself the most experienced rice scientist in IZABU. I lead a team of three researchers and seven technicians. Our key role is to release rice varieties which answer the questions of quality, yield, and tolerance to other stresses," he says.

Asserting the place of fruits, vegetables in the market

Researchers in Rwanda are validating innovations and best practices for processing fruits and vegetables products of mango, passion fruit, pineapple and amaranthus. In a new project; Validation of protocols for processing selected fruit and vegetable products in Rwanda and Tanzania, researchers are optimizing the use of technologies for increased income, nutritional security and employment by the SMEs.

Adding value

Small and medium scale food processors in Rwanda and Tanzania have been producing fruits and vegetable products using varied but appropriate facilities in different environments. They have, however, been using protocols that have not been validated and registered as a guide towards meeting national standards.

Rwanda and Tanzania have in place policies and legislations that ensure that the consumers get safe and quality foods, including processed fruits and vegetables. It is stipulated in the legislations that before a given food product is introduced into the market, it must be registered under the existing regulatory bodies.

The developed protocols need therefore to be validated and registered with regulatory bodies in Tanzania and Rwanda.

Expected outcomes

Using appropriate validated technologies increases the quality of products, confidence and market share, leading to increased incomes. This is expected to increase demand for quality fruits and vegetables, a factor that has the potential to create profitable employment for fruit farmers. Information generated from these activities will be packaged and shared with stakeholders.

In order to address the language barriers, some of the materials will be translated into Kiswahili and Kinyarwanda and communicated to the stakeholders using appropriate channels including exhibitions and training. The users will include fruits and vegetables processors, policy makers, extension agents and farmers.

Value mangos, avocados, oranges



The potential for citrus fruits to fetch premium prices is high

Fruit tree crops (avocado, citrus and mango) are traditionally a significant contributor to food security and nutrition for rural farmers in Africa. Mangoes in particular, becoming an important source of income as they are increasingly being marketed widely. However, the potential to meet the growing demand for improved quantity and quality of fruits and the associated products is limited due to limited good quality seedlings.

Spreading use of improved seed

In response, ASARECA and partners are bringing to speed efforts to enhance the uptake and utilization of improved quality fruit trees, technologies and innovations in Ethiopia and Uganda through the project; Validation and dissemination of quality fruit trees in Ethiopia and Uganda. Already, the project is in the process of establishing new fruit nurseries and validating old ones to enhance nursery service delivery, building the capacity of stakeholders to produce process and utilise high value fruit tree crops; and developing

Ovacado is fetching good prices on the local markers

information materials to facilitate further spread out the technologies.

The fruits industry in eastern and central Africa is characterized by a diversity of traditional and exotic varieties grown for home consumption, domestic markets, regional and international markets. Over the years, the fruit industry has increased in importance both as an income earner and a contributor to improved health and nutrition. Fruits are eaten as whole fruit, salads or processed dry products or juice.

Market available

Domestic, regional and international markets for mangoes, avocados and citrus are expanding. Looking at the trend in consumption, especially in the EU and other international markets where consumers are now looking for health and convenience, there is a great potential to supply this market. However, there are few players in the fruit processing sector and the processing of fruits in the sub-region is low. Most of the processed juice consumed in the region is imported.



Enabling farmers to get disease-free potato planting materials

Upscaling innovations for quality seed potato production in ECA

Over the years, the national potato mean yields for Burundi, Kenya and Uganda have been below 8t/ha. This is mainly attributed to variety degeneration, poor management practices and poor quality of seed tubers. Currently, certified and disease-free seed tubers account for less than 5% of the whole potato seed market in Kenya, Uganda and Burundi.

This has resulted into the widespread practice of planting own-saved tubers from previous harvests or sourced from markets or neighbours. Such tubers are often of poor health due to infections, viruses and other tuber-borne pathogens.

Potato is strategic crop

The project, Upscaling innovations for quality seed potato production in ECA, is Underway in Kenya, Burundi and Uganda, to scale up technologies validated under the previous ASARECA project to enable potato farmers use high quality seed to enhance potato productivity. Improved productivity of potato, a crop widely grown in the EAC countries, is viewed as strategic in eradicating

food insecurity and poverty in the region.

Supply constraints

The seed-plot and positive seed selection techniques when scaled up, could address the seed potato quality and supply constraints among potato farmers. The project is streamlining mini-tuber and quality seed production by improving quality assurance procedures and enhancing seed distribution to increase availability and access to quality seed potato.

The project is also training organised groups of seed and ware potato farmers on post harvest handling and market linkages to improve profitability of their enterprise.

Supportive policy interventions and infrastructure are also key in ensuring success of the quality seed improvement initiatives.

Although East Africa harmonized seed potato standards for quality seed production were approved and gazetted in 2011, individual member countries have not domesticated and internalized them, hence they are not in use.

Community based low cost tissue culture innovations

ASARECA is providing financial and technical support to research Institutions in Eastern and Central Africa to increase access to clean planting materials by mobilizing the private sector and farmers to operate their own low cost tissue culture facilities to micro-propagate clean planting materials. The project, Developing gender responsive community based low cost tissue culture innovations for improved food security and livelihoods in the Eastern and Central African region, is implemented by 13 partner institutions including National Agricultural Research Institutes, Universities, NGO's and Private sector organizations.

High level of participation

The project has incorporated value chain participation in each of the commodities from the laboratory to market. This includes nutritional, biochemical and molecular analysis of the four commodities. The analysis will also include farmer and consumer preferences, and entrepreneur requirements etc. This is meant to address nutrition and market issues.

Laboratory innovations

The project is also conducting research on maximising physical components of the tissue culture technology such as; low cost laboratories, low cost media and culture containers, reducing electricity, lighting, and increasing labour efficiency. Overall, the plan is to strengthen the seed value-chain of cassava, potatoes, banana and sweetpotatoes.

Cutting down cost

Using tissue culture, it is possible to produce disease-free planting materials for the farmers. The tissue culture technology has made it possible for farmers to access large quantities of superior disease free plantlets of various crops. Despite the benefits of tissue culture, the achievement of the full benefits of the technology is limited by the high cost of tissue culture plantlets, which is limiting the adoption of tissue culture crops by small scale farmers.

Certification

The project is developing guidelines and a framework for certification of cassava, sweetpotato, potato and banana. Already, a number of genebanks in the sub-region have made some efforts to collect species of the four crops for germplasm to identify useful genes.

Pursuing prosperity for cassava and sweet potato



These standards will enable cassava farmers like Sarah Nabirye reap huge incomes from planting quality cassava

ASARECA, through its Policy Analysis and Advocacy Programme, this year kicked off follow-up initiatives to enhance the adoption of harmonized standards for cassava and sweet potato, which were approved by the East African Standards Committee and subsequently declared by the East African Council of Ministers for use as East African Standards.

Through a follow-up project; Enhancing adoption of harmonized standards in Eastern and Central Africa, ASARECA aims at strengthening the capacity of value chain actors to apply the harmonized standards and improve compliance to standards.

Slow implementation

Since approval and declaration of the standards in 2010, implementation has been very slow due to inadequate awareness on the availability and requirements of harmonized standards;

inadequate capacity to apply the standards among the value chain actors, sub-standard and unsafe products and limited capacity enforce compliance.

Cassava and potato are among the major root and tuber crops grown and consumed in most parts of East Africa and Africa at large. Besides their strategic role in reducing hunger among smallholder farmers in Africa, the crops also hold high industrial potential for food, feed and industrial raw materials.

Tapping the potential

The New Partnership for Africa's Development (NEPAD) has identified cassava as a 'poverty fighter' capable of spurring industrial development in Africa' and launched a Pan African Cassava Initiative (PACI) that seeks to tap the enormous potential of the crop for food security and income generation. Consequently cassava has been

prioritized as a strategic commodity in CAADP Pillar III and FAAP Pillar IV as a means to increasing food supply, reducing hunger and improving responses to emergent food crises.

Perishable goods

However, these crops are bulky and perishable and this affects their marketing. Although, informal trade of these commodities already exists; it is restricted by country specific inputs, market logistics, and product regulatory regimes.

Improving uptake

The project aims ultimately to improve the uptake of the different standards by the value chain actors, increase quality and safety of cassava and potato products and increase compliance. These will contribute to enhanced food security, trade, industrialization and livelihoods in the region.

Making regional standards work

ASARECA is spearheading efforts to implement harmonized Eastern Africa seed standards, regulations and procedures to improve production and trade of quality seed in the sub-region region. In the project; Enhancing adoption of harmonized seed standards, regulations and procedures in Eastern and Central Africa, efforts are being focused on advocating for domesticating the regulations and procedures.

The project is implemented in Burundi, Kenya, Tanzania, South Sudan and Uganda. The implementing partners want the regulations and procedures developed and implemented at country level.

A follow up

This project is a follow up on previous ASARECA work on rationalisation and harmonisation of standards, policies and regulations in the sub-region. Between 1999 and 2007, ASARECA undertook the first phase of the initiative to rationalize and harmonize seed policies and regulations in the sub-region.

This was followed up with a second phase between 2008 and 2011, which covered dairy, root crops and bio-safety. This led to harmonization agreements in five key areas, namely; protection of plant variety rights; transparent variety release and registration procedures; common phytosanitary regulations, and certification standards. All these were meant to simplify seed trade procedures.

Each country for itself

The initiatives were informed by a study carried out by ASARECA in 1998, which showed that member countries had different laws, policies and regulations governing the seed industry and seed trade, which resulted in restriction in movement of seed across the borders limiting seed market. Adoption of a common set of internationally accepted seed marketing regulations is expected to facilitate the flow of seed between countries, promoting expansion of national and regional seed industries by stimulating private sector investment.



Harmonised seed standards allow easy movement of planting material in the region

High quality seeds crucial

Improvement of seed trade in the region is key to enabling farmers use high quality seeds to enhance crop productivity. Improved productivity of crops in the region is viewed as strategic in eradicating food insecurity and poverty in the agricultural based regional countries.

Diverse interests

According to Dr. Michael Waithaka, the manager Policy analysis and advocacy of ASARECA, policy reforms take longer to formulate and domesticate because of involvement of diverse interest groups with powerful and often misinformed opposition to change the status quo. In addition, policy domestication depends on processes that are difficult to influence such as cabinet sessions and parliamentary calendars.

Besides, most countries do not have the capacities to formulation and implementation of policy reforms. This is where ASARECA has been handy to mobilise and build capacities of seed industry stakeholders and regulators in the sub-region.

Out scaling gains from snap bean research

Research teams and farmers coordinated by ASARECA are working to enhance the production of snap beans (French beans) by validating and disseminating options to manage snap bean pests and diseases and soil fertility. The new project; Validation of snap bean integrated crop management technologies for improved livelihoods, is building the capacity of snap bean small-holder growers and extension service providers to ensure that households have enough to eat and generate income from surplus harvest.

The crop management technologies were developed from previous work on snap bean done, with ASARECA support, by the University of Nairobi (Kenya), Selian Agricultural Research Institute (Tanzania) and NACRRI-National Agricultural Research Organization (Uganda).

Snap bean fetches premiums

Snap bean (*Phaseolus vulgaris* L.) is the leading export horticultural crop in Kenya and has recently gained economic importance as an export crop in Tanzania and Uganda. Promotion of the crop in Eastern and Central Africa is thus a strategic entry-point for revitalization of socio-economic development, especially in rural areas. However, there is low snap bean productivity in smallholder farms and this is largely attributable to insect pests and diseases, low soil fertility, lack of improved locally adapted varieties and postharvest losses.

These technologies are being synthesized and validated on-farm in 6 sites, namely, Kirinyaga South (Mwea) and Embu districts in Kenya, Siha and Arumeru districts in Northern Kenya, and Mpigi and Wakiso in the Lake Victoria region of Uganda. Training of farmers, extension providers, researchers and other stakeholders on snap bean technologies, recipes is underway.

New project targets to improve goat breeds

ASARECA is leading an important initiative to collect information on the common genes of goat species in the region. This is intended to form a basis for improved preservation of species and also serve as a precursor to large scale genetic improvement programmes in Africa.

Catalysing collaboration

The project is already catalyzing regional collaboration to use genetic tools to determine native breeds on the continent. This will result into scientifically based tools for animal improvement programmes in Africa which individual country breeding programs can leverage on.

Characterising genes

The project is in the process of characterizing the genes of about 30



Efforts are underway to boost national goating breeding programmes

distinct populations of goats. This is meant to identify unique lineages to inform germplasm preservation. This information is useful when characterizing the performance of animals in gene banks.

Rebirth of knowledge on acaricide use

It is now common knowledge that controlling ticks and tick-borne diseases using synthetic acaricides, has deteriorated drastically and cannot be sustained any more. Results from a just concluded ASARECA project on prevention and control of ticks and tick-borne diseases, indicate that the majority of farmers in Eastern and Central Africa region do not use acaricides correctly. The rampant malpractices associated with the use of acaricides, the pollution of the environment and food with toxic residues, undesired effects on non-target organisms and development of resistance by ticks can no-longer be tolerated.

Increase knowledge space

In response to this, ASARECA and partners are spearheading efforts to re-invigorate the diminishing technical knowledge on the use of acaricide-based technologies to manage ticks and to increase utilization and adoption of the technologies in the sub-region.

The project titled; Up-scaling environmentally friendly acaricide management for preventing and controlling tick and tick borne diseases in Eastern and Central Africa, is being implemented in three livestock production systems in in Burundi and Madagascar. The aim of the project is to strengthen the capacity of farmers and stakeholders to control tick and tick borne disease, upscaling infection and treatment method and proven acaricide-based technologies to manage tick and tick borne diseases.

Freeing up pigs, checking epilepsy

Work is underway to validate the Taenia solium pen-side diagnostic kit, which was developed under the just concluded ASARECA project; “Diagnostic and Control Tools and Strategies for cysticercosis”. In a research financed, coordinated and managed by ASARECA, scientists at the International Livestock Research Institute (ILRI), Nairobi, Kenya produced this rapid, cheap diagnostic aid, however, for it to be out scaled to the beneficiaries, it needed to be validated.

Field trials

Validation is being undertaken through field trials replicated in the six partner countries (Tanzania, Kenya, Uganda, Rwanda, Burundi and DR Congo). This is meant to ensure that the kit is of appropriate design and adequate capacity and will function as intended. Validation of the kit will also serve to ensure accuracy, reliability and ability to discern invalid or altered records. Once the validation is complete, the kit will be used by pig farmers and meat inspectors in the sub-region to detect animals infected with porcine cysticercosis. Ideally, infected animals should be rejected at the slaughter house or before they are transported to slaughter. The rejected infected pigs should therefore be treated and re-presented for slaughter when in good health. Taenia solium is the causative agent of porcine and human cysticercosis/taeniosis. Cysticercosis is the most common cause of epilepsy worldwide.

ASARECA Gender expert shines

Out-gone ASARECA Gender Specialist, Mrs. Forough Olinga, has been extolled for her contribution in supporting the National Agricultural Research Systems to implement agricultural projects in a gender sensitive manner. Speaking at a reception dinner during the 3rd Annual Review and Partners Meeting in Chimoio, Mozambique in March, Dr. John Dixon from ACIAR, a SIMLESA partner, said Forough was instrumental in mainstreaming gender in the implementation of Sustainable Intensification of Maize and Legume Systems in Eastern and Southern Africa (SIMLESA) in Ethiopia, Kenya, Tanzania, Malawi & Mozambique. Forough received a silver brooch to celebrate her stellar



Gender specialist, Mrs. Forough Olinga

performance. Until she retired recently, Forough headed Gender Mainstreaming in ASARECA, working with project teams across the 11 ASARECA countries to ensure that Agricultural research is informed by the needs of women, men, and the youth.



Kenneth Masuki

Dr Kenneth Masuki joined ASARECA as the Manager for High Value Non-Staple Crops Programme effective 1st February 2013.

He brings to ASARECA over 20 years of research experience in agriculture -

natural resource management, methods and approaches for technology transfer. Prior to ASARECA, he worked with the International Centre for Research in Agroforestry.

He holds a PhD in Agricultural Education and Extension from Sokoine University of Agriculture (SUA), Tanzania and an MSc in Soil Water Engineering from University of Nairobi, and BSc Agriculture from SUA. He has developed proposals for several funded research projects.

He has published a number of scientific papers in journals, written book chapters, co-edited and authored a book.



Patrick Owere

Mr. Patrick Owere is ASARECA Head of Finance since January 2013. A fellow of ACCA, he holds a MSc. Accounting and Finance. Patrick has over 13 years work experience in both private and public sector. Prior to this, he was Finance and Admin Director for Uganda Energy Credit Capitalization Company, a project in the Ministry of Energy and Finance Manager for ADFB funded projects in the Ministry of Health, Uganda. He has worked with Celtel Telcom company and DFCU Bank.



Emmanuel Zziwa

Dr. Zziwa joined ASARECA as Programme Assistant Livestock and Fisheries Programme effective 13 May 2013. Prior to joining ASARECA he worked as Lecturer – Department of Agricultural Production Makerere University and Research Officer – NARO. He holds PhD in Dryland Resource Management (Ecology and Environment) from University of Nairobi, MSc in Agriculture and a BSc in Agriculture from Makerere University. He's trained in Food and Nutrition Security, among others.



Roland Mugumya

Mr. Mugumya has joined ASARECA as Programme Assistant Monitoring & Evaluation effective 02 May 2013. Prior to joining us he worked as Monitoring, Evaluation and Learning Coordinator with Raising Africa and Monitoring & Evaluation Officer with British American Tobacco. He has over 10 years of experience. Roland holds Masters of Science Degree in Rural Development from Ghent University – Belgium, and a BSc in Agriculture from Makerere University.



Briane Isabirye

Dr. Isabirye joined ASARECA as Programme Assistant Staple Crops effective 6 May 2013. Prior to joining ASARECA he worked as Director Operations and Senior Consultant with Kawanda Agri Business Consult, and several other senior positions held in different reputable organisations. He has over 12 years of experience. Briane holds PhD in Biological Sciences, A Master of Science Degree in Environment and Natural Resources and BSc Degree with Education, all from Makerere University.



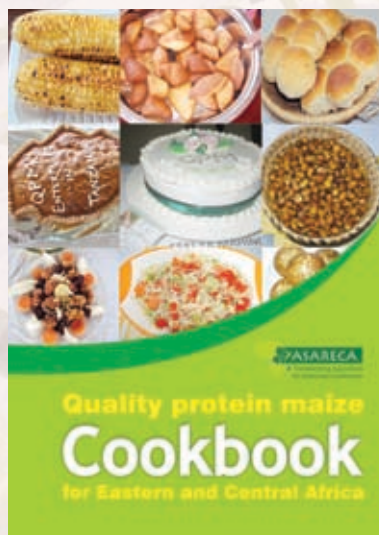
Title: Annual Report 2011: Pooling regional resources to feed populations General Assembly.

Published by: ASARECA

Year of publication: 2012

Synopsis: 2011 was the year during which ASARECA received a new member, Republic of South Sudan, bringing the number of ASARECA member countries to 11. It was the year when many projects initiated in 2008/2009 ended. The year was therefore, a celebration of achievements scored in generating several agricultural technologies, innovations and management practices and knowledge products. The celebratory mood reached a climax when ASARECA held its 1st General Assembly from 14-16 December 2011 in Entebbe, Uganda. Get these and other highlights in this document.

Available on www.asareca.org



Title: Quality protein maize cookbook for Eastern and Central Africa.

Published by: ASARECA

Year of publication: 2013

Synopsis: This cookbook introduces delicious traditional recipes and ways to use Quality protein maize (QPM) in combination with a wide variety of vegetables, legumes and other staple foods available locally in Eastern and Central Africa (ECA) and also to introduce newly developed recipes. The QPM in these dishes adds to the nutritive value of the foods necessary for a healthy family whose staple food is maize. The book is an attempt to introduce QPM dishes found in one area to another area within ECA. QPM offers 90% the nutritional value of skim milk, which according to UNICEF, is the standard for adequate nutritional value.

Available on www.asareca.org

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