The Organic Farmer

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Maize damaged by the fall armyworm (inset): An invasion by the pest in all maize growing areas in East Africa led to huge yield losses to maize farmers last year. However, recent studies show environmentally friendly technologies such as the Push-Pull technology can protect maize from the pest. See Page 3

Plant early to improve maize production

Peter Kamau | A visit to some of the maize growing areas in Uasin Gishu and Trans-Nzoia counties last month shows that some farmers have already prepared their land in readiness for planting next month. However, many have not done so for various reasons.

First rains fix nitrogen

Early planting has many advantages for farmers. One of the advantages is that the first rains trap nitrogen in the air and fix it in the soil in a process called the "nitrogen flush" this extra nitrogen gives the young maize a headstart, which contributes to a healthy growth and improved yields. Farmers should take advantage of this by planting early.

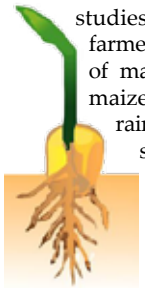
Reduces pests and diseases

When farmers plant early, there is a reduced incidence of pests and diseases. Pests such as thrips, the fall armyworm, stemborers, aphids and whiteflies increase as they reproduce and increase in numbers as crops and other vegetation grows since these are their main source of food. Pests also carry diseases, which they transfer to the growing plants.

When farmers plant early, the pest population is still low at the beginning of the rains. This enables the maize to grow without heavy infestation, increasing their health and vigour. If planted late, the pest population is very high, leading to early infestation and weak growth this is mainly responsible for reduced yields.

Temperature helps in germination

The germination of maize requires adequate water, temperature, light and a nutrients. Research has shown that maize grown when the soil temperatures are high tends to grow faster than whengrown under low temperatures. The studies also show that farmers lose up to 2 bags of maize every week for maize planted after the rains have started. This shows that the germination and growth is affected when maize is planted when soil temperatures are low.



Conserve and spread crop residue

When preparing land, it is important to ensure that crop residue from the last year's harvest is not burnt. Crop residue contains a lot of nutrients and carbon which the growing maize will require. By conserving crop residue, farmers recycle important nutrients that the growing maize require. Crop residue also acts as a sponge, taking in water, which it releases back into the soil for use by the growing maize.

Organic material from crop residue supports a lot of organisms in the soil such as earthworms and bacteria that feed on the organic matter and release nutrient for uptake by the growing crops.

In this issue

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Dear farmer,

As we start the planting season, it is once more a time to give farmers a few tips about inputs, especially seeds. Quality seed is crucial in the production of any crop. It is therefore very important that farmers have access to the best seeds available in the market and those that are suitable to their climatic zones. It is equally important that farmers get seeds that have proved to be good for their regions.

Kenyan farmers' adoption of hybrid seeds is said to be one of the highest in the world. Indeed local farmers know the qualities of each seed variety they have grown and will only go for those varieties they know have good qualities and can do well in their regions.

Some of the varieties farmers have been demanding and which they have been denied include the H600 series that do well in highlands areas which grow the bulk of the maize for the country, the most popular of these is the H614D maize variety that was developed by KARI (now KALRO) and sold by the Kenya Seed Company. The variety is the flagship of all hybrid seed in Kenya due to its good characteristics. Until a few years ago, more than 60 per cent of the farmers wanted this variety. Sadly, the Kenya Seed Company, which holds the rights over multiplication of the variety, has progressively reduced its availability in the market in favour of its brands such as H6213, which requires a high level of management that small-scale farmers cannot meet.

To improve the H614D, KALRO has developed other varieties such as KH 600-14E, the KH 600-23A, KH 600-25A, KH 600-26A and the KH 600-27A. Yet, very few of these varieties have been made available to farmers.

Although the seed industry is liberalized, the government should make a deliberate effort to ensure all high yielding seeds are made available to farmers in order to increase food production in the country. Companies holding rights over such varieties should be compelled to produce enough seeds for sale to farmers.

A company such as Kenya Seed Company is partly owned by taxpayers. The government should use its leverage in the company to ensure it works for the interest of farmers and not individual interests. *Page 4 and 6*

Sweet potatoes can provide both food and money

Sweet potato is highly nutritious. The orange-fleshed variety has vitamin A that addresses deficiency among children and even adults. Sweet potatoes fetch good prices in the market all year round because few farmers grow them.

A sweet potato vine with tubers

Amina Day Ojijo | Sweet potato is a popular food especially in Kenya's Western region. Most of the varieties are drought resistant, hardy and can grow in marginal areas (dry areas), thus contributing to improved food security.

The sweet potato tubers are a rich source of vitamin A, dietary fibres and minerals. The orange-fleshed sweet potato variety has increasingly gained popularity because it is known to boost the immune system.

Importance of Sweet potato in Kenya

- Climate change is affecting amount and rainfall patterns, sweet potatoes is a more drought tolerant crop.
- It is a low-input crop making it ideal for many small-scale farmers; the crop does not require pesticides or fertilizers.
- Production presents an opportunity for farmers to improve their food security situation and income from the sale of the surplus tubers.
- The ability of sweet potato to establish ground cover very fast enables suppression of weeds such as striga, control of soil erosion and maintenance of soil fertility hence making it an important crop for Kenya's farming systems.

Prospects in Kenya

Sweet potato is now consumed by many Kenyans of all socio-economic classes. Many families and hotels are coming up with more creative recipes other than boiling the tubers. Sweet potatoes are regarded as a natural nutritious food due to the fact that they are grown without chemicals hence taken as a healthier dietary choice.

Popular in both local and 5 star hotels

In major producing areas marketing in most cases is through some merchants from major towns like Mombasa, Nairobi and Nakuru. They contract the farmers and purchase their tubers at wholesale prices from their farms.

Sweet potato is relatively cheap for households and serves as a good substitute for bread and cakes.

The demand for sweet potatoes is increasing country wide with entrepreneurs venturing in sweet potato processing.

Other Opportunities

- **Seed bulking** – to produce and sell high quality vines/cuttings to other farmers.
- **Livestock feed** – growing of sweet potatoes as fodder also manufacturing livestock feeds.
- **Industrial use** – Starch is produced from sweet potatoes for industrial use (garment factories).
- **Production of composite flours** – (mixed with millet, sorghum, groundnuts, banana flour).

Requirements for growing sweet potato

Rainfall

Annual rainfall of 750-1000mm annually is best for production however some varieties are known to be drought tolerant. Although sweet potato can tolerate drought to some extent, yields drastically reduce when drought occurs during the first 6 weeks after planting and at root formation and development.

Temperature

Sweet potato is essentially a warm weather crop. Growth is best at temperature above 24°C. When temperatures fall below 10°C, growth is severely retarded.

Soils

Sweet potato grows best on sandy-loam soils and does poorly on clay soils. Good drainage is essential since the crop cannot withstand water logging. A soil pH of 5.6 – 6.6 is preferred. It is sensitive to alkaline or saline soils, and such soils should be avoided. Where the water table is high, the crop is planted on mounds or on ridges. Soils with high bulk density or poor aeration tend to retard tuber formation and result in reduced yields.

Varieties

Both local and improved varieties are grown

- Sweet potato varieties differ from one another in the colour of the tuber skin (usually white, brown yellow, reddish purple), colour of the tuber flesh (usually white or yellow), shape of the tuber, shape of the leaves, depth of rooting, time of maturity, resistance to disease and other vegetative characteristics.
- Varieties whose flesh is yellow-orange coloured have high levels of carotenes used in synthesis of vitamin A. This is particularly important in parts of North Eastern, Coastal, Western and Nyanza regions where Vitamin A deficiency is prevalent.

Improved varieties that are grown in Kenya

SPK 013, SPK 004, Kemb 20, Kemb 23, Kemb10, KSP 20, KSP 11, Mugande Muibai, Ex-Diani, Mafuta, Japanese pumpkin and CIP Selection, 420009.

1. Kemb 10 and SPK 004 are suitable for most areas of the country.
2. KSP 20, KSP 11 and CIP, 420009 have shown good performance in dry areas.
3. SPK 013 is recommended for the Western zone including the Lake Basin.
4. Kemb 23 and Ex-Diani are suitable for Central and Coastal lowlands.
5. Mafuta is suitable for all sweet potato producing areas and is best for foliage production.

It is of great significance for farmers to note that the most traded variety of sweet potato in Kenya is the red skinned and yellow-fleshed because of its high consumer demand. High yielding vines (seed) can be obtained at KALRO Regional Research Centres Country wide and from some farmers.

Planning production

- Ensure climatic production requirement are met
- Source for adequate clean planting material and variety that the market requires
- Plan for marketing in advance.

In the next series as the rains start in March, we shall be focusing on land preparation and planting tips for growing sweet potatoes.

Source: Complete guide on sweet potato farming in Kenya-Helen Omondi Kaundo

More reading on Sweet Potato Article: *http://www.infonet-biovision.org/PlantHealth/Crops/Sweet-potato*

The Organic Farmer is an independent magazine produced monthly for the East African farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. The articles in the *The Organic Farmer* do not necessarily reflect the views of ICIPE nor Biovision Foundation or Biovision Africa Trust (BvAT).

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Push-pull technology can control fall armyworm

Push-Pull technology can control fall armyworm Instead of using expensive and harmful chemicals to control the fall armyworm, the Push-Pull method has been shown to be effective in controlling the pest.

An experimental Push-Pull plot in Nyabondo, Nyakach Sub-county, Kisumu

Beritah Mutune | The impact of the fall armyworm is already being felt across Africa after its invasion of the region in the last two years. The fall armyworm is a heavy feeder that quickly destroys a wide range of crops such as maize, sorghum, rice, wheat and sugarcane, including a number of horticultural crops. It can spread very fast and can fly over 30 kilometres in one night assisted by the wind.

The adult moth lays about 150 eggs in one day. Within as little 10-12 days, the worm changes into a moth and the young adult flies away in search of new regions and other fresh crops to consume. The larval stage burrows into crops, destroys and eventually kills them.

Chemicals are harmful and pests develop resistance

Synthetic pesticides are mostly used to control the pest. The chemical sprays however contaminate the environment and cause major health risks to human, livestock and the biodiversity especially the non-targeted organisms. The adult lays the eggs mostly at night therefore the infestation is only detected after damage has been done to the crop. This makes the control difficult. "The pest also has a diverse range of alternative host plants that enables its populations to persist and spread. Moreover, the fall armyworm has been shown to develop resistance to many insecticides, while the performance of such chemicals is also hindered by limited knowledge and purchasing power of farmers, resulting in the use of low quality, and often harmful products," says icipe scientist, Dr Charles Midega.

Other benefits push-pull technology

Desmodium is a perennial cover crop which is able to exert its Striga control effect even when the host crop is out of season, and together with Brachiaria or Napier grass, protect fragile soils from erosion. It also fixes nitrogen, conserves soil moisture, enhances insect abundance and diversity and improves soil organic matter. Desmodium enables cereal cropping systems to be more resilient and adaptable to climate change while providing essential environmental services. It also makes farming systems more robust and sustainable.

In addition, Push-Pull also controls maize ear rots and

A maize plant infested by fall armyworm

mycotoxins, while improving soil health, producing high quality fodder for livestock. Therefore, the technology facilitates crop-livestock integration thus expanding farmers' income streams. Farmers using 'push–pull' technology not only use it for pest control but also to reduce the devastating effects of the parasitic weed *Striga hermonthica* through the effects of desmodium. The technology is appropriate and economical to the resource-poor smallscale farmers in the East Africa region as it is based on locally available plants, no expensive external inputs, and fits well with traditional mixed cropping systems in Africa.

Trials in Kenya, Uganda and Tanzania

In a recent study by Dr. Midega and others published in Crop Protection journal, entitled "*A climate-adapted push-pull system effectively controls fall armyworm, Spodoptera frugiperda (J. E. Smith), in maize in East Africa, 2017*" indicates that climate-adapted push-pull tool developed for control of cereal stemborer in drier regions can be used for the management of fall armyworm.

The technology comprises intercropping maize with drought-tolerant Greenleaf desmodium, *Desmodium intortum* (Mill.) Urb. and planting Brachiaria cv (Mulato II) as a border crop around this intercrop. Protection to maize is provided by repellent chemicals that are emitted by the intercrop that repel (Push) stemborer moths while those released by the border crop attract (Pull) them.

In this study, 250 farmers who had adopted the technology in drier areas of Kenya, Uganda and Tanzania were randomly selected for the study during the long rainy season (March-August, 2017). Each farmer had a set of two plots, a climate-adapted Push-Pull and a maize monocrop. In the climate-adapted Push-Pull plot, maize was intercropped with greenleaf desmodium and Brachiaria cv (Mulato II) was planted around this intercrop at a spacing of 50 cm within and 50 cm between rows. Greenleaf desmodium was planted in between rows of maize. Maize was planted at inter and intra-row spacing of 75 cm and 30 cm, respectively, in both plots.

Continues on page 8

How Push-Pull technology works

Push-pull' is an effective approach in pest management which uses a repellent intercrop and an attractive trap plant. Insect pests are repelled from the food crop and are simultaneously attracted to a trap crop.

A recent study has established that a climate-adapted version of Push-Pull developed by scientists at the International Centre of Insect Physiology and Ecology (ICIPE), in Kenya and Rothamsted Research, in the United Kingdom, in collaboration with other national partners is effective in controlling the fall armyworm, providing a suitable, accessible and environmentally friendly and cost-effective strategy for management of the pest.

The technology involves intercropping maize with a repellent plant, such as desmodium, and planting an attractive trap plant, such as Napier grass or brachiaria, as a border crop around this intercrop. It involves intercropping cereal crops with insect repellent legumes in the Desmodium genus, and planting an attractive forage plant such as Napier grass as a border around this intercrop. For example, this technology has recently been adapted to drier areas through the incorporation of drought tolerant companion plants: Greenleaf Desmodium as an intercrop and Brachiaria cv (also called Mulato) as a border crop.

Gravid (heavy) fall armyworm females are repelled or deterred away from the target crop (Push) by stimuli that mask the host while they are simultaneously attracted (Pull) to the trap crop, leaving the target crop protected. Desmodium produces root exudates some of which stimulate the germination of striga seeds and others inhibit their growth after germination. This combination provides a novel means of in situ reduction of the striga seed bank in the soil.

What you need to know about seed this season

What you need to know about seed this season The quality of certified maize seed is very important since it determines the maize yield, food security and income for the farmer.

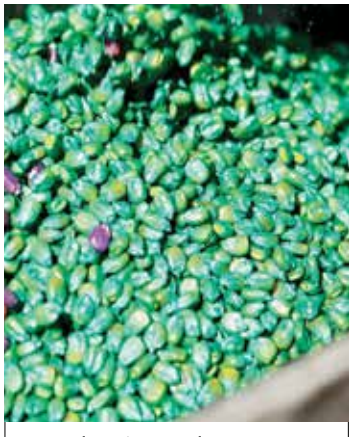
Workers process seeds at Seed-Co company factory at Kiminini, Kitale

Peter Kamau | As the planting season draws near, farmers are busy preparing their land in readiness for planting. The choice of seed, especially maize seed is very important and will help determine the amount and quality of the maize harvest at the end of the year. It is important that farmers buy their seeds early enough to avoid the last minute rush that may force them to buy the wrong seeds or even fake seed, which is often sold when there is shortage of seed, a practice that is common every year during the planting season.

Beware of fake seed

Despite our warning on the existence of fake seeds in the market every year, many farmers still end up buying fake seed, mostly sold by unscrupulous traders in all maize growing areas. It is important that farmers keep to the following guidelines to avoid being cheated:

- Farmers should only buy seed from reputable or licensed seed merchants and stockists.
- Buy your seed early enough preferably during the month of January or February when most of the seed companies have adequate seed. If you buy your seeds in March or April, most of the popular maize varieties will have run out of stock. This is the wrong time for buying seed because of shortage. Most fake seed is sold during this period. Farmers therefore risk buying expired or fake seed.
- All genuine seed have Company tags and inspection labels from the Kenya Plant Health Inspectorate Service (KEPHIS) inside the seed bag. Immediately you open the seed bag, check the tags to ensure the seeds you have bought are genuine.
- Check for the expiry date in each seed bag you buy, expired seed cannot grow well.
- Store the seeds in a cool dry place to ensure they do not spoil through humidity or excess sunlight or heat.



Dressed maize seed

Choose right seed for your region

All maize varieties are developed for the various climatic regions in the country. For farmers who wish to get good maize yields, it is important that farmers choose the right varieties for their region. This enables them to increase their income and boost their food security.

All maize varieties are developed by scientists for planting in different regions depending on the altitude, rainfall, type of soil, temperature and other climatic conditions. This is done to ensure that farmers get the best varieties that are suited to their climatic regions.

New varieties

There is an increase promotion of new maize varieties as companies compete to sell their seeds. Farmers should be very careful when going for new varieties. We always advise farmers to work like professionals. When you buy a new seed variety, isolate a small portion of your land and mark it.

Plant the new variety in this portion of land and then observe its attributes. Check if the variety is prone to opening the cob at maturity which may lead to rotting of the grain. It is important to check if the variety is susceptible to falling during windy conditions (lodging). Check to see if the maize has adequate good grain weight to ensure you have quality maize for milling.

Ensure all maize planted is well-managed throughout the production period. Poor management such as late weeding, poor soils or late land preparation and planting will always reduce your harvest.

How to check if maize seed is genuine

Farmers need to remain alert and ensure that they only buy seed from licensed seed dealers. It is always important to check the shop where you buy seed to ensure they have a licence from the Kenya Plant Health Inspectorate Service (KEPHIS).

In the last two years, KEPHIS has come with a method of checking if the seed you buy is genuine. All genuine maize seed in small packages (2kg and below) have sticker label from KEPHIS attached to each bag. All the farmers need to do is to remove the label and scratch it the same way you do for the mobile phone airtime. After scratching, check the number on the label and send to 1393. You will receive a message indicating if the seed is genuine or not.

For those buying 10kg and 25kg seed packages, one should open the bag and check for a KEPHIS tag that usually shows the variety and even the lot number. You can call KEPHIS on Tel. 0709 891 000. If you provide them with these details, they will advise you if the maize you have bought is genuine or not.

Seed quality depends on strict inspection

To improve and maintain the quality of seed in the country is a very important process. Maize seed is inspected thoroughly at every stage of growth to ensure it has all the desired qualities and characteristics when it is finally released into the market.

If not well- maintained, seeds can lose their vigour. Seed inspectors from KEPHIS visit the seed production farms on a regular basis to ensure the maize seed meets all the parameters. Some of the factors that reduce the quality of seed during production include the following:

Selfing: If the removal of tassels from the mother plant is not done properly, the plant will pollinate itself (selfing), this reduces the quality of the seed from such lines.

Drought stress: If the seed maize is affected by drought, the surviving plants cannot produce quality seed since they lose some of the characteristics of the parent material.

General crop failure or diseases: If the maize seed does not grow as it is expected eg stunting, attack by diseases eg. Maize smut or Grey Leaf Spot (GLS) the maize seed should be condemned because it will lead to crop failure or transfer of diseases. Diseased maize seed will lead to spread of diseases to all parts of the country where such seed is planted.

The benefits of animals and plant proteins

Too much animal protein causes an increase in cholesterol, weight gain, diabetes and hypertension. To get complete proteins, consumers should eat a whole range of legumes.

Linah Njoroge | The key to good health is eating a balanced diet, which means that you are eating from all the food groups. Food is categorized into about 3 major food groups.

Carbohydrates which are derived from different starches, fruits and vegetables. Its is from the fruits and vegetables that we get most vitamins and minerals and other photochemical that are important in boosting the immune system.

Fats and oils. You can get oils from vegetables, nuts and seeds as well as from animal sources. For healthy eating, we recommend that you use oils derived from plant sources or otherwise called vegetable oils as fat from animal is saturated and is high in cholesterol. Too much cholesterol is associated with excessive weight gain or obesity. Obesity is one of the major courses of lifestyle diseases such as Heart, stroke, hypertension, Diabetes type 2 and certain cancers.

Proteins which is derived from Plant or animal sources. We always recommend that you include both sources of protein for a healthy diet. The key difference between animal and plant protein is in their amino acid profiles and rate at which our bodies can absorb amino acids and put them to use. Proteins are the only sources of essential amino acids which are needed for normal functioning and development of our bodies. As adults, we require eight amino acids while infants require nine. Most animal based protein foods contain all the nine essential amino acids and that is why they are called complete protein foods or are sometimes referred to as high biological value protein.

On the contrary, the foods that are deficient in one or more of the essential Amino Acids are referred to as low biological value proteins and originate from plants such as cereals, seeds, lentils, nuts, beans and pulses. This does not mean that plant proteins are inferior to animal protein because they are of low biological value

Photo: NJ

Meat has some protein elements not found in plant proteins

Eat a balanced diet

Rich sources of protein are lean meat, poultry, eggs, milk and milk products, fish and sea food. Most animal protein contains all the eight amino acids while every plant food contains different essential amino acids in varying quantities. That is why we recommend that one eats a varied combination of plant protein not only to get the combination of all the essential amino acids but also for optimal nutrition. One of the best ways to remove the anti-nutrient factor of legumes and to increase the digestibility is through food preparation techniques such as soaking and sprouting plant proteins. This increases the bioavailability of protein. Soaking and sprouting of grains and legumes helps to break down the protein into shorter chains of amino acids thus improving the digestibility.

A deficiency in dietary protein or extreme lack of protein is the cause of a severe form of malnutrition in children called Kwashiokor. Animal protein has cholesterol and excessive intake of animal protein will increase your blood cholesterol levels putting one at risk of lifestyle diseases.

Eat less meat

However, animal protein can be eating in moderation and has very important nutritional values that are important for health such as heme iron. Iron is essential nutrient because it forms an important part of haemoglobin(derived from the word heme-) which carries oxygen in the blood. Therefore inadequate intake or a deficiency in this type of iron will cause iron deficiency anemia which is most commonly seen in young women and children. There are two forms of dietary iron namely heme iron and non - heme iron.

Heme iron is derived from animal protein such as meat, fish, poultry, and sea food while non-heme iron is found in plant based foods such as beans, grains, vegetables, fruits, nuts and seeds. Dried beans and dark green leafy vegetables are very good sources of Iron. Eating a variety of foods especially foods rich in vitamin C will enhance the absorption of iron in the body.

Protein: http://www.infonet-biovision.org/HumanHealth/Proteins

Yoghurt: A healthy food and money maker

When raw milk is converted into yoghurt, the nutritive content is very good especially for women. Yoghurt is known to cleanse women's reproductive health. Women are recommended to take at least four cups of yoghurt every week.

Fourth, yoghurt has a lot of vitamins which are very useful for consumers especially those who have low immunity. Yoghurt is also sweeter than raw milk.

Preparation

Before processing milk into yoghurt, you must ensure the environment and the equipment you are using to do it is clean. This is because milk is a highly perishable product.

- Isolate milk which is free from harmful bacteria and ensure that the animal that produced the milk is free from diseases.
- Ensure that you have all the equipments and the required ingredients.First you need clean milk. Then you need an alcohol thermometer to measure the temperature during processing.
- You also need clear buckets, a sieve, a fireplace, and the Lactobacillus thermophilus bacteria, which converts milk into yoghurt.

Steps

1. The first step is to make a fire. Charcoal is the main source of fuel because you do not want your milk to be smoky.
2. Then select the milk and measure it to know the amount you are processing into

yoghurt. Knowing the amount is important because the ingredients you will be using must be equal to the amount of milk that you are processing.
3. Heat the milk to a temperature of 60 degrees Celsius. At this temperature, make sure you are stirring it.
4. Add a sweetener. This could be normal sugar, special sugar used in making yoghurt. For example, if you have 10 litres of milk, you can add half a kilo of sugar.
5. Continue heating the milk until it reaches 85 degrees Celsius. All this time you are using the thermometer to measure it.
6. At 85 degrees Celsius pasteurize it. This means you release the excess water and bacteria and all the other microbial organisms which are not good, from the milk. Pasteurizing takes 30 minutes.
7. Remove the milk from the fire and then cool it very fast down to about 42 degrees Celsius.
8. Empty it from the hot pan or *sufuria* and sieve it into a bucket.
9. Add the culture and stir it along a clockwise direction. In milk processing you use one direction when stirring.
10. Innoculate the milk for about six to eight hours. To inoculate, you use a device called a fireless cooker which maintains it at a temperature of 42 degrees Celsius.
11. After eight hours, remove the content and check whether it has formed curds. If it has formed curds, remove it and keep it for five minutes in an open place to set.

After it sets, remove the top cream and put the flavours. Stir it again in a clockwise direction. At this point you can serve it or keep it in the fringe for cool.

Karitu Njagi

Be careful when choosing your maize seed

If farmers want to try a new variety, buy a small package and plant it on a small portion of land. Go into full production only if the variety has good qualities that you like.

Peter Kamau | Below we provide farmers with maize varieties including new varieties that have been released by seed companies for different climatic zones zones in Kenya:

Genuine

Fake

It is difficult for most farmers to tell the difference between genuine and fake seeds

High altitude areas (Rainfall 1000-1500mm Altitude 1700-2300 metres above sea level)

Variety: ADC 600-23A

Company: Agricultural Development Corporation (ADC)

Qualities

- Average yield 43-68 bags per acre
- Sweet in taste
- It does not lodge (fall easily)
- Produces double cob
- Resistant to rust
- Resistant to Grey Leaf Spot (GLS)
- Out yields H614D by 43.3%

Suitable growing areas: Trans-Nzoia, Uasin Gishu, West Pokot, Keiyo Marakwet, Laikipia, Nakuru, Kisii, Kiambu.

Variety: KH 600-14E

Company: FRESHCO

Qualities

- Improvement of H614D.
- Average yield 45-50 bags per acre.
- Tolerant to GLS.
- Sweet to taste.
- Flinty (hard cover, not easily attacked by weevils).
- Heavy (like original H614D).
- Droops (cobs face down at maturity).
- Outyields original H614D by 13.3%.

Suitable growing areas: Trans-Nzoia, Uasin Gishu, Kericho, West Pokot, Keiyo Marakwet, Laikipia, Nakuru, Kisii, Kiambu.

Variety: KH 600-16A

Company: FRESHCO

Qualities

- Yields 35-50 bags per acre
- Very good standability (does not lodge).
- Tolerant to GLS and leaf blight
- Has good husk cover
- Droops when dry (no rotting)

Suitable growing areas: Trans-Nzoia, Uasin Gishu, Kericho, West Pokot, Keiyo Marakwet, Laikipia, Nakuru, Kisii, Kiambu.

Variety: Maize KH 600-15 A

Company: East African Seed Co. Ltd

Qualities

- White semi-flint (with hard outer layer) grains.
- Very high yielding variety, 35-45 bags per acre.
- Has a very strong stalk hence good standability.
- Good husk cover preventing Ear rotting.
- Drooping of cobs on physiological maturity to prevent rotting of kernels.
- KH 600-15A-stable performing hybrid.
- Double cobbing (produces two cobs).
- Tolerant to most common leaf diseases e.g. GLS, MSV and blights.

Variety: Prestige HI 16A

Company: Elgon Kenya Limited

Quality

- High yielding.
- Matures in 160-180 days.
- Very good standability.
- Tolerant to grey leaf spot (GLS) and leaf blight.
- Cob have good husk cover and droops when dry.
- Cob does not rot in heavy rains.

Variety: SC Twiga 81(KH600-20A)

Company: The African Seed Company

Quality

- Best in attitudes of 1800-2300 metres above sea level
- Matures in 6 months
- Flint to semi flint grain quality
- Good resistance to blights
- Yield potential 50-53 bags acre
- Has high density grains making it good for weight selling

Variety: H614D

Company: Kenya Seed Company

Qualities

- A very stable variety
- 30-45 bags an acre
- Good standability
- Droops when dry
- Heavy
- Good husk cover
- Resistant to GLS, Leaf blight

Variety: H6213

- High yielding 45-56 bags an acre
- Opens ear (prone to rotting)
- Resistant to GLS, leaf blight
- Heavy
- Good standability
- Does not lodge
- Requires a high level of management to do well

Other popular high altitude varieties from Kenya Seed Company include H629, H628 and the new H6218.

Other high yielding varieties suitable for high altitude areas are KH 600-27A,KH 600-25A and KH 600-26A- These varieties are yet to go into the market.

Medium altitude areas

Variety: H513

Company: Kenya Seed Company Ltd

Qualities

- Recommended for the coffee zones altitude (1000-1700m)
- Partially resistant to maize streak virus
- Yields 24 bags per acre

Variety: SC Tembo 73

Company: The African Seed Company

Qualities

- Produce very big and very long cobs
- Very tolerant to MSV, GLS and common leaf rust
- Maturity 5-5.5 months
- Good for silage
- Yield potential 48-58 bags per acre under GAP

Suitable growing areas: Western Kenya, Kakamega, Bungoma, Busia, Kisii,Nyanza region-Homa Bay, Suba,Migori,Rongo, Siaya, Bondo, South Rift-Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara, Central Province-Muranga, Kiambu, Kirinyaga, Eastern Privince, Machakos, Kitui Mwingi.

Variety: KH 500-43A

Company: East African Seed Co. Ltd.

Qualities

- A medium maturing hybrid maize suitable for growing in medium to high altitude areas (130-150).
- Yields about 28-32 bags per acre under good crop husbandry.
- Plants produce two cobs which have tightly packed semi flint grains with good husk cover.
- Green coloration of leaves is less in early stages of growth and increases as the plant matures.
- It is sweet tasting maize .
- It is tolerant to Maize Streak virus.
- It is heavily leafed and thus is a good dual purpose variety for fodder and food.
- Recommended for planting in Central and upper areas of Eastern and also parts of Western Kenya.

Suitable growing areas: Western Kenya, Kakamega, Bungoma, Busia, Kisii,Nyanza region- Homa Bay, Suba,Migori, Rongo, Siaya, Bondo, South

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Bean fly can be a big problem in bean production

I have planted beans but they are wilting with black pest. How can I control it and what is this pest?

Dear farmer,

Whenever you notice a pest in your crops, it is important that you send us a picture if possible so that we can identify it and advise you on how you can control it. From your description, it is possible that your crop is affected by bean flies. Bean fly is one of the major pests that attack beans and related crops including cow peas, soybeans and mung beans. Infestation by this pest usually occurs during the rains or immediately after rains.

Signs of damage

Some of the symptoms associated with the bean fly include stunted growth, yellowing of the leaf, collapse and drying of the entire plant. One may even give up on the idea of being able to save the weak plants, resulting in loss of yield and waste of planting time as well as loss of income. Some farmers suspect the problem to be caused by nematodes poor seed quality or low soil fertility. But on close examination, the problem is often found to be the bean fly.

A section of bean farm infested by bean fly. Bean fly (Insect)

The adult bean fly is about 2mm long with clear wings that reflect a metallic blue when put against sunlight. The wings do not fold over but form a "V'shape when the fly is resting. The bean fly deposits its legs directly onto the stem, leaf or emerging bean. Incubation lasts between 2 to 4 days, after which the larva- a small white maggot eats its way to the root zone.

Crop yield affected

When the pupation takes place, some bean fly maggots travel through the leaf and stem tissue to pupate near the root collar. During their movement, the larva feed extensively on the stem tissue. The duration of the larval and pupal stages of growth is about 10 days for each stage.

The feeding activity destroys stem tissue and reduce lateral roots (that grow on the sides of the stem) roots. Some plants try to compensate by forming new roots above the damaged areas. Young seedlings and infested plants under stress wilt and die within a short time. Older and more vigorous plants may tolerate the damage but growth and yield will be affected.

Prevention and cure

- If the infestation is high, spray young bean plants with a biopesticide (such as neem, pyrethrum, sodom's apple etc).
- Earth up (put soil around the base of beans plants) around already affected stems allowing the bean to send out more roots.
- Do not over-water beans when using irrigation especially drip irrigation.
- Add neem cake or pymark pyrethrum cake to planting holes and later also around the bean stems.
- Mulch the young beans.
- Be vigilant, deal with the problem before it becomes a disaster.

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Be careful when choosing maize seed varieties

Rift-Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara, Central Province-Muranga, Kiambu, Kirinyaga, Eastern Privince, Machakos, Kitui Mwingi

Variety: SC Punda Milia 529

Company: The African Seed Company

Qualities

- Matures in 4 months
- Good for green mealies
- Good standability leading to reduced lodging
- Deep grain length resulting to high grain percentage
- Good tip cover
- Yield potential 38-45 bags per acre.
- Has good shelling percentage.

Suitable growing areas: Western Kenya, Kakamega, Bungoma, Busia, Kisii,Nyanza region- Homa Bay, Suba, Migori, Rongo, Siaya, Bondo, South Rift-Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara, Central Province-Muranga, Kiambu, Kirinyaga, Eastern Privince, Machakos, Kitui Mwingi.

Low altitude areas

Variety: Prestige 02 WE 1101

Company: Elgon Kenya Limited

Qualities

- Develops for best performance in stress/drought conditions of Kenya.
- Extremely successful in current changing climate due to global warming.
- Better yields in well managed as well as stress conditions.
- Capacity to yield up to 35-40 bags (90kg)per acre.
- Matures in 90-95 days and dried cob can be harvested in 120-125 days.
- Excellent stay green property with average height of 7-8 feet without lodging.
- Good for storage and sweet in taste.
- Good tolerance to all major diseases and pest especially stem borer.

Variety: SC Sungura 301

Company: The African Seed Company

Quality

- Ultra heat and drought leader
- Matures in 80-90 days
- Stable in different environments
- Yields 6-9 tonnes per hectare
- Tolerant to heat stress
- Good husk/tip cover
- Fast dry down rate
- Strong stocks hence less lodging
- Optimum yield received
- Can do well Within 300-1200 metres above sea level

Variety: Tosheka MH401

Company: East African Seed Co.Ltd

Quality

- White maize suitable for medium and low altitude areas.
- Matures in 100-110 days.
- Yields 28-30 per acre.
- Drought tolerant.
- Resistant to GLS(rust and blight) and viral diseases (MSV)
- Heavy grain good for milling and roasting.

Dry land Varieties

Dry land varieties mature between 90- 120 days. The varieties perform well in arid and marginal areas with a mean annual rainfall of 200-500mm. The most suitable these regions are DH01, DH02, DH03 and DH04 (Kenya Seed Company), KDV-1 (Open pollinated Variety) KDV-6 (OPV) From FRESHCO. Areas where the seeds can be planted include Taita Taveta, Mwatate, Lamu, Mpeketoni, Homa Bay, Rongo, Unguja and Siaya.

Striga resistant varieties

In parts of Nyanza and Western Kenya, a parasitic weed-striga, is a big threat to maize choking, and reducing its ability to produce. Resistant varieties have been developed for these areas. One of the varieties developed for striga resistance is FRC 425R (FRESHCO) which produces 30-35 bags an acre. Another variety is WH303 from Western Seed Company.

For more reading on Maize Seed: http://www.infonet-biovision.org/PlantHealth/Crops/Maize-Seed-Production

TOF Radio answers your questions

TOFRadio is broadcast on KBC on Thursday at 8:45pm and Mbaitu FM on Friday at 8.30pm. Tune in and listen to farmer experiences and expert advice on agribusiness and eco-friendly farming methods. On this page, we respond to some of the issues raised by farmers in their correspondence to the radio program. Send your questions and comments via SMS 0715 916 136.

Controlled light store can prolong potato life

Amina Day Ojijo | Potatoes are an important food for many families, and a good way to make money. However, many farmers are forced to sell their produce immediately after harvest even when prices are very low, because potatoes quickly rot when they are stored at home.

Potatoes have a lot of moisture, and they dry out quickly when they are kept in warm, dry places. Dried up potatoes are easily attacked by pests. On the other hand, if exposed to light or are too wet, the potatoes rot or turn green quickly becoming unsuitable for human consumption.

An ambient (controlled light) store

Farmers exploited

Says Ms. Ann Muchomba, Ward Agriculture Officer, Kieni West "Potato farmers have been facing so many post harvest challenges. Production has increased but unfortunately prices remain a challenge as they tend to drop when potatoes flood the market. This is because many farmers depend on rain-fed agriculture and harvest at the same time creating a glut in the market, lowering prices. This gives brokers an opportunity to exploit the farmers by buying potatoes at throwaway prices."

Farmers in Nyeri's Kieni Sub-County have benefitted from a new potato storage technology which helps to lengthen the marketing period of potato and saves them up to 40 per cent loss they faced previously in post-harvest handling and storage.

"Before, we used to store potatoes in our houses but we would loose up to half of our produce. Some would dry out while the wet ones rotted quickly. This store has really helped us because it stores potato for a very long time. The store is constructed from locally available materials. The materials make the store dark and cool which helps to prolong the life of the potatoes. The potatoes we have stored currently have been here for between two and three months and we will sell them when the prices improve," says Mr. Lee Waithaka, the Chairman Kiambogo/Kianjogu Farmers Group.

The Ambient Ware Potato Store seeks to improve food security and has a capacity to handle up to 40 tonnes of potatoes. The store was introduced by International Fertiliser Development Centre (IFDC) and one of the facilities is located in Kenya's Kiambogo area, Kieni Sub-County of Nyeri County and serves 70 members of Kiambogo Kianjogu Farmers group.

Easy to build

Says Patrick Boro, Capacity Strengthening Advisor, IFDC, "The store is constructed using locally available materials. The walls are made of hay straws or wheat bales which help to insulate the space inside from loosing heat. It is important that potatoes are stored in conditions of low temperature with free air circulation and in a controlled light environment."

Controlled light, air and temperature

The store has been constructed using wheat straw for insulation, which is stuffed between the inner and the outer wall. Once potatoes are harvested, the Ambient Ware Store ensures that the produce is safe from excess heat, humidity, pests, and rodents.

It is constructed in such a way that it provides darkness, aeration and temperatures that can enable potatoes remain dormant for up to four months, giving farmers ample time to find market. The farmers can now store potatoes in the Ambient Ware Store for a longer period – and earn more money by selling the potatoes out of season, at a higher price.

***For more reading on Push-Pull**: http://www.infonet-biovision.org/PlantHealth/Intercropping-and-Push-Pull*

Push-Pull method can control fall armyworm

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Results

"This study was done on the basis that over the past several months they received information from Push-Pull farmers that their fields were free of fall armyworm infestation while neighbouring monocrop plots were being ravaged by the pest. Therefore, we evaluated the climate-adapted version of the technology as a potential management tool for fall armyworm in Kenya, Uganda and Tanzania," explains Prof. Zeyaur Khan, Push-Pull leader at ICIPE. The study revealed fall armyworm infestation to be more than 82.7% lower in plots where the climate-adapted Push-Pull was being used, with associated increases in grain yields (2.7 times), in comparison to monocrop plots. The findings were supported by farmers' perceptions through their own observations where the presence of fall armyworm was low in Push-Pull plots.

In conclusion, ICIPE Director General, Dr Segenet Kelemu said that the ability to manage such a devastating pest clearly demonstrates Push-Pull's importance as a platform technology in addressing the multitude of challenges that affect cereal-livestock farming systems in Africa.

Donors involved: *The European Union; Biovision Foundation for Ecological Development, Switzerland; UK's Department for International Development (DFID); Swedish International Development Cooperation Agency (SIDA); the Swiss Agency for Development and Cooperation (SDC); the Kenyan Government amongst others. For more information follow this link: http://www.sciencedirect.com/science/article/pii/S0261219417303216*

farmers forum

0717 551 129 / 0738 390 715

Beehives for sale: We make beehives for sale. Interested farmers can make orders on any quantity they require. The following are prices for various hives: Langstroth Ksh 4,500, Kenya Top Bar Hive Ksh 3,800, Stingless bee hives cost Ksh 400 and Ksh 1,500 depending on size. Interested farmers can call Stephen on 0734 371 557.

Jersey Heifer wanted: I would like to buy a healthy Jersey Heifer preferably incalf for 5-6 months. Call 0722 357 918.

Fleckvieh bull for sale: I am selling a 1½ year old Fleckvieh bull. Call 0726 434 521.

TOF Magazine Readers Whatsapp Group: Would you like to join other TOF magazine readers WhatsApp group send your full name and County to 0715 422 460.