



Cattle for sale in Garissa livestock auction yard - Pastoralists from Somalia, Ethiopia and Northern Kenya trade thousands of goats, sheep, camels and cattle each year. With opening up of modern markets in the region, livestock farmers especially those in arid and semi-arid areas of Kenya are expected to benefit.

Help farmers dry and store maize harvest

TOF - The current rains seem to have come at a time when most farmers across the country are harvesting maize, wheat and other cereals. Harvesting during rains comes with huge losses due to rotting which brings other problems such as aflatoxin poisoning. Indeed, studies have shown



that farmers in Kenya and other African countries lose up to 40 per cent of their maize crop due to post-harvest losses that result largely from rotting and pest damage.

Lack of facilities

Many farmers in the rural areas find it difficult to harvest, dry and store maize appropriately, especially when it rains. Most households rely on the sun to dry their maize and as they do not have alternative drying facilities, the maize is spread on the wet ground where it is prone to infection by mold-

producing aflatoxins. Simple facilities such as canvass on which to spread and cover the maize are lacking. Therefore, a lot of the harvested maize is damaged and cannot be sold or stored for future consumption.

Open drying and storage facilities

The county and national governments can do much to assist farmers with storage. Some years ago, the Ministry of Agriculture, Livestock and Fisheries set up maize drying and storage facilities in some of the maize growing areas. These facilities have remained unused since they have not been made operational to offer this important service to farmers.

Since counties have mobilised funds to mitigate the effects of the El Nino rains, they could also collaborate with the national government to use part of these funds to subsidise the drying and storage of maize and wheat in the National Cereals and Produce Board (NCPB). This will help save farmers' harvest and prevent unnecessary importation of such commodities.

Dear farmers,

If the short rains continue into December and January next year as weather forecasts show, then farmers need to grow and preserve the abundant pasture for use in the dry season or times of pasture shortage that usually come immediately after heavy rains.

Apart from growing various food crops, the other important activity on the farm at this time is fodder conservation. Farmers have a lot of crop residues and various grasses that can be cut and stored for use during the dry spell that usually runs from February to April every year. Fodder can be preserved in form of hay or silage. In countries that have winter season, dairy farmers plan for their fodder requirements well to ensure that their animals remain in good health and maintain milk production regardless of weather changes.

Dairy farming is one of the most lucrative farming enterprises in Kenya at the moment, due to the high demand for milk and its products. For farmers to get maximum benefit from dairy farming enterprises, they need to practise it in the right way. A serious farmer needs to plan for their animals' feed requirements for a period of up to one year. Adequate feed is important in managing dairy animals and requires proper planning. For instance, if you know that your dairy cow needs about 15kg of fodder such as Napier grass per day for optimum milk production, multiply this by the number of animals in your farm to meet their feed requirement per day then by the total number of days in a year. This should give you an estimate of the amount of Napier grass you need for your herd annually. In this way, you can overcome feed shortages that are associated with the dry spells.

With good storage facilities, a farmer can store a lot of fodder to feed dairy animals. Fodder can be stored as hay or silage; the idea is to ensure the excess fodder available during the rainy season is conserved for use when there is little or inadequate pasture.

Another precaution farmers need to check at this time is the outbreak of diseases such as mastitis, pneumonia and rotting of the hooves in sheep, goats and cows which tend to increase at the onset of the rains.

in this issue

Silage making

3



Organic honey

5

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Nets can be used to protect crops against pests

Instead of using dangerous chemicals, farmers can use special nets to protect their vegetables and fruits from pests that cause damage resulting in huge losses in farming.

Musdalafa Lyaga | Vegetables are a great source of nutrition for people in rural villages and cities. They are often sold at good prices that enable farmers to earn a good income. Vegetables require special care, especially when the plants are young. Here in Kenya, many farmers sacrifice their mosquito nets to keep chickens out of seed beds. But this should not be the case because the farmer's health is very important.

"Vegetable farming is like 'green gold' in Central Kenya. It has enabled farmers send their children to school and buy livestock. It also helps us meet our daily needs like construction of houses, food, clothing, hygiene and even entertainment," says Ms. Jane Mugo of Lari Pioneer Processor Group.

Use IPM technology

Vegetable farming comes with its own challenges. Young vegetable seedlings are vulnerable to pests that cut the young and tender stems and feed on leaves. Grasshoppers and snails can be a serious problem for vegetable seedbeds as they chew the tender stem of seedlings while caterpillars seriously damage tomatoes and cabbages.



Nets can be used to protect nursery beds from pest damage.

Many insects in vegetable gardens do no harm to the crops; many are in fact beneficial. The impact of most harmful insects can be minimized by practising integrated pest management (IPM) which keeps off the harmful pests without hurting the beneficial ones.

Pests cause damage and loss

Some of the pests that attack seed beds do so at night. When moths lay their eggs on crops at night, the larvae that hatch start feeding on tomato or cabbage plants. To avoid losses, leave the nets closed day and night.

"There are various pests which are notorious for destroying our seedbeds. While others eat leaves, snails and grasshoppers eat the stem from the moment they emerge. Therefore

we need to use the insect nets so that the seedbed is protected at all times," says Romain Kolo a farmer from Benin, West Africa.

"When insects attack our vegetables, all plants are damaged. These insects destroy our vegetables, thus affecting the yields," laments Amidjissi Bloukoutou, another farmer in Benin.

Chemicals cause resistance

Whiteflies damage vegetable crops in other ways other than by eating leaves or stems. Hiding underneath the leaves, they suck the sap from the plant and by doing so, slow down its growth. The insects are difficult to control with insecticides because whiteflies develop resistance to the chemicals. After you have sprayed several times, the insecticide no longer kills the whiteflies and soon there may be many more whiteflies than before.

When whiteflies carrying viruses attack these crops, they transfer these germs from the sick plant to the healthy ones. Whiteflies live in large numbers in a wide range of plants. To protect the young crops, many farmers use chemical pesticides. These pesticides are not only expensive, but have been proven

to be dangerous to farmers, consumers and the environment. They also kill natural enemies of whiteflies which would have naturally controlled the pest.

Insect nets cut cost of pest protection

"We have drastically reduced the use of pesticides because it makes us sick and to avoid spending our money at the hospital, we protect our young crops with nets. With the nets, the plants grow very well," says Amidjissi.

Insect nets can also prevent moths from laying eggs directly on your seedlings. Most caterpillars will not be able to get through the mesh of the net. It is important to make sure the nets do not have holes on them as the caterpillars will crawl all over the net and find even the smallest hole to get to their food source.

Thus it is important for farmers to find the holes and repair them otherwise once the caterpillars get into the nursery, they hide under the leaves and cause damage.

As long as the insect nets have no holes, they can also keep away whiteflies and protect your seedlings from viral diseases transmitted by whiteflies. Before installing the nets, carefully check and repair any holes. In the next issue of *The Organic Farmer* magazine, we will provide step by step instructions on how to install insect nets in your seed beds. Nets can be removed occasionally to allow pollination.



Insect nets can also be used to protect fruit trees from pests.



Like in greenhouses, insect nets can be used to protect crops.

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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Take advantage of short rains: Make silage

Silage is a highly nutritious fodder that farmers can make and conserve for feeding animals in the dry season. It is wise to make silage now when there is a lot of crop residue for fodder preparation.

Josephat Mulindo | With the expected rains, farmers can boost their fodder reserves by using excess crop residue on the farm. They can also plant short season crops for this purpose. When making silage, the chopped crop is stored in an airtight bags, pits or silos. It ferments resulting in the production of acid, which prevents decomposition and growth of unwanted organisms that can spoil the fodder. The acid kills the microbes and the silage can be stored for a long time and fed to animals especially during the dry season.



Crops suitable for silage making

Crops having good percentage of sugar and appropriate dry matter (35-40%); and moisture (65-60%) are good for making silage. These crops include maize, sorghum, oats, Napier grass and leguminous crops like desmodium and lucerne. These will however need molasses to quicken fermentation.

Harvest at right time

Crops should not contain more than 75% moisture while making silage. Dry crops with high moisture in the sun for about 5 hours to reduce moisture content. You could also add dry hay or straw (about 15%).

- Harvest Napier grass at 1m height. Maize and sorghum should be harvested at dough stage, when the grain is milky. This will reduce the amount of molasses to be added because the grains have enough soluble sugars.

- Crops with stems should be



Farmers making silage in pit silo: A pit silo should be well covered to avoid water seepage. A drum can be used to compress the silage to remove air.

chopped into pieces about an inch in size each to prevent trapping of air and spillage of nutrients.

- Legumes should not exceed 30% of the total material ensiled.

Additives

When making silage, the following additives can be used:

Molasses: Adding molasses gives bacteria sugars for quick fermenting action, especially in cases where the feed being ensiled has legumes like lucerne and desmodium, which have low sugar levels. It also improves the taste of the silage. Molasses may be added at the rate of about 9 kg/ton of green weight silage or 4% of silage material.

Urea: Cereal forages can be enriched for nitrogen (protein) content by spraying urea at the rate of 0.5 – 1kg for every 100kg of fresh forage. Farmers should, however, be cautious when adding urea because excess urea can be poisonous to animals.

Lime: This can be added at a rate of 0.5–1.0kg for every 100kg of maize silage to increase acid production.



Farmers with a few animals can preserve silage in polythene bags.

Removing silage from pit

- Silage should be ready within 2-3 weeks of sealing.

- Silage may be fed from top, layer by layer, daily.

- Once the silage pit is opened and the day's ration is removed, make sure the pit is closed airtight.

- Rainwater should be channeled away from the pit.

- On exposure to air for long periods silage gets spoiled. Hence, try to prevent entry of air into the pit.

- To avoid silage flavours in milk, feed animals after milking, or at least 2 hours before milking.

Feeding amount

A mature high yielding dairy cow can consume about 35 kg of silage per day. This can be divided into 3 feeding portions. In addition to this, make sure the cow has access to wilted green-grass or hay, legumes, mineral lick and adequate water. If the cow is a high producer, also provide good quality concentrates, preferably immediately after milking. These should contain minerals, trace elements and vitamins.

How to prepare pit silage

To conserve larger amounts of fodder for several animals, you can prepare silage in pits. For a silage volume of 1m wide, 2m long and 0.75m high you need about 1,000kg of fodder, or 20 big bags of fresh, chopped material, 10 litres of undiluted molasses and about 7 x 3 m polythene sheeting (1000mm gauge).

- Prepare a level pit preferably on slightly sloping ground for better drainage of rain water.

- Place a big polythene sheet (1000mm gauge) on the floor and walls of the pit and cover also about one metre of the ground on all sides so that the forage does not come into contact with soil.

- Chop the forage to pieces of about 1 inch long, using either a panga or a chaff cutter.

- Empty the chopped material into the plastic lined pit, and spread it evenly.

- Dilute 5 litres of molasses with 10 litres of water. Use a garden sprayer to sprinkle and distribute the solution evenly over the forage.

- Compact the forage by stepping or pressing down on it (use clean boots, a drum with filled water or a tractor).

- Add more chopped feed, sprinkle it with another 5 litres molasses diluted with 10 litres of water and compact the forage again. Repeat this process after adding four bags of forage, apply the molasses while compacting until the pit is filled in a dome shape.

- After a final pressing, wrap the polythene sheet around the silage and cover it with a second sheet.

- Then cover the heap with a thick layer of soil (at least two feet) to keep the air out and to prevent damage of the polythene by rain, birds and rodents.

With good sheeting and enough soil on it, the silage can be kept for more than one year.

Qualities of good silage

- Good silage is green or light yellow-green, smells like vinegar and has a firm texture.

- The taste should be moist, pleasant and acidic, and cows will like to eat, once they get used to it.

Farmers in Western Kenya embrace carbon credits

Many farmers thought they would be paid a lot of money for planting trees. Instead, they are reaping the benefits of increased crop yields and income after adopting sustainable land management practices.

Peter Kamau | News that farmers in the country would benefit from a climate change initiative by planting trees to earn carbon credits created euphoria a few years ago. Rumours that farmers in Western Kenya were making a lot of money from the carbon credits created huge demand for information, especially from the government, development partners and NGOs, on how to enroll to earn money from the World Bank funded Kenya Agricultural Carbon Project (KACP) project. But all these expectations disappeared when many farmers realised the issue of carbon credits was exaggerated and was much more complicated than many had believed.



Trees play a very important role in capturing carbon from the atmosphere and converting it into biomass.

A pilot project

But can farmers really earn carbon credits through planting trees? The whole idea of farmers participation in climatic change mitigation in Kenya started in 2009 when the World Bank started the KACP, a pilot project whose aim was to determine how carbon credits systems can operate in agriculture. When the project was started, it generated

hope among farmers, not only in the project area in Western Kenya and Nyanza, but also in other parts the country.

The project did not mean paying farmers if they planted trees, but rather encouraging farmers to adopt Sustainable Agricultural Land Management (SALM) practices such as agroforestry (planting trees in farms), recycling of farmyard manure

through compost making and soil conservation practices such as making terraces, trashlines, grass strips and water harvesting to stop soil erosion.

Practices reduce carbon emissions

By taking up these practices, the farmers built soil fertility and reduced the use of chemical fertilizers which are partly responsible for the release of nitrous oxide (a greenhouse gas) into the atmosphere. Trees play a very important role in the environment - they absorb carbon dioxide from the atmosphere and release oxygen. The KACP project encourages farmers to recycle crop residue because burning it releases carbon into the atmosphere while leaving the soil free of soil organic matter which is very essential in building soil structure and fertility.

Farmers learnt the benefits of keeping a few high quality breeds of animals instead of large numbers that give little milk but contribute to methane gas emissions. Besides this, farmyard manure is converted into compost to improve soil fertility.

The benefits that come with adoption of these practices is increased farm productivity, crop yields and more income for participating farmers. "When we started this project there were a lot of expectations on the monetary benefits farmers would get, but they are now seeing the other benefits of the carbon project. They have accepted it because it is increasing their farm productivity and income," says Martin Barasa, the Vi Agroforestry Project Zonal Team leader in charge of Bumula.

Farmer has tripled his farm income through tree project

Protus Nyongesa, a farmer from Muanda village, Bumula Sub-County, used to get only 4 bags of maize in one acre of land that he used for maize production. He had one cow that produced only 3 litres of milk in a day. He did not keep any other animals, except for a few chickens. Save for a few trees in his farm boundaries, he did not care about planting trees and would often cut them to create space for crops.

Nyongesa's attitude changed in the year 2009 when the Vi Agroforestry Project staff approached him together with members of Subila Farmer Field School (FFS). They trained the group on the benefits of planting trees with crops to improve soil fertility, provide feed for their animals and for firewood, and other sustainable agricultural practices.

Increased crop yields

Within 5 years, Nyongesa has transformed his 2½ acre farm into a highly productive land. From the same portion of land he used to grow maize, his yields have increased from 4 bags to 12 bags. Now he has three cows which have increased milk production from 3 to 6 litres per



Nyongesa shows off a woodlot in his shamba.

cow. From the cows, he gets farmyard manure that he uses to make compost for use as organic fertilizer on the rest of the farm. The farm has fruits trees mixed with nitrogen fixing tree species such as Leucaena, sesbania, calliandra that he also uses to feed his livestock. Napier grass competes for space with desmodium and other fodder trees.

Made money from trees

A few years ago, Nyongesa harvested eucalyptus trees from his woodlot which he sold to Kenya Power Company for poles from which he made Ksh 1 million. He has replanted the woodlot with various indigenous trees from

where he gets his firewood and timber. To diversify his source of income, Nyongesa has planted cassava, tissue culture bananas, beans and arrowroots. From his farm income, he has built a semi permanent house, paid school fees for his children and he is now planning to go into commercial poultry production.

"My farm is much more productive in a way I would not have imagined five years ago. I earn more than 3 times what I used to earn before the Vi Agroforestry Project came to work with us. We now know that trees have many more benefits that we never thought before," he says.

Peter Kamau

Each participating farm tracked

Although the project works with farmers groups, each farm is taken as a basic unit where the farmer is expected to implement all sustainable agricultural practices that help retain soil organic carbon stocks and improve nutrient levels in the soil to increase food production. In the long run, these practices restore degraded soils, reduce greenhouse gas emissions and help build the capacity of the farmer to cope with the impacts of climate change.

continued on page 6 ➤

Organic honey has health benefits for consumers

Non-organic honey usually has residues of chemicals and other environmental pollutants. It is also highly processed and therefore lacks important nutrients. Organic honey is delicious and free from chemicals like pesticides and artificial ingredients.

Dr. Peter Mokaya | Honey is a nutritious and medicinal substance that is mainly produced by honey and stingless bees. It is also a popular sweetener, often used as a substitute to commercial sugar. However, not any packaged honey is good for consumption. Many consumers unknowingly buy over processed and refined honey, which does not contain most of the essential nutrients. That jar on your kitchen table could be just as bad as white sugar – processed and refined honey usually contains artificial sweeteners such as nutrasweet or aspartame, and is not good for people with diabetes and obesity.

There are different types of honey in the market depending on how it is produced – the non-organic and the organic type. Organic certification standards require that honey is produced in a manner that prevents its contamination from pesticides, heavy metals, antibiotics, harmful bacteria and radioactive materials, which are dangerous to human health. Such



A beekeeper processing organic honey in Mwingi, Kitui County.



Organic honey is carefully processed to preserve important nutrients that are beneficial to human health.

honey should be carefully processed under low temperatures to retain beneficial nutrients, which are usually destroyed by high heat applied during extraction and processing. Non-organic honey is usually highly processed, and this may involve adding other ingredients like high fructose corn syrup which has been linked to diabetes, obesity, high blood pressure, liver diseases and other chronic illnesses.

What makes organic honey different?

Organic honey is obtained from unpolluted environment that are free from harmful chemicals. It is harvested directly from beehives, then filtered and packaged without additives. It, therefore, does not contain harmful chemical residues or pesticides. It is loaded with natural antioxidants, enzymes, amino acids, vitamins, and minerals. It also contains essential minerals like calcium, iron, zinc, potassium, phosphorous, magnesium, copper, chromium, manganese, and selenium. The trace mineral, selenium, in particular, is necessary for the proper support of immune system health. It is a vital mineral antioxidant found in the tissues of your body and assists in supporting well-balanced functioning of your heart and the circulatory system.

Organic honey contains vitamins like pyridoxine (B6), thiamin (B1), niacin (B3), riboflavin (B2), pantothenic acid (B5), which are absent in processed honey. These important nutrients are critical in the proper functioning of the digestive,

nervous, brain, and cardiovascular system.

Organic honey also contains antioxidants, which remove free radicals in the body that cause damage to body cells, which contributes to a number of health problems. Good bacteria that are found in such honey like lactobacilli and bifidobacteria are partly responsible for the therapeutic properties of honey.

Products of the hive, which are not found in refined or processed honey, include health-promoting substances like:

- Protein- and enzyme-rich pollen, collected by bees in tiny carrying baskets on their back legs as they buzz from plant to plant.
- Propolis or "bee glue," a sticky substance full of enzymes, formed when bees combine their own proteins with plant resins. Bees use propolis to fix cracks in the hive.

The difference between organic and ordinary honey

The finest organic honey is collected from directly from beehives, which are kept in fields free from pesticides and herbicides, where honeybees collect nectar from wild flowers. The honey is then bottled and packaged, without being heated, immediately after extraction, which preserves its quality and flavour. On the other hand, to make ordinary honey sparkling and clear, a method called ultra-filtration (using high heat) during processing, which removes pollen (this is normally used to show the origin of the

honey). According to the World Health Organisation and European Commission, honey that has no pollen, is no honey at all.

When honey goes through such excessive heating process, it destroys some of the critical natural enzymes, vitamins and minerals. Processing of honey also filters out many beneficial nutrients which are products found only in natural raw honey.

Avoid processed honey

Many people think that just because honey is labelled 'natural', it is healthy and safe to use. This is not true. Unfortunately, most of the honey consumed today, which people buy from the supermarkets and open air stalls, and even the imported brands, have been heavily processed. Most of this honey is just a mixture of sugar water, malt sweeteners, corn rice syrup and other non-nutritional additives.

Organic honey is safer

By consuming organic honey you are assured of avoiding harmful and toxic chemicals and pesticides. Although honey has many of the important benefits described in this article, it still contains a lot of sugar, so one needs to eat it in moderation. Limit your use of honey to not more than a teaspoon per day.

Other benefits of organic honey

- It is unfiltered and uncooked, which gives it a rich, fulfilling taste with all the nutritious benefits.
- Promotes the growth of 'good' bacteria in your intestinal tract.
- Great way to soothe your skin, healing wounds and skin burns.
- No refrigeration is needed.

Organic bee keeping

Farmers are encouraged to practice organic bee keeping because it provides the farmer high quality and safe honey for use at home. It can also be sold at good prices, which helps generate income to improve their livelihoods and standards of living. As consumers become aware of the risks associated with ordinary honey, they are increasingly more willing to pay a higher price for organic honey.

Dr. Peter Mokaya, Director and CEO, Organic Consumers Alliance (OCA), www.organicconsumers.co.ke email; Mokayapm@gmail.com

Trees seedlings raise income for Wangige farmer

Florence Ndung'u tried growing many crop varieties for the market but her major break came when she established a tree nursery which has changed her fortune.

Edna Muinde | Florence Ndungu is a farmer from Lower Kabete location in Wangige, Kiambu County. She had tried many different types of activities in her 2.5 acre land but she did not earn much from the crops she planted. But this changed when she established a tree nursery where she started planting both exotic and indigenous trees for sale to other farmers. As income from tree seedling sales increased, she planted more tree seedlings.

Tree nursery has 4000 seedlings

Today, Ndungu is one of the most successful tree nursery owners in her neighbourhood. Recently, she had more than 4000 tree seedlings - she sells these according to quality and size.



Florence Ndungu tends her tree nursery in Wangige

Uses organic production technologies

Although she faces challenges such as the high cost of seeds and water shortage, especially during the dry season, her tree nursery is now her main source of income. Tree nursery management is, however, labour intensive and she has to tend the seedlings for many hours to ensure they are healthy.

Florence is a beneficiary of the Biovision Farmer Communication Programme (FCP). Through the training received, she started growing vegetables and portable gardens.

Now she has 80 portable gardens with all varieties of vegetable varieties in her compound grown using organic methods. Every year she makes Ksh 30,000 from vegetables sales.

Promotes organic farming

The Ministry of Agriculture, Livestock and Fisheries has trained Ms Ndungu on bee and rabbit keeping which have enabled her to diversify her sources of income. After training, she bought herself 20 bee hives. From these earnings, she pays house rent and also school fees for her 2 children who are in primary school.

She is now looking forward to buying another water tank in order to increase the number of tree seedlings to meet the rising demand for tree seedlings from her customers.

Florence is a champion for organic farming. She trains farmers on the need to produce healthy food and encourages them to diversify their sources of income in order to improve their livelihoods.

Farmers can contact Florence Ndungu on 0723682750 / 0721125128. Edna Muinde is a Biovision field extension agent based in Wangige, Kiambu County.

continued from page 4 ►

Farmers gain from carbon credit project

Every farmer participating in the project has to fill a farmer commitment form and sign a contract once they have undergone training on all SALM practices. The farm is then tracked to determine the size and the area where it is situated using the Global Positioning System (GPS). The commitment form specifies the area the farmer has designated for the project, the

number of trees they will plant and other sustainable agricultural practices they are expected to undertake. Crop yields obtained from each project plot are also recorded. The farmers' group also signs a separate contract with the project where they commit to abide by all the requirements for participation in the project.

Farmers have to meet targets

Individual farmers, including the farmers' groups have to meet set targets every year on which they are to be assessed. With the help of the project extension staff, the farmers undertake all the SALM activities while keeping records of each activity. At the end of the year, World Bank experts verify the progress made by each of the groups as agreed.

Carbon credit tokens paid to groups

Using the Verified Carbon Standard (VCS), the experts determine how much carbon has been captured by each of the participating groups. Payment is then made to the group depend-

ing on the number of tonnes of carbon removed from the atmosphere through adoption of sustainable agricultural land management practices. The groups are then expected to invest the money received in various activities such as the village savings and loaning schemes, table banking or even poultry keeping where they share the profit made at the end of every year.

"Some of the groups have already received payments for the years 2010 and 2011. But what the farmers get in terms of increased yields and income from the farm is the most impor-

tant objective of the project, not what they are paid for the carbon credits. The carbon credits is just an added bonus," says Barasa.

He says that so far, 20,000 farmers in Bungoma have benefited from the project with 10,980 hectares planted and 443,781 trees grown. He says out of the 13,687 households participating in the project, 75 per cent have experienced a marked increase in crop yields and income. The project targets 60,000 farmers to put 45,000 hectares of land under sustainable agriculture system in Nyanza and Bungoma.



Composting has improved soil fertility in Mr Nyongesa's farm.



Roselyne Nyongesa shows a pile of firewood from her farm. Now farmers have enough trees for firewood, building and other purposes.

It is easy to rear indigenous chickens organically

How can I rear my chickens organically? Is vaccination allowed in organic chicken production? John Kungu, Embu

Rearing of indigenous chickens organically is easier than that of exotic ones because indigenous chickens are not prone to many diseases like exotic breeds. Any farmer with adequate space can practise organic indigenous chicken production. The following are the main requirements for organic chicken production:

Adequate space: Organic production of chickens requires farmers to have adequate space to rear their chickens. Apart from the chicken housing, the chickens should be given enough space where they can move freely, pick insects, do dust bathing and run in order to exercise and reduce stress. They should also be given sand or grit to feed on to aid in digestion. The open area can be planted with vegetables or any other vegetation that chickens can feed on; if this is not available, part of the land should be planted with vegetables such as *sukumawiki* which can be harvested every day and hang around the chicken house or fencing posts for chickens to eat.

Housing: Chickens should be housed properly to ensure they are protected from the wind and rain. The poultry house should be spacious and well-ventilated. Perches should be provided where the birds can rest at night. Ashes and sand should be spread on the ground to control parasites.

Disease control: It is important to vaccinate chickens against diseases. Vaccination is allowed in organic poultry production. Vaccinations should be done regularly to control diseases.

Organic requirements

Organic standards prohibit various practices when it comes to livestock. For chickens, farmers are advised to strictly limit giving them antibiotics to control diseases. In case of disease outbreak, isolate the sick animals for them to be treated under guidance of a veterinary officer. Organic management of diseases relies on boosting the immunity of the birds and hygiene to control diseases. Strong and healthy chickens are not prone to diseases but to prevent some of the common ailments, farmers can put a few teaspoonfuls of aloe vera extracts into the drinking water (this is important especially during the



rainy season when chickens are prone to diseases). Farmers should avoid giving chicken antibiotics for disease prevention.

EM1 can also be added into the water to improve digestion and build the birds' immunity. Like all other animals, organic

chickens should be handled humanely, farmers should never debeak the chickens since there is less pecking when they are properly housed. Hormones for promoting fast growth are also not allowed in organic chicken farming.

Vaccination programme for chickens

Age	Vaccination	Method
1st week	Marek's and Newcastle Disease	Intramuscular injection eye or nasal drops
2nd week	IDB (Gumboro)	In drinking water
3rd week	IBD (Gumboro) Newcastle	Eye or nasal drops or in drinking water
4th week	Deworming, Gumboro forte	In drinking water
5th week	Lasota and Gumboro	In drinking water
6-8th week	Fowl Typhoid	Injection
9th week	Deworming (Every 2-4 weeks)	In drinking water
8- 10th week	Fowlpox	Wing stab
12-14th week	Fowl typhoid	Injection
16-18th week	Renew Newcastle vaccination	Optional (if disease is common)

Why bird eggs have different colours

Why do we have eggs of different colours? Joseph Waita

Bird eggs can acquire different colours such as white,



brown, green, blue or cream. Egg colour is determined by the origin and the genetics of the bird.

The breed of the hen determines what colour her eggs will be.

However, the colour of the eggs has nothing to do with its quality. Eggs of different colours are same in quality.

Farming Tip

Prevent calf pneumonia through proper housing

Early diagnosis is important for successful treatment. If you think your calf has pneumonia call a veterinarian to confirm and advice on treatment and prevention.

Initial signs of pneumonia may not be very clear and may include:

- Dullness
- Reduced feeding
- Fever (over 39.5°C). Every farmer should keep a thermometer in the farm.
- Increased respiratory rate
- Water discharge from nose and mouth

Careful observation of calves at rest time is required to pick up



these signs.

Prevention

Prevention of calf pneumonia has a lot to do with housing. Make

sure calves are kept in dry, well-bedded and well-ventilated facilities. Feed enough milk to calves so that they can keep warm, especially during cold seasons. Feeding calves enough colostrums at birth helps build strong immunity. Do not keep calves in overcrowded quarters because this can lead to the transfer of pneumonia-causing organisms from calf to calf through saliva and moisture from the respiratory tract.

It is important to note that if calves are not treated early enough at the first signs of pneumonia, the surviving harmful bacteria may start growing again and the calf may have repeated bouts of pneumonia.

TOF Radio 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.

How farmers can prepare for the El Nino rains

Joyce Wambui Mahui | Kenya's Meteorological Department's prediction that many parts of the country may experience above-normal rainfall during the October-to-December rainy season has come to pass; heavy rains have already started pounding some parts of the country as the El-Nino begins. This can be both a blessing and a curse to the farmer. While the abundant rainfall may bring much-needed relief to both herders and farmers, excess rain can also trigger devastating floods and mudslides in the country. Among areas prone to land slide include Western Kenya, Lower Tana, Nandi Hills and Muranga.



El Nino has mixed blessings

The meteorological department has marked out possible hot spots where previous El Nino events resulted in loss of lives, death of livestock and devastation of crop yields like maize and beans as a result of either landslides or floods.

The Central Government, County Governments, National Disaster Operations Centre (NDOC), parastatals, NGOs and other humanitarian organizations are putting up measures to save lives and cushion Kenyans from the devastating effects of El Nino rains.

The National Government estimates that it would require 15 billion shillings to prepare the country for the El Nino rains. Treasury has already set aside 5 billion shillings for this purpose as the Government appeals to its partners to chip in. As the country braces itself for the rains, farmers should not only take advantage of the rains but also take every precaution to avoid loss of life.

Food security

The aftermath of El Nino rains are usually characterized by food shortage, thus soaring food prices.

Excess rain may affect both crops yields and animal production. Heavy rains have been known to cause water-related diseases like pneumonia among

livestock due to wet habitats and fungal diseases such as Coffee Berry Disease (CBD).

The weathermen also point out that chances of drought or drier than normal conditions after the El Nino rains are very high. Wise farmers have already started planning to plant drought tolerant crops like sweet potatoes, millet, cassava, sorghum, yams, among others.

To help in ensuring food security after the El Nino, farmers are encouraged to take advantage of the rains and harvest as much rain water as they can, which they can use during the dry season.

During the rains, farmers should also ensure that the livestock shelters are dry throughout such that animals are not tightly kept together to avoid spread of diseases. Animals tend to stay close together for warmth when it is cold, which speeds up the spread of diseases.

Health, sanitation and hygiene

A range of health issues may also emerge with the El Nino rains. The majority of deaths and diseases associated with El Niño are attributable to extreme weather events, including floods and mudslides. Thus, farmers should be cautious.

Floods and drought can cause outbreak of diseases such as malaria. The symptoms of

malaria include high fever, headache, muscle pains, loss of appetite, weakness and vomiting. Malaria can be prevented by dealing with mosquitoes, spraying water logged areas where the females lay their eggs and sleeping under treated mosquito nets.

More water-borne diseases

Widespread outbreak of waterborne diseases caused by microorganisms transmitted in contaminated water is also brought about by heavy rainfall. In rural areas, waterborne diseases can be spread through groundwater which is contaminated with faecal pathogens from pit latrines.

Infection is common during bathing, washing, drinking, in the preparation of food, or the consumption of food that is contaminated. Various forms of waterborne diseases, especially those that cause diarrhoea are common and affect mainly young children.

The most common waterborne diseases include:

Amoebiasis

Symptoms include: abdominal discomfort, fatigue, weight loss, diarrhoea, bloating, and fever (high body temperature).

Cholera

Symptoms are watery diarrhoea, nausea, cramps, nosebleed, rapid pulse, and vomiting.

Dysentery

Symptoms include: Frequent passage of faeces with blood and or mucus and in some cases vomiting blood.

Typhoid fever

Sustained fever of up to 40°C (104°F), profuse sweating, and in some cases diarrhoea.

If one shows any of these symptoms, medical help should be sought immediately from a health facility. El Nino can be a very bad master if preparations and caution is not exercised but a very good servant if the farmers are prepared for this free abundant gift. ■



0717 551 129 / 0738 390 715

Training: Baraka Agricultural College is offering the following courses in sustainable agriculture to interested farmers:

Diploma Courses:

Diploma in Entrepreneurship (January 2016), Diploma in social work and Community Development (January 2016), Diploma in Sustainable Agriculture and Rural Development (August 2016). Entry requirement for: Minimum KCSE Mean Grade C-(minus) or a pass in relevant craft / certificate course/ Division II/ Advanced Level (UACE/KACE) a pass with one principal and two subsidiaries passes or their equivalent in related disciplines from a recognized institution. Classes commence in January 4 and August 22, 2016. Exam body-KNEC.

Certificate Courses:

Certificate in Fisheries Technology (KNEC) (January 2016), Certificate in Agriculture (Beekeeping) January 2016, Certificate in Sustainable Agriculture and Rural Development (August 2016), Certificate in Entrepreneurial Agriculture (August 2016), Entry requirements-Minimum D (plain) KCSE or its equivalent, classes commence on January 4th/ August 2016,

Short courses:

Sustainable Agriculture, Agribusiness, agro-processing and value addition, water harvesting technology, horticulture nursery management, poultry, dairy farming, dairy management, Urban-Periurban agriculture, irrigation and greenhouse technology, dryland farming, feed formulation/hydroponic technologies, beekeeping, technologies, organic farming, soil and water management among others. Apply online or in writing to: The Registrar, Baraka Agricultural College, P.O Box 52, 20106, Molo, Kenya Tel. +254 725 777 421 / +254 020 231 3400 SMS line +254 717 003 122, Email: registrar@sustainableagri.org, baraka@sustainableagri.org

Silage tubes for sale: We have silage tubes for sale. We also conduct training of farmers groups. Call Star Rays Education Centre Tel. 0721 245 443.

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