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Legumes: A Climate-Smart Option

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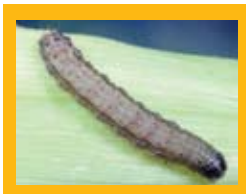

Editorial

Let's Support Agriculture

As we all know Kenya, is agriculture dependant, which implies that farmers act as the dominant force in our country without which the country cannot imagine its existence. As a matter of fact, it is the governing force for the country.

Special attention must be devoted to this particular sector so that farmers can benefit from the latest state-of-the-art technology for agriculture, which in turn can yield good results. Better the focus on agricultural activities, greater will be our nations' growth.

In fact, various beneficial schemes can be integrated with the agriculture-based activities for the growth of the farmers and proper guidance should be given to them on how to improve their ways of farming and learning innovative ways to better their skills. In addition, important steps should be taken to overcome the incurred loss because of inadequate or heavy rainfall so that our farmers can lead a fulfilling life. Agriculture is not only one of the major activities of our country, but the most powerful one too. Its importance cannot be overlooked as it accounts for the high rate of GDP.

So let's take a pledge to support our farmers as much as we can and push the government to give them a favourable working environment.

Masila Kanyingi
Editor.

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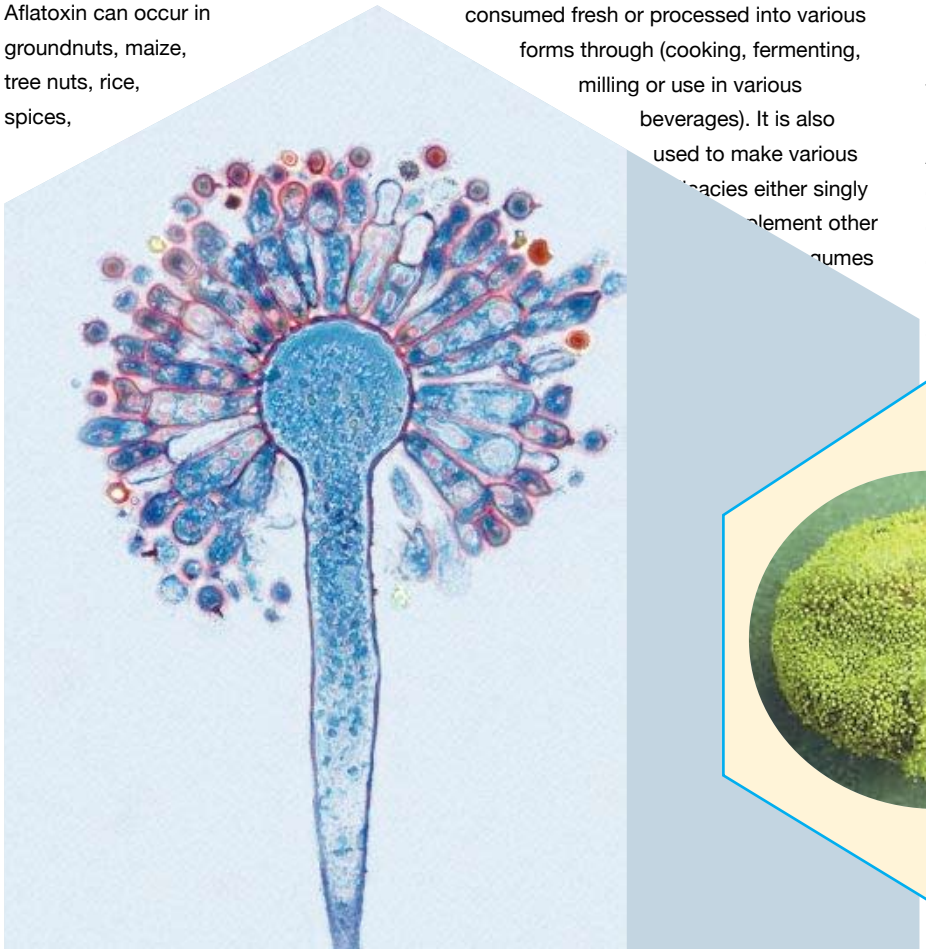
Aflatoxin Risk Mitigation

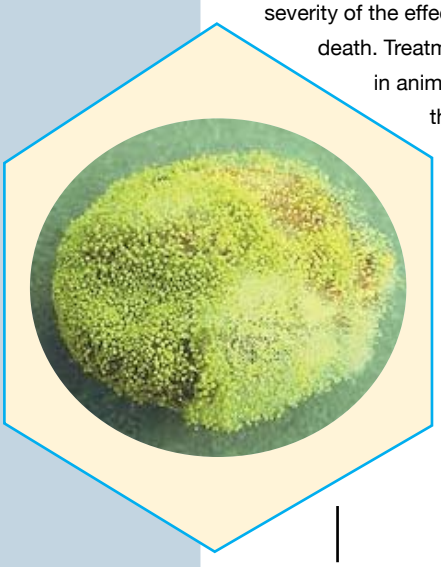
By Mary Mwende Mbithi

Aflatoxins are naturally occurring toxins produced by many strains of *Aspergillus Flavus* and *Aspergillus Parasiticus*. Its appearance is gray-green or yellow green mold that is often found on poorly stored grains and nuts. Large doses of Aflatoxin lead to life threatening Aflatoxicisis (acute liver poisoning), a primary factor for liver cancer. In children it causes stunted growth, and delayed development. Aflatoxin mostly results from ingestion but the most severe Aflatoxin compound (B1) can permeate through the skin.

Aflatoxin can occur in groundnuts, maize, tree nuts, rice, spices, figs and other dried foods, crude vegetable oils and cocoa beans. In East Africa, maize (and maize products), milk and groundnuts are the main sources of aflatoxin exposure. Research shows that maize (*Zea mays*) is a major cereal making part of everyday meals in Kenya and around the world.

It's considered a staple food for people living in warm climates in Africa, Asia and America. Africa consumes about 30% of the maize produced in the world. It is commonly consumed fresh or processed into various forms through (cooking, fermenting, milling or use in various beverages). It is also used to make various ...acies either singly ...lement other ...gumes





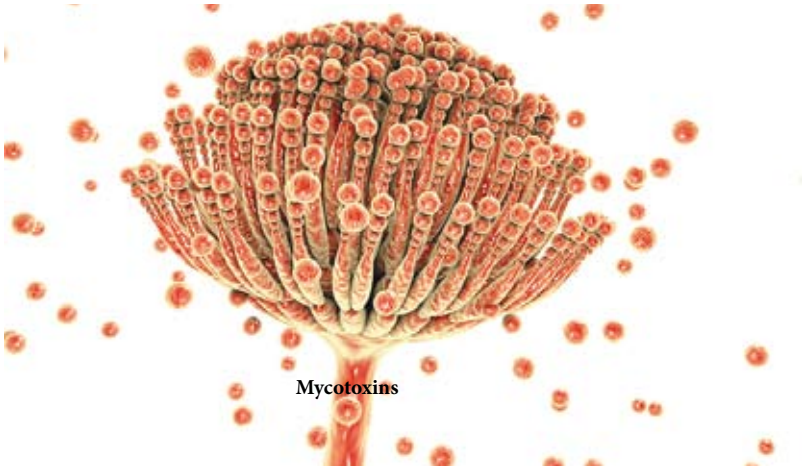
Maize and its products are most often prone to fungal contamination and consequent contamination throughout its growth, harvest, transport, and storage. Climate change also increases aflatoxin risk in tropical and subtropical regions. It impacts the complex communities of Aflatoxin (AF) leading to production of fungi by altering the number of Aflatoxin producers to change its fungal community's structure.

Animals are also exposed to high levels of Aflatoxin-contaminated feeds which can cause liver damage, reduced weight gain and decline in productivity (Eggs and milk). It affects livestock's health as well as the ability to metabolize vaccines. The severity of the effects can result in death. Treatment of Aflatoxicos in animals depends on the degree of liver damage.

Mycotoxins (toxic fungal metabolites that cause intoxication when consumed by animals) are also known to be transferred from

feeds to foods such as meat, milk and eggs. Aflatoxin residues in meat are quite rare but common in specific animal organs like the liver. Eggs may have a low concentration resulting from contaminated chicken diet. Massive aflatoxin contamination of numerous foods and animal feed crops has repercussions on the world's economy and health. Occasionally, most agricultural products are intercepted due to overwhelmingly high contaminations of Aflatoxins which surpass specific thresholds of host countries.

Therefore, there needs to be an urgency in development and implementation of multiple Aflatoxin prevention measures. In addition to better ways to complement existing agronomical practices that will help mitigate aflatoxin contamination in feeds, maize and milk value chains. The information on awareness of aflatoxin and its management as well as a routine scrutiny in the food and feed chains should also be applied.



Mycotoxins

Control of Aflatoxin in Maize

Chemical treatment

A solution of ammonium bipropionate and propionic acid gives temporary control and prevention of growth of fungi in maize with high moisture but cannot destroy Aflatoxin present before the treatment. Maize that is contaminated can be detoxified with ammonia but it is not fit for human consumption but rather can be used as feed for animals. The grain treated in ammonia has a strong odour and is darker.

Mechanical Drying

This is drying maize on stalk for 1 or 2 weeks before harvesting to reduce moisture content to 18% to 22%. It is then shelled within 24 hours and 48 hours of harvest. Then it is dried within 12 hours of shelling and within 48 hours it's dried to 14% moisture content whereby it can be safely stored for at least two months with minimal increase in Aflatoxin content.

Processing

According to a research, the methods include; cleaning the grain by sorting, trimming, washing the food before processing, dehulling grain mechanically, wet/dry milling, frying, canning and baking. Roasting and extrusion cooking also reduced Aflatoxins though for roasting only 85% could be achieved. As for cooking, temperatures have to be higher than the normal home cooking temperatures. All in all, these methods are not a guaranteed way to lower the contamination to safe levels but could still serve the purpose.

Improved farm storage

Research shows that the native habitat of *Aspergillus* is in soil, hay, decaying vegetation and microbiologically decaying grains and all other forms of organic substrates. Another study carried out showed that Aflatoxin spores were found airborne within the grain storage facilities. Also moist and heat are related to aflatoxin surges because they fuel growth of fungus. Therefore, safe agronomical practices as well as post–harvest practices should be adhered to the core to eliminate the contamination of grains. These include; cleaning of harvesting and drying equipment and storage containers (use approved insecticides to treat the container before putting grain) prior to harvest, removal of broken grain, dust as well as foreign material and removing debris. Also, the storage facility should also be dry, insect and rodent free to prevent the fungus growth.

Cowpeas

Pigeon Peas

Green Grams

Legumes: a climate-smart option

Africa's exposure to climate change, Covid-19 and volatile global commodity markets are increasing the risk of hunger and unrest. Can investments in the domestic production of food legumes like chickpea and soybean help?

The economics of hunger and agriculture in Africa.

According to the United Nations, the Covid-19 pandemic has the potential to double (to an estimated 265 million) the number of people without access to nutritious food, heightening the risk of malnutrition, hunger and social unrest in the near future.

But the deeper truth of the matter is that Covid-19 only acts as an early warning system for problems that the continent will inevitably face as a result of the looming crisis that is climate change. In reality, sub-Saharan Africa's growing dependence on food imports leaves it uniquely exposed during periods of global uncertainty and disruption, making its overwhelmingly poor population vulnerable to food shortages and sudden price hikes.

In a region with a food import bill totalling some US$ 35 billion per year, countries will be desperate to avoid a repeat of the 2007–2008 food crises, which saw the price of staple foods rise beyond what ordinary people could afford, triggering riots and upheavals.

Boosting domestic production of staple foods has long been touted as a potential solution to strengthening national food security. And crop scientists say that, in the harsh growing conditions of sub-Saharan Africa, food legumes are a key option to help countries achieve this.

Legumes: the smart agricultural choice for Africa

Why are scientists so interested in food legumes such as groundnut (or peanut), common bean, chickpea and soybean? Partly because these legumes have a natural ability to tolerate harsh growing conditions and survives with limited amounts of water climate-resilient traits that guarantee farmers an income even when other crops have failed.

Plus, these legumes have the unique ability to take nitrogen from the air and transfer it to soil a process known as nitrogen fixation. This enhances soil health and means that when they are grown side-by-side (or immediately before and after) other crops such as wheat and maize, legumes can greatly boost the final harvest while avoiding the need for farmers to buy costly and unsustainable nitrogen fertilisers.

Finally, food legumes are an affordable source of micronutrients and protein which is why they appear so commonly in vegan and vegetarian recipes. In fact, they contain significantly more protein than the starchy staples most frequently consumed in Africa. This means that they could have a big impact in the work to address the continent's critically low levels of daily protein intake.

The micronutrients provide vitamins B, iron, magnesium, zinc, potassium could also prevent malnutrition, infant stunting and chronic diet-related diseases such as diabetes, hypertension and cardiovascular disease. And, because good nutrition contributes to healthy immune systems (as the World Health Organization notes), legumes could even have a role in providing critical protection for Africans against Covid-19.

Identifying the blocks

So why aren't more farmers growing food legumes? To a large extent, it's simply because Africa hasn't had the well organised seed breeding and delivery systems it needs to ensure that African growers can access high-performing legume varieties.

> "Boosting domestic production of staple foods has long been touted as a potential solution to strengthening national food security."

Strengthening Africa's food legume delivery system is therefore a major focus for organisations like the Bill & Melinda Gates Foundation, who over recent years have provided tens of millions of dollars to develop food legume seed breeding and supply systems in sub-Saharan Africa.

The results of smart investment in legumes The approach that Gates Foundation-funded projects like the multi-country Tropical Legumes initiatives have taken is to specifically target those food legume crops that African farmers depend on most including groundnut, common bean, cowpea, chickpea, pigeon pea and soybean. Strategically, this is a smart approach and has resulted in real impacts that other organisations can build on moving forward.

Over the twelve years that this work has been ongoing, millions of farmers have adopted improved legume varieties, generating economic benefits worth over US$ 3 billion. Over half of those benefiting from higher yields and incomes are women.

During this period of focused work, sub-Saharan Africa has substantially increased its production of legumes. Pigeon pea and chickpea harvests have nearly doubled, for instance, and soybean production has increased over 2.5-fold to reach a current annual total of 3.5 million tons.

Surpluses have also created opportunities for producers to tap into growing legume export markets. For example, chickpea global exports have shown sustained growth and some 2.4 million tons now enter world markets each year. And, while most trade opportunities are likely to be within Africa, it is possible some producers could tap into more lucrative markets in Europe, taking advantage of a shift towards healthier, meat-free diets that are now becoming more popular in higher income countries.

Author: Dr Chris Ojiewo, Principal Scientist at ICRISAT and Project Coordinator of the Tropical Legumes and AVISA initiatives.

Balanced Nutrition in Cereal Production

Victoria Nandwa

A good crop feeding strategy at the farm can be achieved with a balanced supply of the main nutrients needed. Balanced nutrition is essential to help crops reaching high yields and quality, moving towards crop's maximum genetic potential.

The main objective of the balanced fertilization is therefore, to ensure that the plant has access to adequate supply of each nutrient at every growth stage in order to avoid any over or under supply and to optimize plant yields.

According to Liebig's barrel principle; a deficiency in one nutrient cannot be compensated by a surplus of the others. Therefore, one nutrient alone cannot ensure the yield, and the balance between the nutrients is essential to ensure reaching yields according to the genetic potential.

Advantages of balanced nutrition

1. Optimize quantitative as well as qualitative yields
2. Maximizes benefit: cost ratio
3. Avoids wastefulness of applied agro-inputs (better utilization of fertilizers)
4. Avoid antagonistic effects among nutrients in soil-plant systems
5. Decreases the incidence of nutrient deficiency, toxicity and hidden hunger
6. Produces normal crops even under poor soil conditions
7. Maintains healthy and productive soil
8. Renders plant competent by increasing its immunity to stress and pest attack
9. Maintains eco-friendly environment

Balanced crop nutrition is the most important factor to achieving desired quality and quantity of yields. Amiran Kenya Ltd and Israeli Chemical Limited (ICL) brings Agromaster® range of fertilizers. Agromaster® is a control release fertilizer, thereby ensuring availability of nutrients for up to 3months. Agromaster® contains eight essential elements required by the crop ensuring balanced nutrition (Nitrogen, Phosphorous, Potassium, Calcium, Sulphur, Magnesium, Zinc and Boron). Agromaster® has been manufactured through the E-Max technology which ensures maximum absorption of nutrients and reduced losses through leaching and volatilization. Agromaster® has a wide range of formulations which ensures different crops nutritional needs are met.

Victoria Nandwa is the Technical Agronomist Crop Nutrition, Amiran Kenya Ltd

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Boon for Makueni Farmers

Contracted to Grow Pigeon Pea Seeds

Recently, 41 farmers in Makueni County were contracted by Egerton University to produce pigeon pea seeds. Among them, John Musyoki from Kibwezi West who has so far grown pigeon peas in his 10 acre farm. Pigeon peas (*Cajanus Cajan*) locally known as 'Mbaazi' are perennial plants believed to have originated in India about 3,500 years ago and spread to different countries within Africa. They are drought resistant crops mostly grown in Eastern and Coastal regions of Kenya. They can withstand scanty or minimal rainfall and are a source of plant protein as well as various nutritional minerals and vitamins.

As he spoke to the media on a visit to his Makueni pigeon peas farm, he said that he had shifted from maize and beans farming to pigeon peas because of the high yields and ready market associated with the crop.

"In the past, farmers would buy seeds randomly from the local agrovets and therefore we would have severe infestation of pests and diseases which translated to under-production." Said John. "Currently there are certified and drought-persistent seeds supply all year round. My years in maize farming were not promising enough and the harvest was meagre. I could only get three 100kg bags from an acre or less in the dry seasons." He said.

According to Bernard Towett, a senior researcher on drought-tolerant crops at Egerton, the university through the Accelerated Value Chain Development Programme, which is funded by USAID-Feed the Future, released three varieties of pigeon peas which they distributed to the contracted farmers to produce seeds. The programme which also incorporates livestock, Irish potatoes and drought-tolerant crops (finger millet, groundnuts, pigeon peas, sorghum and green grams) is being implemented by International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Egerton is in training the farmers, research and the pigeon pea seeds project.

Mr Towett added that getting seeds for the drought-tolerant crops has been a drawback in Kenya but currently they are available though costly to purchase. The demand for pigeon pea seeds is high due to the minimal research conducted previously. Nonetheless, there have been vigorous researches by ICRISAT since 1992, and eventually they were able to release new varieties.

Egerton University released three varieties –Egerton Mbaazi 1, 2 and 3 in the previous year after a successful seven-year research process. Therefore, ICRISAT distributes seeds to the farmers. Egerton University does purchase the seeds. All this is thanks to the seed multiplication programme.

According to Towett these new varieties have an early maturity and still there are those with prolonged duration that matures within 10 months. There is also the medium duration pigeon peas which takes about four months to mature as the farmer harvests for a period of eight months.

These varieties are high yielding and pest and disease tolerant. With the production of

These varieties are high yielding and pest and disease tolerant. With the production of the new varieties ranging between 12 and 17 bags annually the yielding capacity has been boosted.

the new varieties ranging between 12 and 17 bags annually the yielding capacity has been boosted. "We decided to do contract farming with Makueni due to the conducive climatic conditions for pigeon pea growing.

The seeds will also be distributed to farmers in other arid and semi-arid regions like Turkana, Kitui, Kerio Valley, Tharaka Nithi and Machakos." said Mr. Towett.
He also said that they contracted 41 farmers to produce the seeds, with which they will be buying from at KSh100 per kilo. Peter Wambua, chairman of Makueni Agribusiness Ventures, he said that his members who are among the contracted farmers have more than 10 acres of land.

"It was just in the previous year that, ICRISAT trained us on growing drought-resistant crops like the pigeon peas, sorghum and green grams. Egerton University has now contracted us to grow pigeon peas and we are certain from their assurance that we will have a ready market of Sh100 per kilo for the crop. Farmers will be able to sell the remaining pigeon pea seeds to the local market as well as other farmers at KSh50 per kg," Peter Wambua said.

Among the contracted farmers was Peter Kisilu, a youthful farmer. He urged his fellow youth to get into farming terming it a place of mega opportunities encompassed by modern technologies that will help curb unemployment in the country.

Mr. Wambua hinted on formation of a cooperative society in future to incorporate a huge number of farmers especially the young farmers into seed production and also as a way of taming middlemen who are used to extorting farmers of their produce.

Currently, Kenya produces about 275,000 metric tonnes of pigeon peas against the consumption rate of about a million metric tonnes.
In most instances with the support of stakeholders such as the World Bank, KALRO, ICRISAT and Egerton University, resources have been availed to develop interventions to upgrade the pigeon pea value chain.

Another one of such implementations is under the Kenya Climate Smart Agriculture Project. According to KALRO director general, Eliud Kireger the measures put in place include breeding high-yielding varieties, promoting utilisation of improved technologies, innovations and best management practices, and providing information on market trends as well as developing drought and pest tolerant varieties. All these measures are geared towards increasing productivity which has majorly been constrained by pests and diseases, climatic conditions and poor methods of farming.

Yield can also be enhanced through hybrid vigour like regulating male sterility and male fertility in pigeon peas. For hybrid vigour, male sterile plants are required to cross-fertilise or develop hybrids in self-pollinating plants like in pearl millet, sorghum and maize. To generate hybrids in pigeon pea, there has to be a plant without viable pollen (a male sterile) so that its egg can be fertilized with the pollen of a plant with favourable traits.

Charming Kenya's youthful agri-entrepreneurs to agriculture: make it sexy!

By Dr. Murenga Mwimali

Dr. Murenga Mwimali mentoring one of the youths under him

Kenya's vibrant youth are critical to developing a successful agricultural sector. This means shaking off out-of-date insights and providing young people with the right motivations.

Encouraging the seeds of motivation for the youthful agricultural entrepreneurs

Most leadership in many African countries reckon the huge potential of the agriculture sector. The potential is available for not only feeding the growing populations but also to support the export market for most of the foods items. These happening will ignite growth in most economies. The economic growth due to agriculture sector is not going to be unique but it is applicable to Kenya too. However, the sector's potential can only be realized if it can harness the strength and new thinking of Kenya's fast-growing youth population. The youth need to be encouraged to embrace agriculture through the new technologies, digitization of applications in irrigation, fertigation, greenhouse technologies, and horticulture. Enabling decent agriculture and agri-business jobs programme will support in harnessing its huge demographic dividend, while contributing to the rejuvenation of the aging farming population that is average of 60 years in Kenya.

Removing the negative perceptions about agriculture

When and not if young people want money and employment, they should take up agriculture. It will require greater efforts to make agriculture sexier to young people. My concern as a scientist in the agriculture sector is that 'the advertisements on TVs, agrochemical companies, billboards, radio, make it worse by creating an impression that agriculture is for the old people, and not the youth of Kenya'. There is a need to change these archaic perceptions that agriculture involves very hard-work, is unprofitable and for the old folks after retirement from formal employment. There is a need to overhaul negative perceptions that farming is for the aged, the poor and the retired folks. It's about tapping into new innovations and technologies in farming namely; crop development software, computer modelling, ideotype farming to develop disease-resistant varieties, digital soil mapping, digitization of

applications in irrigation, and fertigation. All these technological innovations will make farming smarter, slicker and more profitable. It's about viewing that farming is interesting educated, entrepreneurial youthful persons who perceive a financially worthwhile future in farming: it's about making agriculture sexy. I am confident that there is money to be made in agriculture. However, the initial investment period requires obligation and determination.

Improving financial access for the youthful agricultural entrepreneurs

Accessing sufficient finance to get agricultural production to take off can be a challenge for most of the youth in Kenya due to the lack of guarantee and financial illiteracy. When the banks and corporates in Kenya mean to support the youth in agriculture, then the financial products should be aligned towards benefitting the youth.

Linking youthful agricultural entrepreneurs to market

Reliable market access is critical towards the success of any agri-enterprise. Most factors contributing to market failures could emerge from under developed infrastructure, to poor information on market prices and less exposure. International markets may require exports in large volumes and at certain quality standards that the youth may not be able to meet. The youth in Kenya need better market access to unlock the potential of new agricultural ventures. Education and training, diversity of agri-enterprises, access to price and market information, while practicing sustainable agriculture will enable the youth to have access markets for the products.

Supporting youthful agricultural entrepreneurs to benefit from agriculture

The government of Kenya must practically and seriously involve youth in agriculture. The youth must be at the fulcrum of the countries' plans to implement the national and counties' agricultural policies. The need to show political support by tailoring agriculture budgets and national budgets so as to create an enabling environment for youths to contribute to diverse food production and consumption. The involvement of the public-private partnerships (PPPs) can be a significant step towards the enabling of the youthful agricultural entrepreneurs to access finance.

Investments that will make agriculture must be attractive to the youth may include the following proposed ag-technologies that in the long run may be useful namely; precision agriculture, robotic farms swarms, closed crop ecosystems, synthetic biology, and vertical farms. It may take a little longer to realize this concepts of new farming in Kenya, but it is a viable venture that is worth trying.

The youth not only need finances, but also improved application of technologies, innovations, management and practices that are compliance to their needs. These may include improved seeds, machinery, technology, knowledge and training.

Dr Mwimali discussing new technologies, innovations, management and practices.

The support of the government of Kenya and the private sector, new opportunities will emerge for the youth who will make a contribution towards food security to the increasing population.

Let us charm Kenya's youthful agricultural entrepreneurs to agriculture by making it sexy!

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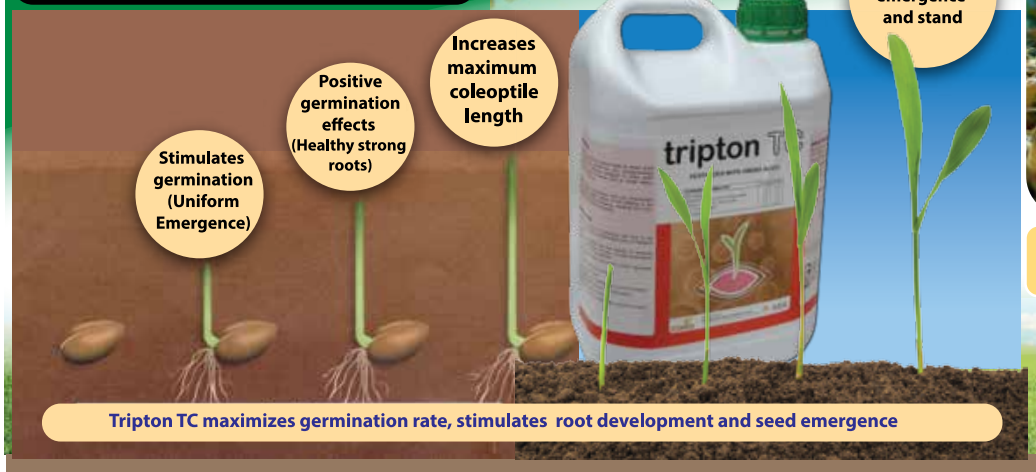

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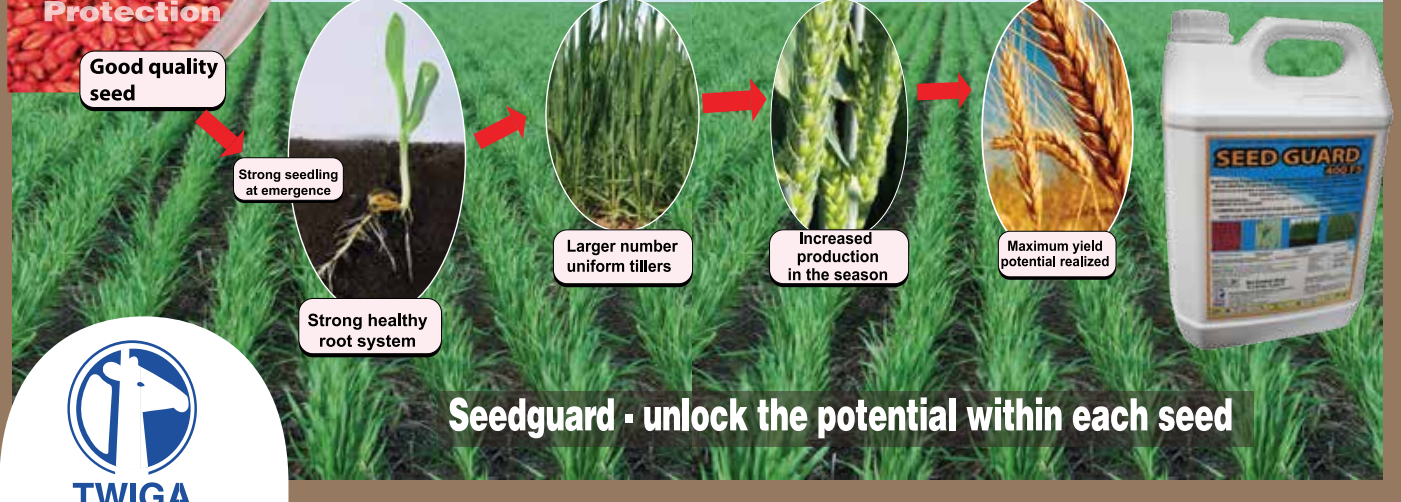

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Dr. Agnes Kalibata, president of AGRA speaks at 2021 AGRF Summit Launch in Nairobi

Africa Agriculture Status Report 2021 Unveiled at AGRF Summit in Kenya

The 2021 Africa Agriculture Status Report (AASR21) was launched at the AGRF Summit in Nairobi, Kenya. The report addresses the challenges and opportunities in the creation of sustainable and resilient agri-food systems in Africa. It explores what Building Resilient and Sustainable Food Africa Systems entails, and calls for the necessary actions by governments, pan-African organizations, bilateral and multilateral development partners, and the private sector.

"This year's AASR21 details the practical steps all stakeholders from governments and regional organizations to the private sector need to take to rebuild and enhance Africa's food systems," said Dr. Agnes Kalibata, President of the Alliance for a Green Revolution in Africa (AGRA).

"The COVID-19 pandemic has shown that despite the progress we've made over the last decade, Africa's food systems remain fragile to external shocks. We must take the opportunity we have to rebuild from the pandemic, to make our food systems more resilient without putting further pressure on the environment," Dr Kalibata added. Sub-Saharan Africa (SSA) has registered the most rapid rate of agricultural production growth since 2000 of any region of the world. However, three quarters of this growth is driven by the expansion of crop land, over yield increases.

With Africa's population expected to double to nearly 2.5 billion by 2050, it is now the time for stakeholders to put the steps in place to increase production without compromising the continent's natural resources.

"Raising yields and productivity on existing farmland is among the most important ways to make African food systems more resilient and sustainable. Raising productivity on existing farmland will reduce pressures for continued expansion of cropland, and preserve valued forest and grassland ecosystems and the biodiversity that they provide," said Andrew Cox, AGRA's Chief of Staff and Strategy.

The report outlines the priorities and next steps that must be taken by all stakeholders to achieve the transformation that will lead to sustainable and resilient agri-food systems. "The AASR21 should serve as a wake-up call of the need to act urgently to support the creation of resilient food systems and reverse or mitigate the impact we've seen on the environment," said Dr. Thom Jayne of Michigan State University, and lead author of the report.

"One of the first steps is meaningfully increasing public investments in agricultural research, development and extension. While agricultural R&D spending has risen over the years, in SSA public investments amount to less than 1 percent of the agricultural GDP in most countries," Dr. Jayne added.

The report further builds on the call to action to African governments from the UN Food Systems Summit, recognizing the need for urgency in this last decade of the global effort to realize the sustainable development goals (SDGs).

The AASR21 was launched at the 11th edition of the AGRF Summit, an annual gathering that brings together heads of states and governments, agriculture ministers, members of the civil society, private sector leaders, scientists and farmers in discussions that define the future of Africa's food systems.

Under the theme Pathways to Recovery and Resilient Food Systems, this year's AGRF Summit explored the pathways and actions needed to steer the continent towards food systems that deliver sufficient and nutritious food, protect the environment and create sustainable jobs.

Courtesy of AGRF.

Seed Giants Must Collaborate or be Dwarfed by Threat of Climate Change

By Leon Broers, Matthew Reynolds and Jeffrey L. Rosichan

The COVID-19 pandemic has exposed vast inequalities when it comes to food security. But there is an even larger and more concerning crisis waiting for us: Global food shortages caused by climate change.

According to the latest report from the Inter-governmental Panel on Climate Change, total global warming is likely to rise around 1.50 C within the next two decades. Nobody knows when or how hard it will hit, but we inch closer each year with new temperature records, the spread of pests, and emerging crop diseases.

We are already seeing the beginning of this future crisis. Climate-induced food price hikes have caused political turmoil in the Middle East, while climate-related disasters have been linked with mass human migration in South Asia.

Every seed company and crop research centre worldwide is preoccupied with the race to breed hardier crops to keep pace with the demands of a growing population as circumstances become increasingly challenging. But the truth is, this is a relay race, and yet the crop research field is running 100-meter sprints in different places at different times.

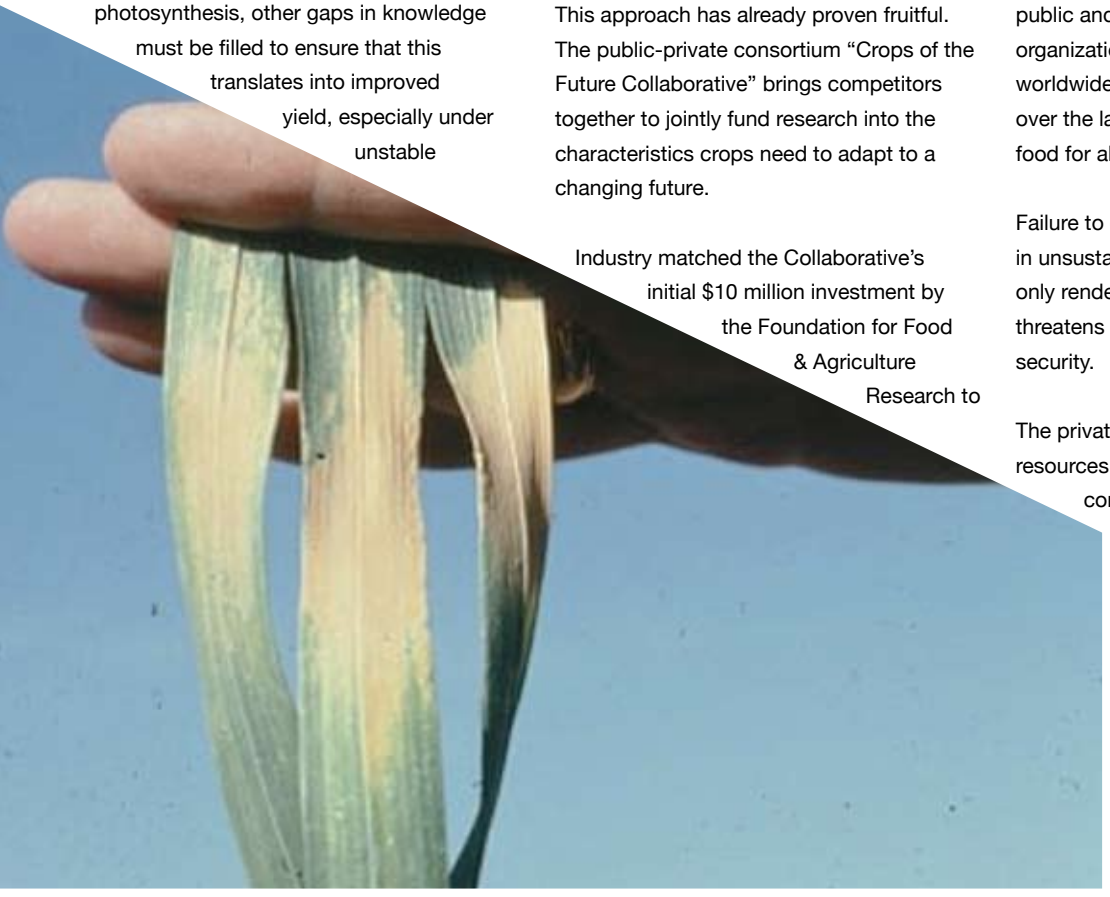
For every scientific advance, other areas of crop research go under-resourced and are technology poor, with asymmetries in research investment creating islands of knowledge that are disparate and disconnected. These research asymmetries hold back crop improvement as a whole, contributing to climate-induced crop failure and the political turmoil that ensues when staple foods become scarce.

While it is common for academic crop scientists to share ideas and collaborate with industry, it is far less typical for major seed companies to cooperate with each other.

If the public and private sectors are to have any chance of outrunning climate change, industry must shift toward investing in mutually beneficial research and development to pool resources and build on every gain, in the interests of the whole. In an unprecedented first step that reveals just how much pressure the sector feels about the daunting task ahead, some of the crop industry's main players and competitors including Syngenta, BASF, Corteva and KWS recently shared their insights into the gaps in existing crop science.

The shortcomings identified that hold back the crop industry from addressing the looming food crisis have three features in common. They are all under-represented

in scientific literature, are likely to boost productivity across a wide range of crops and environments, and crucially, the research is fundamental enough to be "pre-competitive," or valuable without jeopardizing individual business outcomes. For example, although scientists have made progress towards improving the potential of crucial processes in crop development, like photosynthesis, other gaps in knowledge must be filled to ensure that this translates into improved yield, especially under unstable environments.



Such research is critical to ensuring reliable harvests across a range of crops, and can be conducted without infringing the intellectual property or proprietary technology of any single company. However, accessing research funding can be surprisingly difficult. Public research budgets are shrinking, their funds are at risk of being re-appropriated, and collaboration is not the industry standard.

New funding models, such as public-private partnerships, can collectively address knowledge gaps to avoid potential catastrophes for society at large. This approach has already proven fruitful. The public-private consortium "Crops of the Future Collaborative" brings competitors together to jointly fund research into the characteristics crops need to adapt to a changing future.

Industry matched the Collaborative's initial $10 million investment by the Foundation for Food & Agriculture Research to work on corn that survives in drought conditions and leafy greens that are resistant to pests. Conducting this research jointly drastically improves crop efficiency and the technological toolbox available to breeders and other crop scientists, passing the baton in the race towards a food secure future.

Increasing the global food supply through research and development is the most achievable and sure approach to avoid a global food crisis, and comes with historically high returns on investment.

Furthermore, scientists can tap into a global infrastructure of researchers across public and private sectors, international organizations, and the millions of farmers worldwide who have willingly collaborated over the last half century to provide enough food for all.

Failure to collaborate will ultimately result in unsustainable food systems, which not only renders seed companies obsolete but threatens a prerequisite of civilization: food security.

The private sector has the knowledge and resources to redefine the race. Rather than competing against one another, the crop industry must join forces to compete instead with climate change. And it is a contest we can only win if all players work together.

This op-ed was originally published on the Des Moines Register.

Matthew Reynolds is a distinguished scientist with the International Maize and Wheat Improvement Center. Jeffrey L. Rosichan is a director with Foundation for Food & Agriculture Research. Leon Broers is a board member with KWS SAAT SE & Co. KGaA.

Cover crop success will take patience

Sunflowers as a cover crop, being highly mycorrhizal, allow following crops to interact with phosphate far better, something we see very frequently.

By David Jones

Cover crops will have an important role for us in Kenya, especially in terms of weed control and input cost reduction, but farmers need patience and an independent mind-set to understand how to make them successful.

I'm not sure entirely what cover cropping will look like for us yet, but improved Mallow control, lower fertiliser requirements and reduced soil erosion are some of the benefits that we have seen in 2020. Unfortunately, so far we have also seen reductions in yield in the following crop in several yield mapped trials.

We have often observed the effects of cereal crops growing really well after sunflowers, better in fact than after pulses in many cases. This should not surprise us as our soils, often with Organic Matter levels well above 7%, are releasing significant amounts of nitrogen to the point that this element is not limiting.

Phosphate on the other hand is very short in most of our soils, or more correctly our farming systems are not very good at helping plants to access it.

Sunflowers as a cover crop, being highly mycorrhizal, allow following crops to interact with phosphate far better, something we see very frequently.

This is just one of the benefits that cover cropping allows, as well as improving soil structure through root growth, building soil carbon, covering the soil to seal in moisture, and protecting it from heavy rain.
The greatest potential downside is the valuable moisture that cover crops use during the fallow period. This is a very real problem and in a way contradicts the progress that Agventure members have made with good fallow weed management which has allowed us to establish a crop and have no rain for six weeks.

We may have to think very carefully about when we terminate the cover crop, the species in it and what is happening to soil moisture through the profile.

Cover crops that I have seen this year have really impressed me with how they have outcompeted Mallow. Even with glyphosate, uncontrolled Mallow can suck the soil dry so moisture should not automatically be seen as a reason not to cover crop in a bad weed situation.

On the subject of weeds and moisture, it is important to remember that unlike many other parts of the world, be it UK, Australia or Canada, like it or not we have two growing seasons, one of which grows a crop and the other grows good weeds. Glyphosate alone is not the whole answer, and nor do other countries with different weather and weed patterns to ours have all the answers or blueprints.

Whilst we may be a long way from “planting on the green” there is a lot for us to learn and experiment with cover crops.

Key Cover crop lessons so far
Experiment where you have most to gain – in bad Conyza and Mallow situations
Avoid oats if following with a grass crop
Think about potential Sclerotinia build up with Sunflowers
Try out different termination timings and methods, don’t just follow YouTube fashions
Consider how your planter might handle the residue – e.g. be wary of vetch with tine machines

David Jones is a Specialist agronomist with Agriventure. David has a keen interest in soils and no till farming systems where he has undertaken work looking into weed levels and changes in soil structure, and has extensive experience in field trials and in the development of precision farming techniques. In his spare time he enjoys playing rugby.

Solutions to Challenges Facing Agriculture in Kenya

Agriculture in Kenya is on its way up but not without serious productivity challenges and limitations. What can we do to overcome these challenges and become a food secure nation? Ruth Vaughan investigates.

By Ruth Vaughan

The modern world takes food for granted. Historically the struggle to find or produce enough food to eat was the focus for living, and took up most of our time.

2 billion of the world's 7.3 billion people still do not get enough to eat. Famines still stalk Africa. Ethiopia, Mozambique and Zimbabwe (previously the bread basket of Africa…..) still rely on food hand-outs, and millions of African still suffer from malnutrition.

By 2050 the World's population is projected to grow to 10 billion and there is a rising demand for more fish, dairy and meat products. These are higher up in the food chain and require more fodder production. It has been predicted that to sustain the population increase and satisfy the new demands a staggering 70% more food will need to be produced.

Emerging Issues In Agriculture In Kenya

In Kenya the current population is estimated at 47 million and expected to nearly double to 95 million by 2050. Agriculture in Kenya is a fundamental instrument for sustainable development, poverty eradication and food security. The Kenya Vision 2030 highlighted the growth of the Agricultural Sector as a major challenge and the Kenyan Government is striving to improve agricultural productivity through numerous government and donor supported programs. Climate change is worsening Kenya's aridity situation because the increased weather variability is not suitable for sustainable food production.

15-17% of the land used for agriculture in Kenya has sufficient soil fertility and rainfall to be farmed. Agriculture is the largest contributor to Kenya's GDP and Kenya's exports. Over the years the land being farmed has seen a slow fertility degradation resulting in worsening yields per hectare, however total output have increased due to clearing and expansion. This has put pressure on wildlife and most importantly on the forests and water towers of our country, which are so important for determining rainfall and water storage, resulting in rivers drying up. This is not the answer to feeding the population increase.

Solutions To Food Insecurity In Kenya

Increased agricultural output should be driven by agricultural intensification and increasing the yields per acre. There is a massive yield deficit in our current agricultural production and enormous scope for improvement that potentially could see

increased outputs on less land, allowing more land to become available for urbanisation, recreation, forests and wildlife (also very important for the economy).

The agricultural productivity gap in Kenya is large, but smaller than many of its neighbours! Cereal yields around the world, per ha, per country, per year can be compared as follows:- Africa 1.6 t/ha/yr, India 2.9 t/ha/yr and USA 7.6 t/ha/yr. In 2014, World Bank assessed maize production in Kenya at <2.3 t/ha/yr, Europe was >9 t/ha/yr. Clearly there is room for improvement and Kenya could potentially double or triple its yields.

The Kenya Government and donor-funded NGO's are working hard to remove the constraints in agriculture to bring up the yield expectations.

Yield restrictions have been identified as follows:-

Moisture

The amount of rainfall and the length of the wet seasons is a major factor. Increasing climate change and weather variability is predicted. Only about 20% of the land in Kenya that can be irrigated is (106,000 ha vs. 540,000 ha). Rejuvenating existing irrigation projects and increasing water storage is on-going and should be fast tracked!

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Increased agricultural output should be driven by agricultural intensification and increasing the yields per acre.

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Crop selection

Crop selection is most important for successful farming. For example maize needs high rainfall but sorghum, that doesn't, gets destroyed by birds..Kenya has a massive variation in climatic zones, altitudes, soil types and rainfall. Regional trials are needed to identify appropriate crops.

Soil health

Soil health is critical for long term sustainable farming and increased outputs. Soil mapping at county level, with proper fertilizer blending is crucial. Soil types in Kenya are very variable and fertilizers that are suitable in one region can be detrimental in another. Some agricultural zones are very acidic due to years of over-use of fertilizer; and liming can more than triple yields in these areas.

Access to clean seed

Variety selection, breeding and testing new strains, access to clean seed in the major starch crops, is critical and being addressed by the various Institutes and organisations.

Access to farm inputs

Availability, logistics, cost and access to appropriate farm inputs (seeds, manure, fertilizers, lime, gypsum, pest control products) is very limiting. Fertilizer prices in Kenya are some of the highest in the World. Government subsidies on appropriate fertilizers can go a long way to improve yields.

Cost of farm machinery

Agricultural machinery is another big limiting factor. Tractors per hectare of arable land – Kenya has 24, compared to Japan with an excessive 4,600. Cost of equipment, and access to finance and average farm sizes limit this. Forming co-operatives to share equipment or hiring Governmental machinery are the answer.

Access to proper information

Knowledge, education and access to information are crucial. Agrovets are popping up in most rural villages, and they are being trained to offer extension services. The number of extension services is increasing.

The Internet and mobile phone technology

services in Kenya are very advanced.

Land ownership issues

Land tenure and ownership are important.

Improving farm infrastructure and soil health through better farming practices and fertility correction inputs is an expensive long term project, with a long pay-back time, not promoted by short term occupancy. Land ownership gives access to finance.

Access to finance

Access to finance and excessive interest rates is a major stumbling block for agriculture that has recently been addressed in a new bill from parliament.

Access to markets

Access to markets, better rural infrastructure (roads, electricity etc.), price fixing and the dreaded 'middle man' are all being addressed.

In summary, tripling agricultural outputs on existing land is not impossible for Kenya. The constraints to agriculture in Kenya have been identified and are being addressed, and while Kenyan farming still has room for improvement it has come a long way in a short time. Not only does Kenya have the potential to feed its own millions, there is the potential to feed its neighbours too. And, of course, soil testing is the key to unlocking the yield increases..

About Ruth

Ruth Vaughan is the Technical Director at Crop Nutrition Laboratory Services Ltd. (CROPNUTS). Ruth is also a contributing author to Kenya's leading horticulture magazines such as the HortFresh Journal, HortiNews and Floriculture. Ruth is a great believer in soil health, organic matter, biochar and carbon sequestration as a way to alleviate climate change and increase food security. Loves visiting farmers and seeing all the different farming methods

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Cropnuts Launches Cutting Edge Soil Testing Platform

Crop Nutrition Laboratory Services Ltd (Cropnuts), Africa's leading independent laboratory for agricultural and environmental testing, has launched AgViza, a disruptive AI based soil testing and digital crop advisory service for smallholder farmers.

Soil testing services have been out of financial reach for smallholder a farmer, which is reflected in the fact that poor soil fertility remains a key driver of yield loss in smallholder farms across Africa. AgViza soil testing technology will change the status quo by empowering farmers with this critical soil management information.

The technology bundles soil testing, farmer training and specific agronomy advisory into an affordable digital service. It is built on five years of research and development drawing on Cropnuts' extensive soil knowledge, combined with decades of experience serving African farmers and an extensive Africa-wide geo-referenced soil sample database.

The platform's bespoke artificial intelligence engine measures soil fertility properties, which allows it to deliver high-quality soil health management and fertilizer application advice to farmers via interactive SMS, backed up by trained local agronomists.

The combination of different technologies reduces the cost of soil testing by more than 75%, making it more affordable for all types of farmers, especially smallholder farmers in remote locations.

AgViza erases need for traditionally expensive and complex

lab analysis

According to the DOB Equity and AHL Venture backed company, AgViza is a B2B service model that works through business partners such as fertilizer

companies, produce aggregators, public sector extension, development organizations, digital market platforms and financial institutions and addresses key challenges within the smallholder agriculture sector.

Once the partner agronomists collect the soil samples from farmers' fields, AgViza's soil testing engine will measure and correlate the soil fertility properties in the soil, which overcomes the need to use traditionally expensive and complex lab analysis processes.

Traditionally, Cropnuts served large and medium farmers, but its development of the innovative, low-cost soil testing platform will allow it to serve millions of smallholder farmers in Africa. This is critical to realising the potential of Africa's smallholder farmers, improving their livelihoods while contributing to food security and economic growth.

Currently less than 0.5% of smallholder farmers have used soil testing, illustrating the massive potential impact of this technology. Jeremy Cordingley, Managing Director at Cropnuts, says, "We are positioning AgViza to become a key driver of financial inclusion for smallholder farmers. Soil testing will help farmers know the right fertilizer requirements and, in turn, this de-risks lending to farmers."

"The field specific input recommendations will improve farmer yields, leading to higher incomes and improved repayment ability, giving financial institutions better assurance on their farmer loans. "It also gives farmers greater confidence to invest in their land when they know exactly what to do and see the impact first hand."

As a result, smallholder farmers can sustainably maintain healthy soils and achieve long term productivity even when exposed to extreme weather events, such as droughts and floods, which are being accelerated by climate change.

Saskia van der Mast, DOB Equity Co-CEO, says, "After years of development and capturing thousands of calibration soil samples, Cropnuts now has a scalable and digital solution to enable millions of farmers to become more productive and profitable.

"We believe Cropnuts has the potential to accelerate investment in the agricultural value chains, increase food security, as well as manage climate risk." Cropnuts' cutting-edge technology makes it the frontrunner in the testing of soil fertility, water quality, food safety and fertilizer quality, to name a few.

With soil testing already incorporating organic soil carbon levels, the technology has an important role to play in combating climate change by measuring how adapting agricultural practices and inputs enhances soil health and sequesters carbon from the atmosphere.

Courtesy of: Crop Nutrition Laboratory Services (Cropnuts)

The Promise and Limits of Bt Maize to Manage Fall Armyworm in Africa

By Andrew Porterfield

Bacillus thuringiensis (Bt) crops are plants genetically modified to contain the endospore/ crystal toxins of the bacterium, Bt to be resistant to certain insect pests.

As fall armyworm continues to threaten food security in Africa, the use of Bt maize offers significant potential to manage the pest. But it will be critical to manage resistance via multi-toxin crop varieties and appropriate use of refuge planting all in forms accessible to the smallholder farmers that grow nearly all of Africa's maize. The fall armyworm (Spodoptera frugiperda), which devastated staple crops like maize in South America, has become a similarly worrisome pest to African farmers since its discovery on the continent in 2015.

Maize is the most important staple crop in sub-Saharan Africa, accounting for the highest source of calories per capital of all staple plants. In addition, nearly all (about 98%) of maize is grown by smallholder farmers who grow on plots of less than two hectares (4.9 acres).

The fall armyworm has invaded every country in sub-Saharan Africa except Lesotho. Its larvae develop on many species of plants but prefer grasses, maize in particular. The larvae attack maize in all stages of its development, eating leaves, tassels, and ears. In Cameroon, a study found fall armyworm infestation in 53% of maize, 11% of sorghum, 3% of potato, and 2% of cotton and sweet potato.

As fall armyworm continues to threaten food security in Africa, the use of Bt maize offers significant potential to manage the pest. But it will be critical to manage resistance via multi-toxin crop varieties and appropriate use of refuge planting all in forms accessible to the smallholder farmers that grow nearly all of Africa's maize. In sub-Saharan Africa, risk of food insecurity due to fall armyworm is highest in places where households have limited coping capacity and governments have low capacity to support farmers in pest management and to absorb production shortfalls.

Maize that is genetically engineered to contain specific toxic (to armyworms) proteins created by the bacteria Bacillus thuringiensis (Bt) has proven successful in thwarting the crop destruction by the fall armyworm in South and Central America and the United States.

However, fall armyworm populations have developed significant resistance to certain proteins expressed by Bt maize, underscoring the need to implement agricultural strategies that can boost maize yields while circumventing the effects of resistance. Moreover, these strategies must be accessible to smallholder farmers, who often lack the resources of larger, commercial farms.

A research team of noted Bt and agricultural genetics researchers led by Bruce Tabashnik, Ph.D., of the University of Arizona and including Johnnie Van den Berg, Ph.D., and Charles Midega, Ph.D., of North-West University in Potchefstroom, South Africa; Boddupalli Prasanna, Ph.D., of the International Maize and Wheat Improvement Center (CIMMYT) in Nairobi, Kenya; Pamela Ronald, Ph.D., of the University of California, Davis; and Yves Carriere, Ph.D., of the University of Arizona have conducted an

(Photo by Clemson University – USDA Cooperative Extension Slide Series, Bugwood.org)

extensive research review and numerous interviews with other scientists on fall armyworm and the use of Bt maize in Africa. So far, only South Africa has approved the use of Bt maize on the continent but Kenya may be the next nation to make a similar approval. As Bt maize may see more approvals and use in Africa, Tabashnik's team made several recommendations, especially for smallholder farmers:

- Use Bt maize with other pest management methods, including native host plant resistance (non-genetically modified), as part of an integrated pest management (IPM) plan.
- Use Bt maize "pyramids" that produce two or more toxins (ideally, four toxins) that are individually effective against fall armyworm but together significantly reduce the likelihood of the pest developing resistance.
- Avoid single-toxin Bt crops that enable resistance and reduce effectiveness of multi-toxin strains.
- Provide Bt pyramids that smallholder farms can afford, in open pollinated varieties as well as in more expensive hybrid plants and seeds.
- Include refuges of non-Bt maize to more than 50 percent of maize hectares for single-toxin Bt plants and 20 percent of maize hectares for multi-toxin Bt plants.
- Work closely with smallholder farmers at every step from development to harvest of Bt maize.

Resistance to Bt maize is a significant problem for farmers and can evolve quickly. The fall armyworm developed resistance to single-toxin Bt crops in Brazil in just two years. "When multi-toxin Bt crops are deployed optimally with resistance management programs that include adequate refuges of non-Bt host plants and integration with other control tactics, efficacy can be sustained for decades," Tabashnik says. "IPM methods are available for smallholder farmers and can be the foundation for sustainable pest management in concert with Bt crops."

Resistance to single-toxin Bt plants (with either of the toxins known as Cry1Ab or Cry1Fa) has been particularly strong. The researchers found that current requirements for refuge (non-Bt crops that can attract non-resistant fall armyworm) in South Africa at five percent is not adequate to address resistance. Kenya is proposing the same percentage. "We expect these (20 to 50 percent) refuge percentages will be readily attainable for smallholders in Sub Saharan Africa … because they typically plant more than one maize cultivar and are likely to continue to plant many non-Bt maize cultivars after Bt maize is introduced," the researchers write.

Multi-toxin Bt maize, used as part of an IPM plan, should be an improvement over previous strategies that involved heavy, government-funded use of synthetic insecticides. These treatments were hazardous to health and the environment and were not very effective. Bt maize is far safer and offers the potential for working around resistance.

Bayer Crop Science, a provider of Bt maize, is providing the seeds royalty-free. In addition, the researchers were surprised to discover that one of the multi-toxins in Bt maize, Vip3Aa, is more accessible because its patent has expired. "Vip3Aa could be especially useful because it's effective against some lepidopteran pests that evolved resistance to the more extensively adopted Bt crystalline (Cry) proteins," Tabashnik says.

The use of Bt maize in Africa may face social and government resistance as well as insect ones. "Anti-GM activism is impactful and influencing governments," Tabashnik says. "South Africa is the only African nation where Bt maize has been approved. We want to be honest brokers about the benefits and limitations of Bt maize, so all stakeholders can make informed decisions."

Andrew Porterfield is a writer, editor, and communications consultant for academic institutions, companies, and nonprofits in the life sciences. He is based in Camarillo, California.

Source: Entomology Today.

Dr. James Mwangi, Equity Bank CEO

Walking the Path: Commitments Framework

During the penultimate session of The AGRF 2021 Summit, Citizen TV's Jeff Koinange was joined by a stellar line-up of senior leaders, brought together to publicly declare their commitments to building resilient food systems and sustainable, inclusive agriculture in Africa.

Opening the Commitments Framework session, Mr. Koinange said: "I've learnt the 3 'C's this week: Covid, Conflict, Climate change – these are the things we all have to overcome as a continent."

The three 'C's theme ran throughout the session, with Maura Barry, Senior Deputy Assistant Administrator for the Bureau for Resilience and Food Security, United States Agency for International Development (USAID), saying:

"We know strides have been made but we all acknowledge that the three Cs have disrupted the growth trajectory. USAID remains committed to help strengthening resilience.

Unified agenda and commitments to the future of food security

"I really want to congratulate AGRF on a successful Dealroom. We're so encouraged by the unified agenda. We've seen important conversations take place that promote food systems transformation."

The pathway to truly transformed and sustainable food systems brought several key announcements to the table during the session. Ms. Barry gave a teaser to a full announcement planned for the UN Food Systems Summit held on 23rd September, 2021, saying: "We are currently revising our global food security strategy. It will focus on a strong set of commitments that will focus on climate and inclusive development, as well as strengthening resilience."

Ms. Barry talked passionately about deploying climate-smart technology, mobilising private sector finance, the importance of large-scale food fortification, and working hand-in-hand with scientists to holistically improve food systems. Ms. Barry, and fellow speaker Mr. Dominik Ziller, VP, IFAD, talked about the importance of prioritising women, children, indigenous people, and other marginalized groups.

China-Africa development

Hon. Wu Peng, Director General, Dept. of Africa Affairs of the Foreign Ministry, People's Republic of China, was positive about the rapid development of both China and Africa. Hon. Peng cited that there are at least 120

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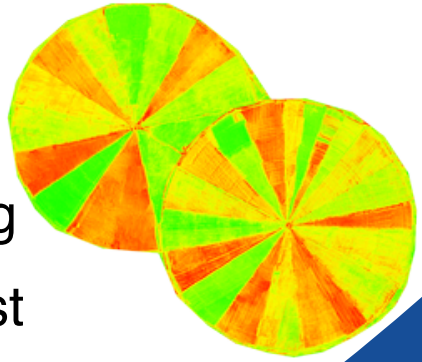

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Chinese agricultural enterprises investing in Africa. He highlighted the recent growth of ecommerce in helping food producers boost income during the pandemic. And he assured the audience that enhancing agricultural cooperation will be one of the top priorities at FOCAC 2021.

"We will encourage China to continue to invest in Africa; to send agriculture experts to Africa. China will be dedicated to working with Africa to fight against natural disasters, increase food production, achieve food security and make new strong contributions to build an even stronger China-Africa community with a shared future."

Representing the African Development Bank Group, its VP for Agriculture, Human and Social Development, Dr. Beth Dunford, said of one initiative that the financing facility aims to do five big things in Africa:

1. Double agricultural productivity
2. Build resilience
3. Bring greater investment into states that are often perceived as too risky
4. Unlock more private investment in agriculture
5. Build infrastructure & policy environment needed for resilient food systems.

Dr. Dunford added: "We're already setting targets for what the financing facility for Food & Nutrition Africa could achieve. We expect it to mobilise $1bn from partners, double yields or more in nine commodities, produce 100 megatons of food, feeding 200m more Africa, that's 80% of the continent's chronically hungry."

> "We are currently revising our global food security strategy. It will focus on a strong set of commitments that will focus on climate and inclusive development, as well as strengthening resilience."

The future of sustainable food and energy systems are inextricably linked

Adding another dimension to the discussion, Dr. Roy Steiner, MD of Food Initiatives at The Rockefeller Foundation, admitted: "We are not going to be able to achieve these goals of having a food system that's equitable, generative and nourishing if we don't end the climate crisis by bringing renewable energy to the near 1bn people living without access to energy globally, 573m of those live in Sub-Saharan Africa."

Startling numbers, which Dr. Steiner insisted could only be reduced by acknowledging that the future of food and energy systems are inseparable:

"To address this, we are launching a global energy alliance that will catalyse a $1bn investment. $500m from The Rockefeller

Foundation and $500m from the IKEA Foundation. It really aims to bring 1bn people renewable energy, reduce 1bn tons of greenhouse gas and attain 100% gains in productivity."

Big numbers kept coming, with Mr. Dominik Ziller, IFAD's Vice President, confirming that they had already directed $175m to smallholder farmers and they aim to mobilise another $500m in the coming years.

GDP contribution and investment inextricably linked

In a moment of brutal honesty, Dr. James Mwangi, CEO, Equity Group Holdings admitted that: "If we look at SDGs, they will not be achieved unless we transform agriculture."

He went on to outline that Equity Group Holdings' comment is: "To appreciate agriculture and resource it to the same level that it contributes to the GDP of the African continent. We have made a bold commitment that Equity will allocate 30% of its entire levy to agriculture."

Reiterating a messaging that has been prevalent across The AGRF 2021 Summit, Mr. Mwangi said we need to make agriculture attractive for young people because no one can transform agriculture alone. And we need to do this by making agriculture part of a bigger ecosystem.

"We have been lobbying the government a lot to try and get agriculture mainstream sector. Government programs shouldn't be seen as socio interventions, but as investment programs that allow private sector capital to throw in. We can't be able to succeed without promoting trade; cross-border trade is a huge area of focus."

Digitising the agricultural value chain and using agriculture to decarbonise the planet

Digitisation is a critical part of food systems resilience. According to Mr. Mwangi, this area needs more investment, to allow agriculture to be fully integrated with the lead economy.

In a frank answer to Mr. Koinange's question: "Are we walking the path?" Mr. Mwangi admitted that: "The paradox that we have talked about – that we have 60% of the world's arable farmland and then we are living in food deficits – would not be happening if we were doing well and walking the path."

Jai Shroff, CEO, UPL Ltd agreed: "At UPL we are very committed to transforming the agriculture sector to be more resilient. Resilience in agriculture can come through tech, helping farmers to become more resilient. The world is focused on decarbonising, agriculture is one of those tools that can actually be used to decarbonise the world."

Talking in the same vein as Dr. Steiner, Mr. Shroff asked why we can't incentivise the food system to follow regenerative practices, saying this is common practice in things like electric cars and solar panels.

Closing remarks

In the closing remarks, H.E. Lionel Zinsou, former Prime Minister of Benin and the Founder of SouthBridge, brought some stark numbers to the table:

"What is the part of the credit of the pot in Benin that goes to agriculture? 2%. What is the share of agriculture to GDP? 27%. What is the active population employed in ag.? 50%."

He pointed out that this is unsustainable. And that if we want sustainable agriculture, those figures have to be dramatically changed. He applauded the consistent, systemic, value chain approach of AGRA.

Fellow former Head of State, former Ethiopian Prime Minister, H.E. Haile Mariam Dessalegn, closed the session, saying: "AGRA's commitment to 2030 is essential. In our ambition to achieving resilient and food secure Africa, the continent requires tested and scalable transformation assets that will fast track the reduction of hunger and poverty."

"To feed our diversity (over 1000 tribes), we cannot apply one simple solution. The challenge is complex and this requires investments and concerted efforts in a collaborative, measurable way."

He urged partners to join AGRA, who is committed to transforming agricultural sustainability, and looking to enhance productivity and innovation capacity. Onwards to the UN Food Systems Summit.

Courtesy of AGRF.

ICRISAT Awarded 2021 Africa Food Prize

Recognized for helping 25 million farmers in 13 countries to improve income and food production

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has been awarded the 2021 Africa Food Prize, for work that has improved food security across 13 countries in sub-Saharan Africa.

ICRISAT, a CGIAR Research Centre, is a non-profit, non-political public international research organization that conducts agricultural research for development in Asia and sub-Saharan Africa with a wide array of partners throughout the world.

Between 2007 and 2019, ICRISAT led a collaboration of partners to deliver the Tropical Legumes Project. The project, undertaken together with the International Centre for Tropical Agriculture (CIAT) and International Institute of Tropical Agriculture (IITA), developed 266 improved legume varieties and almost half a million tons of seed for a range of legume crops, including cowpeas, pigeon peas, chickpea, common bean, groundnut, and soybean. These new varieties have helped over 25 million smallholder farmers become more resilient to climate change, as well as pest and disease outbreaks.

In addition to these new varieties, the project trained 52 scientists, who are already working in national research institutes across the continent. Training these next generation scientists in the countries where the projects were implemented, has helped strengthen the research capacity of national agricultural research systems in Africa and contributed to sustaining the gains the projects have made.

Congratulating the winner, H.E. Olusegun Obasanjo, the Chair of the Africa Food Prize Committee and former President, Federal Republic of Nigeria, said: “ICRISAT’s leadership in developing seeds that not only end malnutrition but also survive in semi-arid areas is inspiring other agricultural organisations to rethink seed development and farming practices that suit and solve Africa’s agricultural challenges.”

“Their work is also important as it provides an inclusive approach that supports the whole agricultural value chain, from farm to fork, providing farmers with farming tools and a market for their produce,” he said.

Accepting the award, Dr. Jacqueline d’Arros Hughes, ICRISAT Director General, said the Institute’s work spanned the entire value chain, from high-end genomics to markets and agri-business in dryland cropping systems.

“We also empower women and attract youth back to agriculture using the latest tools and technologies available to make farming profitable.

“The Africa Food Prize is a major accolade and recognition of ICRISAT’s work in Africa and reinforces our belief that agriculture can be profitable for smallholder farmers. It is also testament to the work of our close collaborators, the national agriculture research and extension systems, without whose support this would not have been possible.

“We dedicate this award to the smallholder farmers in the drylands of Africa, as they are the ones who inspire us with their patience and perseverance in the face of adversity,” said Dr. Hughes.

Dryland ecosystems cover 45 per cent of

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The Board of Directors, Management and Staff of Florinews Ltd Wish you a Merry Christmas and a Prosperous 2022.

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Africa's landmass and feed and support almost half a billion people. However, these systems are fragile and prone to the effects of climate change and environmental degradation.

Programs like the Tropical Legumes projects help the millions of smallholder farmers relying on drylands ecosystems to grow more food and become more resilient in the face of climate change. The project has been implemented in Burkina Faso, Ghana, Mali, Niger, Nigeria, Senegal, Ethiopia, Kenya, Malawi, Mozambique, Tanzania, Uganda, and Zimbabwe.
The Africa Food Prize recognizes outstanding African individuals and institutions leading efforts in the following areas: transformation of Africa's foods systems; promotion of sustainable agricultural practices; support for smallholder farmers to raise incomes; resilience in the wake of climate change impacts; and access to high quality agricultural inputs, knowledge, and equipment. The award, that includes a $100,000 prize, celebrates those changing the reality of farming in Africa from a struggle practice to a business that lifts communities out of poverty.

Key impacts of the Tropical Legume Project

- Groundnut crop interventions demonstrated 32.35% increase in income, 6.72% households lifted out of poverty and 14% out of food insecurity.
- Ten groundnut varieties, including six high-yielding, drought-tolerant ones and four ELS, released in Mali.
- Seven groundnut varieties, with traits such as aflatoxin tolerance, early maturing, drought tolerance etc. released.
- In India, chickpea national program on developing improved varieties resulted in area enhancement up to 68%.
- Chickpea program in Ethiopia won a national award in 2013 for science and innovation.
- Seven-fold increase in number of improved common bean variety releases from 2011 to 2018.

About the Africa Food Prize

The Africa Food Prize recognizes extraordinary women, men, and institutions whose outstanding contributions to African agriculture are forging a new era of sustainable food security and economic opportunity that elevates all Africans. The US $100,000 prize celebrates Africans who are taking control of Africa's agriculture agenda. It puts a spotlight on bold initiatives and technical innovations that can be replicated across the continent to create a new era of food security and economic opportunity for all Africans.

Building on the values and principles established by the Yara Prize, the Africa Food Prize puts a bright spotlight on achievements and innovations with transformative power that can be scaled and replicated across the continent to eliminate hunger and poverty and provide a vital new source of employment and income.

The Africa Food prize is enabled by the sponsorship of Yara International and Corteva. The prize recognises exceptional individuals and institutions improving food security and catalyzing innovation and transformative change in Africa's agricultural sector from amongst nominees. It is awarded every year during the annual AGRF Summit.

Courtesy of AGRF.

Biological Pesticides

Courtesy: CABI BioProtection Portal)

Biopesticide Reconstitution

Biopesticides are types of pesticides derived from natural living organisms such as animals, plants, and micro-organisms.

There are three major types of biopesticides;

Microbial pesticide

They are produced by micro-organisms like bacteria, viruses and Entomopathogenic nematodes (though they are multicellular). They target a huge pest variety.

Biochemical/herbal pesticides

They occur naturally in the environment. They include; insect pheromones that distort mating or botanical extracts like the pyrethrum, rotenone and neem that trap insects and control diseases and other types of pests.

Plant-Incorporated Protectants (PIPs) Are produced from plants as a result of another genetically incorporated material that is usually added to the plant. These are the Genetically Modified crops. It is controversial as it alters the natural biochemistry of the target organism.

Questions to ask Yourself When Selecting the Right Biopesticide Product:

Is there a Biopesticide or biocontrol product authorised for your pest? This entails the country, crop and the pest in question.

Is the Biopesticide or biocontrol product effective under your conditions (covered crop or field use)? This is the suitability of the product to your conditions. For instance; some bio-pesticides are designed to work exclusively in greenhouses while others can be taken out into an open farm.

Is the bio-pesticide Sustainable? If the product is safe for the environment and for human health. The application and disposal as well as environmental compatibility. For example; If the product has health hazards, you will be required to wear Personal Protective Equipment (PPE) or use methods that reduce exposure.

Are there any unwanted effects on pollinators and natural enemies? If the pesticide has side effects to beneficial

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organisms. Like for example; if there's a potential risk to pollinators you might restrict your application to the early stages of crop growth and/or when there are no flowering plants.

Is it compatible with other pest management practices you are using? You need to see whether there could be a negative or positive interaction between activities. You will need to know how compatible the Biopesticide or biocontrol product is with other means of pest control.

Is the Biopesticide or biocontrol product locally available? Checking whether the product is available in the market.

Can you get a hold of the products?
Is the use of the Biopesticide/biocontrol product economically viable?
Is the pricing farmer-friendly enough and will the results guarantee you a value for your money? In the case of a repeat application will it be cost saving, long-term improvement of soil health and biodiversity, and the sustainability of production.

Case study: Biological pest control helps tackle swarms of locusts in Africa
Recently, Biopesticides have been on the fore front in pest control of the desert locust swarms (*Schistocerca gregaria*) invasion in Kenya and parts of Eastern Africa. They have also helped in control of other most destructive agricultural pests in the world.

In 2020, the FAO championed the use of a Biopesticide known as Green Muscle™ licensed to Elephant Vert, which CABI

helped to develop, to control locusts in Somalia, Kenya and the other countries affected in East Africa. This saw them organize the spraying of this product at its most extensive scale of over 100,000 hectares of land.

It is a preventative product that works best when sprayed on locust instars, before they reach the adult stage and are able to fly. It takes about 7-14 days to take effect.

Use of Nematodes for Insect Pest Control
Nematodes are any of phylum (Nematoda or nemata) of elongated cylindrical worms parasitic in animals or plants or free-living in soil or water. They are more specifically insect killing nematodes (entomopathogenic nematodes (EPNs)). They are naturally found in the environment as parasites of insect larvae.

Nematodes form two genera, Steinernema and Heterorhabditis. They are used in control of major insect pests within a range of different crop production systems.

Nematodes offer an alternative to the harmful chemical insecticides which are being banned for agricultural use. They are mainly of essence in targeting pests that are difficult to target like the soil white grub and cutworm larvae.

Reasons to Use Nematodes for management of insect pests.

- Can be used in field crops to control soil-dwelling insect larvae of cutworms, in Greenhouse crops to control larvae of fungus gnats, in fruit orchards to control false codling moth and white grubs of turf grass.
- Can be applied to solid substrates like soil and compost or aerially on foliage or stems
- Can actively search for the target pest, depending on the species.
- Have specific and narrow host ranges
- Are unlikely to promote resistance within host insects- The EPNs themselves will not kill a host insect; this requires the EPNs symbiotic bacteria. When an EPN enters a host insect larva they release their symbiotic bacteria which kill the insect host. The bacterial enzymes then digest the larva and the EPNs feed on the products.
- Are considered safe by national authorities, for the environment, users and consumers- The EPNs and their associated symbiotic bacteria have no harmful effects to humans or other vertebrates. Any non-target effects on field populations of invertebrates are considered to be short-lived.
- Will not feed on plant material-The EPNs are not related to plant parasitic nematodes and do not utilize plant material as a food source.
- Do not produce any residue in crops.
- Reduce the need for chemical pesticides.
- Can be applied using existing spray or irrigation systems- When using conventional spray equipment or overhead irrigation, make sure to remove filters and sieves, and ensure the nozzles are of at least 0.5mm diameter, and use low pressure to prevent damaging the EPNs.
- Can be used with other biological agents or integrated pest management (IPM) components
- EPNs can be applied together with other biologicals such as Bacillus thuringiensis (Bt) or conventional insecticides to manage insect pests, often with synergistic effects or the effective use of lower doses of insecticides.
- Can be used in organic farming.

Kenya Needs a Stable Business Environment

By Steve Biko Wafula

Kenya is a beautiful country with amazing people and resources. We are hardworking and determined to have the best. We are crafty and schemers. But underneath this, our issues and troubles lie. Beneath the surface, the feeling and mood aren't rosy.

One of the things that make the world go round is money and in Kenya, everyone is hard-pressed to genuinely eke out a living. Making honest money in Kenya is becoming a difficult task, thanks to an overzealous government in terms of taxation and corporate harassment of private firms that are apparently successful.

Corrupt government officials are weaponizing government agencies to harass private firms to achieve their selfish goals under the guise of public interest as they rape and mutilate the Constitution in the process.

Ayn Rand once said that either we believe that the State exists to serve the individual or that the individual exists to serve the state. As a private entrepreneur and SME owner, I believe that the State exists to serve me the individual and in return, I pay my fair share of taxes as the consideration of the State taking care of me. This contract is renewed every 5 years at the ballot. Where we elect better officials to manage the government. Unfortunately, being a law-abiding citizen in Kenya has become 1000 ways to die early.

Frederic Bastiat once said that when plunder becomes a way of life for a group of men living together in society, they create for themselves in the course of time a legal system that authorizes it and a moral code that glorifies it. Frederic must have been a seer because his statement simply foretold the future of the Kenyan political class.

The most corrupt, inept, and scandal-ridden group of Kenyans in the history of the country, and unfortunately, they seem to be the best of us. This reflects really badly on us as citizens, voters, and taxpayers. This political class has turned the law into a weapon to harass and blackmail businesses they deem not good for their personal interests or where they can muscle them for political funding. This is what has been happening and in the process, investor confidence has waned to the lowest ever in the history of the country and this has

resulted in more unemployment, tearing of the social fabric due to stress and depression-related issues, and an increasing crime rate.

Louis Brandeis was right when he said that if the government becomes a law-breaker, it breeds contempt for the law. It invites every man to become a law unto himself. The Kenyan government has broken the record of ignoring all court orders and this has created a bad precedence with the populace and now those who believe are important are taking the law into their own hands and this has made investments scarce as investors and job creators relocate and or avoid Kenya all together for other countries like Rwanda and South Africa.

Marcus Tullius Cicero talks about justice being the set and constant purpose which gives every man his due. This justice unfortunately has been rapped and torn apart by a regime that does not care about the rule of law and the adherence to the court orders and this is more damaging than a war to a country. This means the God-given right to property of your own sweat and blood can longer be guaranteed in Kenya courtesy of the law-breaking government. Investors have shied off and we are the ones suffering. Add COVID-19 into the mess and you have yourself a potent cocktail that if not addressed NOW will explode in our faces and that will be the end of Kenya as we know it.

A liberalized market is good for creating jobs and sustaining them. It's good for innovation. Regulations are good for consumer protection and that should be it, consumer protection. The rest should be to prop up and support innovations with better policies, credit access, market access, and public-private partnerships.

This way, you eliminate corruption, you inspire more people to take risks and innovate. Instead of stifling everything and making everyone dependent on the government. The government has no business being in business. Its role should end at creating the right environment for the growth of businesses across all sectors.

Unfortunately, our Kenyan government has done the opposite and the compounding negative effect has seen hundreds of thousands of SMEs closing shop every day.

As a country, we need a good anti-harassment policy that will not only forbid GOK from harassing private firms BUT also provide means with which the firms can report harassment to a commission set up by Parliament for probe & settlement. This will create investor confidence.

We need to support the private sector more because it's the only sector that can create jobs and sustain them. With a crippling debt burden, reduced tax base, rising unemployment, crippling corruption, the best way forward out of this hole is to create a fertile environment for the private sector to flourish and to grow without any government interference. A good example of what am talking about is what has happened to the likes of SportPesa, London Distillers, and Keroche brewery.

The amount these firms circulate, the jobs they create, and the taxes they pay, should be supported. Moral issues should not be used to define a business unless you banning an entire

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sector from all players and not selective harassment. Targeted campaigns in the media to paint job creators as criminals are something that we need to stop.

Tax disputes aren't sufficient grounds for someone to be labeled a criminal. This is why we need a better, independent body to oversee such issues. What SportPesa has been subjected to, for example, is not fair, is not legal and the compound ripple effect has been to scare away more investors, especially in other sectors who believe if SportPesa can go through what they have gone through, what makes them special not to face the same bad treatment? This has created a bad business environment in core sectors of the economy and has resulted in the majority of investors relocating to better countries that have support systems like Uganda, Rwanda, Egypt, Mauritius, and South Africa.

We need to pay our debts. We need to solve the ticking time bomb that is the question of unemployment. We need to increase the tax base. We need to tackle and end corruption and we need to restart the economy or our neighbors like Tanzania will overtake us. We need to remove the government from the realm of business and ensure that they fully focus on creating the right environment for business growth. Firms like Keroche Breweries and SportPesa should be left to operate and a mechanism established to resolve any matters, tax-related or otherwise because the current mechanisms aren't sufficient or they are corrupted to the core. We need these firms and we need more of them for us to be able to jump-start the economy, pay our debts, increase the tax base and create the needed jobs for the millions of unemployed youth.

Morals should never be used to judge a business. Emotions should never be used to judge a business. Instead, we should use facts and numbers as the SI unit in discussing business and looking for a way forward. We have the Kenya National Bureau of Statistics, which should actively churn out numbers for policymakers to interrogate and use to create a better business environment.

My assertion is not just for the government to do the right thing, but for all players. Most importantly, the media. It's the duty and moral obligation of the media fraternity to seek out facts, interrogate reports and tell the people of Kenya the truth. The media has a higher purpose in holding the government true to the tenets of the laws and to telling the truth and the pure truth to the people of Kenya. It's not the role of media to influence a particular outcome. Its role should be to state the correct facts and leave it at that.

The corrupt syndrome of brown envelopes seems to behave permeated the media fraternity to such deep levels that respected journalists are sacrificing the ethical practices to wage a war of SMEs, entrepreneurs, and legitimate businesses at the behest of the corrupt government officials and this have had a very serious negative impact on the economy as every business relocates, seeking regions with fair and independent media outlets. The role of a journalist should be to say the truth, protect the truth and do the truth. Not become an influencer in telling stories that are one-sided just because they have received a brown envelope. The media should be the sword against a corrupt government and reckless corrupt officials. But instead, our media has joined ranks with the rest of us as influencers. This is sad, laughable, and repugnant.

I am hoping that we have all learned our lessons and that as the economy picks up amidst the ravaging COVID-19, we will do the right thing for once for the sake of our country.

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Maize Variety Choices, Can Farmers Ha

Smallholder farmers are often torn between maize seed varieties that have multiple desirable traits. Since they cannot always have it all there are limits on what traits breeders can integrate in any given variety they face the dilemma of which seed to pick at the expense of an equally desirable option.

A study contacted this year provides evidence of this prioritization and seeks to help breeders, seed companies and other stakeholders set priorities that account for farmers' needs and their willingness to make preference trade-offs. The researchers evaluated responses from 1,288 male and female farmers in the mid-altitude maize growing areas of western Kenya.

The study argues that farmer-centred seed systems (including seed companies) should be guided by farmers' priorities and reflect a greater understanding of the trade-offs these farmers make between traits and varieties. They have two key options, according to Paswel Marenya, the study's lead researcher and adoption and impact assessment economist at the International Maize and Wheat Improvement Center (CIMMYT). The first involves prioritizing the critical must-have traits in any one variety. The second option entails having multiple varieties that meet diverse farmers' needs and then segmenting the seed markets.

Varietal trait prioritization is important for balancing commercial realities and farmers' diverse interests.

By Joshua Masinde

ave It All?

While Marenya argues that prioritization is important for balancing commercial realities and farmers' diverse interests, he is quick to add that "market segmentation has limits imposed by the commercial viability of each segment."

"At every turn, from breeding to farmer varietal preferences to seed company considerations, there have to be trade-offs, as one cannot keep segmenting the market forever," Marenya said. "At some point, you must stop and choose what traits to prioritize in your breeding or commercially viable market segments, based on the most pressing challenges already identified."

Differences in trade-offs among men and women

From a gender lens, the paper reveals an obvious difference in tradeoffs made by men and women. Whereas the two groups desire some similar traits in their varieties of choice, women seem to be willing to make slightly larger yield sacrifices in favor of tolerance to drought and Striga and good storability. Women also valued good storability over 90-day maturity, while men appeared to place a higher value on the closed tip, a sign of resistance to moisture infiltration which causes grain rotting.

"These results imply that unless the risks of storage or pre-harvest losses are reduced or eliminated, the value of high yielding varieties can be diminished if they are susceptible to production stresses or the grain characteristics make them susceptible to storage pests," the study states.

The study indicates that farmers may adopt stress tolerant and high yielding varieties with somewhat low storability only if advanced grain storage technologies are available.

Until then, the suggestion to policy makers responsible for maize breeding is to use "multi-criteria evaluations" of new varieties to ensure that traits for stress tolerance and storability are given optimal weighting in variety release decisions.

Additionally, information about farmer preferences should be fed back to breeding programs in national and international institutes responsible for maize genetic improvement.

Courtesy of CIMMYT

Mechanization takes off

Successful establishment of an agricultural machinery workshop in Meki signals a boost for private sector-driven mechanization in Ethiopia.

A two-wheel tractor with an improved driver seat and hydraulic tipping trailer system in Beyene Chufamo's workshop in Meki, Ethiopia. (Photo: CIMMYT)

By Emma Orchardson

In a small workshop in Ethiopia's Oromia region, mechanic Beyene Chufamo and his technician work on tractor repairs surrounded by engines and spare machinery parts. Established in Meki in 2019, Beyene's workshop provides maintenance, repair and overhaul services for two-wheel tractors and their accessories.

It acts as a point of sale for spare parts and implements such as planters, threshers and water pumps. Beyene also works as a tractor operation instructor, providing trainings on driving, planter calibration and how to use threshers and shellers.

The city already had a well-established mechanics and spare parts industry based around four-wheel tractors and combine harvester hire services, as well as motorcycle and tricycle transportation services. But now, as market demand for two-wheel tractor hire services rises among smallholder farming communities and entrepreneurial youth race to become local service providers, business is booming.

Building a business

Beyene's business has benefitted from support from the International Maize and Wheat Improvement Center (CIMMYT) and the German development agency GIZ since its formation. Beyene was initially trained as a mechanic through the Innovative Financing for Sustainable Mechanization in Ethiopia (IFFSMIE) project, which promotes small-scale mechanization in the area through demand creation, innovative financing mechanisms and the development of private sector-driven business. He went on to receive additional technical and business skills development training to enable him to run his own enterprise.

His ongoing association with the project and its new leasing scheme has helped Beyene establish connections with local service providers, while also improving his own skills portfolio. Currently, he helps maintain the smooth operation of machinery and equipment at CIMMYT project sites in Amhara, Oromia and Tigray. This involves everything from training other local mechanics and troubleshooting for service providers, to facilitating the delivery of aftersales services in project areas.

In addition to this, Beyene receives orders for maintenance, repair and overhaul services for two-wheel tractors and implements. He sources replacement parts himself, though the cost of purchase is covered by his clients. In some cases and depending on the distance travelled CIMMYT covers the transport and accommodation costs while Beyene services

equipment from service providers and sources equipment from local distributors.

When individual parts are not readily available, he often purchases whole two-wheel tractors from the Metals and Engineering Corporation (METEC) and breaks them down into individual parts.

The way forward for sustainable mechanization

"Mechanization take-off relies heavily on skilled staff and appropriate infrastructure to perform machinery diagnostics, repair and maintenance," said Rabe Yahaya, a CIMMYT agricultural mechanization expert based in Ethiopia.

"Agricultural machinery should be available and functional any time a famer wants to use it and a workshop can support this. Beyene's work in Meki reflects the way forward for sustainable mechanization success in Ethiopia."

Creating an agricultural machinery workshop from scratch was a challenging task, Rabe explained, but support and guidance from partners like CIMMYT and GIZ helped to make it happen. "Also, Beyene's commitment and flexibility to travel to CIMMYT project sites anywhere and at any time — even on bad roads in difficult weather conditions — really helped him achieve his goal."

Beyene is excited about how quickly the local two-wheel tractor market has grown in the past few years. He currently has 91 service providers as regular clients at CIMMYT project sites .

Trends show that with support from local microfinance schemes and the removal of domestic taxes on imported machinery aftersales services will continue to evolve, and the number of service providers will rise alongside increased market demand for mechanization services, both at farm level and beyond.

With this in mind, Beyene aims to remain competitive by diversifying the services offered at his workshop and expanding his business beyond CIMMYT project sites. As a starting point he plans to hire more staff, altering his organizational structure so that each mechanic or technician is dedicated to working with a specific type of machinery. Longer term, he hopes to transform his workshop into one that can also service four-wheel tractors and combined harvesters, and establish a mobile dispatch service team that can reach more locations in rural Ethiopia.

For now, however, he simply remains grateful for CIMMYT's support and investment in his business. "I am happy that I have been able to secure an income for myself, my family and my staff through this workshop, which has changed our lives in such a positive way."

Courtesy of CIMMYT.

Tools and spare machinery parts lie on the ground during at Beyene Chufamo's workshop in Meki, Ethiopia. (Photo: CIMMYT)

International Exhibition & Conference on Agriculture Technology

The upcoming edition of Agritec Africa, International Exhibition and Conference on Agriculture Technology will be held in Nairobi, Kenya a Kenyatta International Convention Center in October 20th to 22nd 2021. Africa has huge potential for Agricultural growth, thanks to ample amount of Land and Water Resources. Yet, land and agricultural productivity are found to be one of the lowest in the world In Africa, Agriculture employs 65% labour force.

Agriculture Sector accounts for 32% of GDP of Africa. Africa requires attention on following three core areas for Higher and Sustained growth: Facilitating agricultural markets and trade, Improving Agricultural Productivity, Investing in public infrastructure for Agricultural Growth.

Highlights

- More focus on Farming Machineries & Farming inputs
- Open to sky area for Machineries
- Visitors can pre-schedule their meeting with Exhibitors well in advance
- Seminars and workshops will be conducted for first two days during Agritec Africa 2020

The exhibitors of Agritec Africa will include Agri Ecology, Agricultural Building Contractors, Agricultural Machinery & Equipment, Agro and Food Processing, Aquaculture, Biotechnology, Fertilizers & Chemicals, Floriculture, Fork lift & Handling Equipment, Greenhouses, Horticulture, Irrigation and Water Technologies, Livestock & Dairy farming, Marketing & Export/ Import Services, Organic Agriculture, Plant Protection, Plasticulture, Post-Harvest Treatment, Poultry-Precise Agriculture, R & D, Renewable Energy, Rural Development, Seeds, Nurseries & Plant propagation Materials, Small Ruminants, Software & Hardware, Veterinary, Turnkey Projects & Knowledge Transfer.

Source: Agritech -africa

East Africa's premier International Food & Agriculture exhibition to host Exhibitors from over 26 countries

Kenya's premier Food & Agriculture exhibition returns to Nairobi from 18 - 20 November, 2021. FOODAGRO AFRICA 2021 will showcase top products, equipment and machinery presented by exhibitors from over 26 countries.

Building on the success of previous events, the FOODAGRO AFRICA 2021 just gets bigger and better. Also contributing is the recognition of Kenya as one of the major access points in Africa and the huge volume of imports in the country for its own consumption for over 40 million consumers. Last year, Kenya imported goods valued at $200 million and re-exported goods worth $520 million.

An enticing mix of consumer interaction and industry presence, the show boasts not only the highest attendance per day, but also the highest business dealings per individual. The number of exhibitors and visitors in 2021 is expected to rise by at least 20% since an aggressive campaign has been launched while celebrating the event's 20th birthday.

Trade visitors from all over East & Central Africa are being invited directly and in collaboration with several regional trade bodies in Kenya, Tanzania, Ethiopia, Uganda, Somalia, Mozambique & Congo. This year's show has an exciting line-up of both local and international companies and is an ideal platform for product launches, finding new buyers & distributors, promoting brand names & image, updating existing customers and updating oneself with the latest in the industry.

The FOODAGRO AFRICA 2021 is the place to learn more about what's new on the food,

hotel, and kitchen and agriculture scene and present your own products to consumers and potential clients. The experience and comments of exhibitors at previous events indicate substantial gains from unexpected foreign visitors and we strongly feel that a rise in such statistics would ensure business, especially for the foreign participants, who form almost 80 - 85% of the exhibition.

Courtesy: Expo Group and Food Agro Africa

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