

# The Organic Farmer


The magazine for sustainable agriculture in Kenya



Nr. 63 August 2010



## in this issue

Lumpy skin disease	2
Bean harvest and storage	6
	
Foot and mouth disease	7

## Breeding scandal in dairy goats

*Inbreeding problems and unscrupulous farmers have reduced quality of dairy goats.*

### The Organic Farmer

The introduction of exotic dairy goats into the country 16 years ago, was met with excitement by many farmers. The goats could give as much as 6 litres of milk a day. At last, farmers who had small parcels of land had an option of keeping dairy goats which required less feed and just a small housing area. Goats then became an occupation of choice for many small-scale farmers.

But dairy goat keeping is turning out to be another scandal amongst farmers. First, there is lack of bucks (male goats), leading to inbreeding and

deterioration of the quality of dairy goats. Second, the goats have become a very quick source of income. Unscrupulous farmers and traders have taken advantage of the high demand. The farmers falsify records to show the goats are high quality breeds, which they then sell at between Ksh12,000 and Ksh15,000 depending on age. Farmers who buy such goats soon discover that some have stunted growth and yield as little as one litre of milk due to inbreeding.

Things are getting even worse. Attempts to introduce artificial insemination AI services for dairy goats, which can help reduce inbreeding, have been frustrated by the government which has set stringent conditions for AI providers. *Page 3*

## Healthy bananas withstand pests

Bananas are a very high valuable crop. They are not only threatened by the Panama disease and the rapidly spreading fungus, known as "Black Sigatoka". Many farmers have problems with weevils and nematodes, the two most important pests in bananas. Healthy and vigorous plants



are able to withstand attacks from pests and diseases more easily.

So it is in the interest of every farmer to improve soil fertility and crop nutrition on their shamba. In this issue we describe the important steps and measures needed to achieve this goal. *Pages 4 & 5*

## Dear farmers,

The story of dairy goat inbreeding in the country is so disheartening to read. With only a small number of bucks available for breeding purposes in the country, chances of "accidental" inbreeding in a few goats cannot be avoided. This can however be eliminated by practising clean record keeping that traces the lineage of each and every buck used to ensure goats and bucks from the same family line do not mate.

Breeding is a very important aspect of animal production. It calls for integrity among all stakeholders: Dairy goat farmers, service providers, regulatory authorities such as the Kenya Stud Book (KSB) including the Ministry of Fisheries and Livestock Development. Unfortunately this has not been the case; when it comes to dairy goats, the KSB is under-staffed. Farmers simply walk into the KSB offices and buy record-keeping cards without proper verification of the goat's history.

The government has worsened the situation: It made it difficult for private service providers to start Artificial Insemination (AI) service for goats; this would have reduced inbreeding. Things became worse, when a number of NGOs jumped into the goat sector and assisted small-scale farmers to acquire dairy goats. Because the demand was high, the NGOs did not care about records, in this way promoting inbreeding.

But the worst form of cheating is taking place amongst the farmers themselves. They falsify records and sell poor quality goats to fellow farmers, defeating the very purpose of purchasing the goats.

Dairy goats would have provided a quick solution to alleviation of poverty among the poorest citizens of this country. Majority of the small-scale farmers do not have the cash for buying a cow. In order to provide their children with milk, they acquire a dairy goat only to realize that they have nice pedigree papers and a goat that produces only one or two litres milk a day.



## New services from *The Organic Farmer*

1. Do you want to buy or sell farm products? Beginning this month, TOF will offer free advertising space for farmers on its website.
2. From August this year, you can read some of the most commonly asked questions and answers from other farmers on the TOF website. See page 8.

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# Lumpy skin disease common in wet season

*Lumpy skin disease is one of the major cattle problems affecting cattle keepers in Kenya.*

**William Ayako**

In sub-Saharan Africa and Madagascar, the Lumpy skin disease is quite common; it has as well been noted in Egypt and Israel. The disease is a viral infection caused by a poxvirus that is transmitted mainly when blood sucking insects like mosquitoes and flies bite the animals. This usually happens at the start of the wet season when most insects start breeding. European cattle breeds get the disease more easily than zebu (humpback) cattle which are more resistant to it.

## Symptoms of the disease

- The animals have much saliva coming from the mouth. A clear discharge comes from the eyes and nose. Later the discharge from the nose becomes grey/white.

- The cattle are weak and tired and stop eating. They have a fever that sometimes goes down after 1-2 days but then goes up again. Young animals are often more severely affected. Milk yield is decreased, pregnant cattle may abort, and bulls may become sterile.

- Skin nodules appear on the body, usually around the head and neck, under the belly, on the legs, and around the genitals and the udder.

- The lumps are hard and usually all about the same size. The hair on the lumps stands up. Softer, yellow/grey lumps may appear on the mouth. They rub off easily leaving sore red patches.

- Many of the skin nodules turn into sores that get infected and become deep wounds. Most of them dry up and heal after a few weeks but they leave scars that damage the hide. Some lumps become hard and do not go away.

- Cattle do not usually die but they may become very emaciated.

- Occasionally the disease is very mild, animals only have a low fever and lumps on the skin that heal in about six weeks.

## Treatment

There is no treatment for lumpy skin disease. Give an antibiotic injection to stop the damaged skin getting infected by bacteria. With good care, animals



These are some of the symptoms of lumpy skin disease

(Photo IN)

generally recover; but this may take up to 6 months.

## Prevention and control

Vaccination for lumpy skin disease is effective and all animals in contact with the disease should be vaccinated.

Lumpy-vax vaccine can be purchased from leading agrovet shops. Farmers can also contact the veterinary departments for information about vaccination campaigns organized by the ministry.

# Cattle skin is sensitive to sun

*Some plants contain poison that can affect the skins of cattle.*

**William Ayako**

Most livestock keepers in the tropics are affected by photosensitization without knowing what it is and what causes the problem. Ideally, photosensitization is not a big issue but lack of knowledge about it can be a serious problem. Photosensitization is a skin problem associated with the liver function of animals and plant poisons. Phylloery-

thin, a breakdown product of plant chlorophyll in the fore stomachs of ruminants, is excreted into the bile by the liver in healthy animals. However, in animals with impaired liver function it accumulates in the blood and is transported to the skin. Where the skin is not protected by pigments (light skin with light hair), it is sensitized when exposed to the sun, resulting in inflammation. Animals, especially cattle and sheep, can also get photosensitized when they eat certain plants which

*continued on page 6*

## Dangerous plants

A number of plants contain liver poisons that may result in photosensitization if eaten in sufficient quantities. These are:

*Lantana camara*, an ornamental garden shrub which has become wild in many parts of the world and is now found throughout Sub-Saharan Africa. Lantana poisoning is virtually confined to cattle.



*Tribulus terrestris* (devil's thorn), a ground creeping plant with yellow flowers, is widespread throughout the tropics. It is regularly eaten by stock without causing problems, but is also suspected to cause photosensitization.



*The Organic Farmer* is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development.

*The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views



of icipe

*The Organic Farmer* is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.

[www.biovision.ch](http://www.biovision.ch)

**Publisher** African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, [icipe@icipe.org](mailto:icipe@icipe.org), [www.icipe.org](http://www.icipe.org)

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# Inbreeding reduces quality of dairy goats

*Lack of breeding stock and cheating by farmers is destroying the dairy goat industry.*

## The Organic Farmer

Ruth Wambui, a member of Arahuka Self-Help Group in Wanyororo, Nakuru, was a happy farmer when she bought her first dairy goat; it was a high quality goat that gave up to four litres of milk a day. For the last ten years she has relied on dairy goats as her main source of income. One of the benefits of dairy goat keeping is that apart from providing high quality milk, they do not consume much feed and require little land area to keep. Besides she can sell a goat at short notice and solve her financial problems due to the high demand for the goats.

Although she is well-versed with goat breeding, there is a serious problem she is going through; she cannot be able to get good quality bucks to serve her goats. For the last three years, she has had to rely on bucks (male goats) of unknown pedigree.

### Farmers getting less milk

Wambui is not in this alone. Jennifer Nyambura bought three dairy goats some years ago. Although she was assured that the goats could produce as much as four litres of milk per day, she can only get one litre or less from each of the goats despite providing them with adequate feed and care.

Hundreds of dairy goat keepers in the country are faced with a big dairy goat breeding problem. As more farmers acquire the goats, they soon discover that the goats are not as high yielding as they were promised. Many have been forced to use related bucks for lack of breeding stock. Inbreeding is the order of the day, and this has considerably reduced the quality of dairy goats in most parts of the country.

### Recording service manipulated

The quality of dairy goats in the country was standardized when the dairy goat project started, through proper record keeping and choice bucks for breeding purposes. One of the organizations involved in training farmers is the Dairy Goats Association of Kenya which is based at Nyeri. To ensure that farmers used proper breeding practices, each of the goats was registered with the Kenya Stud Book (KSB). This ensured that the history of the dairy goats was well known. Farmers could rely on the records to get good quality goats whenever they wanted to buy them, but this is no more.

### Difficult to get a pedigree goat

The Dairy Goat Association Kenya (DGAK) is overwhelmed by the big demand for goats and can no longer control breeding. Most of the farmers who want to sell goats simply visit the

Kenya Stud Book offices in Nakuru and buy the record cards; they then fill details about the goat as required and declare their goats as pedigree. The practice is so rampant that at the moment, it is almost impossible to tell a good pedigree goat from a poor quality one because the records are manipulated.

There is another problem. After every 16 months, the association is supposed to visit all farmers' groups with dairy goats and rotate the bucks to avoid inbreeding. However, they have not managed to do so in all the areas. The result is increased inbreeding among all dairy goat farmers.

### A ban on imports

According to the Nakuru Catholic Diocese Extension officer Laurian Nambubi, the problem of inbreeding cannot be blamed on the DGAK alone. He says the problem goes back to 1994 when the country imported 11 goats for breeding purposes into the country. Some years later, European countries which were the main source of breeding stock, were hit by the Mad Cow Disease. As a result, the Kenyan government imposed an import ban on all life animals, which has not been lifted to date.

"Up to now the country is still relying on these 11 bloodlines to breed goats in the whole country. This is a crisis because the possibility of inbreeding cannot be avoided", Nambubi says. He adds that organizations such as the DGAK simply "do not have the capacity for quality control and to cope with the orders from farmers across the country, who need dairy goats".

### AI services introduced

One solution the Dairy Goats Association has tried to overcome the problem is to start an artificial insemination service



for dairy goats. Already, 20 farmers in central province have been trained to serve the seven regions of Nyeri, Kiambu, Muranga, Kirinyaga, Nakuru, Embu and Western province.

However technical problems emerged immediately the dairy goat AI services were introduced. The government insisted that it was only trained veterinary officers who could offer the services to farmers. The Director of Veterinary Services certified four technicians out of the twenty farmers who had been trained. The 20 farmers, including other technical personnel who had been trained to offer this service were therefore rendered redundant.

But even with the restrictions, the DGAK was unable to equip the few technicians who were licensed to operate the service. They lack equipment such as nitrogen tanks, including the logistics of acquiring semen from the Central Artificial Insemination Service in Kabete, Nairobi. - The deterioration of the dairy goat quality will worsen unless urgent measures are taken to save the sub-sector.



Use of related male goats (bucks) for breeding is responsible for low quality dairy goats.

# Strategies for fighting banana weevils...

Bananas are a high value crop – they are too valuable to let weevils and nematodes spoil them.

**Theresa Székely**

Problems with weevils and nematodes, the two most important pests in bananas, are often connected with soil fertility and crop nutrition. Organic husbandry will improve both and produce healthy and vigorous plants. They will be able to withstand attacks from pests and diseases more easily, and yields usually increase within a few seasons. Here we describe the important steps and measures to achieve this goal.

## Priority: Rotate bananas

Weevils have a slow population build-up and are usually a problem in ratoon crops (ratoons are new shoots or volunteer bananas). In newly planted fields where bananas have not been grown for a few years, weevil levels are low. If you plant bananas and plantains in a different place every three years, weevil populations cannot reach pest levels.

## Clean up before planting

If you replant into old banana land, all banana residues must be removed and destroyed. Plant something else for at least 6 months until all residues are rotten down and all adult weevils have died.

## Use clean planting material

Buy tissue culture bananas if they are available; they are free of pests and diseases. Alternatively, select vigorous, healthy and weevil-free planting material. Examine the material by taking one or two slices from it. Trim (pare) infested material. Badly damaged suckers should not be used for planting.

## Trim infested planting material

Use a sharp knife to remove the roots and outer leaf layers (please see also the nematode section). Crush and kill all eggs and larvae that you find.

## Protect suckers with neem

Prepare a mixture of water and powder made from neem tree seeds. Use at least 20% neem powder. Dip the suckers into the solution just before planting. This treatment has a repellent effect on adult weevils and reduces egg laying and egg hatching rates. You may apply 50 g of neem seed powder or neem cake around the base of the plants at planting and repeat this every four months. Use 100g per mat for established bananas. Be careful:

### Farmer's question

What organic method should I use to control banana weevils and nematodes? Gideon Ocholla, 46-Kombewa, 0722 298 699



Banana weevil at larvae stage (left) and at adult stage (right)



Too much of it may be harmful to plants. This treatment is also effective against nematodes.

## Plant immediately

Plant the suckers immediately after paring, because leaving them overnight in heaps may attract weevils. Plant them about two feet deep. This prevents weevils from accessing the suckers. Mix the soil with manure or compost before you refill it into the planting hole.

## Further husbandry

Good husbandry ensures healthy plants and better yields!

- Mulching is essential for bananas (see the box on page 5).
- De-sucker and remove water suckers regularly. Too many suckers drain nutrients and water from the mother plant. Only leave three suckers: a "mother", a "daughter", and a "granddaughter".

- Crop nutrition: Regular application of animal manure is important to promote good growth of the banana plant. For bananas, manure may be applied composted or fresh. Besides mulch, use wood ashes for Potassium (K), composts, rock phosphate etc.

## Clean up after harvest

Female weevils are attracted to recently cut plants and lay their eggs into the stems. To prevent breeding, remove the stem residues after harvest from the field.

- Cut stems after harvesting or pruning at ground level. Cover the cut rhizome with a thick layer of soil to prevent attracting weevils and egg-laying.
- Dig out and remove old stems, trash and other materials where weevils may breed.
- Chop stems into small pieces and dry them up in the sun completely to stop attracting weevils and to dehydrate eggs and larvae feeding inside. You may use the material as mulch after this.

- Use stem pieces for trapping (see sketch on the right)
- Banana stems are a good pig feed. Slice, pound, pestle and mix them with cereal bran.

## Trap banana weevils

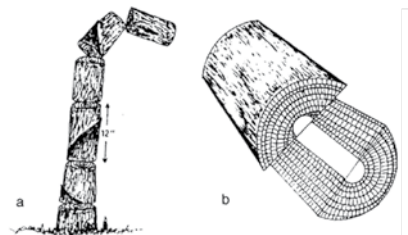
- "Split traps": Cut the stem in pieces of one foot length and split them. Place them with the flat side down near

the base of the plant. Weevils will be attracted, hide under them and lay eggs inside it. Collect and kill the adult weevils every 2-3 days and destroy the traps after 2 weeks.

- "Disc-on-stump" traps: Place a stem slice on top of harvested plants cut at the rhizome. This kind of trapping attracts even higher numbers of weevils than split traps.

## Direct control

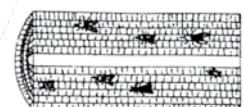
- Weevil control with commercial pesticides is usual in commercial banana plantations. Most of these are not used in organic agriculture. Beware that the banana weevil has the ability to develop resistance to most classes of chemicals!
- Neem (*Azadirachta indica*) can effectively control weevils and nematodes in banana plots. This botanical pesticide works best in fertile soils with moderate pest infestation.
- Mulch material or extracts obtained from Tephrosia or castor bean plants can also help to control weevils.



Cut the pseudostems in pieces of 30cm and cut them in half.



Place the pseudostem pieces with the flat side down at the base of the plant.



Kill the trapped weevils every 2 to 3 days, destroy the trap after 2 to 3 weeks.

# ... and destructive banana nematodes

The strategy against nematodes is very similar to weevil control. Chemical nematicides are usually toxic to many beneficial soil organisms and are not used in a responsible plant production.

## Rotate banana land

Avoid nematode infestation and plant bananas on land where bananas and other nematode hosts have not been planted for at least one year. Grow nematode-resistant crops before bananas! Cassava, grains and grasses, sesame, onions, garlic or siratro (purple bean) can all reduce nematode populations.

## Nematicidal crops before bananas

- Marigolds (*Tagetes* species) are very effective nematicides. Their live roots interfere with the development and reproduction of nematodes. Grow them in a single stand before bananas for a whole season or plant them densely on banana mats. Marigolds produce large numbers of seeds allowing farmers to produce their own seed supply.
- Brassicas (especially canola and mustard), *Crotalaria*, Sudan grass and sorghum have nematicidal properties. They contain chemicals that release powerful nematicides when their residues are worked into the soil before planting the next crop.
- Sesame crop significantly reduces nematode levels and increases the yields of the successive crop.

resistant cultivars such as 'Goldfinger (FHIA-01)' are available in your region. Always pare the planting material (except tissue bananas).

## Trim infested material

- Select suckers which will weigh at least 3/4 kg after trimming.



- Remove at least one ring of leaves. Trim the stem tissue with a sharp knife, removing all black or discolored spots and leaving only clean white tissues (see picture).
- Rinse the trimmed stems with clean water, and allow them to dry before planting.
- Remove the trimmings from the planting area.

## Hot water treatment

Hot water treatment of the trimmed suckers is recommended, because paring alone may not control nematodes completely. Weevils will also be killed, but not as effectively as nematodes. Strict control of temperature and time is essential to ensure the nematodes are killed without killing the suckers!



### Method 1:

Submerge trimmed suckers for 20-25 minutes in water at 53-54°C.

### Method 2:

Remove all roots and peel the sucker. Dip it into boiling water for 30 seconds - count 1 to 30, remove and cool in cold water immediately!

After this, spread the suckers on a clean surface. When they are dry, plant them immediately.

## Planting material

If clean tissue culture planting material is available, this is a very good investment. Try to find out whether

## Biopesticides

All nematode species can be controlled by incorporating neem powder or cake into the soil near the banana plants (use 100 g per mat every 4 months). Incorporating plant material from neem, sesame, marigold, castor bean, papaya, *crotalaria*, tephrosia etc. or drenching the soil with extracts from these plants can also be effective.

Some effective commercial and organic nematode control products are produced from sesame oil, seed meal or ground plants:

- Dragonfire™ (oil), Ontrol™ (seed meal)—both manufactured by Poulenger USA
- Nemastop™ (ground up sesame plant) from Natural Organic Products).

## Crop husbandry

- Use mulch (see the box left). Covering the soil surface with plant residues reduces soil temperatures and helps reduce nematode damage. Root necrosis due to nematode damage declines when soil organic matter increases.
- Sources of nematode-suppressive organic matter: Green manures and mulches (see the sections "Nematicidal crops before bananas" and "Biopesticides"), oilcakes, sawdust, sugarcane bagasse, bone meal, horn meal, manures, compost.
- Remove infested plants.
- Ensure good crop nutrition.

## Mulching keeps bananas happy

Productivity is best in mulched bananas for several reasons:

- Organic inputs improve the biological activity in the root zone, increasing populations of beneficial fungi and beneficial nematodes. This improves plant nutrition, plant growth, and increases plant tolerance to biotic or abiotic stresses.
- Mulch material adds plant nutrients. 2cm mulch can provide more than 100kg K per acre and other nutrients such as N, P, Calcium, Mg, Sulfur, Boron, Zinc or Copper.
- Mulching conserves water by avoiding evaporation and improving infiltration. Increasing water availability is important in areas with low rainfall.
- Mulching prevents erosion of rich topsoil from which banana roots feed. Bananas have superficial roots that go only about 1 foot deep and spread up to 1.5 meters around the stems. Do not disturb them, but mulch this area.
- A mulch cover of 2.5 cm will suppress almost all weeds.



chopped and dried up before you use them as mulch), corn stalks, uprooted weeds, grasses, *Tithonia*, coffee husks etc. Make a layer of at least one inch thickness. You may spread the mulch away from the banana stool leaving a clear ring of about 60 cm around the stems. This keeps the roots from growing upwards, resulting in poor resistance against strong wind. Apply more mulch as soon as you notice that the layer is getting thin.

## Mulching, nematodes and weevils

Root necrosis (death) due to nematode damage is reduced in mulched crops due to reduced soil temperature and increased soil organic matter and higher biological activity.

On the other side, mulch is known to attract weevils. But in spite of higher weevil densities in mulched plots, weevil damage is usually tolerable. Because of better nutrition and water supply, mulched bananas show a healthier growth and yield heavier bunches. This demonstrates that the beneficial effects of mulching outweigh by far the damaging effect of weevil activity.

## How to do it

You may use any plant material: banana residues (stems must be



contain poisons that the liver cannot destroy and which make the skin very sensitive to sunlight. These poisons are produced by the plants or by fungi that live on them.

#### Symptoms of photosensitization

- The pale coloured parts of the skin become red and inflamed and the skin cracks open. This often happens on the back and around the nose but can happen anywhere on the body. Sometimes the skin dries up and large pieces of skin fall off leaving sore patches underneath.
- The mucous membranes sometimes become yellow.
- Most animals do not become sick but a few of them may become very sick.

#### Prevention

- Make sure the animals have the possibility of finding shade during the day.
- Move the animals to a different pasture away from the poisonous plants. Some plants are only poisonous at certain times and the pasture may be safe to return to later in the year.
- Remove known poisonous plants in pastures by digging them out.

#### Treatment

- Shelter the animals under a shade and keep them away from bright sunlight for a few days.
- Put a wound dressing on the cracks and sore places.
- Give an antibiotic by injection to treat infection if the skin is damaged.

## Protect your beans from pests after harvest

August and September are bean harvesting seasons in the country. To reduce losses and maximize their harvests, farmers need to take several precautionary measures. The most important is to harvest beans on time when all the pods have turned brown, in sunny weather the pods tend to shatter and the beans fall off leading to pre-harvest losses. In rainy season, rotting of beans is common especially when beans are intercropped with maize or other crops. It is therefore advisable to harvest the beans and spread them out to dry before threshing. Before storage ensure the beans are completely dry.

One of the causes of bean loss during storage is damage by grain weevils (bruchids). The pest drills holes, then enters and feeds within the beans, leading to loss of weight and income to the farmer.

#### Control methods

1. Mix the dry beans with wood ash 5 kg of ash for every 90 kg bag of beans.
2. Mix a teaspoonful of corn oil such as Elianto for every 1 kg tin of beans. This keeps away the pests during storage.
3. Use of diatomite, a white powder

made up of millions of fossilised microscopic plants called diatoms, which have sharp edges that pierce insects and killing them. Diatomite is harmless to human beings and it does not affect the quality of beans or any other grain. Insect pest cannot develop resistance to diatomite. Farmers can buy diatomite from African Diatomite Industries at Gilgil (Tel 0722 277 120). A 20 kg bag goes for Ksh 400 exclusive of VAT. A ½ kg of diatomite powder is enough to preserve one 90 kg bag of beans maize or wheat.

#### Sunning and sieving

Farmers with small quantities of beans say 1 or 2 bags and who live in an area with adequate sunlight can dry the beans once in a while- this kills the eggs and larvae of insect pests that damage beans, the adult pests also fly away. For this method to be effective, farmers should spread the beans in the sun for about 6 hours. After every three months the beans need drying and sieving every 2 weeks and then once every 3 months.

However, the use of diatomite is still the best method for protecting beans against pests.



## Answers in brief

#### Tithonia as foliar feed

Is it advisable to mix tithonia and manure together while preparing liquid compost? Joel Kanyi, Gatuto

Yes, you may do that, with one restriction: if you apply liquid fertilizer prepared with manure, you should be careful not to spill it on any parts of the crop that will be harvested and consumed soon, because there is a danger of infection with harmful micro-organisms. This limits its use and especially the application as foliar feed. With pure Tithonia tea you do not have to worry about that.

#### How much is 25 kg?

How can one come up with 25 or 50 kg of materials without a weighing scale during preparation of plant tea and liquid manure? Captain Alice Salvation Army Neema 2010 Group / Buyangu

Try the following: Stuff a large porous bag tightly with chopped green material or with fresh manure. Compare the weight of the full bag with the weight of an adult indigenous goat; they usually weigh between 25 and 35 kg. The exact weight does not matter much. The more material you use in relation to the water volume, the higher the nutrient content of your tea or liquid manure will be. It is as simple as that. Seal the container during fermentation to keep the nitrogen inside – this is what matters most.

#### Comfrey is no livestock fodder

You mentioned that comfrey contains compounds such as pyrrolizidine alkaloids which can cause cancer in human beings. Are these compounds dangerous to our livestock? Can we give comfrey to cattle? John Kimani / Sirikwa

Common comfrey (*Symphytum officinale*), in contrast to some other comfrey species, usually does not contain poisonous alkaloids, but, unfortunately, sometimes it does. As these compounds are toxic to the liver, the recommendation is to apply comfrey only externally and to avoid ingesting high doses of comfrey preparations regularly. We also think it is best to be cautious and to avoid feeding high amounts of comfrey to livestock.

#### Compost is always good

What quantity of farm yard manure is needed per hole when planting and at per what seed rate? Kevin Okang'a Musonye / Buyangu

Generally, I would say: as much as possible for heavy feeders, for large plants, and in poor soils. Usually, between 10 and 20 tonnes of farm yard manure is used per acre. That would make 2.5 to 5 kg per square meters, or in the case of plants that are seeded at a rate of 4 to 5 seeds per square meter, 0.5 kg to 1 kg per hole (a few handfuls). Make a hole, mix the manure into the topsoil, and place the seed or seeds inside.

## Foot and mouth disease needs vet attention

My cow is suffering from foot and mouth disease, please advise. Solomon Mwai, Kamuiru - 0726531314 / Gatuto.

As you may know, foot and mouth disease is a notable disease in Kenya just like in most countries of the world. If this disease is suspected, you should report it immediately to the veterinary authorities. After confirmation of the case, they will invoke a quarantine to prevent the disease from spreading. The foot and mouth virus can spread faster than any other disease, is very persistent in the environment, and can affect growth and milk production of animals permanently. For these reasons, many countries follow a rigorous quarantine, slaughter and decontamination policy.

Assist your animal

There is no treatment available, but most animals will recover within two weeks. Assist your animal in this painful period during which it can



not eat and walk! Be aware that young animals may die from inflammation of the heart muscle without showing symptoms.

- Make sure your cow can drink clean water at all times.
- Offer soft feeds like fresh grass. Addition of molasses will provide more energy.
- If the pains are too strong and the animal can not chew, you may drench it with a mixture of cereal flour and

water: For one cow, use 5 kg of maize flour or millet flour mixed into 5 litres of water, and drench it distributed over the day.

- Protect the sick animal from sun and rain.

- Antibiotics should be administered by injection. This is necessary to prevent the blisters from getting infected with bacteria, resulting in mastitis, permanent reduction of milk production, abortion, hoof deformation and chronic lameness.

### Clean properly

After your animal has recovered, destroy (burn) all bedding and feeds that remained from the disease period. Also, clean and disinfect your clothes and all equipment you used. Be aware that the foot and mouth virus can also spread with the meat, milk and semen from infected animals. In affected areas, animals should be vaccinated regularly.

## Be careful when using Datura

After spraying tomatoes with Datura extract against insects, how long do I wait before picking the fruits? James from Tabuga / Sirikwa.

This is a very important question, because Datura is one of the most poisonous plants. Datura extract may be a natural product and an effective pesticide, but it is difficult to handle it safely in a farm. For the same reason, tobacco preparations are not used in organic farming. The waiting period after spraying this toxic preparation should be preferably one month, especially if there is little or no rain (greenhouse). This means that you should



stop spraying Datura one month before you harvest the first tomato fruits. Do not forget that tomatoes are usually consumed without peeling. And because tomatoes start to bear early, we think it is better to stay on the safe side. Generally, we recommend using some other plant extract like neem or Tephrosia to treat tomatoes.

## Eating potatoes with the peels?

Since most of the vitamins are contained on the covering of most root crop like potatoes, carrots etc, should we eat the root crops with their peels? What about some other root crops? Buyangu

Farmers should not forget that all edible crops have a long history of cultivation. They have been tested, selected and consumed by hundreds of generations of people. This experience is very important. Let us look at Irish potatoes, for example. Their tubers are very nutritious, but all green parts contain a poison, solanin. Therefore, never eat potato leaves or potatoes that have become green because they were exposed to light! You could prepare the leaves of carrots, on the other hand, but they are not very nice to the taste. We think traditions are often a very reliable source of knowledge when preparing food. You are right that green leaves contain essential vitamins that can not be found in roots. But there are many crops that we cultivate for their tasty covering: Kale, cabbage, amaranthus, spinach, leek, nightshade, and cowpea leaves... Eat them together with root crops and you will have the whole benefit of both crop types!

## Root nematodes and root nodules

How can I differentiate a plant root infested by root nematodes and root nodules of a plant? Daniel M. Karubiu, Kirunda

You may excavate the plant carefully and wash the soil from the roots. Beneficial nodules are spherical or cylindrical and are attached to the outside of the roots. They are about 0.5 cm in diameter, all equal in size and form and neatly separated from each other. The roots and the whole plant show a normal development and look healthy.

Root galls or knots caused by root knot nematodes are not attached, but are swellings of the root itself. You would find nematodes inside. These galls are of irregular size and form, from very small to larger than one inch, when several of them lie close to each other and join. Fine feeder roots may be missing, and parts of the roots may be rotten.

The plant itself may show wilting, pale, yellowing leaves, and stunted or reduced growth.



Plant affected by root knot nematode (picture left), a normal root nodule (right)

## Leucaena seeds

Hi, I am Meshack from Kitale. Where can I get leucaena seeds or seedlings in Kitale?

0721 314 335

Try the Vi Agroforestry Centre Kitale, KARI, KEFRI or even the Kitale Forest station. They stock tree seeds and seedlings for sale to farmers.



## What makes raw cassava dangerous?

*What does cassava contain that when taken raw or cooked in plenty, it kills? Benson Shivachi, Diversity initiative group of organic farmers / Buyangu*

Cassava tubers contain cyanides (to be precise: *Cyanogenic glycosides*). If they are ingested in very low quantities only, the body can still neutralize them. If consumed in higher quantities and over longer periods, the chronic intoxication will lead to nervous disorders and goitre. Very high levels of the toxic compounds can lead to paralysations or even death. By the way: this is actually just the way plants defend themselves. Being poisonous is a very good protection against being attacked by insect pests or from being chewed up by some animal. One could also say that the plant gives a lesson to anyone who touches it.

How now can processing remove this poison? The secret is hidden in the cassava tuber itself: There is another compound present inside it, an enzyme that is capable of breaking the toxic compounds down. In the cells of a healthy, intact plant, these enzymes are separated from the toxic cyanides.



But any step that breaks the cell walls of the tuber can bring the "good guys" (the enzymes) in contact with the "bad guys" (the poisonous cyanides). When this happens, the enzymes start to convert the cyanides to cyanide gas that is released into the air, resulting in detoxified cassava.

In sweet cassava varieties, the toxic compounds are mainly located in the skin. They therefore only need peeling and boiling to reduce the cyanide content to non-toxic levels. But the bitter varieties can have very high cyanide levels. They should be milled, grated or chopped finely. This process will bring the enzymes into contact with the cyanides. During fermentation which occurs while the product is soaked in water, the cyanide gas is given time to escape. Drying and boiling will detoxify the product further. And as a last step, consuming proteins (e.g. fish, meat, dry beans, eggs or milk) along with cassava will help to reduce the toxic effects of remaining cyanides. *tsz*

### Egg incubator

Our article on egg incubator (TOF Nr 62 July 2010) has drawn a lot of interest from farmers across the country. However we forgot to mention that it is important to put some water in a container inside the egg incubator to increase humidity. The humidity provides the right conditions for egg incubation and hatching. We will illustrate this with a sketch in our September 2010 issue.



### Anything to sell?

#### We will assist you!

Farmers often have problems selling their farm products. *The Organic Farmer* has a new service of opening for you new markets. Beginning July this year, we will have a special section in our website ([www.organicfarmer-magazine.org](http://www.organicfarmer-magazine.org)). Farmers or agriculture-related companies will have a forum to advertise various farm products they want to buy or sell. How do you get there? You can send an SMS to Tel. 0715 916 136 with your name, the product you want to sell or buy, and your full address. We will then put your advert on our website. The service is free of charge! TOF has a readership of around 160'000 readers. Expand your market reach! This new service will expose you to a wide range of clients locally and outside the country!

### Question and answers now on the web!

Every month, dozens of farmers send their questions to our magazine. We answer the urgent ones through SMS and direct calls. Others are answered through *The Organic Farmer* magazine and TOFradio (Thursdays on KBC, at 8.15.pm). Some urgent questions might also be of interest to other farmers. That is why we have decided to post the questions and the answers on our website [www.organicfarmermagazine.org](http://www.organicfarmermagazine.org). You just go to the website and you will see a link to the question/answer page. All you need to do is to send the question through SMS to Tel. 0715 916 136. The site will also have some of the most common questions and answers. This new service provided by *The Organic Farmer* will be launched in August this year.

### Shocking story

Your potato story is shocking, thanks to TOF we got to know it. How much damage can a government do to its own farmers before anybody can correct the situation? It seems that farmers especially have no voice. We accept injustice or perhaps we have left everything to fate. When shall we farmers organize ourselves and form an organisation that can push for small-scale farmers' rights and interests? Josephat Wamalwa, Kakamega

### Learning material

Let me take this opportunity to congratulate you on the production of TOF. I occasionally get copies and find them very informative. I work for an NGO known as Swedish Cooperative Centre under a project known as Farmers' Organizations in Poverty Alleviation (FOPA). The project is geared towards strengthening the farmers organizations. We are currently working with 10 organizations with an average membership of 400, however the said members have formed learning groups and the magazine can reach more than 50 groups. I will appreciate if you include us in your mailing address.

Richard Nyabuti, P.O. Box 807, Molo-20106 Tel: +254 0733 707 382

### Hyax Organic Fertilizer

Provides your crops with the following nutrients: Nitrogen, phosphorus, potassium, calcium, magnesium, copper, Iron, Zinc, sulphur, sodium and manganese. Hyax is manufactured by HYAQUIP (K) LTD. Farmers interested can contact Peter (0723 966 920) or Danson (0722 622 784)

### We need your contacts!

More and more farmers are reading *The Organic Farmer* magazine. That is why we need to update our mailing list in order to serve TOF organic farmers' community better. Please send us an SMS with the following information:

1. Your full name(s)
2. Your postal address/area code
3. Your location
4. Your mobile number(s)

The service is free. All you need is to send us an SMS and immediately, we will send you Ksh10 to cover your SMS expenses. Use the following phone number: 0715 916 136

Why do we need your contacts? If we have your telephone number, we can alert you through the SMS service when we have sent you the magazines. So you can request for your monthly copies from your chairpersons, the local distributors or courier company branch. This will enable you to get TOF regularly and on time. We can also update you on any upcoming events. This is a free Service for the TOF farmers' community.