

Conserve fodder for dry season



Photo: TOF

TOF - Kenyan dairy farmers rarely plan their animals' feed requirement for the dry season. This is one reason why milk production tends to go down during this period because the animals have little fodder and water for their body maintenance and milk production. However, a look at feed resources within a farm reveals

that there is a lot of fodder during the wet season, which can be conserved to feed animals during the dry spell.

Experienced dairy farmers should know how much fodder and water a dairy cow requires in a day; from these they should be able to work out how much feed their cows will require

during the 3 - 4 month dry spell (January to April) the following year. This will ensure they prepare and conserve enough feed for this period through hay preparation and silage making.

In this issue we show farmers how to get through the dry season and maintain a steady milk production and income. *Page 5*

Dear farmers

It is now clear that we are likely to face food shortage next year following poor harvest in all maize producing areas this year. While some of the factors responsible for the low production such as weather changes may be beyond our control, a lot could have been done to avoid the situation. Whenever we have a national food deficit, the government spends a lot of money to import food, funds that could be used to develop other sectors of the economy.

A major reason for the decreased maize yields this year is that farmers planted late because of the late delivery of government-subsidized fertilizer. Surveys have shown that most of the maize planted late was more prone to the Maize Lethal Necrosis (MLN) disease than did the maize planted in mid March to the beginning of April 2013.

The National Cereals and Produce Board (NCPB) had not started purchasing maize from farmers by mid November despite assurance by the Ministry of Agriculture that it had been allocated Ksh 3 billion for the purpose. Middlemen are now exploiting farmers by buying maize for as low as Ksh. 2,400 per bag.

With the anticipated shortage of maize supply next year, this is the time that farmers should be very careful when selling their maize. Although they can sell some in order to meet other pressing financial needs, a farmer who manages to store maize stands to make very good returns given the expected high maize prices.

Farmers can also take advantage of the Cereal Warehousing System (CWS) where they can store their maize with NCPB. The receipt given for the supply can be used to get credit from banks while waiting for maize prices to go up. In this way, farmers can avoid middlemen who exploit and benefit from their sweat.

Low maize production a threat to food security

TOF-The year 2014 looks bleak for Kenya's food security due to unexpected significant decrease in maize production this year. In spite of the good rains, the major-



ity of farmers delayed in planting, owing to delayed delivery of government-subsidised fertilizer. The crop disease Maize Lethal Necrosis (MLN) has destroyed more than 26,000 hectares (about 117,000 tonnes) of maize in major producing districts of North and South Rift and Western Kenya.

According to a report: *Achieving food supply in Kenya: The role of selected policy instruments* by the Tegemeo Institute of Agricultural Policy and Development of Egerton University, this year's maize production will be 34

million bags, less than the country's annual consumption of 40 million bags. Last year, we produced 43 million bags of maize, well above consumption targets.

Kenya usually relies on maize imported from Tanzania and Uganda to bridge its maize deficit but these countries have also recorded a poor harvest this year. This means that our country could experience a severe food shortage next year if the short rains of this year are inadequate or do not start on time.

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Feed your chickens well to be productive

It is important to ensure chickens are given the right feed, both in quantity and quality, for improved productivity and income.

Peter Kamau | Feeding chickens is a tricky area for many poultry keepers. But unless it is done in the right way, farmers may not get good returns, especially in commercial poultry production. Chickens must be fed properly to maintain their health and productivity.

The ingredients in chicken feed formulations are carefully made and nutritionally balanced to ensure the chickens' daily requirements in terms of vitamins, minerals and proteins are provided. Overfeeding can cause problems such as obesity, deformed eggs, feather picking, reduced egg production and even feed wastage. Underfeeding will also result in poor health and low production. Farmers who provide the



Chickens require adequate feed and water at all times

right feeds both in quantity and quality are rewarded with good egg and meat production.

When feeding, ensure only the recommended feed quantity is given to chicks, layers and broilers, according to their age. Measure the rations properly. Most shops and supermarkets have calibrated plastic containers that can be used to measure

quantities of feed for chickens.

Water: Chickens must have adequate water at all times. The water helps to soften the feed and activate their digestive system while helping to transport nutrients to all their body organs and tissues. On average, an adult hen requires 400mls of water per day. In hot weather, chickens require

even more water, at times even three times the amount given during cool weather. Farmers should know that hot weather can cause chicken deaths due to water stress and dehydration.

Deworming: Even with proper feeding, chickens that are not regularly dewormed may not attain optimum growth and production. The main reason for this is that worms take up most of the nutrients that chickens need for proper growth. Farmers should ensure that their chickens are dewormed at intervals of three months to remain worm free.



Wheat pollard

Daily feed rations for chickens

It is important that feeding in chickens be done according to age and type. Sometimes different breeds may also have different feed requirements. If the farmers make their own feeds, they may come up with their own daily rations basing on their own experimentation since different raw materials have different nutritional levels. However the standard ration for most chicken feed is given below as a guide to farmers:

- An egg-laying hen requires 130g of feed per day - total feed required is obtained by multiplying this by the number of hens available.
- A chick requires 40g of feed per day for the first 8 weeks (so if a farmer has 100 chicks, he/she should use 4 kg per day for the entire flock). Farmers can supplement the daily rations with fruit and vegetable peelings to keep the chicks nimbling

all the time.

• A pullet (young hen about to start laying eggs) should be fed 4.5 kg of feed for 2½ months until the first egg is seen- from then onwards, it should then be put on layers' diet (130g per day of layers mash per day) supplement the feed rations with vegetables, edible fruits, plants leaves and fruit peelings (layers fed on these supplements lay nutritious eggs with yellow yolk).

Additional source of feed additives: In our last issue, we gave farmers two suppliers of feed additives. The following supplier has a range of premixes that can also be added to home-made feeds to balance their nutrient levels to improve quality. Contact *Champion Products Distributors Ltd* on 0722 320 210, 0721 449 966, 0732 298 860, 0712 0716 710 150.

Diarrhoea in cattle calves can be treated



TOF - Indigenous cattle calves are prone to diarrhoeal infections, which are often misdiagnosed by most livestock keepers. The disease is caused by an infection known as Toxarcia. Calves affected by this infection do not respond to any medication and the infection in most cases may lead to death. Recent research has shown that pastoralist communities believe

that the diarrhoea is caused by worms collected from certain types of pastures. But research has established that this may not be true.

Causes of calf diarrhoea

It has been established that calves suffering from this form of diarrhoea get infected in three

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The Organic Farmer is an independent magazine for the East African farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. It is published monthly by *icipe*. The reports in the *The Organic Farmer* do not necessarily reflect the views of *icipe*.

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African Insect Science for Food and Health

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Sponsor Biovision, a Swiss-based foundation for the promotion of sustainable development, based in Zürich, Switzerland. www.biovision.ch

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A net that protects your livestock from flies

Flies cause discomfort, stress and even diseases to livestock leading to poor health, low productivity and income. A new insecticide treated net solves the problem.

Peter Kamau | Like many livestock farmers, Lucy Mburu Njatha, a dairy farmer in Thakwa village in Githunguri, Kiambu county has had a persistent problem with flies in her milking shed and zero-grazing unit for many years. The flies were a great nuisance to her dairy cows, which constantly inflicted painful bites on the animals forcing them to keep on wagging their tails, kicking and moving from one point of the shed to the other.

"The cattle had no peace. They would remain restless throughout the day. But the problem was worse during the milking time; the cattle would kick constantly, sometimes even making us spill the milk. Sometimes I would lose up to 40 kg of milk in one month due to spillage," she says.

However in May this year, field staff from Coopers Company Ltd visited her farm and noticed the problem. They advised her to try ZeroFly®, a new insecticide-treated net, that protects animals from flies. When they visited her next, they brought the net, which they wrapped around the zero-grazing shed to a height of 1m (according to research, most flies rarely fly beyond this height).

To her amazement, Ms Njatha noticed that no flies were getting into the cow shed and the milking parlour. "My cows have completely stopped kicking when I milk them. Before I would kill up to ten flies while milking, but they have all disappeared. The few that manage to get into the shed die within minutes. The cows have stopped being restless and their health has considerably improved. I have no way to thank the people who invented this net," she adds.



Lucy Njatha shows the ZeroFly® net installed on her cow shed

Gadflies cause great discomfort to cows leading to increased stress and poor body condition. The cattle tend to stay together in order to protect their front legs, which the flies like to bite, and this interrupts the normal feeding and resting. The biting also induces stress. The animals' digestion and even feed intake is affected, resulting in poor body condition and decreased milk production. But the use of the ZeroFly® net is reversing this problem. Farmers using the nets have recorded increased milk production because the animals are able to relax and feed comfortably, improving their feed conversion and general sanitation in zero-grazing sheds.

The ZeroFly® net is treated with deltamethrin, a pyrethroid that does no harm to animals or the environment. It is manufactured by Vestergaard Frensen Ltd, a Danish company. Mr. James Nderitu, a Food Security manager with the company, says the net does not leave any pesticide residue and has no smell like most pest control products.

The net has been able to control other disease-causing insects such as mosquitoes that cause the lumpy skin disease on cattle and the tsetse fly, which transmits a disease known as trypanosomiasis (also called Nagana) in animals and sleeping sickness in

humans. According to studies, 3 million cattle die every year, causing losses estimated at 4 billion dollars annually to livestock keepers in Sub-Saharan Africa. The use of treated nets can drastically reduce losses especially among exotic breeds of cattle such as Friesian, Ayrshire, Jersey and related breeds that are highly susceptible to the disease-causing pests.

In a study conducted in Busia and Teso areas in Western Kenya, tsetse fly attacks were prevented when Holstein-Friesian and Ayrshire were confined in sheds lined with the ZeroFly® nets. In the study, 57 dairy sheds were protected with the nets while another 42 sheds were left open to serve as controls. The insecticide treated nets significantly reduced tsetse fly number in the 57 sheds while the general health of the protected animals improved considerably compared to the cows in the non-protected sheds. Participating farmers also observed a decrease in flies and mosquitoes outside the protected sheds and even in their homesteads.

Pigs are also prone to trypanosomiasis infection. Pig pens are usually attractive to flies. In a study conducted to determine the effectiveness of insecticide treated nets in Ghana, 28 pigsties (pig sheds) were lined with the nets. A second set of 14 pig-

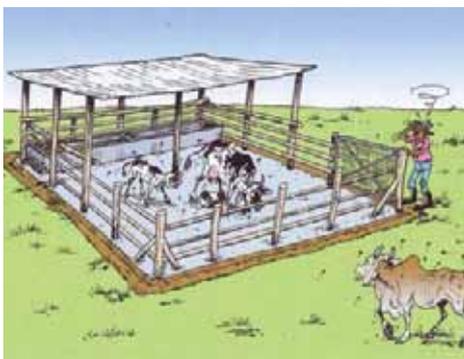
sties was left without the nets; the tsetse fly population was monitored with the use of traps placed near the pigsties.

The results showed that the fly population in the pigsties with nets decreased by 97 per cent. However, there was no noticeable change in fly population in the pigsties without the nets. After 6 months, 60 per cent of pigs in the control group were infected with trypanosomiasis compared to 8 per cent in the pigs that were protected. Studies on the efficacy of ZeroFly® are also being conducted by *icipe* in partnership with FAO in Kisii and Bungoma counties.

How to install the protective net

- Measure perimeter of the shed. Cut the required length of ZeroFly® net from the roll.
- Nail the net to the bottom of the pen (keep the net 10cm above the ground). Stretch and nail to the highest board of the pen.
- Pull the net tight to avoid sagging. Do not overstretch it.
- Wear gloves and protective clothing to avoid contact with skin. Rinse the hands.
- For livestock in concrete and brick shelters, attach screen on top of the wall. Tie net on fixing points along the wall.
- Use fly or broom to keep the net clean. The net can also be washed with water.

The ZeroFly® net lasts for a period of one year. To increase its lifespan the net is UV protected and can last up to 1 year before the farmer can replace it. A metre length of netting costs Ksh 200. The Kenya National Federation of Agricultural Producers (KENFAP) are the main distributors of the nets. Farmers interested can get in touch with KENFAP. Call 020 600 1995, 0722 617 704, 0717 897 912.



Source: Vestergaard Frensen Ltd



Kitchen gardens: All year source of vegetables

Vegetables grown organically in a 2m by 2m space can provide a household with a steady supply of nutritious food throughout the year.

Caroline Nyakundi | The short rains at the end of the year will soon be followed by a hot and dry season lasting till March. Many farmers will be faced with challenges especially in getting enough vegetables for their families. This need not be the case, if they have a well-prepared and managed kitchen garden.

In TOF No. 5 of November 2009, we answered a farmer's question on how to set up a kitchen garden in a new home. We have the same information (in TOF No. 43 of December 2008) on how to set up and manage a Mandala garden (small circular kitchen garden) close to the farmer's house. In this issue, we show farmers how they can prepare different kitchen gardens, to ensure they have enough vegetable supply for their home use and earn extra money for other household expenses.

Mandala garden

A Mandala garden is a small circular kitchen garden, about 900 square feet (30 ft by 30ft) made close to the house where the farmer can easily water the garden and grow such vegetables as *sukumawiki*, *managu*, *terere*, spinach, tomatoes, onions, beans, chilies and other vegetables. To prepare one, follow these steps:

1. Select a suitable site near the chickens house or compost heap. This helps to save time and energy getting manure and water. The place should be away from shades and be well protected.
2. Prepare the seed bed - With a stick and rope, make the outline of a circular garden in the seedbed using double digging method to make sure the soil retains water and has the right texture.
3. Make a hole for watering at the centre of the circle.
4. Dig small furrows and ridges 2ft apart around the circular outline.
5. Make a small water channel from the kitchen to the watering hole at the centre of the circle. The waste water from the kitchen flows directly into the garden.
6. Water the garden and then plant the desired vegetables on the ridges. To protect the garden



Water from the kitchen is used to water a Mandala garden

from the animals, make a hedge around it or even use a net to protect it against birds.

Keyhole kitchen garden

A kitchen garden can also be made cheaply on a raised bed even without digging, using locally available materials. Since the garden has a number of layers, the soil retains moisture longer and the compost basket (in the middle) replenishes the soil's nutrients. This makes the garden more productive than a conventional kitchen garden. The disadvantage however is that a farmer cannot plant crops like maize and potatoes, which need more space.

To make a kitchen garden, you need medium or large stones, bricks or logs, 4 large sticks, stones, broken pots/cans/ aloleaves, thatching grass, spades, 10 metres of string or rope, some wire and a mixture of well-draining top soil (10-20 wheelbarrows), compost and quality manure (10-20 wheelbarrows). Follow these steps:

1. Select a suitable area to accommodate a circular garden about 6.5 ft (2m) by 6.5ft (2m). Mark the circle and note the centre of the garden.
2. Start weaving a simple basket of thatching grass (1m high) on 4 large sticks in the centre of the garden. This is for the compost material and water.
3. Place the first layer of stones around the circle and add aloleaves, broken pots or tin cans. Instead of stones you can also build the raised bed with bricks



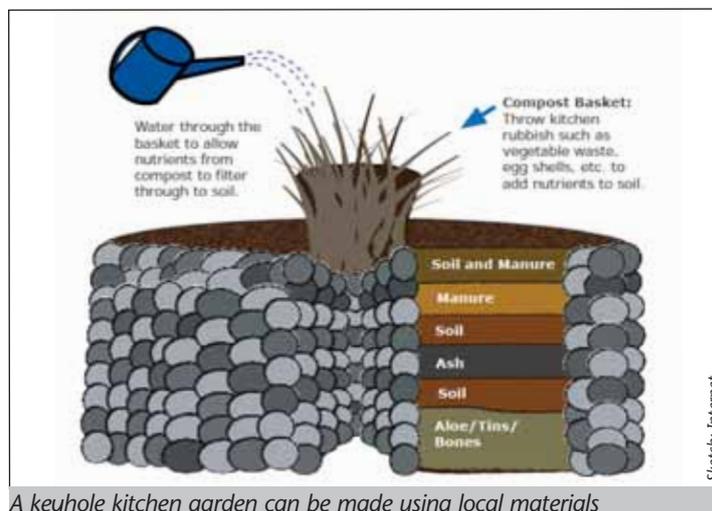
or logs. Then add soil, ash and manure in that order (see illustration). Leave a small 'basket' at the centre where the compost material (like kitchen vegetable waste) is put to rot. An access area or 'keyhole' is left in the middle and this gives the garden a keyhole design when viewed

from above.

4. Pile new fertile soil and manure (mixed in 1:1 ratio) in the top layer and plant the crops in rows of about 50cm apart. Ensure this layer slopes slightly (like the roof of a house) to prevent it from sinking towards the keyhole.

5. Water the plants through the 'basket' so that nutrients from the compost pass through into the soil.

Note: Keyhole gardens are best for planting *sukumawiki*, spinach, lettuce, herbs, root crops, carrots, beetroot, garlic, radish and turnips. It is not advisable to use them for tomatoes, pepper, peas, potatoes, cabbage, egg plant, maize, beans and squash since these need more nutrients, space and water to grow well.



A keyhole kitchen garden can be made using local materials

Tips for a good kitchen garden

A farmer who is new to kitchen gardening or is not organized in making one can use the following guidelines:

- Make a layout plan – start small and expand gradually.
- Prepare seedlings separately well in advance. Plant a little at a time but often to ensure continuous production.
- Harvest water for irrigation during the dry months.
- Transplant the seedlings. Plant the crops in rows; alternate rows of vegetables that need a lot of space with those that do not.
- Remember to plant a mixture of fast and slow maturing crops. Some like *terere* can only be harvested two or three times before replanting while some varieties of *sukumawiki* can be harvested several times in the course of

the year.

- Ensure you continually top-dress the garden with compost and mulch to retain soil moisture.
- Work the garden daily, even if only for a few minutes to monitor progress to identify any problems early enough.
- Check for pests and diseases. Use organic methods like natural pesticides such as ash, tea and neem extracts as well as soapy water, garlic, chilies and lemon grass plants also repel insects when planted in the garden. Beneficial insects like wasps are extremely effective at controlling pests.
- Harvest the crop once mature and aim to feed the family first. Look for a market if you have excess vegetables. Your neighbours and friends can provide a ready market.

Prepare enough fodder for the dry season

We are about to enter the dry season. This is a difficult period for most farmers because there is little pasture for livestock, and especially dairy cattle.

Peter Kamau Most small-scale dairy farmers in the country will have to rely on low quality crop residue from the recent harvests and this will result in decreased milk production and loss of body condition. It is therefore very important that farmers plan well ahead of this period to ensure the feed requirements for their animals are met during the dry spell.

Plan ahead

Planning animals' feed requirements is very important. Farmers will not only need to maintain their animals' health, but also stand to earn more income from their milk sales because the milk production during the dry spell is considerably reduced pushing the demand and prices up significantly. During the month of December, there is plenty of crop residues from maize stalks, bean residue, some of which is still green and good for fodder preparation. Farmers can take advantage of the available fodder to conserve and use it during the dry spell that stretches from January to March.

Below, we give three methods farmers can use to conserve



Gather and store all on-farm crop residue for use as fodder

fodder for their livestock during the dry spell:

a) Hay making

Hay is fodder made from drying of various types of green forage such as Rhodes grass, Nandi setaria or even oats. The grasses may be conserved with or without forage legumes. Forage legumes such as lucerne, desmodium, lablab (dolichos), calliandra, leucaena or mucuna when added to hay increases its nutritional value.

Stages of conservation

Harvesting: The grass should be cut just before flowering when nutrient levels are still high in both quantity and quality. Forage legumes should also be cut before flowering or at intervals of 6 to 8 weeks. Lucerne and lablab are ready for harvesting when about half of the crop has flowered. Desmodium is harvested 3 to 4 months after establishment, then at intervals

of 6 to 8 weeks thereafter.

Curing: Curing is a process of drying the material to a right moisture content of between 15 and 20 per cent. Curing starts in the field after cutting and leaving the material to wilt. The wilting period varies with the type of material and the prevailing weather conditions. Most of the material takes 2 to 3 days to wilt. Lucerne and desmodium take 4 to 6 hours to wilt. Desmodium leaves wilt faster than stems. Hay should be turned over frequently to ensure the stems dry properly. If it is wet, the fodder material should be hang in fences under the shade, using simple stakes or tripods made from wood. The fodder material to be cured should be raised from the ground to allow for air circulation.

Drying: Hay should be left to dry for two weeks after curing before it can be baled.

Storage: Hay should be stored in a cool dry store or barn. It should be placed on a raised platform and covered with grass to avoid damage by rain or sunlight. There should be proper air circulation.

Feeding: Good quality hay can help the animals sustain milk production during the entire dry season. One cow will require 1 bale of hay per day if no other feed is available. Legume forage increases the nutritional value of hay and also milk production.

Qualities of good hay

- It is green in colour.
- It has a pleasant smell.
- It is not easily broken.
- It has more leaves than stems.
- It is palatable (animals like it).

b) Making silage in pits and silage bags

Silage making is a method of preserving raw materials by fer-

mentation. The product is often a high value feed that leads to high milk production especially during the dry season if supplemented with other feeds that are rich in protein.

The process of silage making involves stopping the inflow of fresh air so that oxygen in the air inside a polyethylene bag, pit or airtight chamber is used up. In the absence of oxygen, a bacteria called *lactobacillus* produces lactic acid, which feeds on sugars contained in the preserved material (facilitating silage making). The simplest way to keep out air is to cover the silage material with a polyethylene sheet. When the hot air rises through the silage, it is trapped inside, so no fresh air is allowed in, facilitating the ensiling process.

Material for silage making

Common material for silage making includes Napier grass, sorghum, green maize stalks or even sugarcane tops. The right time for cutting is when the plant material has sufficient sugar- for maize at milk or dough stage, for sorghum when heads have emerged and for Napier grass at 1.0 to 1.5 metres high. Sunflower is ideal for silage making when the seeds have formed. Add molasses to Napier grass and sorghum as they have low sugar content to provide carbohydrates the bacteria needs to ferment the silage. Put the forage to be ensiled in the sun to wilt for half a day (12 hours) before using them for silage making.

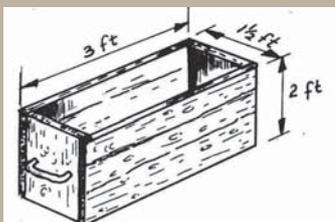
How to make a pit silo

This is the simplest form of silo that can be prepared for good silage making. The pit silo should be located in an area where the water table is not high. A pit silo should have a



depth of 1.5 metres, with sides having a slight slope narrowing at the bottom (see sketch).

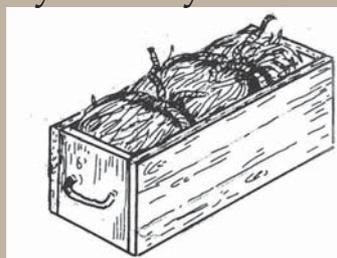
How to bale your hay



Baling: Small-scale farmers can use a simple wooden box and sisal strings for baling the hay after drying. A box measuring 3 feet long, 1½ feet wide and 2 feet deep. The box should have no bottom.



Step 1: The box is filled with hay and tightly compacted.



Step 2: The compacted hay is then tied.



Step 3: Removing hay.

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main ways:

- The calf may get worms from the mother.
- Dormant eggs in the mother become active and larvae migrate to the mammary glands.
- In-house calves become infected after suckling milk of their infected mothers.

How to treat the sick animals

- Treat the sick calf with a dewormer (use a safe effective, metabolisable and economic dewormer).
- Ensure that the calf is well restrained to avoid choking during drug administration.

It is easy to identify the disease

- Infected calves have a non-stop diarrhoea.
- The calf has colic abdominal pains.
- The stool is full of mucous that is unsightly to look at.
- Diagnosis can only be done in a laboratory.

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The main advantage of a pit silo is that the compacting or consolidation of the material can be done using a tractor or a drum filled with water. In a pit silo, there is minimum wastage after filling. It is also easy to maintain



Photo: TOF

temperature for fermentation and anaerobic reactions.

c) Polyethylene tubes

Polyethylene tubes are ideal for small-scale farmers who have no adequate amount of fodder for making silage. The chopped forage is mixed with molasses and put in a polyethylene tube and compacted tightly before the mouth is securely fastened with sisal twine.

Diarrhoea in calves

Only a laboratory test can prove the cause of the diarrhoea. Collect samples of the stool and take it to the nearest livestock laboratory for testing. The eggs of the parasite can be easily identified under a microscope.

How to prevent the infection

- Treat the in-calf heifers in the last trimester of pregnancy with a reliable dewormer.
- Treat all the in-house cattle calves.
- Clean the animal sheds to avoid re-infection.
- Treat all the new animals before introducing them to your herd.
- Share the knowledge with other cattle holders to increase awareness of the disease in the community.
- Ensure regular deworming to make your calves worm free.

(Source: *Diagnosis and Control of Cattle Calf Diarrhoea (Toxcara)* J. C. Njanja, H. K. Walaga and S. G. Kuria) KARI Marsabit.) ■

Coping with dry season

Requirements

- 1 gunny bag full of Napier grass, chopped to a length of 2.5cm using a chaff cutter or *panga*.
- A watering can.
- 1litre of molasses (a 1kg cooking fat tin can be used).
- 3 litres of water.
- A shovel.
- A big polyethylene tube (1000 gauge) tied with sisal twine at one end.

Preparation

- Mix 1kg of molasses with 3kg of water in a watering can.
- Spread out the chopped Napier grass on a polyethylene sheet and sprinkle with the molasses water mixture. Mix the grass with the molasses water mixture thoroughly.

- Put the mixed material in a giant polyethylene bag. Tie the top of the polyethylene tube with the sisal twine. Where a drum is used, compact the it tightly and cover with a lid or polyethylene sheet fastened with the sisal twine. Silage made in polyethylene tubes or plastic bags should be stored in a rat proof store. The storage area should also be free of termites.

Source: *Coping with feed shortages during dry seasons* - KARI ■

Saving local seeds reduces farming costs

Most traditional seeds have disappeared and replaced with improved or hybrid seeds that are expensive. Preserving local seeds is a sustainable practice that reduces the input costs.



Photo: TOF

Hanging maize above the fire place

Njeri Kinuthia | Apart from fertilizers, chemicals and labour, seed is one of the most important inputs in agriculture. Good quality seed can greatly increase a farmer's harvest and ensure food for the family throughout the year. Traditionally, small-scale farmers had rich knowledge of preserving their own seeds for use during the planting season. Such indigenous or local seeds were selected from plants with desirable characteristics like high yield, and resistance to pests, diseases and drought. Most of the commercial seeds sold in the agrovets or market today are, however, improved or hybrid varieties which are mainly made to last longer on the shelf, produce attractive or uniform plants and grow quickly. Use of hybrids or improved seed varieties is not without challenges. In some cases, farmers buy seed varieties from the agrovets that are not suitable for their areas and these have to be bought every season. This worsens the farmer's situation because the burden of high production costs, labour, seeds, fertilizers and pesticides is greater.

Preserve indigenous or 'kienyeji' seeds

Saving local or 'kienyeji' seeds is important in ensuring the farmer has food throughout the year and preserving local varieties of crops liked by communities. These seeds are cheap to produce and can be reused, which assures the farmer of a good yield as long as there is fertile soil and enough rain. They are also strong plants and that need less chemical fertilizers or pesticides to grow. The farmer therefore needs to select the healthy and attractive crops for seeds. It is also critical for each farmer to aim to save enough seed for their family first, and only sell the surplus.

Indigenous seeds are more preferable

Some consumers still prefer the taste of the *kienyeji* varieties of

crops since they are not used to the improved types. During training sessions, some small scale farmers say, for instance, that *ugali* cooked with hybrid maize is not as sweet as the *kienyeji* one. Many people are accustomed to the taste of indigenous crops and find the improved types not as tasty and therefore reject hybrid or improved types. Also, some crops have unusual cooking characteristics. For example, some will take long to soak and cook. You will find farmers saving the indigenous seeds for home use and the improved types for the market.

Agriculture is influenced by the traditions of farming communities. In spite of this, researchers rarely involve consumers or farmers when coming up with new seeds, which end up being rejected by consumers. Sometimes farmers have no alternatives with desirable qualities and plant the improved types only for a short while and later revert to using their local seeds.

How to select seeds for planting

When growing crops for harvesting seeds, it is important for the farmer to closely monitor the plants and select the ones which have vigorous growth and appear healthy, strong and free of pests or diseases. From this lot, the farmer should identify good seeds and allow them to mature properly. They can then be harvested separately from the rest of the produce to avoid mixing them. If it is a maize crop, select only the grains at the middle of the cob and disregard the small and wrinkled ones at both ends of the cob.

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Farmers derive many benefits from organic farming

Does organic farming benefit farmers?

Nutrients levels in most fruits, vegetables and grains are lower than they were 60 years ago. Multiple nutrient deficiencies are on the increase globally which in the long run is likely to increase susceptibility to more serious diseases in plants and animals. Organic crops are known to have more dense root systems, more broader leaves and shorter internodes in a crop such as coffee. Organically grown crops are therefore less susceptible to diseases and pests. In coffee, the berries have a tougher skin and thicker outer coat than coffee that is grown using conventional methods.

Soil fertility improved

Soil nutrient improvement and the agro-biodiversity associated with organic production lead to more sustainable production base for a farmer. This environment has a great influence on food security at the household level. This is by influencing the stability and fertility of the

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Seed selection Storing local seeds

The seeds should be stored and preserved properly in a cool, dark and dry place to prevent contamination and pest infestation. They can then be used as the planting material for the farmer in the following planting season. Some of the indigenous practices that are effective in preparing seeds for planting are:

- Soak for 5-10min the harvested and dried maize seeds in ash mixed with a little water, then dry them in the sun. This helps protect the seeds from pests during storage.
- Hanging good maize cobs over the fire place. This helps protect the seed from pests and preserve it until it is used.
- Chitting (storing in cool and dark place to start germination) is done so that the potato seeds produce buds or 'eyes'. This makes them grow quickly when planted.
- Storing beans in their pods helps protect the seeds from pests.
- Mix cow dung (2 parts) and soil (1 part) with water and stick maize on the flat shapes made of the mixture then dry them in the sun. This helps prevent pests from attacking the maize seed.



Demand for organic food is higher than the supply

Photo: TOF

soil, improvement in water efficiency and agricultural systems through biodiversity. Organic production allows the recycling of natural resources in nature. Although there is a noted reduction in crop yields in the short run (e.g. for perennial crops), in the long run the system stabilises as the soil improves, leading to increased crop production. In Mbumi Estate, the average production of a coffee tree is 28Kg against a national average of 15Kg.

Increases adaptability to climate change

The Sustainable Agriculture Community Development Programme (SACDEP, Kenya) reports its experience in Eastern Kenya. They note that many farmers practicing organic farming are self sufficient in vegetable production with surplus for sale. In addition, many of the households are able to have enough vegetables for their families over the long dry seasons compared to their neighbours. Organic production therefore contributes to increased adaptability to climate change, improved, diversified and healthier household diet and nutrient intake, leading to



more food availability, accessibility, stability and utilization.

Organic farmers are less exposed to toxic chemicals than

those who work in conventional farms. Workers interviewed in Muiri Farm (Gatundu) and Mbumi Coffee Estate in Kiambu show that they recognise the dangers of working in conventional farms. They further indicate that their health problems are reduced significantly and they feel free to have their young children accompany them to coffee estates as the children are safe. This state of affairs is caused by reduced pesticide use on the farm leading to reduced air pollution and less polluted drinking water.

Organic sector is growing fast

Organic farmers are assured of guaranteed market, increased incomes and financial benefits in the long and short term. Increased awareness and health consciousness among consumers has created a market for organic foods worldwide. Currently, the industry is worth more than 6 billion US dollars and it is the fastest growing food industry sector in the Western World.

Demand higher than supply

The changing lifestyle has created increased demand for organic fruits and vegetables, meat, grains, beverages (coffee and cocoa), human body care products and organic cotton. Generally, consumers are willing to pay more for organic produce (between 10-50% increase in price). The market is growing and expanding while the generated demand is difficult to satisfy. Su Kahumbu, the proprietor of Green Dreams and a pioneer in organic food market in Nairobi, indicates that demand for organic

produce outstrips supply.

You need more labour

Organic farming consumes less fossil energy than conventional agriculture due to less reliance on synthetically produced fertilizers, pesticides and herbicides. But in most cases it tends to consume more fuel than conventional farming because many of the management practices are handled mechanically rather than using chemicals. Composting (high volume) replaces synthetic fertilizers (low volume), mechanical weed control replaces chemical weed control, and planting of a green manure crops, which is a substitute for nitrogen fertilizer application. There is an increased labour in organic farms than conventional ones.

Organic food should cost more

More labour is needed to produce compost, plant cover crops and green manure and for weed control. This tends to increase production costs in a



big way, which is compensated for the use of premium prices to make up for the increased labour and reduction in net returns. When this is compared with the fact that organic farming achieves similar or slightly lower yields, compared to conventional agriculture, the economic efficiency of organic farms is very variable. Premium prices are needed to make up for income disparity.

Organic food tasty

Does organic food actually taste better?

Promoters of organic food have well documented cases of organic food being superior in terms of taste, colour, texture and weight. Mr. John Mwangi an organic poultry farmer based in Kagumu village, in Gilgil Nakuru County says organic eggs weigh about 84g compared to the average of 60g for conventionally produced eggs. The eggs have a deep yellow egg yolk with a shell harder than normal eggs. (Mwangi's contact 0722 617 732).

TOFRadio answers your questions

TOFRadio responds to some of the questions raised by farmers after the TOFRadio programme. Send your questions and comments via SMS on 0715 916 136.

Milk fever

My cow has just given birth and it is very weak. It is having a lot of difficulties standing up. What do I do?
Pauline Mwangi, Muranga.

We have a growing number of farmers who are complaining that their animals are unable to stand up after calving down due to weakness in their legs. This is a condition that affects mature cows, occurring a few days before, but mostly just after calving. It is common in high yielding dairy cows.

Low calcium to blame

It is important for farmers to know that milk fever is a disorder that is very much related to feeding and feed management on the farm. It is caused by low calcium levels in the body resulting in increased demand for milk production, which takes its toll



on the body of the animal. Therefore, the nutritional status of the cow in the dry period is known to increase the risk of the disease occurrence. If the nutrition of the animal is compromised and calcium deficiency is too severe, chances are high that the animal will suffer from milk fever before calving down.

Low calcium levels are related to the balance between calcium and magnesium. Low magnesium in the diet hinders absorption of calcium hence predisposes the animal to milk fever. Magnesium is required for the production of hormones that are important for the absorption of calcium from the gut and the utilization of calcium from bones. The disease is more prevalent in cows after third calving but is rare in calving heifers.

Signs of milk fever

The first sign of the disease is loss of appetite followed by slight drop in temperature. The most observable and alarming symptom is that the animal

becomes uncoordinated, falls over, is unable to rise and sometimes the neck is bent in such a way that the head rests on the shoulder. If not treated immediately, milk production drops and the animal cannot be milked, as it sits on its stomach and udders. Also, the cow may go into coma and die within days after the first signs.

Prevention and Control

Feed the cow with the correct levels of nutrients from the late pregnancy to peak lactation. Feed a high quality mineral supplement with a good balance of magnesium and phosphorus.

- Feed diets with the right dry matter content such as offering additional hay in combination with green pasture.
- If the cow already cannot stand, make sure she is not lying on her side as this can cause bloating. Prop her up to lie on her chest. Do not use rocks and boulders as these can cause injuries.
- Seek the immediate attention of a veterinary officer in your area. Usually a subcutaneous or intravenous injection of calcium is administered. Only qualified veterinary personnel should treat the animal.

Guard your tomatoes against bacteria wilt

I have a greenhouse in Rongai, near Nairobi. Unfortunately, my tomatoes are affected by bacterial wilt. The previous harvests have been better but it is getting worse every other season. Kindly advice. Simon Mugambi.

There is an increase in the uptake of greenhouse technology in the country, particularly in the peri-urban areas. However, bacterial wilt is threatening to drive tomato farmers out of business.

Greenhouse conditions are conducive for rapid multiplication of *Pseudomonas solanacearum*, the bacterial that causes the wilting disease in tomatoes.

Symptoms of bacterial wilt

Bacterial wilt causes the foliage of the tomato plant to wilt suddenly but the foliage remains green. To identify bacterial wilt, take the part of the plant stem just above the soil line. Cut a section of the bark. In the early stages of the disease, the centre of the stem (pith) appears water

soaked and later turns brown and sometimes becomes hollow after prolonged infection. Plants that are infected early in their growth hardly give any fruits, while those that are infected at a later stage do not give fully developed fruits as the disease has a direct effect on fruit development.

Prevention and control

Any preventive measures should target reducing these pathogens from the soil or making sure that new plants do not come in contact with the infested soil.

Avoid or reduce injuries to the roots and stems of young plants, especially when transplanting, weeding and when conducting routine inspections. Remove and destroy affected plants at the end of the season. Till surrounding soil to reduce spread of the disease.

Crop rotation is important

Susceptible crops of the tomato family, also those of eggplant, potato, pepper and cucumber family should not be planted in the same place continuously. Instead, rotate them with crops like cabbages, beans and onions. Plant tomatoes in well-drained soil with a balanced pH. Acidic soils provide good incubation environment for the bacteria. Use agricultural lime to balance the pH of your soil.



Tomatoes in a greenhouse

Make sure the green house has enough air circulation. Space plants generously. Extra room in between plants allows air to circulate. High plant density spreads the disease much faster.

Plants such as mustard can be planted and ploughed into the soil. Before setting up the green house, cover the soil with polyethylene and expose it to sunlight. This is called soil solarization.

The other option is use fresh soil from outside the greenhouse that is not infected with the bacterial wilt. **John Cheburet**

 farmers forum

0717 551 129 / 0738 390 715

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