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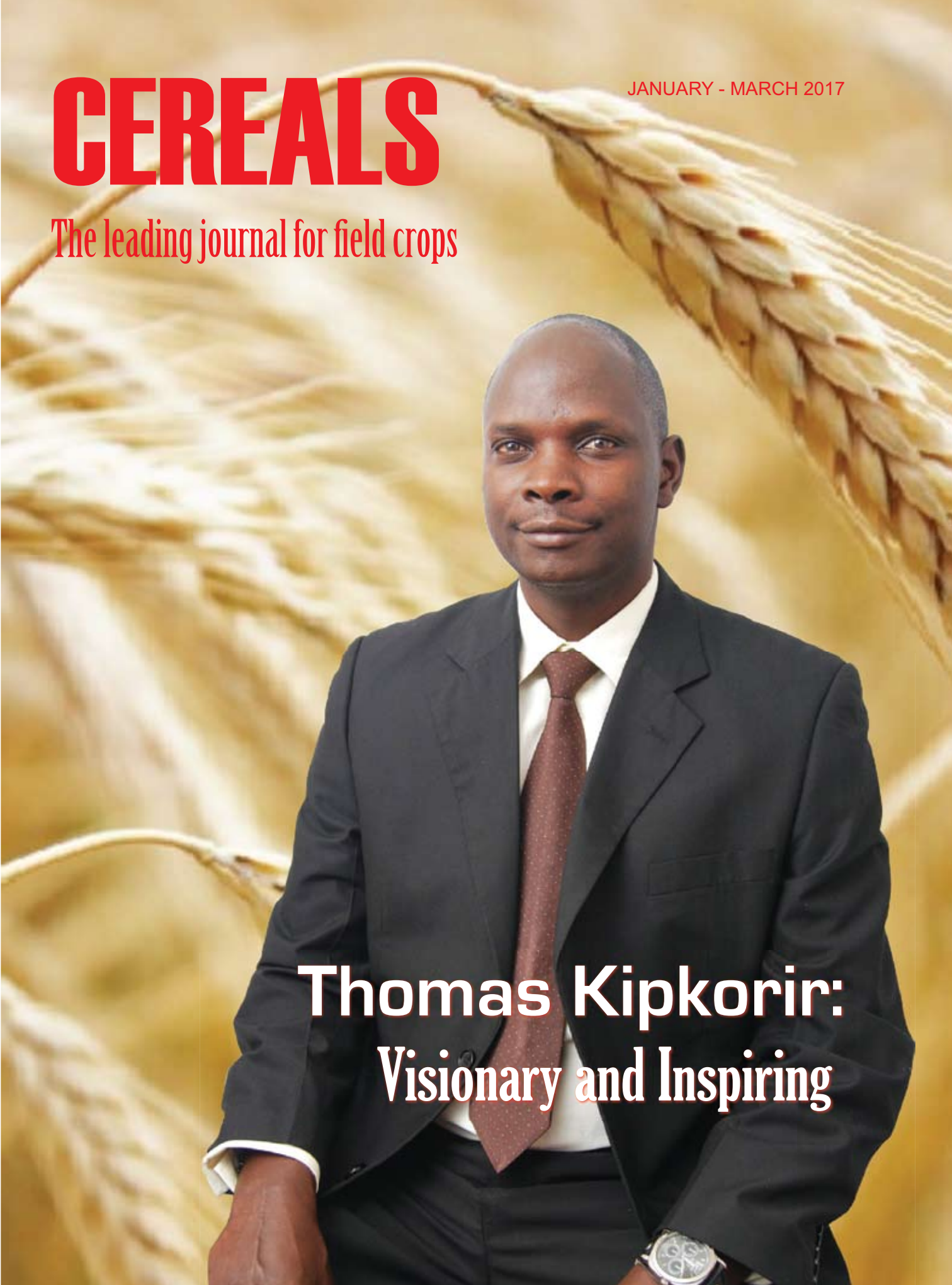

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Editorial

Reliable data in a sustainable world.

I have already endured by 'trial by fire' at Cereals Magazine - you might have met me during my extensive introductory round through this fantastic sector. We may see each other again during the open days, which will kick in 2017.

Such dynamic companies, such opportunities and inspiration. My enthusiasm and dedication are increasing by the day. I want to remind you that Cereals Magazine is here for you, and we want to join you in developing further innovations for sustainable business. Information must be useful and reliable.

You may have a lot of questions in your head. I grow my crops sustainably, but is that obvious to others? Why do my customers keep demanding that I meet new standards? Will I still be able to use this substance next year? How does my farming and farm produce affect my consumers, environment, fauna and flora?

Questions, questions, questions....

After the 'trial by fire' we can now answer your questions. They are as easy as ABC. But if only' you get a copy of Cereals Magazine in every quarter. It will ensure that your beautiful products are kept free of certain substances without harming the environment, fauna and flora.

Make a date with the right company in 2017.
Reliable data in a sustainable world.

Masila Kanyingi
Editor

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Climate Change NOT a Myth

Mr. Kassim Owino of Seed Co. Presents a sponsorship cheque to Mr. Ochieng Onduu, CEO STAK

A stakeholders meeting organized by local seed industry players association warned that climate change is a reality and not a myth anymore, and called on farmers to prepare to respond to the phenomenon by putting in place mitigating measures. "Global warming is here with us. The phenomenon of climate change in Kenya is now more apparent than has been before in recent history," said Mr. Duncan Ochieng Onduu, the Chief Executive Officer, of STAK.

"While Kenyan farmers may for example not be able to agree on the scientific explanation of global warming, one thing that is clear is that they have experienced it first-hand, with the inability to predict the onset of rains unlike the case before. The sun is scorching and the environment unforgiving," he said.

Experts attended the congress said there is need to utilise coping and resilience mechanisms in order to enhance access to improved seeds that are more adaptable to changing climatic patterns. Dr. Florence Wambugu, chief executive officer of Africa Harvest Biotech Foundation International and Nehemiah Mburu, the programme manager, said that experts need to develop seed varieties that are tolerant to drought and floods, and those that are heat, pest and disease resistant. Additionally, they said there is also need for seeds that are suited to various agro-ecological zones, and those that mature early and are water-efficient.

Addressing the same forum, Raha Kariuki the chief executive officer of Acre Africa, a micro-insurance product designer linking farmers to agricultural insurance through localized solutions to reduce climate risks said.

Farmers in East Africa now have more crop insurance options to help cover them when they are affected by adverse effects of climate change. "Agriculture insurance is not a far-fetched concept since food security depends on seed security and the international seed industry must be able to continue to deliver the quantities of quality seed required for this purpose," she said

A regional farmers' federation called for increased partnership between governments in East Africa and the private sector in implementing climate change adaptation strategies.

The Eastern Africa Farmers Federation (EAFF) further said that stakeholders should seek for opportunities to scale up work on 'Climate Smart Agriculture' (CSA), including access to more technologies and information.

According to the World Food Organisation (WFO), Climate-Smart Agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. It aims to sustainably increase agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible.

Stephen Muchiri, the CEO of EAFF said that the federation is seeking support to participate and build more institutional and policy capacity to engage in climate change programmes at all levels.

The trade expo is to attracted over 300 delegates involved in the seed industry, including government officials, development partners, research institutions, universities, agrochemical industry players, processors, machinery suppliers, farmers and the media.

The congress came in the backdrop of the African Green Revolution Forum that was held at the United Nations Complex in Gigiri, Nairobi, which underscored the critical role that agriculture plays in ensuring food security and livelihoods for the continent's population.

The Congress also happened at a time when the UN is urging world nations to ratify the Paris pact on climate change, which was adopted by 195 parties to the UN Framework Convention on Climate Change a year ago in Paris. The agreement calls on countries to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future.

Food security depends on seed security

Monsanto Launches DK777

"Monsanto in partnership with Kass FM engage farmers in a roadshow spanning three days from Narok to Bomet".

Farmers and invited guests register their details at the launch of DK777 in Bomet County.

Guests at the Launch of DK777

Mr. Ronald Osumba, Chairman of the Youth Enterprise Development Fund Board, addresses guests during the launch.

Paul xxxx of Farm Inputs Promotion Africa (FIPS) demonstrates the recommended spacing of seed holes during planting of maize as Everlyn Musyoka, Commercial Lead Kenya and Alex Tum of Kass FM look on. Monsanto advocates best in practise agronomics in addition to using quality seeds.

Monsanto staff cut a cake to celebrate the launch of DK777.

From left: Everlyn Musyoka, Tony Gathungu and Patricia Bacquet of Monsato Kenya cut a ribbon to unveil the planted DK777 maize variety at the Bomet Prison Farm.

Calvine Nyaberi addresses farmers following unveil of the DK777 planted crop. DK777 has a good tolerance to MNLD.

Adapt to climatic changes

The long term survival of our food production systems is intimately tied to the seed stewardship.

By Moses Wasamu

Climate change has had serious implications on rain-fed agricultural systems of Sub-Sahara African countries. These changes can be seen in change in rainfall patterns and distribution. Traditionally in Kenya, the short rains were expected in Mid-October but now the onset date has shifted to end of October/starting of November. The distribution is more erratic and unreliable.

These changes have led to reduced food production and increased food insecurity, especially among rural-based communities, reduced incomes of and increased vulnerabilities of farmers, and has led to unpredictable seed production and sales.

Experts now say there is need to utilise coping and resilience mechanisms in order to enhance access to improved seeds that are more adaptable to changing climatic patterns.

Dr. Florence Wambugu, chief executive officer of Africa Harvest Biotech Foundation International and Nehemiah Mburu, the programme manager, said that experts need to develop seed varieties that are tolerant to drought and floods, and those that are heat, pest and disease resistant. Additionally, they say there is also need for seeds that are suited to various agro-ecological zones, and those that mature early and are water-efficient.

Dr. Florence Wambugu, chief executive officer of Africa Harvest Biotech Foundation International

They were speaking during the just concluded Seed Trade Association of Kenya (STAK) Annual Congress and Expo held in Nairobi. They said that seeds play a critical role in the food security of any country and thus the governments in the region should pay more attention to the sector.

They say that seed companies have to ensure timely access of improved seeds that are true to type, have good germination (above 85%), those which are treated and also certified.

Continuous improvement and long term strategies in research and development is critical to success, they say, especially with regard to new crops for new technologies, market opportunities and resilience.

Dr. Wambugu said STAK has a critical role to promote seed companies, address common challenges and support members to adapt to climate change.

2016 STAK Conference Key Stakeholders with Agriculture Cabinet Secretary, Mr. Bett

"The contribution of foreign multi-national seed companies should also be considered in the context of the value-chain and overall food security agenda in the country," she said.

Government policies, which currently target a few members in the value chain, should consider the impact on all the stakeholders in the value chain and focus on more members. They said the success of seed companies is influenced by the success or failure of other value-chain partners in the crop business.

They say stakeholders should foster value-based and inclusive producer-public-private-partnerships (4Ps) to strengthen value-chains in order to improve coping mechanisms. "NGOs, other community based institutions (CBOs) and local governments have an important role in the sustainability of value chain development initiatives," they say.

To make this a success, they propose that formal, as well as informal seed systems, should be promoted to enhance access, affordability and diversity of local germ-plasm (these are living genetic resources such as seeds or tissue, that are maintained for the purpose of animal and plant breeding, preservation, and other research uses).

The experts say that because of climate change and changing climatic patterns, there should be timely delivery and distribution of seeds, and the development of monitoring systems and information dissemination pathways to farmers e.g. when to plant.

This can work better when there is closer integration with weather forecasting departments (public) or investing in private forecasting platforms, they said.

Most wheat producers have their total disease management program in place once the seed is in the ground. By that time, decisions have been made relative to crop rotation, tillage/ seedbed preparation, variety selection, seed quality, seed treatment, planting date, seeding method, seeding rate, and soil fertility. Individually and collectively, these decisions can play an important role in influencing which diseases develop, their severity, and their effect on crop yield and weight.

IS IT BREAD AND BUTTER In Kenya's Wheat Basket?

ALTITUDE
From 1500 – 2500

RAINFALL
From 500 mm to 1,200 mm

The giant New Holland machine rips through the plantation, raising blinding dust in its wake. After one long trip amid the humming of the engine, it deposits grain into a waiting truck before embarking on a virgin set of rows. Tens, perhaps hundreds of combine harvesters have pitched tent, slowing traffic on the Bomet-Nairobi road and bringing roaring business in Narok and other trading centres.

Fast Track eight to nine months later and the scenes are completely different. The sight of farmers around drying wheat on the ground with agents haggling over price and quality is a reminder of how farmers take advantage of the plentiful sunshine to cut post-harvest costs. Makeshift canvas driers line both sides of the Maai Mahiu-Narok-Bomet highway, a section of the Northern Corridor transport system that creates a shorter link to western Kenya.

Wheat Growing

Narok is Kenya's undisputed wheat basket, producing slightly over 250,000MT which is around 70% of the national wheat output in any given year. Wheat is the second most important cereal grain in Kenya after maize. Wheat farming in Narok is largely done for commercial purposes on a large-scale. The region produces the hard variety wheat which is the best for baking quality, making it popular with millers.

Scientists at the Kenya agricultural Livestock and Research Organization (Kalro) are instrumental in coming up with varieties that are stress tolerant disease resistant. The main varieties grown in Narok are Robin, Njoro 2, Mwamba and Kwale. Robin is known to be resistant to diseases mainly stem rust popularly known as UG99. In addition they have higher yields, are drought resistant, no lodging and have tillering capability. The crop is grown both by small scale and large scale farmers. The fields are ploughed by tractors during the dry season. This is followed by several harrowing with a round of non-selective herbicides

Conditions Favoring Wheat Farming in Narok

Gentle slope

The land where wheat is grown is gently or fairly level and this has allowed for mechanization. Additionally, most of the farms have not been sub-divided making it easy for machine cultivation

Altitude

The growing areas have a high altitude ranging from 1500 – 2900 mm. This reduces the incidence of diseases.

Moderate rainfall

The wheat growing areas receive moderate rainfall ranging from 500 mm to 1,200 mm which promotes the growth of wheat.

> "Farmers are advised to start with a clean field and control weeds early by using a burn-down treatment or tillage combined with a pre-emergence herbicides. After planting, farmers apply post emergency herbicides if necessary"

Machinery Used in Wheat Production

Every commercially available wheat variety has a unique range of reaction to common diseases. Which and how many varieties are planted determines the potential for certain diseases.

Warm temperature

Warm temperatures of 15ºC to 20ºC at least for three months. This enables maturity of the wheat.

Fertile soils

Deep fertile black clay soils which lead to high production.

Dry spell

Warm dry sunny spell which enhances ripening of wheat and harvesting.

Crop Production

Wheat is machine intense farming with most of the work done mechanically. The area has one main season running from November to July. Land preparation is mechanically done either by ploughing or tilling. Control of weeds is done manually by small scale farmers while large scale farmers use modern scientific methods e.g. application of herbicides. Integrated weed management practices; includes scouting, historical information related to other mechanical, cultural, biological and other chemical control practices are advisable.

An integrated approach to weed management, whether in crop or non-crop land, is an important environmental and economic consideration. Multiple management practices can be used in an integrated plan to prevent or delay the development of herbicide resistant weed populations.

Farmers should Monitor treated weed populations for resistance development. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment and clean planting seed. Use of certified seed greatly minimize the introduction of weed seeds from herbicide- resistant biotypes.

Farmers are advised to start with a clean field and control weeds early by using a burn-down treatment or tillage combined with a pre-emergence herbicides. After planting, farmers apply post emergency herbicides if necessary.

Crop Protection

Wheat farmers rank disease as one of the top factors limiting wheat yields on their farms. Disease management is a key component of high-yielding wheat. Some diseases, must be managed proactively and cannot be controlled once they are established. Other diseases, such as foliar diseases caused by fungi, can be managed by the timely application of foliar fungicides.

Stem rust popularly known as UG99 because of the country it was first discovered (Uganda) and the year it was named has not been, giving farmers a breather. Also referred to as the polio of agriculture, the disease can wipe out up to 70 per cent of the crop. In addition, farmers should also be careful of yellow rust, leaf rust, septoria also known as glume botch, and fusarium (late infection). Other than diseases, insects could also be a menace. The Russian wheat aphids are the main insects though cut worms, caterpillars, wire worms, chaffer grabs can also wipe your wheat.

Disease Management

Most wheat producers have their total disease management program in place once the seed is in the ground. By that time, decisions have been made relative to crop rotation, tillage/ seedbed preparation, variety selection, seed quality, seed treatment, planting date, seeding method, seeding rate, and soil fertility. Individually and collectively, these decisions can play an important role in influencing which diseases develop,

their severity, and their effect on crop yield and weight.

Because pre-plant and planting decisions are important in the management of wheat diseases, you need to understand how they affect disease.

Depending on the rainfall pattern, farmers should do a minimum of three to five fungicide sprays. All fungicides must be applied within specific growth-stage. Fungicides provide the greatest benefit when plants are protected from disease between flag leaf emergence and soft dough. The most critical stage is typically from mid head emergence through flowering. This is the period in which fungicide applications are often most beneficial.

Scouting for disease

Scouting for disease is very important for two reasons. Yearly scouting helps you to build an on-farm database that can be used to select appropriate disease management tactics for future crops. Scouting also helps you determine if and when to spray fungicides. Once fields are properly scouted, data can be used to determine disease control options. Course of action should be started only when you are fully armed with up-to-date, accurate information.

Variety selection

Decisions relating to variety selection are, perhaps, the most important decisions in managing diseases. Every commercially available wheat variety has a unique range of reaction to common diseases. Which and how many varieties are planted determines the potential for certain diseases. Failure to consider the implications of variety selection in managing diseases is a costly mistake made by many wheat farmers.

Crop rotation

Crop rotation helps in the management of wheat pathogens that survive between wheat crops in wheat residue. When a crop other than wheat is grown in a field, levels of wheat pathogens decline. This occurs simultaneously as the residue of previous crops deteriorates. Reduced levels of pathogens can translate into reduced disease pressure the next time wheat is produced.

Tillage / Cultivation

Ploughing wheat residue hastens the breakdown of residue that harbors certain disease organisms. This can help reduce levels of take – all and foliar diseases, such as Septoria leaf blotch and tan spot.

Insects Management

Scouting for insect pest is important for two reasons. Yearly scouting helps you build an on-farm database that can be used to select appropriate insect management tactics for future crops. Scouting also helps you determine if and when to spray insecticides. Once fields are properly scouted, data can be used to determine insect control options. Course of action should be started only when you are fully armed with up to date, accurate information.

Decision to apply an insecticide should be based on scouting and the use of threshold. Scheduled or automatic applications of insecticides should be avoided because unnecessary application can be more costly than just the cost of the insecticide. Application of insecticides on an as-needed basis will allow beneficial insects to be preserved which reduces the likelihood of secondary pest out breaks.

Wheat is the second most important cereal grain in Kenya after maize.

Scouting for insects

Depending on when the crop is planted, insect problems vary from non-existent to severe. Identifying the pest and understanding its potential for damage is necessary when selecting appropriate control methods. Each pest does not respond the same way to a given method. Monitor fields at least twice per week. Walk a "V" or "W" pattern through the field and select plants from 12 random locations along the pattern. When plants are still small (up to 10 leaves), examine 6 adjacent plants per location for insects and disease. As plants get larger sample 3 leaves per plant on 6 adjacent plants per location (total of 216 leaves).

Insects cause injury to the leaves, stems, roots, and fruit. The developmental stage of the plant at the time of attack often governs which plant part different insect pests may injure. However, some insects feed specifically on one plant structure; others may feed on several structures. The first step in control is to identify the insect.

Most insect problems can be treated as needed if detected early, but no one insecticide will adequately control all the insects that may attack a crop. Scouting for insects is the most efficient way to determine what problems may exist and what action should be taken.

In addition to monitoring for pest insects, some beneficial species exist which should be considered. Several species of predatory and parasitic insects are present in crops. These natural controls are considered especially during early season. Big – eyed bugs, minute pirate bugs, fire ants and Cotesia wasps are four important beneficial insects. The presence of these natural controls may delay the need to treat for bollworms. The use of beneficial insects should be maximized in attempts to reduce production costs.

When the crop is ready for harvesting, the small scale farmers use simple tools e.g. sickles or sharp knives to cut the wheat heads. The cut wheat is threshed dried and winnowed. Large scale farmers use machines mainly combine harvesters.

Migratory bird menace

Recently the crop has also come under attack by the quelea, a migratory bird species that can consume thousands of acres of crop in a week. Each bird consumes 10 grammes a day, and if uninterrupted by farmers who scare them away, nine million birds can decimate 90 tonnes a day. Farmers need to be more prepared in controlling the migratory birds.

Harvesting and Post harvesting

Many farmers harvest 12 bags from an acre and above with an increment vary. In harvesting, farmers must ensure the dry grain has attained a moisture content close to 14. To be successful farmers, they must ensure they have their own silos or store where they can fumigate, dust or spray. Thereafter depending on the market price, they can store and wait for better prices.

Challenges Facing Farmers

The productivity of wheat in Narok is under threat due to the following:

Inadequate capital

Generally production is very expensive. Some of the small scale farmers do not have enough capital for the purchase of expensive farm input such as fertilizers, herbicides and hire farm machinery e. g., tractors and combine harvesters. The crop is in some instances affected by pests and diseases can destroy the crop leading to low yields.

Climatic hazards

Narok can be compared to Les Vagas. It is very important for farmers to confirm rain patterns through weather setilites probably in the US or

UK. Farmers can also visit weather sites like Accuweather in the internet. Heavy stormy rains during the rainy seasons can destroy the crop by flattening it leading to rotting. Drought before the crop is ready may destroy the entire crop.

Price fluctuation

Price fluctuations on the domestic market leads to losses for the farmers as at times, they are made to sell their produce at very low prices. Kenya is a wheat-deficit country relying on imports to meet the growing demand for the product. Millers take advantage of the deficit and flood the market with imported wheat to lower the local prices to unmanageable levels. Middlemen also can infiltrate the system. To cushion this, farmers can form an association to

take care of their interests.

Why the Government should support the farmers

Wheat has benefited the economy of Kenya and can still grow it to higher levels through:

Industrialization

Wheat farming has led to the development of related industries in the growing areas and also in the major urban centres e. g., Nairobi, Eldoret and Nakuru. These are mainly industries that deal in confectionaries. These are not able to feed the country so there is room to grow more.

Infrastructure

Roads have been established in the wheat growing areas to assist in the transportation, this has assisted in the improvement of rural infrastructure.

> “Failure to consider the implications of variety selection in managing diseases is a costly mistake made by many wheat farmers.

Saves foreign exchange

All the wheat grown in Kenya is for local consumption. However, the country still has to import some wheat to satisfy her domestic requirements. Wheat farming therefore helps the government to save foreign exchange by reducing the amount of wheat imports.

Employment

Many people have gotten employment through wheat farming directly and indirectly. For example, while some have been employed directly on the wheat farms, others are employed in the related industries e.g. bakeries and other confectionaries.

Source of income

Through wheat fanning, farmers have earned an income directly through the sale of their crops. This has raised their standards of living and helped in alleviating poverty in the country.

Deficit

All said and done Kenyans are far from achieving near self-sufficiency in their essential supply of wheat and bread. The current population of 40 million is increasingly urbanizing and the demand for wheat is estimated at over one million metric tons compared to annual output of 450,000 tons or only 45% percent.

Not much has changed in the past four decades; our national output is fairly much the same as it was in 1969 when the population was 10.9 million and more rural. The population has since then increased over 3.6 times, so we are depending more on imported wheat and using more foreign exchange. The bottom line is that with farmers producing 5.6 kg of wheat per Kenyan today compared to 20.5 kg in 1969, the stress and conflict between farmers and consumers is bound to continue rising.

Last Word

The soil life in Narok is completely depleted and if caution is not taken, we will be nailing the last nail on their coffin. Farmers need to revamp the soils through the right crop rotation. Other than the commonly used maize for rotation, there is need to change to Canola, Sunflower and Garden Peas.

Secondly, farmers must change to conventional or zero till. Chisel plough not disc plough to break the hard pan can also be of help. This will open the soils for good aeration and water infiltration for better sucking of the water by the roots.

Lastly farmers invest millions and forget that their fate can be determined by Kshs. 1,500 for soil testing. Soil Ph and soil solubility tests will determine certain levels of fertilizer and guide on nutrition for a better crop.

Farmers Discuss their wheat production

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Canola

Put Good Fat in your Diet!

Canola oil's mild flavour allows the flavours of the food and the other marinade ingredients to prevail. Staying liquid while refrigerated allows the canola marinade to be drained off easily. It stays liquid in the fridge which facilitates the marinating process.

Some people think that all fat is bad. In truth, fat is an important part of the diet, providing the greatest output of energy per gram of any food. In addition, fats help keep us warm, and regulate the immune system. They contain essential fat-soluble vitamins and fatty acids and improve the flavour of food. However, there is general agreement among health professionals that the type of fat consumed is as important as the total amount eaten. That's why it's important to choose healthier unsaturated fats, like canola oil. Eating too much and the wrong kinds of fats – saturated and trans – cause an imbalance, raising the bad LDL cholesterol and lowering the good HDL cholesterol, which can increase blood pressure, narrowing of the arteries (atherosclerosis), heart attack and stroke.

Canola oil is one of the healthiest vegetable oils available to consumers. It is the lowest in saturated fat, which raises bad LDL cholesterol and has been linked to increased risk of heart disease. It is high in monounsaturated fat which may reduce the risk of coronary heart disease by lowering bad LDL cholesterol in the blood and helping control blood glucose. And, it is high in Omega-3 fat as well as a source of Omega-6 fat – which must both be consumed in your diet.

Canola oil contains no trans fats and is cholesterol free. It is high in Vitamin E which protects against oxidative damage and may protect against cancer and heart disease. Canola oil is also a source of Vitamin K which is important to blood clotting and bone metabolism. Fats, like canola oil aid in the absorption of the fat-soluble vitamins A, D, E and K.

Cooking with Canola

Canola is a versatile oil which can be used in baking, sauteing, frying, marinating and salad dressings

Salad Dressings- Canola oil has a light taste and colour, stays liquid in the fridge (making it free-running) and blends well with herbs and spices.

Baking- Using canola oil in baking results in a soft, moist texture. It can be used to grease baking pans and can be used to replace high saturated or trans fats as an ingredient. Canola oil does not impart a distinctive flavour to baked products.

Deep-Frying - Canola oil has a high smoke point. Even after a long frying time, canola oil forms a minimal amount of trans fats. It doesn't transfer food flavours.

Marinades- The oil in a marinade helps to moisturize the food while the acid (vinegar or lemon juice, etc.) helps to tenderize it. Canola oil's mild flavour allows the flavours of the food and the other marinade ingredients to prevail. Staying liquid while refrigerated allows the canola marinade to be drained off easily. It stays liquid in the fridge which facilitates the marinating process.

How to Store- Store canola oil in a cool, dark place.
Under these conditions, it will keep up to one year if tightly sealed. Storing

When it is ready to harvest, the plant changes colour from green to light yellow. These tiny seeds are crushed to extrude canola oil.

canola oil in a warm, light intensive place can speed up oxidation which causes the oil to turn rancid.

Why Use Non-Hydrogenated Canola Margarine?

- It is recommended as a heart healthy choice.
- It has cholesterol-lowering effects.
- It contains Vitamins A and E.
- It contains essential fatty acids.
- It has less trans and saturated fats.

Vegetable Oil Comes From... Some food products labelled “vegetable oil” may contain canola oil. “Vegetable oil” on a label allows a food manufacturer to substitute or combine oils without having to change the product label. This is not always the healthiest choice as there is no guarantee of the oil’s fatty acid composition.

Canola was developed in the 1970s by Canadian plant scientists. It has become a very important plant crop globally. Canola seeds are about 43 percent oil. This oil is low in saturated fat and is an excellent food choice for a healthy diet. The oil from canola is used for cooking and baking at home, restaurants and in food processing plants. Canola oil also has non-food uses - for example biodiesel and bio-plastics. Canola meal, the part left over after the seeds are crushed and the oil extracted, is used for animal feed, pet food and fertilizer. Millions of acres of canola are harvested each yearglobally. Canola is the third most widely used vegetable oil in the world after soybean and palm oil.

What is Canola? And How Does it Grow?

On the farm, these plants grow to a height of one to two metres. Canola is a plant that is a member of a large family of plants called crucifers . Crucifers are easy to identify because the four yellow flower petals form the shape of a cross. The yellow flower produces seed pods that are about 5 centimetres in length. There is an average of 60 to 100 pods per plant. Each seed pod contains 20 to 30 tiny, round seeds which are 1mm. in diameter. When it is ready to harvest, the plant changes colour from green to light yellow. These tiny seeds are crushed to extrude canola oil. From germination to seed production, the life cycle of a canola plant takes about 3months, depending on temperature, moisture, sunlight and soil fertility. Canola is a cool season crop. It grows particularly well on areas, where cool nights and hot days allow it to develop its unique fatty acid profile. Canola belongs to a section (or genus) of the crucifer family called Brassica. As well as canola, Brassica plants include mustard, Brussels sprouts, cabbage, cauliflower, broccoli and turnip. Brassicas are a major source of food in many countries.

Where did Canola Come From?

The name ‘Canola’ was registered as a trademark in Canada in 1970. The name comes from Can as in Canada and ola as in oil! The plant was bred by Canadian scientists, Dr. Baldur Stefansson and Dr. Keith Downey, who selected rapeseed populations when looking for a crop that would produce a healthy, edible oil product. Prior to canola oil, most of the oil Canadians used for food purposes was imported and people wanted a home-grown edible oil. Canola was selected from rapeseed through the knowledge and ingenuity of these prairie plant scientists.

Canola is NOT rapeseed. It may look the same but it’s nutritional makeup is totally different. Canola came about only after years of hard work, research and countless field tests of new plant varieties. Canola oil has a complement of fatty acids that make it one of the healthiest oils. Canola oil is also a source of Vitamins E and K. Canola meal is a nutritious livestock feed.

Today, Canadians consume more canola oil per person than any other country in the world. In Canada, canola oil has captured about 80 percent of the salad oil market, 60 percent of the shortening market and 45 percent of the margarine market. Other large markets for Canadian canola include Japan, the United States, Mexico and China.

How are Farmers
Re-engaged With their Soils?

Through fear, finances, regulation or education?

Some of the tractors used on soil

There are countless examples throughout human history of entire civilisations which have crumbled as a result of the inadequacies of their soil management: Mesopotamia, Ancient Greece, the Roman Empire, European Colonies, Central America, and more recently the collapse of the American prairies. Yet we appear doomed to repeat these mistakes century after century. In an industry as old as agriculture new techniques are hard to come by. This poses challenges for our psyche which prefers new solutions to old problems. We therefore end up badging old techniques as new in order to pique interest. Take controlled traffic farming, a technique designed to reduce the compaction damage we have caused by movements of vehicles which get heavier and heavier with each purchase.

For at least a generation traditional soil husbandry has been far from fashionable. The rise of fertilisers and sprays has made it possible to prop up yields despite declining soil health. Further to this the ever increasing power and weight of machinery has meant that only being able to work soil when conditions are right has become an inconvenience of the past.

Machinery available now is bigger and stronger than ever allowing us to do what we like, when we like. I heard John Lewis-Stemple, a notable writer and an advocate for all things sustainable and organic, observe that one of the reasons farmers have become less connected to their surroundings, is due to enclosed cab tractors.

Now we don't get wet when it rains or hear the birds chirp in the hedgerows; of course it does have practicalities like air conditioning during hot weather and protection from drift during spraying. Likewise if our only interaction with soil is from the comfy seat of a tractor rather than with our hands and a spade, it is no wonder we don't realise when damage is being done or how our soil is changing over time. The dependency on inputs and technology is unfortunately combined with increased administrative burdens, which often results in more time farming from the office than the field.

Pressure from contracts more often than not worsens the habit of disregard for soil. If the contract says the crop must be harvested by X date and that day happens to be wet there is not a lot that many growers can do but pull on their wellies and make a mess. Further to this, where salad crops and vegetables are concerned, contracts often stipulate that organic manures cannot be used to maintain fertility of the soil. This is due to consumers not liking the inconvenience of washing their food before use; consequently not only compromising the health of the soil but also the quality of the produce. To further complicate matters, in recent years we have seen a rise in the amount of land rented under short term tenancy. *Who then has the soil's best interest at heart? The landowner who is receiving rent no matter the state of the soil, or the tenant who will not reap any of the long term benefits of taking care of it today?*

So why seek soil enlightenment now? Professor Wilfred Otten concluded that "*there is only a thin layer standing between humanity and extinction, and our salvation lies in the soil….*

We are thinning this critical layer at a rate slow enough to prevent immediate anxiety in society but fast enough to threaten long term survival." How many acres of top soil are washed every year by rain? Is this recognised by the farming community as a particularly awful incident? May be it passes most by without too much concern: just another rain storm with "a bit of brown water". Even fairly significant soil loss does not cause anxiety when it is diffuse by nature.

For other sectors this anxiety is already more acute. Each time the rivers run red after rain there are negative impacts on tourism, fisheries, local housing growth and potable water supplies. But the impacts of our rivers not meeting the requirements of the Water Framework and Habitats Directives are not limited to off-farm. These failures hint at declining organic matter levels, increasing costs for cultivations and artificial inputs, inefficient grazing and an overarching decline in traditional soil husbandry at the expense of profitability and sustainability. But this transition has been gradual. Most people haven't even realised it's happened. Besides, technology is far sexier than soil. Worms and organic matter don't make your neighbours crane their necks when they drive by.

The Government is not ignorant of the issue either. A Policy on introduction of more ambitious soil management requirements into cross compliance is needed. Those working proactively to improve their soil the arrival of more stringent regulations are of little consequence. For those pushing their soils hard with little understanding of its "health", witnessing structure issues and runoff on a regular basis, this poses a significant threat to their basic payment. The latter group is exactly the audience the soil GAECs are aimed

at, but without appropriate enforcement it seems these requirements will also fail to engage farmers with their soil.

Soil is not only a growing medium for the food we eat but a crucial tool in mitigating climate change. Meanwhile the media is plagued with negative press exposing the industry's perceived shortcomings of "*2 million tonnes of top soil degraded each year" and "only 100 harvests left*". But at a grass roots level - pardon the pun - there felt like a gathering of momentum in the level of interest in soil health. What approaches for reinvigorating a farmer's interest had proven to be successful elsewhere in the world?

Conclusions

No single mechanism if implemented alone will reinvigorate interest in soil health. A combination of regulation, knowledge transfer and financial rewards is more likely to engage the broad range of farm type and farmer personalities.

Regulation must be enforced so that it can be, relied upon to address poor practice which impacts negatively on the environment. Its presence can encourage the adoption of innovative solutions which result in more resilient businesses.

Financial incentives may engage an audience but it can also create a mind-set of only following good practice if you are paid for it. Instead financial benefits should reward, or be a happy consequence of, good practice.

The role of facilitation is essential for effective knowledge transfer and farmer empowerment. Promotion of "leading" practice through discussion groups, peer-to peer, on farm events, and short videos will enhance the cascade of enthusiasm from early adopters.

Only those who have changed can explain how they overcame the barriers. Much resource can be wasted chasing the 20% who don't willingly engage when much more can be achieved with the 80% who do. Resources and effort should be prioritised accordingly.

Recommendations for re-engaging farmers with their soil Research should focus on quantifying the benefits of healthy soils in order to equip those who engage with farmers with the tools to win over hearts, minds and wallets. This will also inform the wider landscape and societal benefits that agriculture provides and may identify innovative funding streams, for example ecosystem services. Researchers must utilise existing networks to disseminate relevant findings.

Legislators must proactively engage and consult the agricultural community over new regulations, especially the drivers and consequences in relation to their own business. The agricultural community must not shy away from taking ownership of the issues the regulations seek to address and ensure credit is given for improvements made. There is need for an independent soil health initiative to promote the benefits of a range of approaches rather than segment itself under one, e.g. holistic or organic, to ensure it can engage a broad audience.

Thread soil health principles across multiple streams of governmental policy rather than just agriculture. Distil and disseminate relevant research in a user-friendly accessible format. Engage the wider public over the importance of soil and its associated health benefits to ensure long term behaviour change of consumer habits and improve understanding of our farming systems. Those in charge of initiatives proactively engaging with farmers should develop their role as a Facilitator rather than considering themselves to be an Educator. Empowerment of leading/host farmers will allow for the cascade of enthusiasm to occur with ideas and practices shared peer to peer.

Recommendations for farmers wishing to re-engage with their soil "As to methods there may be a million, but principles are few. The man who grasps the principles can successfully select his methods..." This quote from Ralph Waldo Emerson must be considered when addressing soil health issues. There is no 'magic bullet' product or practice that will cure degraded soils. Once the cause and effect of said degradation is understood methods can be chosen to correct it. Be mindful of what your personal barriers to change are so that if they are restricting progress you will be able to identify this and rectify it.

Change does not occur over the short term and support during the process is essential. Involving family and/or friends in the process establishes a valuable support network. Sir Isaac Newton used the phrase "Standing on the shoulders of giants" and this is recommended for those adopting new techniques. Learn from those who have already implemented them successfully; involvement with innovative groups and taking advantage of key alliance opportunities can ensure the transition is less challenging.

Think of soils as a bank account; whatever we take out with cultivations and cropping we need to replenish with grazing, manures, chopping straw, cover crops. Understand the cost-benefits of good soil health so that funding opportunities are a consequence not a driver of change.

Heavy machinery have impact on the soil

Is it Muscle or Machine the Future of Agriculture in Africa?

it is clear that Sub-Saharan Africa can no longer rely on human muscle power to feed its growing population. It is essential for decision-makers and the development community to take a new look at the opportunities available for mechanizing agriculture in Sub-Saharan Africa.

Most of Sub-Saharan Africa's (SSA) economies are dominated by the agriculture sector. On average, agriculture accounts for 32% of gross domestic product and employs 65% of the labor force. In some countries, it contributes over 80% of trade in value and more than 50% of raw materials to industries.

But despite being a crucial sector in many economies, agricultural productivity on the continent is very low. Yields of maize and other staple cereals have typically remained at about one ton per hectare - about 1/3 of the average achieved in Asia and Latin America. During the past 30 years, the competitiveness of many Sub-Saharan Africa export crops has declined and the region's dependence on imported food crops has increased. In the years ahead, global warming is expected to intensify the current constraints on food production. Is the lack of mechanization the Achilles heel of African agriculture?

The greatest source of power for land preparation in Sub-Saharan Africa remains human muscle power. In Central Africa an estimated 80% of cultivated land is worked manually while in Eastern and Southern Africa, that figure is about 50%. On average, less than 20% of mechanization services are provided by engine power in Sub-Saharan Africa.

Furthermore, Sub-Saharan Africa is the only developing region where the number of agricultural workers per hectare is no more than half of the average for all developing regions. Not only does Sub-Saharan Africa have an acute lack of human resources available for agricultural production, it also has very few tractors available as an alternative source of power. Taking the number of four-wheel tractors as an indicator of advancement in mechanization, FAO reports the following trends over the past 40 years.

• In Asia, the tractor numbers increased five times between 1961 and 1970, from 120 000 to 600 000 units. Thereafter the number increased by 10 times to 6 million units by 2000. Since then, numbers have continued to increase, especially in India, which had 2.6 million tractors in 2010, and China which reached over 2 million units by 2008.

• In the Latin America and Caribbean region, tractor numbers increased 1.7 times between 1961 and 1970, from 383 000 to 637 000 units and thereafter tripled to 1.8 million units by 2000.

• In Sub-Saharan Africa, the trend has been rather different. In 1961, the number of tractors in use was more than in both Asia and the Near East (at 172 000). After that the number increased slowly to peak at 275 000 by 1990 before declining to 221 000 by 2000.

Experiences in other continents and especially in the developing economies of Asia and Latin America show that agriculture has been transformed in recent years into a progressive, more productive industry. Investments in irrigation, fertilizer and high-yielding varieties went hand in hand with increasing power inputs, mainly in the form of tractors for land preparation and diesel engines for irrigation. This has enabled farmers to intensify production and improve their quality of life as well as contribute to national and local prosperity.

Meanwhile, in most of Sub-Saharan Africa, where farming systems were more complex across variable agro-ecological zones, quality seed and fertilizer were not backed by irrigation support or mechanization inputs. Sub-Saharan Africa was therefore largely bypassed by the Green Revolution that helped transform agriculture and reduce poverty in Asia and Latin America.

The evidence is incontrovertible: Higher levels of mechanization are linked to economic growth, improved farm productivity, higher incomes and greater food security. But mechanization is no panacea: If not done right, it can potentially burden small farmers with machines they can't afford or maintain and tools that eliminate jobs and disempower wage earners. It can also harm the environment by increasing pressure on fragile natural resources, driving soil erosion and compaction, prompting overuse of chemical inputs and encouraging farmers to farm lands that currently serve as valuable forest and rangelands. So any sort of move towards mechanization will have to be done in a careful, considered way to ensure that it brings positive, rather than negative, outcomes.

Nonetheless, it is clear that Sub-Saharan Africa can no longer rely on human muscle power to feed its growing population. It is essential for decision-makers and the development community to take a new look at the opportunities available for mechanizing agriculture in Sub-Saharan Africa. 'Hello Tractor,' a Nigerian social enterprise that allows farmers to request affordable tractor services via text message is one promising and innovative approach. Indeed, there is much that can be done to make Sub-Saharan Africa's agricultural development and food security policies, strategies and programs "mechanization-smart" and promote interventions to support efficient, lean and environmentally-sound mechanization.

Thomas Kipkorir: Visionary and Inspiring

"He is passionate about his work because it fills a large part of his life, and the only way to be satisfied is to do what he believes is great work. And the only way to do great work is to love what he does," says the Country Manager Crop Protection and Public Health business at **BASF**.

Briefly discuss Thomas Kipkorir (Background and Professional life to your current position)

Thomas is the Country Manager, Crop protection and Public Health business at BASF. Before joining Basf East Africa Ltd, Thomas worked for Amiran Kenya Ltd (2012-2013), as the Cereal Manager in-charge of all large and medium scale farms in Timau, Narok, Nanyuki, Eldoret, Nakuru, Naivasha and all Adventure groups of farms in the country.

Before joining Amiran, worked for Hygrotech East Africa Ltd (2003 – 2011) as the Regional Manager in charge of Western Kenya region in charge of Cereals, Corn, and Coffee, Sugar cane, Ornamentals and vegetables business.

Thomas's ambition is to be part of a proactive, dynamic, diligent team that defines plans, develops, and provides efficient and effective management strategies to business enterprises. His personal skill includes proven managerial ability, excellent numeric and analytical skills, good organizational skills, excellent interpersonal and leadership skills, ability to manage cross cultural teams. He also has good writing skills, ability to draft projects/research proposals. Thomas has a Master of Science in Agricultural and Rural Development from KeMU, Bachelor of Science in Agriculture (Production Option) and Diploma in Management & Administration from Cambridge, Diploma in Veterinary Science Assistant from Thomson College.

How would you describe your time as Country Manager- Kenya, Crop Protection and Public Health Business? Are you passionate about what you do?

The post of a Country Manager is a great responsibility, but this is also a grand opportunity to demonstrate all I have learned. I am truly passionate about my work because my work fill a large part of my life, and the only way to be satisfied is to do what you believe is great work. And the only way to do great work is to love what you do as famously said by Steve Jobs. It's my desire to use the skills and knowledge I acquired through training, education and work experience so far, to achieve and surpass organizational goals and objectives while developing the same skills or new ones in response to the challenges the organizations or environment may present in the course of the work.

In a nutshell describe BASF products and services to the farmers

BASF's Crop Protection division is a global leader in crop protection and a strong partner to the farming industry providing well-established and innovative fungicides (Swing®, Abacus® and Osiris®) insecticides (Fastac) and herbicides (Stomp CS®, Basagran® and Integrity®). BASF is committed to supporting the farmer discover his potential in farming by offering innovative solutions in crop protection.

BASF offers solutions and not merely products. We are constantly exploring new frontiers in crop protection to meet the demands of the growing world population. Farmers worldwide use BASF's solutions and services to improve crop yields and crop quality. Other uses include public health solutions, structural/urban pest control solutions, turf and ornamental plants, vegetation management and forestry.

BASF aims to turn knowledge rapidly into market success. The vision of BASF's Crop Protection division is to be the world's leading innovator, optimizing agricultural production, improving

nutrition, and thus enhancing the quality of life for a growing world population. It is the reason that we celebrate our farmers by recognizing that Farming, is the biggest job on earth. We are supporting agriculture to enable increasing production of enough food for the burgeoning world population estimated to reach 9 billion by 2050. This figure has sent food experts to the drawing board with a warning that current production methods are not compatible with the required high farm productivity. Without technology, food production becomes a herculean task explaining why BASF is supporting farmers to access innovation, solutions and experts to enable them to improve productivity, increase efficiency, and stay at the cutting edge of their profession ensuring growing demands are met, year after year.

Briefly discuss cereal farming in Kenya.

Wheat farming dates back to the colonial era when Lord Delamere introduced it on experimental basis in Nakuru. Wheat is the second most important cereal grain in Kenya after maize. It is largely done for commercial purposes on both small and large scale farms. Small scale farmers grow wheat in small areas of less than 50 acres and large scale farmers grow on more than 50 acres of land. Furthermore, large scale farmers are more mechanized in wheat production compared to small scale farmers. The large scale farmers dominate wheat production with a share 70% of wheat area and 80% of production. The main wheat growing areas in Kenya includes Narok, Nakuru, Eldoret, Naivasha, Kitale, Nanyuki, Timau, Meru central and Trans Mara.

Wheat production has however declined over the years due to high production costs, high capital costs, lack of credit for production, and the low level of technology-adoption in wheat production. Kenya has had to rely on wheat imports to meet the and regional demand for wheat and wheat products. Increased wheat imports have led to further decline in wheat production because imports dampen domestic prices, which disincentive to production. Kenya's exports of wheat products have also faced increased competition because of the high cost of

Mr. Thomas Kipkorir

domestic wheat. These factors combined could lead to collapse of the domestic manufacturing industry and consequently loss of employment and livelihood of many Kenyans.

Where do you see the cereal sector globally in the next 5 and 10 years from now? How is BASF prepared for this change in the industry?

Cereal sector space is diminishing due to exponential population growth rate which reduces production land for settlement purposes. And also climate change is an issue. At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility.

Lately we have seen a more aggressive Cereal sector, what can you attribute this to?

The Common Market for Eastern and Southern Africa (COMESA) region, with a population of about 400 million people, provides a large market for Kenyan wheat products.

Where do you think the most significant growth will occur in the cereal sector in the next few years?

The main area of growth will tilt towards value addition (processing) and diversification i.e. more use of wheat by – products.

What's the biggest challenge YOU feel the cereal sector faces, and how do you inspire growers to meet it head on?

Marketing of wheat for better prices in face of stiff import competition. I personally inspire my farmers to form groups or associations to enable them pool together for a better bargaining power.

How do you compare cereal farming in Kenya with the rest of the region and globally?

Kenya has a comparative advantage in the export of wheat products into East and Central Africa region due to well established milling infrastructure and a good transportation network.

Competitiveness of wheat production in Kenya indicates that Kenya does not have a comparative advantage in wheat production compared to major world producers like China, Canada, Australia, Argentina, and United states. It is therefore apparent that with world globalization in trade in wheat and other commodities, domestic wheat production is not competitive and Kenya will have to rely more on imports to meet domestic and regional demand for wheat and wheat products.

What do you think should be the vision for the cereal sector?

The focus and vision on policy should be relaxing constraints in wheat production, manufacturing, and marketing of wheat products in the domestic and regional markets.

What should be the top priorities for the sector for (Growers, Government, Suppliers, and Market)?

The private and public sector have to come together to address factors that hinder productivity and profitability of wheat and wheat products.

What is your personal work ethic, and how does this affect the company culture?

As the common adage goes "Team work allows people to share their ideas, leverage the inputs of different thinking patterns, and discuss the viability of such ideas in the light of diverse experience of the different team members. The results of such joint actions are greater than the result of individual actions taken separately. Thus team work allows people to pool their talent, resources, and insight for mutual benefit.

What decisions have you made in your career that you look back on and feel where mistakes and what have you learned from them?

I used to despise people who criticise me when I decided to pursue a Management & Administration course. But I learnt that criticism is part of learning and growth. It means that you are taking initiatives to learn something new and grow over from your current state. If you are not getting criticised, it means you are not taking enough risk to learn something new and to grow. At present the skill I learnt are very vital in my current role.

Discuss the most pivotal moments in your career that you either learned from and/or that got you where you are?

I know you have heard it a thousand times before. But it's true – Smart

Mr. Thomas Kipkorir greets Agriculture CS Mr. Willy Bett

work pays off. If you want to be good, you have to practice, practice, and practice. If you don't love something, then don't do it. I am always prayerful, professional, polite, passionate, purpose driven, punctilious, pristine, punctual, promising and above all practical. These has contributed enormously to my growth.

Describe your ordinary day? Do you have enough personal time?

I make sure to be ready and out the door so I can get to work at least 30 minutes before start time, that way if there are delays such as traffic I am still on time for any meetings or important tasks. I check my calendar, then plan my sit down work time around other things like meetings, emails and calls.

I always create quality time for myself after work to relax and to tune out. And do something different. My best ideas often pop-up when I am most relaxed and free thinking mode.

Other than proffessional service, what else do you extend to the community?

If you allow me to quote Martin Luther King Junior- He once said the greatest question on earth is what have you done for others? Am involved in mentoring young upcoming proffessionals and talking to university students on crop production and crop protection.

Give your final comments.

The best way to not feel hopeless is to get up and do something. Don't wait for good things to happen to you. If you go out and make some good things happen, you will fill the world with hope, you will fill yourself with hope.

Full of smiles as Women enjoy their harvest

Farmer Training Session

Why are Farmers Poor if Agriculture is Kenya's Golden-egg Layer?

Kenyan farmers produce enormous wealth for the country yet are largely poor. They must reject the farming model that keeps them perpetually poor, indebted, frustrated into alcoholism, domestic violence and seek trade justice crops grown on African farms are sold in retail outlets in Europe and the Middle East, while the aroma of coffee, tea and cocoa grown in her fields fills the air in most coffee and confectionery shops, outside of which the scent of flowers grown with her water fills the sidewalks.

Yet, the African small scale farmers that produce these valuable products of perpetual global demand are poor - food insecure, living in dilapidated dwellings without adequate water or sanitation, unable to pay for health care or education and unable to retire from farming as they lack a pension and other social protections. While Kenya exports coffee, tea, flowers and other horticultural produce, many Kenyan households, including those of small scale farmers are food insecure – cannot afford three meals a day. 30 percent of Kenya's children are malnourished and Kenya is a net importer of good crops, mainly grains such as maize, rice and wheat.

Most of Kenya's adult population has grown up being taught that agriculture is the backbone of Kenya's economy. The fact that agriculture employs three in every five people in Kenya (60 percent); accounts for 27 percent of Kenya's GDP and contributes more than 50 percent of the export earnings (1) means that the importance of agriculture to Kenya's economy cannot be overemphasize. It is what it is; a particularly important aspect in the lives of every Kenyan.

So why are small-scale farmers, the majority of Kenya's farmers, poor and one in three of her children malnourished? Why has the agriculture budget been consistently below 5 percent despite government's commitment in the 2003 Maputo declaration to raise its allocation to 10 percent? Who is growing the cash crops that make up 50 percent of Kenya's earnings? If it is the small-scale farmer that is growing these agricultural exports why don't the livelihoods of small-scale farmers reflect having earned 50 percent of Kenya's export earnings?

High Produce Prices in the Local and International Markets Still Leave Farmers Poor

A 2012-3 study titled "Global Financial Markets and the Right to Food: A Focus on Small and Marginal Coffee Producers in Kenya" found that even in times of highest coffee prices in the global market, small-scale farmers get no significant improvements in their livelihoods. This begs the question – where is the money from the sales of Kenya's coffee going if livelihoods of small-scale farmers are not improving?

The report says that this contradiction of farmers that grow a globally valuable product being poor is explained by price volatility; farmers limited understanding of global supply chains; lack of information on pricing; increasing costs of inputs; delays in payments and the huge number of players (read brokers) between the farmer and the retailer who must 'eat' before farmers eat; the soaring food prices, all of which result in high levels of debt among small scale farmers. So why are farmers in debt – at the schools their children attend; unable to pay hospital bills for family members that fall sick and with huge chunks of their coffee bonuses being hived off to offset debts? There are various ways in which small scale farmers lose their money.

Small scale farmers of the various cash crops grown in Kenya – coffee, sugarcane, vegetables, rice, etc receive seeds from millers, the cooperative or the exporting company. They must later pay for them at prices they did not negotiate as there appears to be no standard price for the research that goes into developing the right seed. So farmers pay what is charged as the seeds are advanced to them at the start of the season, and the un-negotiated seed price deducted months later (often at an interest) from the money that should have been paid to each farmer. They have to pay for the seeds whether or not they produce the expected yield. Low productivity is blamed on the farmer's laziness or careless agricultural practices rather than on

the seed quality. Even the most diligent of small scale farmers cannot win this argument as s/he cannot adduce the evidence to show that she grew the seeds as directed.

Farmers, particularly those growing horticultural produce such as green beans, snow peas etc also receive soil testing and technical advice on which seed to grow; fertilizer or pesticide to use. However, this advice is often not from the Agriculture extension officer whose salary and benefits are paid for by tax payers, but in most cases from a technical adviser employed private companies that export the produce. It follows that the small-scale farmer is paying double for agricultural extension services. First, small scale farmers as taxpayers are paying Value added Tax (VAT) each time they buy seeds, fertilizer, pesticides, any food stuff or other commodity they use buy their homes. They are also paying for licenses and various services and are taxed before they are paid for their produce. So there is no doubt that small scale farmers make up the taxpayers that contribute to the GDP, which explains the statistic that says that over 45 percent of Kenya's Gross domestic product (GDP) is from agriculture. Despite having contributed close to half of their monthly pay, the agriculture extension officer doesn't show up to advise the farmer; granted that often it is due to lack of transport or poor supervision. Secondly, when a private company sends a technical adviser to the farmer to offer the same advice that an agricultural extension officer should have given, the cost of this advice is hived off before the farmer is paid for her produce.

So it would be interesting to know how much of the Ksh59.3billion allocated to agriculture in Kenya's 2014-5 budget was intended to go into counties for the purchase of vehicles to take agricultural extension officers to the farms of individual and groups of small-scale farmers; or to set up demonstration farms in one of their farms. Interestingly, none! The expectation is that agricultural extension officers together with doctors, nurses, water engineers and all public officers delivering services that have been assigned to County governments will be paid from the meagre 21 percent of the 2014-5 budget that that will shared by all 47 Counties, which is also expected to buy vehicles for the extension officers and fuel them. The Ksh59.3b will go into national government projects on agriculture – such as the Galana project, improving irrigation, coordinating the agriculture sector etc.

The story is the same even for small scale farmers that grow produce for the local market. Kenya only grows half of the sugar and one third of the rice that it requires to satisfy the local demand. One would expect from the laws of supply and demand that farmers who grow a commodity that is in low supply and high demand to be rich, but this is not the case. Even sugarcane and rice farmers are poor; unable to build permanent houses or install piped water or electrify and improved pit latrines on their farms; with children that are frequently chased out of school for parents' inability to pay the levies charged even in public schools or pay medical bills for family members hospitalized.

Small scale farmers must know the true value of their produce and learn to approach farming as a business that must break even – do the maths.

Cost of Marketing Agricultural Produce

Small-scale farmers do not know who in Europe or the Middle East eats their vegetables or drinks their tea or coffee; or who sells it there and how it gets there. What is clear, though hardly ever discussed is that by the time the farmer is paid Ksh70 - 140 for a kilo of coffee delivered; or Ksh 35-100 for a kilo vegetables, the petrol or jet fuel cost of transporting the produce has already been deducted; the drivers paid and workers who pack the produce for the retail market paid; the packaging material paid for; export taxes in Kenya paid and tariffs or taxes charged by Countries that import Kenya's produce and the shareholders of the private company with which they have a farming contracts paid their profits. All these are costs that are paid for before the small scale farmer is paid. Should all the produce transported not be purchased or its quality drop due to delays in transit, the value of this loss is first deducted as a cost of doing business before the farmer is told how much s/he will get for a kilo of her produce.

This explains the statistics say that two in every three people in Kenya (over 60 percent) are employed by agriculture. It is in reference to the self-employed small scale farmer that owns the land and grows the produce, the extension workers – private or public that give technical advice, the drivers or pilots that transport it, packaging materials and workers, produce inspectors, the brokers or shareholders of the companies that export the produce, government officers employed both at national and county level etc. all of whom are paid with the small scale farmers sweat. The only problem is that the farmer earns the least – less than the driver or even the security officers that guards the brokering companies' premises.

Cooperatives Respite For Members?

Where her produce is sold by a produce marketing cooperative in which s/he is a member, instead of by a private company with which s/he has a farming contract, the produce price paid to the farmer is not any higher. Members of agricultural produce marketing

cooperatives appear to be getting poorer not richer; losing assets bought jointly rather than gaining profits; members being indebted rather than receiving dividends.

Kenyans must ask themselves the difficult question of why private and public companies appear to deliver more profits for shareholders than cooperatives and out grower institutions involved in exactly the same business. It would appear like the definition the term 'cooperative has slipped to mean 'a badly run company that takes from shareholders rather than generates profits for them; the opposite of a company'.

Even after doing it many times with the same result, government continues to 'rescue' farmers from debt bondage by using public funds to pay 'cooperatives' and other shylocks in the name of offsetting debts owed by farmers. This is almost always done just before elections. On receiving the funds, the money lenders release peasant farmers' national identification documents so that they can register as voters. The payment is almost always followed by the head of the cooperative, broker or money lender resigning to 'enter into politics'. It is time to admit that all the 'rescue' and 'reform' initiatives done in this sector decades are not working. Since government has always had its hand in the cooperatives, maybe it is time to try a different model; get government out of the cooperative and instead leave it to play a regulatory role. Or better yet, convert all cooperatives into companies, and apply the same stringent governance requirements in the hope of a different and better result.

Seeing the Big Picture of Agriculture As the Golden-Egg Laying Goose

Agriculture and specifically, coffee and all the crops for the local and export market are the golden-egg-laying-goose for Kenya. Too many people in the economy earn from it. For national government agricultural exports improve the balance of trade and generate foreign exchange. By supplying local retail markets, small-scale farmers improve the national statistics on food security and employment by simply ensuring that supply is high enough for food prices to be within the reach of all. Small-scale farmers thus give Kenya higher ratings on human rights indices such as the MDGs as performance on Goal1 (reduce poverty by half the rate it was in 2000) uses employment and food security as indicators and most of the other seven goals rate access to the very things (human rights) that small-scale farmers would be able to pay for and access if they were justly remunerated for their produce.

If small-scale farmers do not make enough money to meet their basic needs and live in dignity, they will be forced to abandon farming and look for other jobs, thereby increasing the rate of unemployment. Kenya will continue to import maize, rice and sugar. Food prices will continue to rise, decreasing the number of people that can afford 3meals a day. They will assert more pressure on public amenities. Inflation will rise as Kenya spends its meagre foreign exchange on importing foodstuff that can grow locally rather than on equipment and services that create new jobs. It is therefore in government's best interests (both national and county governments) to look out for the best interests of small-scale farmers.

While government has spent large sums of money to train youth as entrepreneurs, the training does not effectively focus on encouraging youth to venture into agribusiness. Even when training is offered to farmers, it is rarely transformative because it does not comprehensively cover content that would support small-scale farmers to deal with their real challenges namely – their limited understanding of global value chains, lack of pricing information and ICT services, lack of skills to help them organise and govern cooperatives and other farmer organisations better. The result is always the same; – farmers' inability to cut out the middleman or reform their cooperatives. If anything, by paying off cooperatives and shylocks and coming up licensing procedures (e.g. under coffee) that widen the gap between the farmer and the produce retailer, government is complicit in the disenfranchisement of small-scale farmers.

> "County governments must motivate and supervise agricultural extension officers to ensure that they actually show up on farmers and advise farmers."

A Budget Policy to Keep Kenya's Commitments

A decade ago, Kenya was part of many African governments that made the Maputo Declaration and its platform for action. In it African Governments committed to spend 10 percent of their GDP on improving agriculture. The Ksh 59.3billion allocation to agriculture is only half of what was Kenya for its part committed to spend on this sector. Unless Kenya develops a budget law and policy that compels it to adhere to such commitments, the funds allocated to agriculture will fluctuate from year to year and never achieve the grand plan that was intended.

Wheat grown in Kenya

Under devolution's subsidiarity principle funds must follow functions. It follows then that having the agriculture function under county governments' means that requisite funds ought to be allocated to county governments for service delivery. This service delivery money is intended for buying equipment (e.g. vehicles for the agriculture or livestock extension officer to access farmers) or supplies (e.g. gloves or syringes for the local dispensary); and for paying technical staff performing all the functions devolved to counties i.e. agriculture, livestock and fisheries officers, environment, water and sanitation engineers, soil scientists, veterinary officers and other public officers. Small-scale farmers also pay CESS and other service charges. Essentially, the only reason why County Governments get fund allocations from national government and are allowed in law to collect revenue is because they deliver a service. If agricultural extension officers are not visiting and advising farmers, and there are complaints on service delivery in health and water sector, it defeats the purpose or rationale of having devolved government. County Governments must be careful not to make themselves irrelevant by not delivering the services they were created to deliver. All in all, it is the best interests of County Governments to promote the service delivery - best interests of small-scale farmers. County governments must motivate and supervise agricultural extension officers to ensure that they actually show up on farmers and advise farmers.

No Fertilizer Made in Kenya 50 Years After Independence

Five decades after independence, Kenya still imports fertilizer and pesticides despite the phrase 'Agriculture is the backbone of Kenya's economy' being in each year's Madaraka and Jamuhuri Day speeches and more recently in the state of the Nation and State of the County address. None of the Ksh 59.3 billion allocated to agriculture in the 2014-5 budget appears to be for the building of an fertilizer processing plant in Kenya. No one has been prosecuted for 2-3decade old corruption scandals for misappropriation of funds intended for this purpose at the time. So far, none of the 47 County governments have in their first two years' budgets or strategic plans included proposals to establish a waste treatment mechanism that can generate fertilizer or offered incentives to private corporations to do so.

ICT Challenge

One of the reasons why there is such a huge disconnect between small scale farmers and those who retail their produce in local or international retail outlets is their lack of access to market information and particularly pricing information. Farmers receive less than 20 percent of the price of their produce – Ksh 140 per kg of coffee is paid to farmers, yet its price at the Nairobi Coffee Exchange is Ksh 6-800 per kg, while still largely unprocessed. A cup of good coffee, hence one teaspoon (5gms) of coffee goes for Ksh2-300 in Nairobi. Yet the International Coffee Organization (ICO) and many other websites publish the weekly and even daily prices if coffee in the international market. Farmers, including those with internet enabled mobile phones do not have this information. Farmers' trainings, the digital villages and M-FARM concepts appear not to be telling farmers what they need to transform their lives.

Farming As A Lifestyle Not A Business

Finally, small scale farmers must also begin to see farming as a job – employment that must be gainful for all those it employs. In most of the households of small scale farmers, land is owned by the male head of the household, who often does very little or no actual farm work. The day to day crop production work is done by women and their post teenage children, many of whom have dropped out of school, or by hired casual labourers under the supervision of women.

If a sugarcane farmer receives a cheque of Ksh 300,000 for cane that has taken 2 years to grow and be harvested, it means that s/he has been paid a monthly salary of Ksh12,500 per month in those 24months. If he and his wife and two other unemployed adult in the family worked on the cane, it means these four adults are each earning about Ksh 4,000 a month. This barely puts such a family above the poverty line pegged at USD 1.25 per day (about Ksh 3250 per month) and less so if any of these adult children are married and have children too.

Small scale farmers must know the true value of their produce and learn to approach farming as a business that must break even – do the maths. Hopefully doing such maths will result them getting angry enough to bother to learn about global value chains, track produce prices on their phones, demand better governance from the cooperatives, build warehouses, cooling plants and local jaggeries to either store or mill their own produce until they can get a better price for it from the broker.

However, even before it becomes unacceptable to government for its producers to pull down Kenya's poverty ratings, farmers themselves must reject this business or farming model that keeps them perpetually poor, indebted and frustrated into alcoholism, domestic violence and other ills through which producers' poverty is manifesting in Kenya today.

EXPERTS BLAME POLITICS, INEFFICIENCY

For Galana Project Failure

Transfer of most services to the county provided a great opportunity to transform small-holder agriculture

High costs due to inefficient use of fertiliser, water and land as well as political wrangles between the national and county governments could have contributed to the dismal performance of the Galana Kulalu. The one-million-shilling Galana Kulalu food security project that straddles Tana River and Kilifi counties managed a paltry ten 90kg bags of maize per acre on the 10,000-acre model farm - a far cry from the 40 bags that had been expected from an acre.

A 40-bag harvest of maize from an acre at Galana scheme would have surpassed the national average of 17 bags that farmers in the country's grain basket of Rift Valley harvest from the same size of land.

Agricultural Policy and Development, experts, say that plot level factors such as inefficient use of land, fertiliser and water as well political economy issues such as irrigation governance conflicts between the national and county governments, procurement flaws, changing of projects costs and non-inclusive prioritisation, might have contributed to the poor yields.

Dennis Otieno, a research fellow at Tegemeo Institute, said that they did a study on new irrigation schemes being developed in Kenya with a special focus on maize production. "In our study we found that the average output from an acre of land was 11 bags per acre, which was very close to what was obtained from the Galana Kulalu," said Dr Otieno.

They found that irrigated maize is profitable, viable and sustainable and that positive cash flows are reported within the investment period. The study also found that most farmers, about 73 per cent, were willing to pay for irrigation services and water as the value they got from using water was much higher than the costs they incurred.

Disagreements

However, they found a production gap of up to 71 per cent due to crop level inefficiencies in the use of water, land, and fertiliser. The researchers found that fertiliser was excessively utilised while water and land were under-utilised.

There were also issues with investment prioritisation with disagreements ranging from whether a project should be developed to benefit individuals or the society; whether to grow maize or raise animals under pastoralism; and when using resources like water, how to price it?

Besides irrigation, the Egerton University-linked research institute also looked at the impact of land scarcity, climate change, input intensification, crop insurance, subsidy programmes, extension services and devolution on small-holder agriculture. The study found transfer of most services to the county provided a great opportunity to transform small-holder agriculture; that crop revenue including that from tea and maize are significantly affected by persistent climate variability and change.

The report also found the need to suggest awareness and training on crop insurance. On targeted input subsidy programmes, the analysts emphasised the use of existing private-sector input distribution mechanisms, which will encourage private sector participation and reduce distortionary effects of subsidies and private fertiliser.

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Description

AZIMUT 320 SC is an agricultural systemic and translaminar fungicide for the control of yellow rust and stem rust in wheat.

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MIXING AND TIMING OF APPLICATION

Crop	Stage	Rate/ha in 200 L of water	Rate/20 L of water
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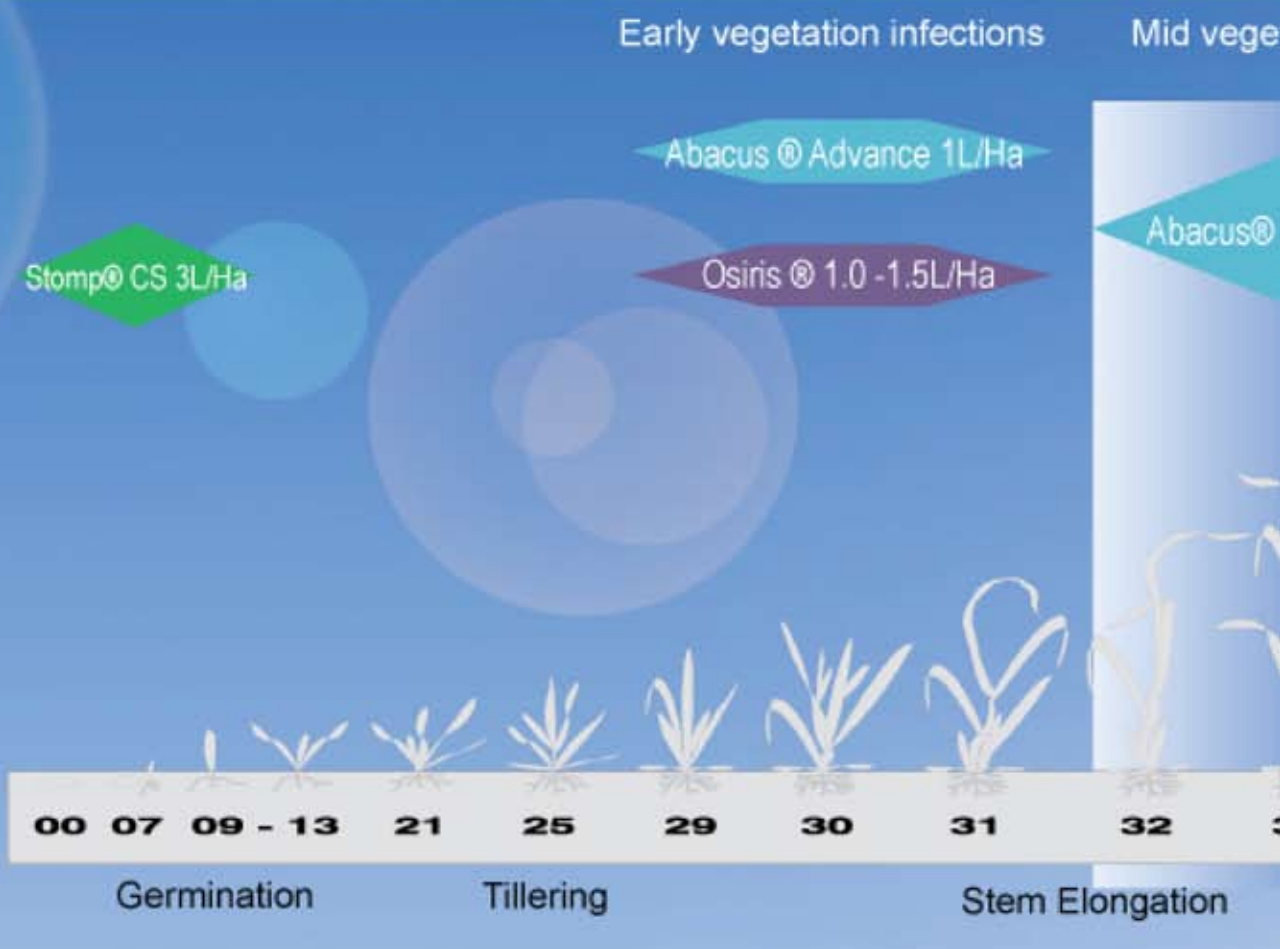

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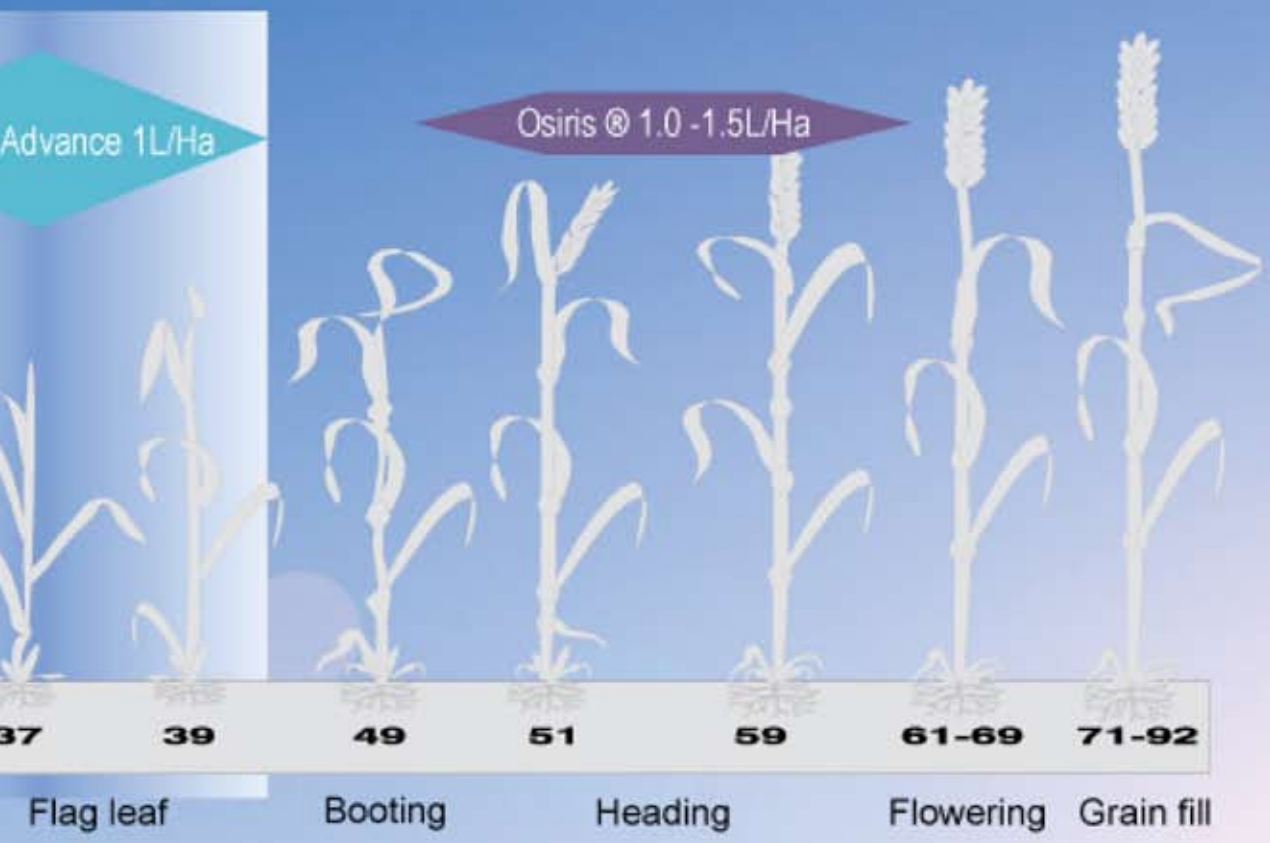

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Building
A Sustainable Farm Business

A sustainable farm business needs people with passion, energy, skills and knowledge.

1 Tell our story and celebrate our industry

While there are numerous problems and glaring disparities, farming is a career and way of life full of heritage, great people and promise. No other industry delivers so much; from food and fuel to fun, flora and fauna. While the industry has borne the brunt of much criticism over the years, and quite rightly so in many cases, we also have many of the answers to society's ills at our fingertips - there are great opportunities ahead if we work together. Let's tell our story and celebrate. It is easy to forget, when bogged down in mud, paperwork or routine, how wonderful and colourful farming is sometimes. Travelling has reminded me why I love farming.

2 Put soil health first

The clearest conclusion is the importance of soil health. Without a fully functioning soil we do not have the foundation for a sustainable farm business. Without good soil management our yields will not meet the needs of the future. While this is recognised in all the countries there are still practices. We must do more for soil organic matter, and improve our understanding of bacterial and fungal activity. Minimal tillage, cover crops, composting and better rotations that include grasses and herbs, are all crucial. And improved soils must span all labels – whether organic, biological or conventional – with the use of natural and agro-ecological processes being the norm.

3 Celebrate the role of small farmers

Small farmers across the globe deliver so much. The smaller farmer remains the bedrock of the industry and of fragile rural communities. Their production is not fully captured by traditional GDP measures, and associated economic and social multiplier effects are complex. To avoid a spiraling crisis of participation we need to celebrate and support the role of small farmers and seek more eyes per acre.

4 Nurture people

It is often easy to overlook the role of human capital in a farm business. Without good people a business is nothing. A sustainable farm business needs people with passion, energy, skills and knowledge. We need people who are prepared to work hard for just reward and progression. A sustainable industry needs leaders with vision and inspirational communication and management skills. The most impressive businesses engage with others at all levels. The best programmes and policies understand stakeholders' motivations and leverage points. "Building a Sustainable Farm Business"

5 Seek outcomes not output, effectiveness not efficiency

If we measure the wrong things we get the wrong answers and develop the wrong strategies. I have seen too many businesses

focus on output (tonnes per ha, litres per cow etc.) at the expense of outcomes (net profit, improved soil, happier workforce etc.). Drives for efficiency and economies of scale, such as larger farmed units with a simplified system, can result in a reduced set of outcomes. A sustainable farm business will seek balanced economic, environmental and social objectives and targets using a more holistic approach. A sustainable food and farming policy will consider the range of public goods and not just focus on food security. A change of mindset is needed here.

6 Build diversity and complexity

For too long we have followed reductionist science and policies of specialisation. We need diversity of farm types, entrepreneurs and enterprises within farms. We need a diversity of plants in our farms providing different rooting depths and nutrient attributes. We need a cropping and habitat mosaic not based on over-simplified prescriptions. We need biodiversity – from pollinators and earth worms, to rare breed genetics. We need a diversity of people. Diversity and complexity brings increased resilience (to, for example, climate change) and economic, agronomic, environmental and social benefits.

Regenerative agriculture can rebuild soil, enhance habitats, strengthen rural communities and create new business opportunities.

7 Seek regenerative agricultural systems

Our soils, ecosystems, biodiversity and natural resources are being continually depleted. We are far from achieving a sustainable level of existence and development. Our priority should be economic growth and basic food security. To help turn we must move away from simplistic policies based on sustainability and the status quo. We must be bold and seek and support regenerative systems - practices that put more back than they take out. Regenerative agriculture can rebuild soil, enhance habitats, strengthen rural communities and create new business opportunities. Organic farming approaches are key here but conventional technologies and innovation play a role too.

8 Move to a true cost paradigm

It can be said that it is more profitable to farm unsustainably than it is to farm sustainably. The drive for cheap food is forcing this race to the bottom. The external costs of our food system are passed on to others or ignored. We need to develop a new system, a true cost paradigm, that places fair monetary value on the benefits and impacts of different farming and food production systems. We should introduce policies that correct damaging practices and support the development of systems that deliver positive environmental and public-health outcomes. "Building a Sustainable Farm Business"

Industry

a) We need to work with all farming, food and environmental stakeholders to develop a new integrated food and environment strategy with regenerative agriculture and soil at its very heart. Food security goals should not drive this strategy – output should be balanced with the diverse range of economic, environmental and social outcomes. The strategy should seek a new partnership between local consumers and producers, nurture people within the industry and celebrate the smaller farmer.

b) The industry should work together to develop a new support mechanism for farmers that rewards the provision of valued environmental and social public goods. New models of delivery should be considered and a true cost paradigm introduced. The scheme should be based on results (those providing the most public goods receive more) and be simple, practical and value for money.

c) Industry should work and support rural entrepreneurs promoting diversity of enterprise, cooperation and good leadership. Particular emphasis should be placed on developing new enterprises that draw on and build (not deplete) natural and social capital, for example, local food initiatives, appropriate renewable energy schemes, agri-tourism/eco-tourism projects and educational activity.

d) Industry should press for improved food legislation and labelling, backed by an industry campaign, to help consumers choose, value and pay the true cost of produce of defined quality.

The Government

a) Government and wider industry, should lead the development of strategies and support mechanisms that reward multi-functional and regenerative agriculture. Whereas the industry should not focus on food security at all costs, it should seek a range of outcomes too.

b) Government should be bold and innovative, and trial new models of support, communication and advice delivery e.g. testing the reverse auction or payments for results models, building exemplar sustainable farms and estates.

c) Government should ensure their holdings are attractive and open to young farmers and rural entrepreneurs, helping to nurture the next generation and human capital.

d) Government should recognise and celebrate the role of the smaller farm, "Building a Sustainable Farm Business"

Elgon Kenya's plant clinics inspiring smart ways of producing food

2016 Winners display their medals in a group photo with the CS Mr. Willy Bett and Elgon Management Team

As early as eight o'clock on a chilly Saturday morning, hundreds of farmers had already congregated at Kenya Agricultural and Livestock Research Organization, KALRO, Njoro some carrying diseased plants while others had black polythene bags that has soil in them. They had come for the second edition of plant clinics, a series of new consultative meetings sponsored by Elgon Kenya in association with Nation Media's Seeds of Fold, KALRO, and Tegemeo Institute of Egerton University.

Farmers had come from as far as Kisumu, Machakos and Thika with a view to getting diagnosis on their sick plants and soils while interacting with soil experts.

Peter Mungai a farmer from Thika was among them. "For the last three years I have been specializing in farming beans, but I always end up harvesting 15 bags in my one acre despite ensuring I apply fertilizer and tame all pests and diseases. My colleagues who are in the same business with me manage to get over 90 bags from the same plot as mine. What am I doing wrong?" he wondered. To which Dr Benard Towett, an expert from KALRO replied. "Your case is that of using old varieties from previous harvest. "Farmers need to understand the new innovations especially in seed development if they are to get good prices and adequate harvest from their products. This clinics offers direct interaction with farmers and on this basis they are able to get free and researched advice on their crops," he said.

The Njoro clinic was the second one, with the first having been held at the Practical Training Center in Thika. There was no end in sight for the questions the farmers had, depicting the growing thirst for information. "This is exactly why we set up these clinics. We want to go directly to farmers. We want to play the role of extension officers who are now hard to come by. Farmers have now been left to produce food on their own despite emerging threats. They now fumble and farm with no information," said Elgon Kenya Head of Seed Production Dr B L Menaria.

The two clinics have returned roaring success with more farmers insisting the clinics have been timely at a time when it has become increasingly tough to produce crops.

"We have been toying with all these ideas on how best to make farmers enjoy food production. When we launched our pioneer clinic in PTC Thika, the reception was mind blowing. So we made a decision that we would upscale these clinics to all areas of Kenya. We want to reach every single farmer in this country and exchange ideas on how best and smart we can farm," said Bimal Kantaria, Elgon Kenya's director.

The plant clinics are a shot in the arm of the agriculture sector as the country now counts on it sectors to help it propel to mid economic status through the country's economic blue print Vision 2030.

But the sector has traditionally been beset by numerous hiccups including tired soils from overuse of chemicals, and age old farming practices that have taken a toll on yields. Such practices with no economic payoffs have turned the young people away from agriculture. But a revolution has slowly been unfolding. A growing number of young people buoyed by the growing technology and the investment in new age farming by both government and private companies are being enticed in to farming. Mobile phone applications and other technological platforms have fanned what is now being referred to as 'telephone farmers.' They include youth some educated and working in cities but practicing agriculture as a part time activity. Such enthusiasm is being tapped and encouraged through schemes like the National Farmers Awards.

"We feel really happy and encouraged when we see young people attending and actively participating in these clinics. We need to bring them at the food production agenda because they are the food producers of tomorrow," added Bimal.

As Kenya's population burgeons, putting pressure on food production even as 22 per cent of the country's population remains food insecure, plant clinics are viewed as a panacea to the country's episodic hunger.

PICTORIAL

The winner in the Small Scale Farms Gearing to Commercialization Anastasia Wanjiku of Ngarama Farm in Nakuru County

Mureithi of Dim Com Eden Villa Farm in Laikipia County gets rewarded by Agriculture CS Willy Bett.

Michael Ochieng Laro the overall winner Physically Challenged category was feted by President Uhuru Kenyatta Nairobi International Trade Fair

Prof. Charles C. Ngugi of Kirinyaga County is rewarded for being the first runners up in the Small Scale Farms Fully Commercialized category

Agriculture CS Willy Bett and BASF East Africa team presents Michael Gitau and staff of Maakiou Estates, the winners trophy in the Large Scale Fully Commercialized Farms category.

Engineer James Toroitich Kisa, proprietor of Macheo Farms receives the first runners up trophy from Agriculture CS Willy Bett escorted by BASF officials Carles Amengual and Gift Mbaya

Agriculture needs new partnership Structure to fulfill its socio-economic Potential.

By Moses Wasamu

The challenges to achieving global food security are enormous. Experts say that at least 900 million people do not get enough food to eat, global population is expected to increase by 2 billion by 2050 and scientists are battling the threat of climate change, which causes erratic weather patterns and global warming.

And all these factors, plus many others, affects the income of farmers and peoples livelihoods.

Gagan Khurana, co-founder at Maxiterra, an agricultural innovation and technology organisation, says that because of rapid development in agriculture planning, solutions which have worked before may not be relevant any more. Therefore, he proposes new partnership structures that will enable agriculture to improve and fulfill its social and economic potential.

In a presentation made in Mexico to mark 50 years of International Maize and Wheat Improvement Center (CIMMYT) work in the world, Gagan said that significant issues exist at every stage of the value chain which hinder progress. Gagan says that subsistence farmers (smallholders) are stuck in a poverty trap preventing them from improving their livelihood.

An analysis of the situation shows that smallholder farmers fall outside the formal supply chain. He adds that it is possible to break this vicious cycle of poverty without subsidies and donor grants, through innovations in the existing supply chain structure.

Whereas cooperatives societies, which are common in most developing economies, have tried to achieve increased incomes for farmers, they have not succeeded in most cases because of lack of capability in managing all aspects of the value chain on a commercial basis, limited education levels which do not allow farmers to develop commercial and business skills, and dependence on government subsidies and political interference.

To reverse the situation, Gagan says, there is need to restructure the value chain in order for the small holder to take a larger part of the profit margin, build small holder capabilities in order to increase the size of the profit margin through better yields and higher quality products, and to involve all stakeholders (government, private companies, NGOs) to identify and address critical non-agriculture related enablers and blockers to smallholder success.

Fortunately, he says, governments, global organizations and farmers are already collaborating with each other to help improve existing agriculture and supply chains through public Private Partnerships (PPPs). He points out that these public and private sector engagements have been the missing link in the agricultural value chain.

Agriculture stakeholders should change their business-as-usual approach

For these changes to happen, he says, agriculture sector companies and other stakeholders will need to change their business-as-usual approach, in order to take advantages of reduced costs per unit sold due to sharing of distribution channels, and creation of more robust value chains due to increased interaction and integration between the players along the value chains.

Since agriculture supply chains in most emerging markets are not efficient, he says one way to go around this would be to make the value pool distribution more efficient through improved information flows backed by alternate access channels that allow the farmers to earn more money without necessarily increasing factory-gate prices.

This can happen by way of the PPPs creating an innovative field model to achieve inclusive growth. He proposes a Special Purpose Entity (SPE) to create and manage integrated value-

chains. The purpose of the SPE would be to coordinate the work and output of several actors and companies in the value chain. These actors include input suppliers and distributers, farmers, aggregators, consolidators, the broader market and buyers.

The proposed SPE ownership structure should include farmers, companies and NGOs initially, with farmer associations increasing their stake over a period of time. Gagan says that to make this work, there is a critical need to create practical structures which allow complex PPP arrangements to efficiently and quickly implement projects on the ground.

Other necessary interventions he mentions are in the area of research and development, input distribution and adoption, farming, trading and processing, and in manufacturing and retailing. Cross-cutting issues that can also be addressed include policy environment, infrastructure and market linkages.

There is need to restructure the value chain in order for the small holder to take a larger part of the profit margin, build small holder capabilities in order to increase the size of the profit margin through better yields and higher quality products.

Positive results as a result of interventions in Africa

Gagan said that a better understanding is required of the optimal tradeoffs between different stakeholder needs and the results that can be achieved. He says that in some countries like Rwanda, Morocco and Ghana, some positive results have been achieved as a result of putting in place some interventions.

Gagan, an expert on agriculture and water, says these interventions have seen maize yields increased two-fold, and agriculture GDP reached 7% per annum in Rwanda; in Morocco, the smallholder income increased from USD 1,000 to USD 3,000, while in Ghana, it led to the vision to increase rice self-sufficiency from 30% to 70%.

Gagan was one of the main speakers in the conference that brought together over 500 scientists, government officials, farmers and members of the international agriculture for development community in a three-day conference.

According to the organisers, the event was a chance to reflect on the past and discuss how the socio-environmental challenges of the future will affect agriculture research for development, smallholder farmers and crop yields.

Gagan has worked extensively in Asia, Latin America and Africa over the last two decades. His work focuses on agriculture, rural supply chains, sustainable use of water and land, economic issues related to rural development and social programmes.

The CIMMYT works throughout the developing world to improve livelihoods and foster more productive, sustainable maize and wheat farming. It targets critical challenges, including food insecurity and malnutrition, climate change and environmental degradation.

Maize Grown in Kenya

Crop Insurance

By Esther Kimani

Agriculture is the main source of income for rural communities in Africa. While investment in agriculture throughout Sub-Saharan Africa has led to increases in cash and subsistence crop productivity, weather risks threaten these gains. Smallholder farmers are often ravaged by uncertain weather that affects their harvests, restricted access to capital and farm inputs such as fertilizer or seeds, unfavorable trade policies and price fluctuations. Because many have no collateral cover, creditors consider it too risky to lend to them because unpredictable events may result in widespread loan defaults. These setbacks put the smallholder farmers in a vicious cycle of poverty.

Success in agricultural production and subsequent financial stability does not only solely depend on the farmers' agricultural knowledge, but also on the containment of risks that affect production. Without risk management tools, formal financing and investment by farmers, gains in the agricultural sector will remain limited. Agricultural insurance is one of the ways to address these constraints by reducing uncertainties. Coverage motivates farmers to invest in riskier but potentially higher yielding farm activities. Timely insurance pay-outs after crop losses can help smallholder's smooth consumption and prevent the sale of their assets. Insurance can also act as a catalyst, as lenders will be more likely to extend credit to farmers covered by insurance, allowing them to make productivity-enhancing investments.
ACRE Africa, the brand name of Agriculture and Climate Risk Enterprise Ltd (ACRE) links farmers to insurance products so that they can confidently invest in their farms. All ACRE Africa's products are custom tailored to meet the needs of smallholder farmers who previously have not had access to insurance.

ACRE Africa's Crop Insurance Products

Our products enable smallholder farmers to access affordable insurance products that mitigate their risks and furthermore unlock access to agricultural credit.

a) Weather Index

Weather index-based insurance offers a method to insure farms as small as one acre by replacing costly farm visits with measurements from weather stations as the indicator of drought conditions. The weather stations measure the rainfall and these measurements are compared to an agronomic model specifying crops rainfall needs.

b) Multi-Peril Crop Insurance Cover (MPCI)

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Crop insurance is available for most crops such as wheat, maize, tea, and coffee.

Wheat Farm: Insurance can be vital for losses

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As a company, AGRICHEM AFRICA LIMITED® has a wide experience of more than a decade in agrochemicals trade, thus having immense knowledge of the African market better and therefore we are always in the process to give something better to farmers. Apart from selling agrochemicals the company also provides technical support and guidance to the farmers and growers to help them get the right products and methods to increase their productivity. We are not just stopping its responsibility after selling the products, but also have professional staff members who constantly keep visiting the farmers so as to understand their challenges and suggest to them the right solutions. The story of success of the company can be viewed from its huge number of satisfied customers in cereals farming sector. With our wide and well equipped logistic infrastructure, we are delivering products to the door of our distributors and commercial customers countrywide.

As we believe success is not an accident but it's a process, and it requires efforts and loyalty. Being a business organization we are as other companies and more so remarkably different from the rest as we keep contact with our customers to ensure that their needs and demands are addressed to make way to real opportunities by effective response to customer satisfaction.

The company's operations ethics in crop production and development in the Cereals Farming Sector is believed to lead towards our society and nations development. Being a responsible organization we believe in partnership and growth together.

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Eat your sprouts!

Tackling the food waste issue

Food gabbage in urban areas

Food Waste on Farm

Food waste is a global issue and widely recognised as having a negative impact on society, the economy, the environment, the climate and food security. It is also a moral concern that food is wasted to such a huge extent when so many, in both developed and developing countries, still go hungry.

Reducing food waste is a 'movement'; some have even called it a revolution. Food waste is an issue that everyone can associate with and is engaging the public, policy makers and politicians. Previous experience indicates that where farmers have not been at the forefront of developments relating to food and its production they have often suffered the consequences of measures determined by those beyond the farm gate. Farmers should therefore be thoroughly engaged to shape solutions, opportunities and outcomes. Cooperation is therefore vital, farmers need to be more proactive and see solutions as an opportunity. Reducing food waste at farm level does not have to be rocket science but does require thought, investment, ingenuity and courage in various measures.

A farmer friendly 'space' that includes practical examples of success stories at primary production level should be developed as it would help inform and inspire others to engage with the issue.

Quantifying food waste on farm is an inherently difficult task. As such, the industry should be open to taking measures to ensure data collection is as accurate as possible. Some of these measures may not be popular but they are necessary.

Lastly, Government and others should create a favourable legislative environment for farmers to prevent and reduce food waste and to innovate.

Farmers leading from the front

Over the past number of years, the Brussels agricultural agenda has been dominated by discussions on environmental concerns including climate change, the need to produce more but impact less, and food security. Food waste has therefore advanced up the political agenda as it not only results in the loss of valuable nutrition, but also the loss of finite resources such as energy, water and land that are required to produce our food.

The issue has not only gained traction amongst policy makers but consumers and politicians are also becoming more aware of the problem due to public facing initiatives including Feeding the 5000, the Pig Idea and campaigning by celebrity chefs.

"Throwing away food is like stealing from the table of the poor and the hungry."

Pope Francis

Fruits go to waste in market place

Previous experience indicates that where farmers have not been at the forefront of developments relating to food and its production they have often suffered the consequences of policy and regulation made by those beyond the farm gate. It is therefore vital that the industry understands the issues, is proactive in learning what solutions are possible and is given the tools and the inspiration to find those solutions.

"Throwing away food is like stealing from the table of the poor and the hungry." Pope Francis

Definition of food waste

"Food waste is any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed (including composted, crops ploughed in/not harvested, anaerobic digestion, bio-energy production, co-generation, incineration, disposal to sewer, landfill or discarded to sea)"

That is not to say that food waste used for animal feed or energy production, for example, does not have value. Indeed, these are massively favourable in comparison to disposal or landfill. However if food is grown for the purposes of feeding people it is my opinion that as far as possible, it should be used for that purpose.

The environmental cost of food waste

According to the FAO, "the environmental cost of food wastage is staggering which makes tackling it through specific actions an urgent priority".

The environmental impact of wasted food could be described as a 'double whammy' for the environment. At one end, scarce and precious resources such as water, nutrients, land and fuel are used to produce food. If this food is wasted, not only are we losing the food itself, but we are squandering the valuable resources used to create it.

The FAO has tried to illustrate the scale of the impact of food waste on the environment using a number of effective visual statistics.

The total area globally used to grow food that ends up being wasted was about 1.4 billion hectares. This figure represents a land area larger than Canada or China.

If the food that is produced annually but not eaten originated from a single country, that country would rank number three in the world for greenhouse gas emissions behind the USA and China.

Many commentators also highlight the impact that the growing demand for food has on world biodiversity. Dealing with world demand for food by minimising food waste would reduce the pressure to produce food in environmentally important and sensitive areas such as rainforests, wetlands and natural grasslands.

Food waste on farm

It is clear that the extent of the food waste problem differs at different stages of the chain. In general, household food waste is at the centre of many of the campaigns to tackle the problem. However, research and knowledge at farm level on fresh produce is lacking and the complexity of the problem along with the lack of data available on primary production losses have not been addressed with the same urgency.

Fresh produce food losses on farm occur for a number of reasons, some of which are outlined below.

1 Weather

The loss of perfectly good food as a result of severe or unusual weather conditions is an ongoing problem. Extraordinary large-scale weather events can obviously increase food losses significantly but many primary production losses are the result of localised weather patterns.

2. Produce rejected for cosmetic reasons

Demands by consumers for produce that reaches a certain weight, size and aesthetic standard contribute significantly to perfectly edible food being wasted. Entire crops or portions of crops can be wasted prior to harvest on the grounds of physical appearance. In recent times these specifications have become tighter and more unrealistic leading to crops being destroyed or left unharvested in fields because they do not make the aesthetic grade.

3. Forecasting

Despite best efforts to forecast future consumer demands, it is inherently difficult to always get it right. Estimating demand is very complex and is influenced by multiple factors, such as climate, season, specific marketing campaigns, new product launches, promotions, and holidays.

Farmers grow based on demand from those further up the chain and when this demand changes waste often occurs. Insufficient purchase forecasting, inappropriate ordering and planning and/or the cancelation of forecast orders can often leave farmers with an unsaleable product.

4. Price

The market price is undoubtedly a huge factor in terms of food waste on farm. Like in many

businesses, farmers often weigh up the costs of bringing their produce to market based on the return that they are likely to see from that market. When market prices are very low, an economic decision needs to be made on whether it is more cost effective to harvest the crop and try to find an alternative market for it, or leave it in the fields.

5. Overproduction

The fear of not being able to completely fulfil retailer contracts can lead growers to produce more than the contract requires as insurance against unforeseeable problems and to avoid penalties. Agriculture representatives of all nationalities have highlighted the pressure farmers are under to ensure contracts are filled completely.

6. Lack of storage facilities

Although an issue frequently quoted as a solution to the problem in developing countries, lack of adequate storage can also result in an increase in food losses in the developed world.

A lack of effective storage frequently forces farmers to sell their produce as soon as it is harvested. This is often at a time when many others are trying to sell the same crop resulting in a flooded market and decreased prices. A glut in the market can of course also lead buyers to demand stricter arbitrary aesthetic standards, thereby creating increased waste.

Improving storage facilities can lead to multiple benefits. For example, it extends the season of products allowing products stored to be released onto the market at a time when it is not in abundance. This can result in better prices for the farmer and reduce the waste caused by over supply at a specific time of year.

7. Limited secondary markets opportunities

Levels of on farm food waste increase if there is a lack of alternative markets that has been rejected by buyers or resulting from oversupply. Secondary markets can be a vital income source for producers that have already invested in a crop. However, the ability to access alternative markets can depend hugely on factors such as geography, infrastructure and cost effectiveness.

8. Lack of understanding and education on food production

The aim of most farmers and growers is to produce and provide the highest quality product possible for their customers. As mentioned above, quality is increasingly being associated with aesthetics and 'natural' shapes and sizes, although often equal in terms of taste, are seen as an inferior product. In addition, products that are mildly damaged are also often classed as inferior. Many in the supply chain recognise that these issues have little to do with real quality but they often see it as a risk to be associated with anything but top quality products. The consequences of this lack of understanding on quality trickles back down the chain to the farm and dictates what the farmer can sell and what is likely to be wasted.

9. Logistics

Often the key to ensuring that alternative markets for fruit and vegetables are found or mouths are fed is manageable logistics. Redirecting food can be a huge challenge especially for perishable fruit and vegetables. Avoiding spoilage is often only possible if efficient and timely measures are taken to redirect the food to its end user and if it is cost effective for the farmer to do so.

Silos used for storing maize

10. Labour

Food waste as a result of issues with on farm labour is emphasised in some literature, but wider political events do not preclude this becoming an issue. Labour shortages have been highlighted as a major hurdle leading to crops being left in the fields.

Discussion on barriers to finding food waste solutions

"Nobody said it was easy" - Coldplay

The inspiring solutions in this article is just a tiny flavour of the food waste reduction activities that I learned about on my Nuffield Farming travels.

Although very different businesses, there were a number of common challenges that emerged from discussions with those that I interviewed and met along the way. These are outlined below.

1. Time

I met with a tomato farmer who runs a lucrative stall in New York's Union Square Farmers Market. Despite his very successful business, he said that waste tomatoes are a concern for him. He said that he already knew exactly what to do with them "I have the perfect recipe for the best tomato sauce", adding that "it will fly off the stall". When I asked why it wasn't available yet he simply said he had "not got the time, picking the tomatoes is busy enough and anything else during picking just doesn't get done".

2. Money

Nobody likes to see waste, least of all farmers and growers who have put so much time, money and effort into producing their crops. This has inspired many to donate produce, facilitate gleaning and find other outlets for their produce that are more palatable than ploughing it in. But to really tackle the problem head on, there must be viable economic solutions.

Finding these solutions is the responsibility of the farmers and growers themselves, but given that the cause of so much waste is the result of demands from their customers, they must be supported in their efforts by others in the chain. Unexpected changes in demand from retailers and others, can lead to huge amounts of waste and costs for the farmer.

Developing a framework to share the risk between farmers and their customers is therefore vital. Better collaboration and engagement might also inspire new ideas on how to use the food.

There is also a role for policy in reducing financial risk. We may need a legislation extending tax incentives for food donated to charity, a move that is welcomed by many food stakeholders. If should be for all in the supply chain from farmers to corporations with the aim of reducing food waste and encouraging food donations. How attractive or feasible it is however requires more research.

3. Inspiration

The view amongst some farmers that food waste was simply an inevitable consequence of the market is far fetched. There is no doubt that the buying practices of big companies and indeed consumers have a huge impact on the extent of waste on farm but farmers themselves cannot be complacent. As awareness of the issue grows and gains further social and political traction, the industry will be called on to take action. We need to shape that action but also educate ourselves and innovate to demonstrate we are playing our part.

It is difficult to find practical examples of measures to reduce food waste that are led by farmers or show farmers working successfully in partnership with others in the chain.

4 Innovation

New ideas can inspire others in the chain to also start addressing food waste. If farmers are to be encouraged to innovate to reduce food waste then they need to know there is a potential market for new products. Support or willingness amongst those further up the chain to try and test new ways of working and ideas not only gives confidence but inspires people to be braver.

5. Data

Ultimately, food waste impacts on the farmer's bottom line. Finding a market for produce that would otherwise be wasted relies on consumers and others recognising that they can help solve the problem. This is difficult without clear information and data on how much food is actually wasted on farm.

Grain storage is a major challenge to many growers

Based on facts on the ground, it is clear they would be nervous of the introduction of a requirement to collect information on food wasted on farm. Think of the extra bureaucracy, the difficulty in getting accurate information and commercial concerns on how that information might be used. However, until we know the extent of the waste on farm it is difficult to motivate others to support efforts by our industry to address it.

6. Liability

Just like most mothers like to see an empty plate, most farmers would be happy to see their fields empty after harvest. There is concern in some quarters that giving away produce for free can impact on market prices but the most significant concern for farmers is liability. Health and safety on farm is paramount and there is understandable nervousness amongst farmers to allow (sometimes) inexperienced strangers onto their fields

Rather than creating obstacles, the legislative environment should empower farmers to innovate and try new things to prevent and reduce food waste. Policy on issues such as health and safety, environmental health and relationships within the food chain should enable rather than hinder farmers from playing a comprehensive role in finding solutions.

6. Customers

There is no doubt that many farmers feel that they have little control over the extent of food waste on farm. The requirements and specifications of their customers must be met and many believe food waste is an inevitable consequence of the actions of others within the chain. Some measures that would help farms limit food waste include developing forecasts and production programmes well in advance so that farmers can plan how much to plant, altering specifications to ensure produce can be sold if there have been weather or seasonal impacts and developing promotional campaigns at times of higher production.

Ultimately the key is better collaboration and ensuring that farmers are treated fairly and appropriately by those further up the chain.

Engaging Youth in Agriculture
The Key to a Food Secure Future?

Engaging youth in agriculture has been a prominent topic recently and has risen up the development agenda, as there is growing concern worldwide that young people have become disenchanted with agriculture.

With most young people around 85% living in developing countries, where agriculture is likely to provide the main source of income it is vital that young people are connected with farming. Currently around the world we're living in an era where rapid urbanisation has led to a decline in rural populations and for the first time ever the majority of the world's population lives in a city. The UN World Health Organization predicts that "by 2030, 6 out of every 10 people will live in a city, and by 2050, this proportion will increase to 7 out of 10 people" meaning that more young people than ever before are moving to cities and towns to find work, leaving few behind to work in rural areas.

With this predicted concentration of the global population in urban areas it is easier to understand why the number of young farmers is in decline. So how do we reignite the love for farming when the trend is to live in cities and towns?

In our latest blog, Farming First looks at some encouraging examples from around the world of ways to engage the next generation in agriculture:

Add Agriculture to the Curriculum

It has been discovered that most pupils in Kenyan schools lacked access to training and education on farming and therefore were not being encouraged to perceive agriculture as a future career. Therefore, some projects should be initiated where students were shown how to grow high-value crops, keep livestock and how to market produce for global markets.

Offer Young Farmers a Voice

Despite the decline in interest for agriculture as a career there are still young farmers working all over the world. To encourage others to join the sector it is vital that they are offered a voice, and that we take note of what they have to say. Particularly this includes giving young farmers at policy level a chance to offer their opinion and experiences. In this way, they can show other young people that farming can be a rewarding career as well as highlighting the important role of agriculture on a global scale.

Recently, at the Tanzania Youth Forum (TYF) participants urged the Tanzanian government to establish a Youth Council that includes a farmer and livestock keeper as representatives. Demonstrating the recognition of the Youth Council to include representation from agriculture at government level.

Another, rather different, way of offering young farmers a voice is to use media. At the beginning of 2013 a British television programme followed the stories of a selection of young farmers across the country, entitled First Time Farmers the programme aimed to defy stereotypes and demonstrate that there is a role for young people in the agriculture industry.

Innovation

As the 6th Africa Agriculture Science Week from 15 – 20 July demonstrated, new technologies are available that can help mitigate the effects of climate change and grow more food with less inputs. However, a lack of extension services has meant farmers have been unable to access these new innovations.

A younger generation can help introduce new technologies whilst also learning from traditional methods, holding the potential to offer the perfect fusion of new and traditional solutions to some of the world's biggest challenges.

Many organisations, such as the CGIAR, Climate Change, Agriculture and Food Security Research Programs, also often believed that innovation will help make agriculture more attractive to young people.

The Technical Centre for Agricultural and Rural Cooperation (CTA) established the Policies, Markets and Information and Communication Technologies (ICTs) programme to show young people that innovation can play a big role in agriculture.

The programme aims to illustrate the role of innovation in agriculture by promoting the application of ICTs for Value Chains Development. Director of CTA, Michael Hailu, spoke to Farming First about the scheme: " There is a lot of concern about engaging youth in agriculture, in many ways, young people are not very much interested in continuing in agriculture because they don't see much prospect in the future of agriculture, they don't see it is as an active profession in the long-run, so many of the smallholder farmers are quite aged. ICTs could provide new opportunity for making agriculture more interesting for young people. CTA has a very strong programme of supporting youth to get into value chains. One of the ways to do that is to train them and give them opportunities to access ICTs so that they can engage in value chains. "

The increased use of mobile phones in farming can also help deter young people away from stereotypes of traditional farming and help change their perceptions on agriculture, helping them to view it as an exciting and innovative industry.

A Chance to Make a Difference

Farming offers the young generation a chance to make a difference by growing enough food to feed the world.Those who become farmers now have the opportunity to be the generation that end world hunger and alleviate malnutrition, as well as helping the sector adapt to climate change.

There are many challenges ahead for the sector but if young people are offered education in agriculture, a voice at policy level, and in the media, and are engaged with innovations then the agriculture industry can attract youth again. As we look to find solutions to feeding a world of nine billion people by 2050, it is this new generation that – working together – can help to achieve global development.

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Everlyne Musyoka addresses farmers during the unveiling of the DK777

Monsanto Kenya Ltd Launches DK777

A new maize seed variety tolerant to Maize Lethal Necrosis Diseases

In November 2016, Monsanto Kenya Limited launched, DK777, a new maize seed variety that is tolerant to Maize Lethal Necrosis Diseases (MLND) in Bomet County. MLND has been a big threat to the yield potential of many small-holders farmers in the region who largely rely on maize farming for their livelihood.

DK777 is uniquely made to thrive in the medium to medium-high altitude areas such as parts of Bomet, Kericho, Narok and neighboring areas, which are well known for their contribution to Kenya's agriculture and consist largely of small scale and a few large scale farmers. At the time of the launch, the areas were experiencing short rains which started in October and ended in December, making the launch timely to encourage farmers to consider the variety then and in the next planting season which kicks off in February, 2017.

Key Features of DK777 include:

- 130 –150 Days to Maturity.
- Stable yielder across environments.
- Potentially Double Cobbing.
- Tolerant to Maize Lethal Necrosis Disease (MLND).
- Tolerant to Cob Rot.
- Good seed quality i.e. flint (Suitable for green maize, sweet to taste and good pound-ability when dry).
- Uniform Cob Placement thus making it easy to harvest .
- Does not lodge easily i.e. has good stand-

Staff Group Photo during the Launch

Spot the Difference: (Left) Maize affected by MLND (Right) Tolerant DK777 with double cobbing

ability.

To ensure DK777's introduction did not go unnoticed, its ceremonial unveil was preceded by a 3 day roadshow across 15 key towns along key routes leading to the demo field at the Bomet Prison Farm.

The roadshow was in partnership with a regional radio station, Kass FM, that broadcasts in one of the local vernacular languages "Kalenjin" which is the pre-dominant language of farmers in the South Rift region and where DK777 would be grown. The roadshow took an edutainment angle with leading Kass FM radio hosts and popular local musicians present to engage audiences on who turned up in large numbers on key advantages of the variety and mobilizing them to attend the variety launch event.

Also present during the roadshow was distributor, Siana Agro Supplies and teams from various business units at Monsanto, who issued sample seeds to the over 2,000 farmers who turned up to the unveiling ceremony.

Key guests and stakeholders included representatives from the County Government of Bomet, Chairman of the Youth Enterprise Development Fund Board, Mr. Ronald Osumba, who encouraged the youth to take up farming whose output had been advanced with the onset on technology in the agriculture, USAID KAVES, Farm Inputs Promotion Africa (FIPs, Cereal Growers Association, East African Growers Association, The Seed Trade Association (STAK) among others.

Monsanto will continue to interact with farmers and farmers associations in the regions to popularize DK777 and recommend uptake of good agronomic practices. DEKALB maize seed is also available in other varieties namely DKC90-89, DK80-31 and DK80-33, which are however suited to other agroecological zones.

Lower prices for staple grains more than offset by rising sugar and dairy prices in FAO Food Price Index

Global Wheat & Rice Harvests Poised to Set New Record

Cereal prices are drifting lower on the backs of the expected hefty supply. Wheat and maize futures on the have both dropped more than 16 percent since the start of the year, while quoted rice prices are at their lowest level since early 2008.

Global food markets will likely remain "generally well balanced" in the year ahead, as prices for most internationally-traded agricultural commodities are relatively low and stable, FAO said.

The benign outlook, especially for staple grains, is poised to lower the world food import bill to a six-year low, according to the Food Outlook. Record global production forecasts for this year's wheat and rice harvests, along with rebounding maize output, are helping keep inventories ample and prices low. Worldwide cereal production in 2016 should rise 2 569 million tonnes, up 1.5 percent from the previous year and enough to further boost existing inventories.

The value of total food imports is expected to fall 11 percent in U.S. dollar terms in 2016 to 1.168 trillion, as lower bills for livestock products and cereal-based foodstuffs more than offset higher bills for fish, fruit and vegetables, oils and particularly sugar. However, the decline is expected to be slower for economically more vulnerable nations, many of which have depreciating local currencies.

Bumper crops

FAO raised its forecast for global wheat production to 742.4 million tonnes, led by increases in India, the U.S. and the Russian Federation - which is poised to overtake the European Union as the grain's largest exporter. Total wheat utilization is projected to reach 730.5 million tonnes, including a big jump in use of lower-quality wheat for animal rations.
Global rice production is predicted to expand for the first time in three years, increasing 1.3 percent to an all-time high of 497.8 million tonnes, buoyed by abundant monsoon rains over Asia and sizable increases in Africa. Coarse grain output is seen rising 1.8 percent on the year, buoyed by record crops in the U.S., Argentina and India.

Cereal prices are drifting lower on the backs of the expected hefty supply. Wheat and maize futures have both dropped more than 16 percent since the start of the year, while quoted rice prices are at their lowest level since early 2008.

Production of cassava, a dietary mainstay in Africa where per capita consumption is above 100 kilograms annually, is also projected to grow 2.6% this year to 288 million tonnes. However, China's shift to drawing down its maize stockpile for domestic industry and feed has curbed international prices and trade flows for cassava.

Soybeans and other oilcrops could reach an all-time production high this year, thanks to record US yields, although demand is expected to grow even faster. In the livestock sector, dairy markets are also expected to return to general balance in 2016 after a long period of excess supply, but tightening milk availabilities in the EU triggered the largest monthly rise in dairy prices in many years.

Stagnant world meat output in 2016, twinned with rising international demand for pigmeat and poultry, especially from East Asian markets, continues to lend support to meat prices.

Global fish production, meanwhile, is forecast to expand by a below-trend 1.8 percent this year to 174 million tonnes, as aquaculture output is expected to expand by 5 percent and wild-caught fish output to decline by 0.9 percent, due in part to El Nino's impact on Pacific sardines, anchovetas and squid.

Food Price Index

The FAO Food Price Index, also released, averaged 170.9 and 10 percent more from a year earlier.

Palm oil prices also rose, helped by low stock levels in both exporting and importing countries, as did those of soy and rapeseed oil, lifting the FAO Vegetable Oil Price Index by 2.9 percent for the month. The FAO Meat Price Index was unchanged from August. The FAO Cereal Price Index, meanwhile, slipped 1.9 percent from the previous month and is 8.9 percent below its year-earlier level.

The FAO Food Price Index is a trade-weighted index tracking international market prices for the five key commodity groups. Its current level is the highest since March 2015. The sub-index for cereals is now at its lowest in a decade in deflated terms.

Why rice is overtaking Maize as Kenya's Staple Food

For many years, maize has been Kenya's staple food. However, this may not be the case in the near future because rice is increasingly becoming popular among Kenyans, shows a new survey. The report shows many Kenyans are now turning to rice and other foods because maize production has gone down and rarely meets the demand.

Also, the report notes, changing lifestyles and growth of the middle class has seen consumers substitute maize with rice. Other foods increasingly becoming popular among Kenyans are potatoes and bananas. The report shows the country's maize production has been on a downward trend for years and this has forced Kenyans to start stocking rice as a staple food. The analysis reveals that rice, plantain and potatoes are the alternative staple foods that continue to gain popularity among both rural and urban households.

The survey shows rural households consuming posho maize flour declined to 78 per cent in 2015, from 86 per cent in 2013. The average weekly consumption per household also declined to 6.9kg in 2015, from 7.9kg in 2013. Consequently, there was a decline in the national per capita maize consumption from 83kgs in 2009 to 55–78kg per household. The survey was carried out in Uasin Gishu, Trans-Nzoia, Nakuru, Nandi and Narok counties, the main maize-producing areas in Kenya.

Households consuming rice increased from 54 to 61 per cent between 2013 to 2015. Increase in consumption of plantain also went up from 29 to 34 per cent, with those consuming potatoes going up from 41 to 44 per cent over the same period. "On average, the country imports over 50 per cent of its demand for rice and wheat and 7 to 10 per cent of maize. This is despite favourable conditions for production, thus implying an unexploited potential or lack of sufficient policy support for increased production," says the report.

The National Rice Development Strategy projected that demand for rice will rise to 350,000 tonnes this year. But other reports show demand for rice overshot the projection by almost 50 per cent to 550,000 tonnes.

Rice farm in Mwea

Sorghum farmers to earn more in value addition with new variety

Farmers are earning handsomely from value addition.

The Kenya Agricultural Livestock and Research Organization, KALRO, is championing the making of sorghum sausages as farmers record success in growth and market for the crop. The crop has been one of the most successful in adoption across the country, especially in the arid and semi arid areas. This has been due to its drought resistant traits surviving where ordinarily other crops have failed.

Introduction of new high yielding varieties of the crop has further worked to boost production. One such variety, the Sorghum Gadam, whose origins is South Sudan has been particularly fond with local farmers due to increased yields per acre. But as weather patterns fail taking a toll on traditional crops like maize which is recording dwindling yields as seasons go by, sorghum continues soaring in terms of preference to farmers.

This has led to adoption of the crop by farmers in areas that traditionally never grew the crops. Areas like Central Kenya and Rift Valley are embracing full cultivation of the crop as weather patterns changes, according to the Ministry of Agriculture. The crop requires a third of water less to grow than other non conventional crops. But is the opening up of markets by a wide range of buyers that has also made the crop enjoy widespread uptake among farmers. Buyers like the East African Breweries, who have been using it to make their beers have provided a ready market for farmers.

The many uses of sorghum including sorghum stovers which are used as nutritious livestock fodder and the sorghum fortified flours which have been proven to boost immunity among the sick have opened up value addition enterprises which have seen farmers earn more. Now KARLO, which is known for releasing a host of improved sorghum varieties and training farmers on new farm management practices, is working with sorghum farmers across the country, especially in arid and semi arid areas in value addition ventures in order to earn more. Through individual farmers and farmer groups, the institution is for example trialing making of sorghum sausages as demand for sausages in the country grows. "New value addition enterprises have been coming up targeting sausages, including chicken and rabbit sausages. We realized because we have taught our farmers new value addition enterprises like making fortified flours why not move it further and trial with something else.

KALRO has also produced detailed brochures on easier ways of making and cooking sorghum brochures which they share with farmers in meetings with the brochures also available in all their centers at Sh30. "We want the farmers to not just learn to make the sausages for sale but for home consumption especially so that they can increase the nutrition of their families.

First Drought-tolerant and Insect-resistant "Stacked" Transgenic Maize Harvested in Kenya

Bt hybrid maize showed better resistance to the stem borer

By Brenda Wawa

Life has become more difficult in Kenya for the intrepid stem borer. For the first time, transgenic maize hybrids that combine insect resistance and drought tolerance have been harvested from confined field trials, as part of a public-private partnership to combat the insect, which costs Kenya $90 million dollars in maize crop losses a year.

Conducted at the Kenya Agricultural and Livestock Research Organization (KALRO) centers in Kitale and Kiboko, the experiments were managed by the Water Efficient Maize for Africa (WEMA) project, a collaboration led by the African Agricultural Technology Foundation (AATF). The test crop successfully weathered intense, researcher-controlled infestations of two highly-aggressive Kenyan insect pests—the spotted stem borer and African stem borer.

The maize is referred to as "stacked" because it carries more than one inserted gene for resilience; in this case, genes from the common soil microbe *Bacillus thuringiensis* (Bt) that confers resistance to certain species of stem borer, and another from *Bacillus subtilis* that enhances drought tolerance.

First time maize resists two-pest attack

WEMA partners from KALRO, the International Maize and Wheat Improvement Center (CIMMYT), U.S. seeds company Monsanto and the African Agricultural Technology Foundation (AATF) hope that, given the successful results of this experiment, they will soon be able to test the new maize in national trials.

"This is the first planting season of the stacked materials and, from the initial data, there was a clear difference between the plants containing the stem borer resistance traits and the conventional commercial maize grown for comparison, which showed a lot of damage," said Murenga Mwimali, WEMA coordinator at KALRO.

The maize in the Kiboko experiment was infested with the spotted stem borer (*Chilo partellus*, by its scientific name), a pest found mostly in the lowlands. At Kitale, the scientists besieged the crops with the African stem borer (*Busseola fusca*), the predominant maize pest in the highlands. This was the first time that Bt maize had been tested in the field against *Busseola fusca*, according to Stephen Mugo, regional representative for CIMMYT in Africa and leader of the center's WEMA team.

A maize stem infested by the African stem borer

"From our observations, this is the first time that stacked Bt genes provided control for both *Chilo partellus* and *Busseola fusca* in maize," Mugo said, adding that stem borers annually chew their way through 13.5 percent of Kenya's maize, representing a loss of 0.4 million tons of grain.

"Losses can reach 80 percent in drought years, when maize stands are weakened from a lack of water and insect infestation," he explained. Although the impact of the stem borer in the field often goes unnoticed because the insects sometimes destroy the plant from the root, the loss is significant for a country that depends on maize for food.

The new maize was developed using lines from Monsanto and CIMMYT-led conventional breeding for drought tolerance.

Seeking approval for widespread testing and use

Trial harvesting took place under close supervision by inspectors from the Kenya Plant Health Inspectorate Services (KEPHIS) and the National Biosafety Authority (NBA), strictly in line with regulatory requirements for handling genetically modified crops in Kenya.

The NBA has given partial approval to KALRO and AATF for open cultivation of the stacked transgenic hybrid maize. Once full approval is given, the varieties can be grown in non-restricted field conditions like any other variety and the Bt maize can be tested in the official national performance trials organized by KEPHIS to test and certify varieties for eventual use by farmers. "The data we are generating in this trial will support further applications for transgenic work in Kenya, particularly for open cultivation," Mwimali said.

Courtesy : CIMMYT

Focus On Efficiency

When it comes to treating seed, many producers are reluctant to treat too much supply ahead of time, because it can be hard to dispose of leftover treated seed. For example, some areas might receive too much rain and then the planting process can be delayed, a field might have to be switched to a different crop, or planting could be completely set aside. "

By Jason Kaeb

In today's agricultural landscape, convenience and ease of use are more important than ever. Bulk bins and on-site seed treatment can deliver this value — saving time, preventing waste and automating record keeping.

Having the ability to store and treat seed on site has become the norm in the downstream market. On-site storage and treating help alleviate some of the worries that come with planting, such as not having the right seed when it's time to hit the field. No one wants to wait weeks, or even days, before it goes in the ground.

Bulk bins and downstream treating systems increase speed and efficiency for both seed dealers and growers.

There are also mini-bulk capabilities for those who do not need as much of a specific variety. Mini-bulk allows producers to supplement their bulk storage with smaller quantities of certain varieties that can meet the specific needs of some customers.

When it comes to treating seed, many producers are reluctant to treat too much supply ahead of time, because it can be hard to dispose of leftover treated seed. For example, some areas might receive too much rain and then the planting process can be delayed, a field might have to be switched to a different crop, or planting could be completely set aside. Having the ability to treat downstream and just-in-time allows for less waste on expensive products.

Another huge efficiency factor in the industry today is automation — we've come a long way from using the augers, shovels and manual

labor of yesteryear. Automation integrates the entire process into a single point of control for smooth seed flow and better overall control of the process. This has become the heart and soul of bulk seed systems. We are able to completely automate seed flow, treatment and storage or packaging.

When combined, these systems provide proper recordkeeping, which is essential in knowing how much seed was treated, from what lot, and to whom it was sold. Over the years, this information can easily become convoluted, especially as dealers add more growers to their customer list. All this data can easily be kept, stored and sorted with advanced data management and reporting tools.

Remember: Bulk and mini-bulk sites add convenience for both seed dealers and growers, while automation brings data management to the forefront and is critical in helping maintain proper records.

CEREAL FARMERS IN KENYA

FARM NAME	LOCATION	CONTACT PERSON	EMAIL	TELEPHONE	CROP MIX	ROTATION CROP
-	MT. KENYA	-	-	-	-	-
Oldonyo ltd		Brynn	bryn@oldonyo.co.ke	0722817163	Wheat/ Barley	Peas, Canola
Kisima ltd		Shaun	shaun@kisima.co.ke	0729924353	Wheat/ Barley	Peas, Canola
Wangu Investment		Ben	ben@wanguembori.co.ke	0724545475	Wheat/ Barley	
Marania ltd		Jamie	marania@maraniafarm.com	0721573634	Wheat/ Barley	Peas, Canola
Lengetia ltd		Sessions	Lengetiafarm@gmail.com	0722332647	Wheat/ Barley	Peas, Canola
Mastermind ltd		Gitonga	dgitonga@mastermindkenya.com	0722751488	Wheat	
Tumili ltd		David Beak	tumili@wananchi.com	0722823543	Wheat/ Barley	Peas, Canola
Thamba Ngombe		Thamba	thamba@gmail.com	0724927351	Wheat/ Barley	
Mt Kenya saw mill		shah	nainhshah@gmail.com	0722511691	Wheat	
-	NAROK	-	-	-	-	-
Simba Estate		SS. Dhillon	simbaestate@simbaestate.com	0722511460	Wheat	Maize
Farm Africa ltd		Raghu	raghu.penmetsa@farm-africa.com	0788299442	Wheat	
Lalela ltd		Neylan	neylan@macc.com	0722385329	Wheat	Sorghum
Mann Wheat ltd		Magal		0722518964	Wheat	
Green Farms		Wambugu		0722287337	Wheat	
South Siox Farm		Guri	gurbir@southsiouxfarms.com	0722676878	Wheat	
Olerai ltd		Alistair	alandbill@olerai.co.ke	0728484659	Wheat	Seed Maize
Talent Farm		Paul	sarpau@internode.on.net	0729846736	Wheat	
Rm Farms		Amit and Sanju	rishi-amit2007@yahoo.com	0722225330	Wheat	Maize
Ndovu estate		Viney		0722824793	Wheat	Maize
Country motors		Singh	country@africaonline.co.ke	0722764763	Wheat	
Oldonyo Nairasha Estate		Karan	ssdhillon@africamail.com	0722323296	Wheat	Maize
Development Trust		David		0724741718	Wheat	Canola
Oratili ltd		Mahesh	farmpartsltd@africaonline.co.ke	0722848474	Wheat	Canola
Upland crops		Koos	fm@uplandcrops.com	0704681651	Wheat	Maize
-	NAIVASHA	-	-	-	-	-
Kijabe ltd		David Cullen	ndabibi@gmail.com	0729950910	Wheat/ Barley	
Soyonin ltd		Benajamin Kipkulei		0733605071	Wheat	
Livewire Ltd		Goddy Millar	info@livewire.co.ke	0722205992	Wheat / Barley	
-	NAKURU	-	-	-	-	-
Lesiolo ltd		Tundo Franco	frtundo@gmail.com	0724333322	Wheat / Barley	
Madrugada		Jonti	jonti@madrugada.co.ke	0722734179	Wheat / Barley	Maize, Peas, Canola, Sunflower
Tony		Hughes	hoozie@swiftkenya.com	0722808058		
Chepkonga		Andrew	andychep@yahoo.com	0710308917	Wheat / Barley	
Siruai		Rose	skvarose@gmail.com	0722865892	Wheat / Barley	Maize
Sasumua Agriculture		Luke	luke@sasumua-agriculture.com	0722779618	Wheat / Barley	Canola, Peas, Sunflower, Maize
Kenana Farm		Oliver	pkenana@africaonline.co.ke	0722725002	Wheat / Barley	Canola, Peas, Sunflower, Maize
Remsons Ltd		Mugambi	remsons.ltd@gmail.com	0722807773	Wheat / Barley	
Molodowns		Chris Foot	ckfoot@gmail.com	0722717130	Wheat / Barley	
Gogar Farm		Simon	md@gogar.co.ke	0722327718	Wheat	Maize
Kinoru Farm		Barlow	barlow@africaonline.co.ke	0725777479	Wheat / Barley	canola, Peas, Sunflower
Comply industries		Sandhu	sckihumba@complyindustries.com	0729870025	Wheat / Barley	

CEREAL FARMERS IN KENYA

FARM NAME	LOCATION	CONTACT PERSON	EMAIL	TELEPHONE	CROP MIX	ROTATION CROP
Chemusian ltd		Too	chemusian@gmail.com	0722209754	Wheat / Barley	
Kikwai farm		Patrick	padykikwai@gmail.com	0731817804	Wheat / Barley	
-	ELDORET	-	-	-	-	
Sergoit farm		Yani/ Kruger	tingaspike@gmail.com	0718338099	Wheat / Barley	Maize
Komol farm		George Killi		0722732757	Wheat	Maize
Mohammed		Kaittany		053-2062234	Wheat	Maize
Elfam ltd		Ngetich		0721517701	Wheat	Maize
Mace foods		Margret Komen		0722840799	Wheat	Maize
Kuinet Tarus		Tarus		0721934176	Wheat	Maize
Moiben Chepkener		Chepkener		0719506980	Wheat	Maize
Chepkorio		Jelimo		0722571355	Wheat	Maize
Kenya ordnance		Chirchir		0721851931	Wheat	Maize
Kandelo		Kandelo		0720305041	Wheat	Maize
Kimoso		Kimoso		0734858619	Wheat	Maize
Silas Tiren		Tiren	skktiren@africaonline.co.ke	0725792463	Wheat	Maize
Shiv enterprises		Albert Kimwatan		0722652300	Wheat	Maize
Timothy Busienei		Busienei		0727085756	Wheat	Maize
Plateau Ngeria		Sile		0724752143	Wheat	Maize
Victoria Chebet		Chebet		0753466025	Wheat	Maize
Maji Mazuri		Ziwa		0723024971	Wheat	Maize
Kibogy Moiben		Kibet		0728706668	Wheat	Maize
Kapkabai Farm		John	wilchem@africaonline.co.ke	0722724990	Wheat	Maize
-	ATHI RIVER	-	-	-	-	-
Ausquest ltd		Stuart Barden	stuartbarden70@gmail.com	0703119444	Barley/ Wheat	Sorghum
-	KITALE	-	-	-	-	-
Bubayi		Jonathan Mayer		0735488001	Wheat	Maize
Panocal		Chris Carpenter	cereals@panocal.co.ke	0719505785	Wheat	Maize
Murmet		Chelimo		0722571355	Wheat	Maize
Cheptembei farm		Robin		0722817638	Wheat	Maize
Robert		Tuitoek		0722813381	Wheat	Maize
Biwott		Biwott		0720955748	Wheat	Maize
Express Farm		Mbugua		0722766176	Wheat	Maize
Western seed company		Harry		0720897860	Maize/ Wheat	
Kenya seed company		Mwarei		0722614639	Maize/ Wheat	Barley
ADC Farms Edward			edwardmwando@gmail.com	0728453942	Maize	Sunflower/ Pasture
-	MOLO	-	-	-	-	-
EAML		Gacheru		0722791563	Contracted farmers	Barley
-	KISUMU	-	-	-	-	-
Dominion farms ltd		Okoth		27494585	Rice, Maize, Sugarcane	

OUR WHEAT & BARLEY

	Crop Stage	Target	Product	Application Method /Rate
1.	**Zero Tillage / Pre-plant**	Common weeds	Wipeout 360 SL & Aurora Turbo 70 	For total control of all weeds use a tank mix of Wipeout (1.5L/ Ha) and Aurora Turbo 70Sg (400gsm/Ha)
2.	**Seed**	Soil borne pest and diseases including dumping off, fusarium and nematodes	Seed coat 	Seed dress at a rate of 25mls/kg of seed
3.	**Early Tillering**	Over 20actively growing grass weed species including *Alopecurus mysuroides, Apera interupta, Avena Ssp., Phalaris Ssp., Setaria Ssp., Snowden polystacha, Sorghum halpense, Zea Mays, Bracharia phatyphylla, Digitaria Ssp, Echnochloa crus Gali, Eleusine indica, Leplochlea chinensis*	Foxtrot 	Foliar spray at 1 Litre/Ha
4.	**2nd Node Detectable Stage** 7-10days after foxtrot application	Broad leaved weeds *Amaranthus Spp., Argemone mexicana, Bidens pilosa, Capsella bursa-pastotis, Chenopodium album Commelina benghalensis, Conyza stricta, Datura stramonium, Solanum nigrum* etc.	Aurora Turbo 70 SG 	Foliar spray 0.6Litres/ Ha. Tank mixed with Natural Wet only
5.	**Beginning of tillering**	To promote and increase tillering	Synergizer 	Foliar spray at 1.5Litres per hectare
6.	**At Tillering**	Septoria Tritici, Powdery mildew, yellow rust Ryncho etc (preventive dose)	Smash SL 	Foliar spray at 4Litres per hectare

FROM: **Juanco SPS Ltd**

SPRAY PROGRAMME

	Crop Stage	Target	Product	Application Method /Rate
7.	**After Tillering**	Incase of Septoria Tritici, Powdery mildew, yellow rust Rynchо etc.	Shafi 125 SC 	Foliar spray at 0.75Litres per hectare
8.	**Booting & Early Flowering**	To promote flowering and grain formation	Synergizer 	Foliar spray at 1.5Litres per hectare
9.	**First sign of insects' infestation**	Russian wheat aphid, thrips, caterpillars, bores, scales and mites	Marshal 250EC 	Foliar spray at 1Litre per hectare
10.	**Before Flowering**	Caterpillars, aphids, thrips, mites	Either Talstar 100EC 	Foliar spray at 0.1Litres per hectare
		Caterpillar, aphids, thrips, mites, cutworms and chaffer grubs	or Brigade 	Foliar spray at 0.4 Litres per hectare
11	**Tillering & Mid-Tillering**	Copper deficiencies	RovaCop 	Foliar spray at 1.2Litres per hectare

NB: Inclusion of natural Wet in sprays improves efficacy

DISCLAIMER: IT IS IMPORTANT TO FOLLOW INSTRUCTIONS ON THE APPROVED LABEL WHEN HANDLING, STORING OR USING ANY PEST CONTROL PRODUCT.

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