The Organic Farmer

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biovision

The magazine for sustainable agriculture in East Africa

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Photo: icipe

Levi Odhiambo Obura from the ICIPE's Anthropod Pathology Unit (APU) shows visitors how beneficial fungi protect plants against diseases and pests during the institution's Science Day held in November 9th and 10th this year.

KALRO to release MLN resistant maize

TOF - The Kenya Agricultural and Livestock Research Organization (KALRO) and the International Maize and Wheat Improvement Centre (CYMMIT) have developed two maize varieties that are resistant to the Maize Lethal Necrosis (MLN) disease. The two varieties, H12ML and H13ML will be released to the farmers at the beginning of 2016. The development of the two maize varieties is expected to stop the spread of the viral disease that has

led to huge losses for farmers in Kenya and the East African region.

The MLN disease is transmitted by two viruses, the Maize Chlorotic Mottle Virus (McMV) and the Sugarcane Mosaic Virus (ScMV) which combine to cause the disease.

The disease is spread through seed, maize pests such as thrips, stemborer rootworms, flea beetles and many other insects.

Effort to stop spread

The Head of CYMMIT's global Maize Programme Dr. B.M. Prasana asked research institutions to continue working together on surveillance and monitoring of the disease in East Africa to ensure it does not spread further to areas that are not yet affected.

Dr. Eliud Kireger, the KALRO Director-General said that Kenya will work with neighbouring countries - Uganda, Rwanda, Tanzania and Ethiopia - to curb the spread of disease to these countries.

The MLN project that is being funded by USAID will coordinate regional efforts to strengthen rapid response to MLN outbreaks in the region. Research on MLN disease is being conducted by KALRO Naivasha, ICIPE, CYMMIT among others.

Virus is soil-borne

MLN disease, which has ravaged maize in the region in the last three years, is mainly spread by insect pests. However new studies show that the McMV virus can remain in the soil for up to 49 days after the maize harvest. Farmers who do not practice crop rotation are at a higher risk of having the replanted maize crop infected.

Revision of seed inspection standards

It has also been established that pests, especially thrips that attack crops such as *sukumawiki* (kales), cabbages and onions can transfer the disease from these crops to maize. The Kenya Plant Health Inspectorate Service (KEPHIS) has revised its regulations on seed inspection with a requirement that any seed with an infection above 1 per cent cannot be certified as seed to reduce chances of disease spread.

in this issue

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Dear farmers,

As in previous years, the year 2015 has not been an easy one for many farmers. The year started with delayed rains that came in May, and disappeared after a few weeks, leaving farmers with a wilted maize crop in most of the medium potential areas. There were, however, some positive developments - for example, most of the farmers in the food basket areas of the country such as Trans-Nzoia and Uasin Gishu recorded an increase in maize production due to reduced incidence of the Maize Lethal Necrosis (MLN) disease. A bumper harvest is expected in these areas if the crop will not be damaged by the ongoing El Nino rains.

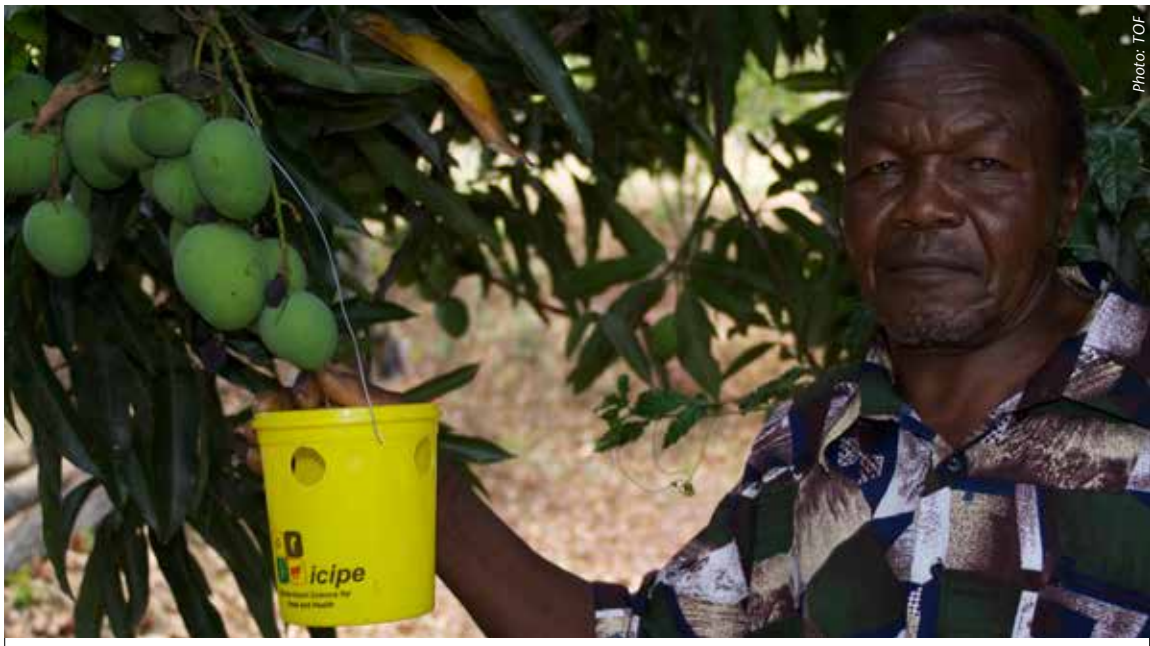
The food security situation in the country is likely to improve if farmers take advantage of the current El Nino rains. The general outlook is not so bad if farmers grow various crops for food and sale before the rains cease. With increased production, it is likely that there will be excess food production, which may push down food prices between January and April 2016. Therefore, smart farmers especially those growing cereals should not be in a hurry to dispose their produce after harvest. El Nino is usually followed by a dry spell that is accompanied by high food prices. Any farmers who store their produce between April and August or beyond will sell it at a better price than those who dispose it immediately.

To succeed in farming, farmers need to plan ahead in terms of what to grow not only for home use but also for the market. This year, TOF has featured a lot of information on various crops farmers can grow for the market. Since, agriculture in changing rapidly from traditional methods of farming into modern modes of production, farmers need to keep pace with these changes in order to increase production and maximize their earnings.

Farmers need to know that the use of products promoted by multinational companies that are dangerous to consumers, animals and the environment is a threat to sustainable agriculture in Kenya and other African countries. Chemicals like RoundUp® herbicide, which has been linked to certain cancers, have been banned in developed countries but are still on sale in Kenya. Also, there is a sustained campaign to introduce GMOs into the country, whose safety has not been established.

ICIPE fruit fly starter packs help Elgeyo Marakwet n

For many years, farmers in Keiyo South had unsuccessfully tried many methods to control fruit flies in their mango orchards until ICIPE's fruit fly bait was supplied to them. It proved so effective that mango farmers now want training and more baits to deal with the pests.



Julius Kipsoi shows one of the starter kits he received from ICIPE to control fruit flies in his mango orchard.

Peter Kamau For many years, mango farmers in Koimur location in Keiyo South in Marakwet County have grown mangoes as their main cash crop. But they have never reaped from growing the crop due to heavy fruit fly infestation levels (resulting in 30 – 80% losses). The female fruit flies lay eggs under the skin of fruits especially at colour break stages (when fruit starts ripening), causing damage to the fruit. The eggs hatch into larvae that feed on the decaying flesh of the fruit causing the infested fruits to quickly rot and become inedible or drop to the ground. The pest destroys a large portion of the mango fruits that the farmer targets for the local urban domestic markets and the lucrative export markets in the regions.

Chemical pesticides failed

Julius Kipsoi, a farmer from Koimur, has six acres with over 500 mango trees in his orchard. But he has not managed to recover his cost of production due to the damage caused by fruit flies. Kipsoi had tried several chemical pesticides as advised by agrovets to use on his mango fruits during the fruiting season. The chemicals proved ineffective against the fruit flies and the farmers in the area sought alternatives.

"This is major mango production zone in the country with readily available access to the market as it serves traders who come from Iten, Eldoret, Kitale, Kakamega and even neighbouring countries like Uganda (Kampala). We are unable to meet the increasing demand due to fruit fly damage," he says.

Standing L to R: *Dr. Sunday Ekesi, Mr. John Njoroge, Dr. Joseph Mureithi, Dr. Nguya Maniania, Dr. Henry Kiara, Mr. Peter Kamau (TOF Editor), Ms. Nancy McNally (former member) and Dr. David Amudavi.* **Sitting L to R**: *Ms. Caroline Kwamboka (TOF Manager) , Ms. Regina Muthama, Mr. William Makechi and Rt. Senior Chief Josiah Arende.*

The TOF Editorial Advisory Board members and staff

Since September 2014, TOF has relied on the professional and practical expertise and advice given by the Board members to improve the relevance, quality and efficient outreach to its many readers. In 2016, this Board transforms into the Biovision Farmer Communication Programme (FCP) Advisory Board and will continue to provide similar support.

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 and Biovision Foundation.

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mango farmers

Fruit fly discourages mango production

His neighbour, Silas Turchi, has a 25 acre-farm most of which he plans to put under mango production. From the five acres he has put under mangoes, Turchi says he sold fruits worth Ksh100, 000 but he had to throw away a lot of the fruits he had harvested due to fruit fly damage. "I would like to increase the acreage under mangoes in my farm but I am unable to do so because of the fruit fly menace," he adds.

Retired Chief, Wilson Chesonok, has 100 mango trees in his ½-acre farm. Like the other farmers, he has been discouraged from expanding his mango orchard due to the threat posed by fruit flies.

Appeal to TOF

Earlier this year, farmers from Koimur sent an SMS to *The Organic Farmer* magazine seeking for advice on how they could control fruit flies in their farms to increase mango fruit production. The magazine approached scientists at the ICIPE Fruit Fly Programme who donated two types of fruit fly IPM components and advice on how to use the starter kits to suppress fruit flies in their orchards. The baits were delivered by TOF in January this year.

Baits helped increased mango harvest

When TOF revisited them recently, all the farmers who received the starter kits appreciated the assistance. They all reported increased mango production and successful harvest during the season after using the fruit fly IPM technologies. However, they do not have an outlet where they can access and buy the products apart from the ones they received from ICIPE. "I have never harvested and sold as many mangoes as I did this season since I started growing mangoes in the year 2002," says Kipsoi. He observed that although the fruit fly materials was not applied in every tree in his orchard, the effect was so great that very few of his mangoes (less than 20%) were damaged during the season by fruit flies.

Silas Turchi, another farmer from Koimur sub-location of Elgeyo Marakwet, says he had

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How to control mango fruit flies

In East Africa damage from fruit flies has been reported to range between 40 to 80 per cent since the invasion by one of the most destructive mango pests - *Bactrocera dorsalis* (*formerly invadens*) in Kenya. This fruit fly species is the dominant pest in lowland areas such as Keiyo South in Elgeyo Marakwet. The pest is also known to attack over 40 unrelated fruits which include oranges, tomatoes, bananas, guava, custard apple and avocadoes. Other fruit fly species of economic importance are the *Ceratitis Cosyra*, *C. rosa*, *Ceratitis anonae*, *C.* and *C. fasciverantris* - these pests also attack other cultivated and wild fruits.

The female fruit fly lays its eggs under the skin of the mango fruit. The eggs hatch into whitish maggots that feed on the decaying fruit, which cause rotting and great damage to the fruits, resulting in great losses to farmers. Farmers can control fruit flies through the following Integrated Pest Management (IPM) methods:

Food baits: The food bait attracts the fruit flies from a distance to the spot of application where the flies feed on the food bait which contains a "soft" pesticide. They die when they eat the bait, killing them before they infest the fruits. The bait is applied to a localized 1 m² spot on the fruit tree canopy using CP 15 knapsack sprayer when the mango fruits are about golf ball size (about 4cm in diameter). This application should be continued until fruit harvesting is completed.

Commercial baits in the market include NuLure®, Buminal, GF-120®, Solbait, Biolure®, Torula yeast®, Hymlure® - these can be mixed with biopesticides such as spinosad and applied as explained above. GF120® is already mixed with spinosad. Traps baited with such food baits capture both females and males of several species of fruit flies. Apart from Biolure, which is replaced every four weeks, all the other food attractants are renewed every 7 days. However, because these baits are expensive and not readily available, ICIPE is in collaboration with a private partner in Kenya to fast track the production of local bait (Dudulure®) as an alternative source that is equally effective and can replace the more expensive products in the markets. This food bait will be made easily accessible to all farmers at much lower and reasonable prizes for the local farmers.

Augmentoria

Soil inoculation: Research at ICIPE has identified a potent fungal isolate (*Metarhizium anisopliae*) that is effective against adult or the pupa and larval stages of major fruit fly species that are of native and of exotic origin. During the developmental cycle of fruit fly, the mature larvae leave the fruit and drop to the ground where they burrow into the soil and form resting stage called puparia. An important part of fruit fly suppression includes soil treatment with these fungal pathogen to kill the maggots and puparia in the soil. The fungus is formulated into granules, which can be dispersed by hand and

The fruit fly (Bactrocera dorsalis

then raked into the soil while oil-based formulation is applied using a knapsack sprayer. Both formulations are effective and only one application is required on the ground below the mango canopy. Application is usually done at the onset of fruiting and can persist in the soil for over a year.

Orchard sanitation: Orchard sanitation involves the collection and destruction of all fruit fly infested mangoes found on the trees and fallen ones on the ground to significantly reduce fruit fly populations in the orchard. This should be done at least twice a week for the entire mango fruiting season. In this regard, the collected fruits should be destroyed or composted by dumping them in an Augmentorium rather than burning or burying deep in the soil or putting them into plastic bags to kill the fruit fly maggots. The Augmentorium is a tent-like screen structure that is designed to retain fruit flies (while allowing their parasitoids to leave or enter the structure).

Augmentoria can be easily constructed by farmers. It serves the double purpose of field sanitation and conservation of natural enemies of fruit flies. The tent is designed in such a way that it is able to confine all the fruit flies that emerge from the fallen rotten fruits that are collected from the field and deposited in the structure, while at the same time conserving their natural enemies by allowing the parasitoids to escape from the tent through a fine mesh at the top of the tent.

Biological control is the use of beneficial insects like parasitoids whose immature life stages develop within the fruit fly host (pest), ultimately killing the fruit fly before they emerge. They are also referred to as "farmers' friends" and help to reduce the damage caused by fruit flies. One of the most outstanding successes against fruit flies is attributed to the use of the egg parasitoid, *Fopius arisanus* against *Bactrocera dorsalis*. It attacks the eggs of the fruit fly in the fruits and develops through the larval stages of the fruit fly and emerges as an adult parasitoid in the pupa of the fruit flies. This parasitoid is presently being released for free in major mango growing zones in Kenya and Africa at large. Another important parasitoid that is being released alongside with *F. arisanus* in Kenya and other African countries is a solitary larval-pupal parasitoid called *Diachasmimorpha longicaudata*. Both parasitoids are now established in most areas of Kenya or other countries where they have been introduced.

Male annihilation technique (MAT): This involves the use fruit fly traps particularly Lynfield traps consisting of a male attractant (methyl eugenol) combined with an insecticide, which are distributed at regular intervals over a wide area in the mango orchard to reduce the male fruit fly populations to low levels that mating does not occur or reduced to low levels. MAT is currently being promoted by ICIPE as a component of the IPM Strategy for fruit flies. Male attractants such as methyl eugenol, cuelure, vertlure and terpinyl acetate can be used with appropriate toxicant such as Mimbecidine® spinosad and deployed in the orchards. The traps should be serviced after every 6 – 8 weeks.

Fruit protection: Fruit protection involves wrapping, bagging or sleeving of individual fruits or bunches of fruits with plastic or paper bags to prevent adult fruit flies from laying eggs on the fruits. The fruits must be wrapped well before fruit fly attack at least one month before harvest. The method is effective especially if used to protect fruits meant for export or home use.

Elkanah Isabokhe

Grow chillies to diversify your sources of income

With proper management, chillies are easy to grow and can provide farmers with an alternative source of income.

Olive Mukuna | Chillies (*Capsicum frutescens L.*), hot pepper or *pilipilikali*, belongs to the family Solanaceae. They are grown mostly for their fresh fruits used to flavour soups and stews and for seasoning and making sauces. Chillies are rich in vitamin C (100-500mg ascorbic acid/g of fresh fruit).

Climatic requirements

In Kenya, the major areas of production are in altitudes below 2000m such as Machakos, Makueni, Meru, Murang'a, Kiambu and Kisumu counties. Most cultivars are adapted to temperatures of 20-30°C. Temperatures above 30°C or below 18°C may affect the production of pollen which is important for the pollination of the crop. Adequate rainfall levels of 600-1200mm per year are required for successful production of chillies. Commercial production may require the use of irrigation.

Soil

Fertile loam soil with high organic matter content and a pH of 5.5-6.8 is needed to grow good chillies. The quality of pepper is greatly affected by soil fertility and nutrient levels in the soil. Chillies do not do well in clay soils. They grow well in soils well-drained to a depth of 600mm. The soil must permit adequate root growth to support the plant and supply water oxygen and mineral nutrients.

Nursery establishment

Chillies are propagated using seeds. They should be planted in nurseries in plastic cups or by make raised beds 1m wide,

15cm high and of required length (several 3-5m long beds are more ideal than one long bed). Cover the seed bed with a plastic sheet for about three weeks to control soil-borne diseases and even weeds (this process is called solarisation).

PHOTO: IN

After sowing chillies in the seedbeds, transplanting can be done 30-40 days after planting when 8-10 true leaves appear. Hardening of seedlings before transplanting is done by removing shade (do not irrigate 3-4 days after transplanting). Chillies can be intercropped with other perennial crops such as garlic and onions.

Plough and harrow the field to a fine soil texture then dig holes spaced at 60x60cm for planting your chillies. It is important to apply compost in the holes before transplanting or spread 10-20 tons/ha and mix it with the soil. Make sure the soil is moist when planting.

It is highly recommended to establish chilli seedlings on wet soil. Always make sure that the holes on the ridges where the seedlings are about to be transplanted are exactly the same size as the seedlings plugs.

Fertilization

Correct application of fertilizers determines the success of any chilli crop. Chilli require soils with a pH of 5.6 – 6.8, phosphorus 30-60mg/kg, potassium 100-250mg/kg, calcium 300-2000mg/kg, magnesium 120-300mg/kg and nitrogen 10-50mg/kg.

Irrigation

Water supply should be adequate at all times - but excess water can damage the crop. It is important to apply just enough water to ensure optimum growth.

Varieties in Kenya

They include

- Long red cayenne
- Cayenne long slim
- Anaheim
- Jalapeno
- Fresno

(bullet chillies)

- Bird eye chilli

Harvesting and storage

Chillies are usually ready for harvesting 3-6 weeks after flowering. They are either harvested when red or green depending on the use for a continuous two months. Those for drying and sauces should be red when harvesting. Careful handling is important and the harvested crop should be stored in well ventilated crates.

Diseases and pests affecting chillies

Disease	Damage	Control
Leaf spot	Round spots on the leaves	Proper field hygiene
Powdery mildew (*Unique to the Solanaceae family)*	• Invades through stomata directly to cuticles • Causes yellowish spots on leaves	• Apply natural fungicide like Fosphite 53 SL® (from Juanco) • Use flow irrigation
Anthracnose seed borne	Brown grey sunken spot on fruit	• Hot water treatment of seeds before planting use of certified disease-free seeds. • Use hot water to treat own produced seeds. • Practise field sanitation (removal of crop debris after harvest).
Viruses ie potato virus y, tomato mosaic virus	Mosaic patterns on leaves, yellow spots, deformation and distortion, curling of leaves	• Plant resistant cultivars if available. • Select planting dates to avoid high population of vectors. • Close plant spacing to compensate for diseased plants. • Use barrier crops to minimize virus spread. • Use oil sprays to reduce virus transmission by aphids. • Use reflective mulches to repel aphids and thrips. • Use certified disease-free seed in case of tobacco mosaic virus.

Pests	Damage	Control
African bollworm *The major pest on chillies*	Bores in to the fruits and flowers creating holes that lead to rotting	• Inspect the field for bollworm caterpillars to start control. • Practice deep cultivation to destroy pupae in the soil. • Avoid planting susceptible crops in succession. • Parasitoids such as *Trichogramma spp*, and predators ladybird beetles used with biopesticide like neem • Use of IPM *Bacillus thuringiensis* (*Bt*) • Insect growth regulators such as Match
Leafhoppers	Suck sap from the leaves and distort growing points	• Sticky traps • Removing and destroying infected plants • Natural predators like lacewings
Whiteflies	• Suck sap from leave and buds leaving honey dew • Results in wilting	• Parasitic wasp *B. tabaci* (paralyzes whitefly larva) • Neem products as pesticide
Aphids	• Suck sap from leaves causing distortion • Causes leaf curls virus	Neem oils Nimbecidine® reduce aphids

If prepared the wrong way, meat can cause cancer

Kenyans love *nyama choma*. But medical evidence has shown that the way meat is prepared is one of the major causes of cancer. However, consumers should go for meat obtained from free range animals and avoid processed meats which contain many harmful additives that cause health problems.

Roasting meat increases chances of the formation of substances that cause cancer.

Dr Peter Mokaya | Many people including farmers are concerned about whether or not they should eat any meat at all in view of the recent announcement by the World Health Organization (WHO) that meat causes cancer. In this article, I share with the readers both good and bad news about meat. Naturally, when concerns are raised by the WHO, the leading global authority on health matters, that certain foods may cause cancer, the information raises serious concerns among consumers, including organic consumers.

Recently, an international panel of experts convened by the World Health Organization concluded that eating processed meats which include; sausages, hot dogs, tinned meat, ham and bacon causes cancer. These products from meat of cattle, goats, sheep and pigs increase the risk of cancer, and that consuming other red meats, even those not processed, increases the risk of colon cancer, in particular.

Why eat meat?

Human beings evolved as hunter-gatherers with meat being a major part of their diet. In fact, history shows that the structure and function of human teeth was meant to enable people to eat meat as an important protein source. However, with time there have evolved many plant sources of proteins, including good quality organic vegetarian sources, that enable some people to do without meat and still maintain good health. For non-vegetarians, some meat, is recommended for protein.

What type of meat should we eat or avoid?

Good quality meat is that which is from grass-fed, free roaming animals, with plenty of sunshine (best source of vitamin D) – that is naturally raised cattle, goats and sheep. This type of meat is considered organic, especially if it is raised with little or no use of vaccines, antibiotics, hormones, growth enhancers and other chemicals that speed up growth and protect the animals from diseases and pests. Organic meats, other than their superior nutritional content, contain higher amounts of conjugated linoleic acid (CLA) which has anti-cancer properties and hence protects people from cancer.

Bad quality meat

People should keep away from meat that is raised in unnatural environments. These include confined animals not fed on grass - these are usually fed mostly on grains, some of which contain harmful chemicals, including Genetically Modified Organisms (GMO) products. Keeping the animals in enclosed sheds limits their ability to move around with freedom to exercise and get enough sunshine.

In the USA, for example, they call such animals "factory raised animals" or Concentrated Animal Feeding Operations (CAFOs). The meat from this type of cattle is not only of inferior quality but also contains many harmful products that include cancer-causing residues.

This type of meat (and its processed products) causes cancer and should be avoided. These products may be entering Kenya, illegally, and ending up on our supermarket shelves. Only specialized testing of imported processed meat products can confirm whether they are fit for consumption.

Unhealthy preservatives

Processing involves adding non-food ingredients including harmful preservatives like nitrites, (which convert to cancer- causing products when heated), artificial coloring and genetically modified (GMO) soya and corn products which contain high residues of cancer causing chemical residues, like glyphosate. This is what makes "processed meats" particularly harmful to health.

WHO researchers have confirmed that processed meat can cause cancers, especially colon cancer. Fortunately, it is easy to identify and keep off such meat products: They are often imported and sold in local supermarkets and have several ingredients (some of which are very difficult to pronounce). Meat that has no preservatives is easy to identify – it has meat as the only ingredient.

How you cook meat affect its quality

Cooking any meat, especially red meat, on open charcoal, at high temperatures, results in chemical reactions between creatine in the meat and amino acids which convert to cancer causing polyaromatic hydrocarbons (PAH) and carcinogenic nitrosamines. Nitrosamines and other cancer causing products can also be produced from roasting meat on open air charcoal, even if the meat is organic and free from processing and preservatives.

It is important to know that carcinogenic substances form from a combination of the fatty smoke and the black spots on meat when it is "too well done" as is often the case with "*nyama choma*". Processed meats like sausages, hot dogs and bacon, when consumed in large amounts and frequently over a long period of time, are likely to cause cancers, especially colon cancer. You are advised to keep off from such meat.

In order to reduce the "cancer-causing effect" through meat cooking methods, minimize the period of roasting the meat. Turn the meat frequently and eat it when it is roasted to a medium standard. Unfortunately, because of habit and cultural considerations, most people enjoy their *nyama choma* when it is extremely roasted, that is, when almost burnt. Avoid cooking meat in this way.

Cook meat the right way

On the positive side, there are some ways of reducing the carcinogenic effect of red meat. Roasting the meat in an oven or "broiling" is a form of indirect heating of the meat which reduces its carcinogenic effects. One can also boil the meat. Another way of reduc-

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Women group benefits from TOF chicken article

When a local women's group read about the KALRO improved indigenous chicken breed in the TOF magazine, they immediately decided to start rearing the breed. Now they have started a successful poultry business.


Photo: TOF

Rearing KARLO improved indigineous chickens has provided income for farmers.

Patrick Kimeu | An article on KARLO indigenous chickens featured in The Organic Farmer magazine of June 2012 article has completely transformed King'ang'ani Women Group in Machakos county. When Mrs Eunice Mutiso and members of her group read the magazine, they immediately decided to start rearing the hardy breed of chickens that produce more eggs than local breeds. From the first batch of 150 chickens, the group realised Ksh 150,000 from the sale of eggs and chickens and now they are looking forward to raise 340 indigenous chickens from the breed.

They obtained loan

The article in the magazine did not only help Mutiso increase her family income from chicken sales, but it also helped her group secure Ksh 150,000 grant from *Njaa Marufuku* Kenya a project of the Ministry of Agriculture, Livestock and Fisheries. Ms Mutiso is now a successful indigenous farmer. Her poultry farm is also used for training of other potential poultry farmers.

This year, King'ang'ani Women Group is planning to make Ksh 1,000,000 profit from chicken and egg sales. Members of the group narrated their success story during a farm visit by Patrick Kimeu – a Biovision Field Extension Agent, in June 2014.

Bought chickens

When they read about the new chicken breed, they travelled to Kenya Agricultural and Livestock Research Organisation Centre in Naivasha where they purchased the chicks. They were also trained on how to rear the new indigenous breed. At the research station, the group bought chicken feeds, vaccines and antibiotics. Using the contacts of other groups in their region, they volunteered to start distributing TOF Magazine which they obtained from Kola office of Katumani Resource Centre. This was aimed at passing the information to interested farmers.

The new breed has major advantages as compared to other indigenous chicken. They need less feed - for five months they reach 6.5kg after which they gain a weight of 1.4-1.65 kg for layers while broilers reach 2-2.3kg. The hens lay approximately 250-280 eggs annually. An egg from the breed goes for Ksh 15. The farmers have earned a good income from selling the eggs. Moreover, it is easy for farmers to differentiate the cocks from the hens even while still young because the cocks are speckled while hens are usually black in colour.

Mr Magee Kalama DAEO (WAO) says the group wrote a proposal from King'ang'ani Women Group and after their appraisal they qualified for a grant from *Njaa Marufuku* Kenya, project of the Ministry of Agriculture.

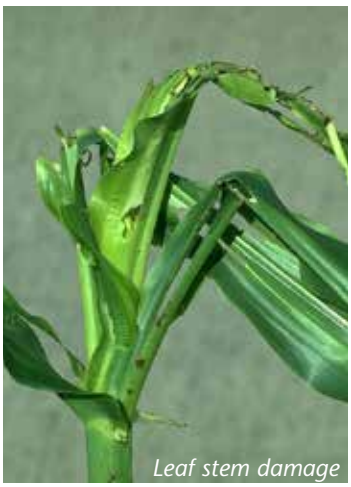
A better method for the control of stemborer in maize

Traditionally, farmers have used several methods to control the stemborer to stop its destruction of their maize crop. One of the most common methods used practiced by farmers in many African countries is the application of soil on the maize funnel (the growing part). Although this method has not been researched exhaustively, it has been found to inhibit the hatching of the eggs once they have been laid by the stemborer but it only reduces stemborer damage, it does not eliminate them. When a farmer applies the soil, it stops a small number of eggs from developing to the caterpillar stage of the stemborer, but the rest will still hatch into caterpillars and still cause damage to your maize.


Maize stem damage


KARI

However, farmers can control the stemborer in their maize using other better researched methods such as the use of home-made plant extracts such as dried pepper (chillies) mixed with wood ash- to make the mixture, all you need is to buy powder or use dried and ground chillies from your shamba. You can then sieve cold wood ash from the fireplace, and then mix 5 tablespoofuls of chilli powder with 1 tin (gorogoro) and mix them thoroughly. Put the mixture in a used container that has holes at the top such those from vim®. Apply the mixture by shaking it into every maize funnel. You can also use pyrethrum or neem powder in place of chillies with the same result. Another very effective way for stemborer control is the use of the Push-pull method (we will revisit this method next year).


Leaf stem damage

Elkanah Isaboke

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Nyama choma...

ing cancer- causing products in meat is by marinating the meat with various health promoting spices and herbs. Marinating the meat overnight, using red wine and beer has been found to have beneficial effects of reducing cancer causing nitrosamines, before roasting it.

How much meat should one consume to avoid or minimize cancer causing results?

As with everything consumed, the rule of thumb is: Consume in moderation: A few pieces of meat, equivalent to less than 500g of meat per week, is all you need to get enough of the protein that your body needs: Not eating a quarter kilo of meat per sitting! Unfortunately, some people consume even half or even a kilogram of meat per meal. This is not only unhealthy but may lead to early death from colon or other cancers.

Added sugars

Many vitamins, such as vitamins A, D, E, and K (which form the acronym ADEK), are fat-soluble, and one needs to have fat in order to absorb those vitamins from consumed food. Many people also don't realize that processed foods labeled as "low-fat" typically contain very high amounts of added sugars and artificial sweeteners instead of good quality animal fats. The added sugars, usually refined sugar and artificial sugar like aspartame® is what contributes to obesity, which in turn leads to inflammation, which is the root cause of all chronic diseases including heart disease, diabetes and cancer, among others.

Vegetable oils unhealthy

A study published in the British Medical Journal (BMJ), has found a disease link to trans-fat consumption.Trans-fats, which are formed from vegetable oils heated at high temperatures also called hydrogenation, were linked to a 28 per cent increased risk of death from coronary heart disease, and a 34 percent increased risk of all-cause mortality. This is important because many "experts" frequently confuse trans-fats with saturated fat intake.

Research has shown that replacing saturated fat (found in foods like meat, egg yolks, dairy products, salmon, nuts, avocados, coconut oil, and olive oil) with monounsaturated fat (vegetable cooking oils), carbohydrates (sugars and grains) raised the risk of non-fatal heart attacks.

Is fat from meat dangerous?

Our ancestors (and the Maasai of today) have consumed meat as a large part of their diet: Animal meat and fat, as long it is organic and consumed in moderation, is actually beneficial to the body - without the fats we cannot absorb the ADEK group of vitamins; our brains (which are 80% fat) cannot function optimally without fat or cholesterol, especially the Omega 3 type of fats.

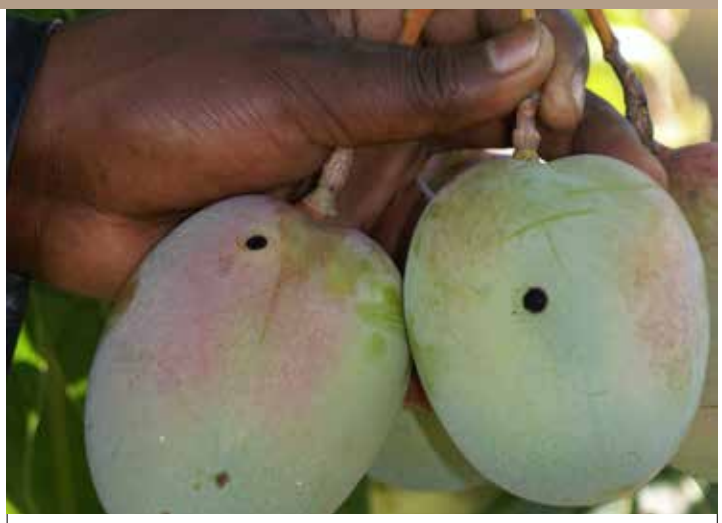
The "bad fat" comes from partially hydrogenated vegetable oils, like margarine and vegetable oil: these harmful vegetable oils are wrongly called "heart friendly" vegetable oils. But when heated to high temperatures like when frying chips, these oils become "partially hydrogenated" and convert to "trans-fats" which are very bad for the heart. Instead use animal fat, butter and ghee, coconut oil, avocado, eggs and olive oils, preferably from organic sources.

For questions, contact the article author, Dr. Peter Mokaya, Director and CEO, Organic Consumers Alliance (OCA) at www.organicconsumers.co.ke peter.mokaya@organicconsumers.co.ke or Mokayapm@gmail.com

continued from page 4

mangoes...

always relied on chemical pesticides to protect mangoes in his orchard from fruit flies, but they have not been effective in eradicating the pests with losses rising every year to between 60 - 70%. But the application of the starter packs obtained from ICIPE has proven to be very effective in controlling fruit flies. However, they are kindly appealing to ICIPE to show them where they can purchase these products in future to protect their mangoes from this devastating pest. The different farmer groups are also requesting ICIPE for more training and assistance to enable them to effectively combat this pest to ensure increased production of quality mangoes and other fruits in the region.



Contact ICIPE's Fruit fly Programme on +254 (20) 8632000; Email: icipe@icipe.org for information on how to put up an augmentorium or more information on controlling fruit flies.

Farming Tip

Weather forecasts indicate that the current El nino rains may extend to January in most of the country in the country. This should be good news to farmers who have replanted various crops following erratic rains at the beginning of the year. Farmers now have to take advantage of the prevailing rains to nurture their crops to maturity. Good crop management is a practice of every successful farmer. One major task farmers need to undertake is continuous scouting of their

crops to ensure any disease or pest is identified early and dealt with before it wreaks havoc on the crop.

It is important to observe the crop on a daily basis, turning the leaves to inspect any signs of pests. Observe the crop for any changes in colour that may be due to absence of essential nutrients. Preventions of diseases and pests is always the first line of defence against damage to crops. If you are using home-prepared plant extracts and foliar feeds, spray your crop two or three times every week. The crop should remain weed free in order to stop competition for nutrients. If these measures are taken on time, the result is increased crop yield and income for the farmer.

TOFRadio answers your questions

TOFRadio is broadcast on Milele FM at 8:45pm on Sunday, and KBC on Thursday at 8:45pm. 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.

Beware of new invasive weed

Discovered in Kenya in the 70s, the *Parthenium hyteroporus* weed can prevent the germination and growth of other crops. It suppresses livestock pastures, sustains malaria-causing mosquitoes and is harmful to humans and the environment.

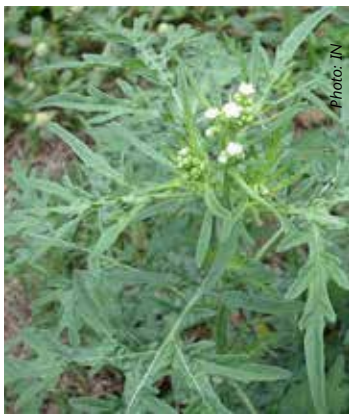
Trotsky Lumiti | Agriculture is not only the country's main employer, but also the economic pillar. It employs over 70 percent of Kenya's working population. Farmers, mainly aim at maximizing farm yield. Some of the major methods practiced by farmers to increase farm yield include: irrigation, improving soil fertility, reducing crop pests and weeding. There are several methods used to control weeds in the organic farm. They include mulching and uprooting. However, some weeds may be problematic to manage and can be very harmful not only to crops, but also to human beings and the environment at large. Such weeds include the parthenium weed - one of the world's top ten noxious (poisonous) weeds.

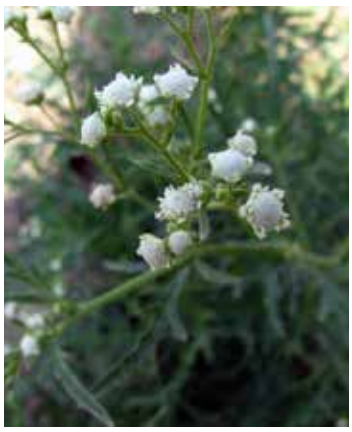
Parthenium hysterophorus

Commonly known as Santa Maria, white top, famine weed or feverfew, *Parthenium hysterophorus* was identified in Kenya around the 1970s. It was gazetted as a harmful weed after spreading to other parts of the country. It has not been possible to contain it. It is spreading at a faster rate than the water hyacinth and much way faster than *Prosopis juliflora* (*mathenge* weed). While it's not clear how the harmful weed got into Kenya, it has serious negative effect to crops, animals, human and the environment.

It suppresses pasture and spoils milk taste

There is great concern about the weed contaminating the food and fodder crops. The weed is foul-tasting to livestock, so its invasion results to fodder shortages. When mixed with fodder, it spoils meat and milk. Moreover, it produces certain substances that prevent other plants from germinating and growing near it. This inhibits the germination and later growth of a wide variety of crops including pasture grasses, cereals, vegetables, other weeds and tree species growing near the weed.





Prevents seed germination

As a result, the weed may reduce crop yields besides displacing edible species in natural and improved pasture- which would be used as livestock feed. Furthermore, the pasture carrying capacity can be reduced by 90%.

The weed's pollen, too, are allelopathic (they produce chemicals that kill other crops). Thus, heavy deposits on nearby crops may result in failure to set seed. Also, *Parthenium hysterophorus* also acts as an alternate host for several crop pests and diseases such as the tomato leaf curl virus. This results in reduced crop yield in tomatoes.

Avoid handling weed with bare hands

The negative effect of the weed is not limited to field crops and livestock; human beings are also at great health risk when exposed to the weed. *Parthenium hysterophorus* has been reported to cause skin rashes (dermatitis), on those parts of the body that come in contact with the weed on a regular basis, watery eyes, swelling and itching of the membranes of the mouth and nose, constant coughing especially at night, continually running nose and sneezing, itching of the roof of the mouth and fatigue. Allergy-prone people are particularly susceptible to both the dermatitis and respiratory problems.

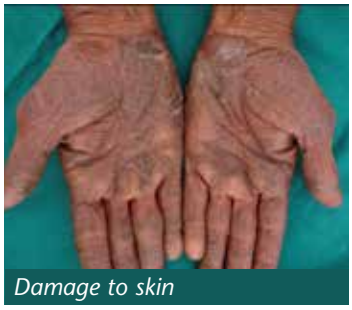
Recent research by ICIPE has also shown that the weed has the ability to sustain the malaria-transmitting mosquito - *Anopheles gambiae* - by extending its life even in the absence of a blood meal.

"Our results show that when female Anopheles mosquitoes feed on Parthenium, they survive much longer, and they also accumulate substantial energy reserves." Says Prof. Baldwyn Torto, an ICIPE scientist. As a result, the spread of the *Parthenium hysterophorus* weed may lead to higher disease transmission, such as malaria.

Management of Parthenium hysterophorus weed

The precise management measure of any invasive weed is prevention. However, if invasion has already occurred it may be necessary to treat the infestation rapidly when it is just starting- to prevent them from establishing. Early detection and management is necessary. Controlling the weed before it produces seeds may reduce problems in the future.

To control the weed, uproot the plant before it flowers. This should be done carefully to ensure no regrowth occurs. Direct skin contact with the weed may result to skin diseases. Therefore, lightweight, long sleeved garments and cotton gloves should be worn to prevent skin contact with the weed.


Damage to skin

The weed can also be controlled by digging it out, before it seeds. However, this must be followed up by sowing a crop or direct seeding of perennial pasture (eg pasture grasses).

Stop livestock from spreading weed

To stop spreading the weed through animal droppings, always confine livestock in the same area to contain weeds carried in contaminated fodder. Assign livestock into small paddocks until seed has dropped from their coats and tails. Establishing several paddocks complete with their watering points, then practicing rotational grazing between the paddocks can prevent them from spreading the weed seeds.