

# The Organic Farmer

The magazine for sustainable agriculture in Kenya



Nr. 66 November 2010

## Africa now free of rinderpest



Rinderpest eradication is good news to livestock owners. Page 5

Photo: FAO

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### Dear farmers,

Farming is a challenging profession. It is not only about hard work; there are many risks that farmers have to cope with, such as water scarcity, pests and diseases. Even though not all these problems can be solved, at least some of them can be avoided, through proper planning.

Indeed, a farmer has to be a good planner. He needs to focus ahead. A good example for the importance of planning is dairy farming, which is very attractive due to the good milk prices. However, feeding a dairy cow is still a big problem. Most small-scale farmers who keep good dairy cows get between 5 and 10 litres of milk in a day during wet seasons, in dry seasons 3 to 5 litres. With proper feeding, such a cow would most probably produce as much as 15 or 20 litres of milk.

Lack of planning leads to this unfortunate situation, that is worsened by the following three practices:

**Overstocking:** If a farmer with two acres of land keeps four or five dairy cows, how can he produce adequate feed quantities from such a small area? It is impossible! Before buying a cow, a farmer needs to calculate the amount of fodder that any additional cow needs.

**Dry seasons:** A dairy farmer should be able to know the feed requirements of his dairy cows. The planning for the dry season begins at the first day of the rainy season. This is the time to plant feed in quantities that are also sufficient to feed all animals during the entire dry spell.

**Proper feeding:** The quantity of the feed is one consideration, the quality another. Many farmers offer their cows nothing but maize stalks that contains practically no nutrients, and do not understand why the precious animals produce only 2 litres a day. The lack of knowledge about a balanced dairy diet is a big hurdle for many small-scale farmers.

Nobody can influence the weather and the amount of rains. Nevertheless, everyone can cope with the three challenges we just mentioned – if there is a will. On pages 2 and 3, we offer some advice on how to do this.

## A bumper harvest, low prices

TOF - A bumper harvest of maize is expected in all maize producing areas in the country. Other marginal areas such as the Eastern province, Nyanza and Coast province reported good harvest in April and May as a result of the rains, which started late last year.

However, the biggest problem now facing farmers is marketing. The over supply of maize has led to a fall in prices. A 90 kg bag of maize is now selling at between Ksh 700 and Ksh 800 in Kitale and Eldoret. The low prices have sparked protest among farmers in Kitale who demand that the National

Cereals and Produce Board should buy the maize at Ksh 2500 per bag. Currently, the board is buying the maize at Ksh 1500 per bag.

The Assitant Minister for Agriculture Gideon Ndambuki told parliament last month that the government does not have money to buy maize from farmers.

We will highlight the maize marketing problem in our December issue. We invite farmers to share with us their experience. Write to *The Organic Farmer* P.O. Box 14352, 00800 Nairobi or: info@organickenya.org or SMS 0717 551 129.

## Prepare enough fodder for the dry season

Do you know how much feed and water your dairy cow requires in a day or even one month? Some fodder plants contain more nutrients than other, see table below. We are now moving into the dry season, when pasture and water will be hard to get. This requires careful planning. Right now there is a lot of crop residue from maize and beans. More and more farmers are making silage, using polythene bags, as our picture shows. Page 2 and 3



### Rough protein content of some common forage plants.

Low protein content	Medium protein content	High protein content
<b>Crop residues</b>	<b>Grasses</b>	<b>Legumes and others</b>
Maize and Sorghum stalks Banana stems Wheat, rice and barley straw	Napier, Guatemala, Rhodes, Sudan (Kow kandy), Kikuyu, Guinea, Makarikari, Congo signal grass, Giant setaria	Lablab, Lucerne, Desmodium, Centro, Calliandra, Leucaena, Sesbania, Mulberry Sweet potato vines Young maize leaves

# What cows need to give more milk

*Cows require a balanced diet which has sufficient energy, proteins and vitamins.*

## The Organic Farmer

Feeding an animal with any fodder is not enough to ensure its good health and milk production. Just like human beings, animals require a balanced diet. Their feed should have the right proportion of different nutrients.

Cattle require feed that gives them energy, proteins, minerals and vitamins to maintain their body condition, milk production, and reproduction. Young animals need sufficient nutrients for growth and weight gain. Dairy cows require more nutrients to produce milk, especially during the first 3 to 4 months after calving, when milk production is at its highest.

### Green fodder is the main diet

The most important nutrient source for cattle is roughage (green fodder). But only roughage of good quality provides all nutrients that dairy cows need. Good quality roughage has two properties: It is green and young; this means that fodder plants must be fed or cut and preserved while it is still young (before flowering). Farmers should know that crop residues that have lost their green colour may just help an animal to survive, but they are very poor in energy, proteins and minerals and cannot sustain good milk production in a dairy cow. Low quality feeds must always be supplemented with feeds that provide missing nutrients in a concentrated way.

### Energy sources

All grasses are good sources of energy, but only if they are fed at a young stage. The most popular fodder grasses include Napier grass, Kikuyu grass, Rhodes grasses, Nandi setaria, Guate-



Use quality fodder to feed your cow.

mala grass and makarikari. Stripped green maize or sorghum leaves are very rich in energy. Energy concentrates should be fed in small amounts. They can be obtained from all cereal grains, wheat germ, or molasses.

### Protein sources

A cow requires protein to help micro-organisms in the rumen (stomach) to break down the roughage (fodder) into nutrients that the animal can use.

**Rule 1:** Young green plants have a higher protein content than older ones. Young maize leaves and sweet potato vines are especially rich in protein.

**Rule 2:** Legumes have a higher protein content than grasses. Examples are

green residues of all beans and peas, desmodium, lucerne or white clover. Leaves from leguminous trees such as leucaena, calliandra or sesbania have high protein content too. All legumes should not be fed at rates higher than 30% of the total ration to avoid health problems.

Other concentrated protein sources are *omona*, cotton seed cake, sunflower or soybean cake.

### Mineral sources

Cattle need additional minerals. They should be available at all times. e.g. as lick blocks. Growing animals, pregnant and lactating cows especially need high amounts of minerals, e.g. calcium and phosphorous. Leguminous plants and other plants other than grasses provide calcium and mineral supply.

### Concentrates? Yes, but not too much

Dairy meal or concentrates contain nutrients in high concentrations. But they are also harmful to the animals if fed in high quantities. Fodder from grass or hay must always remain the main feed for all grazing animals. It is not advisable to feed more than 6 kg of concentrates per day to a medium sized cow of 450 kg. They should always be given in small quantities of not more than 2 kg at once, mixed with roughages. Increase of concentrates before and during lactation should not be higher than 2 kg per week so the stomach can get used to it. Experienced farmers include fodder trees and shrubs in the diet of their animals. They can even replace dairy meal to some extent. Research shows that 3 kg of fodder and other legumes such as desmodium or sweet potato vines give the same milk yield as 1 kg of dairy meal. Farmers can therefore save money if they fed their animals on leguminous plants instead of buying expensive concentrates.

## Home-made rations for a dairy cow

Ration 1		Ration 2	
Ingredients	Quantity	Ingredients	Quantity
Chopped maize stalks	2 debes, tight	Chopped maize stalks	2 debes, tight
Chopped sweet potato vine	2 debes	Chopped Leucaena	2 debes
Chopped Napier	2 debes	Chopped Napier	2 debes
Maize germs	3 tins (gorogoros)	Dairy meal	5 gorogoros
Cotton seed cake	1 ½ gorogoros	Dairy lick	5 tablespoons
Dairy lick	2 tablespoons		

Source: KARI

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# Prepare fodder early for the dry season

Farmers can avoid dry fodder shortages by conserving it when it is plenty during the wet season.

## The Organic Farmer

If we go by recent weather forecasts, the country is likely to experience a more severe drought in the coming dry season beginning next month. Live-stock farmers might face problems in getting fodder and pasture for their animals. But this should not be the case if farmers plan ahead to determine their feed requirements and take fodder conservation measures.

Farmers have been blessed with adequate rains since the beginning of the year. The rains have provided most parts of the country with plenty of pasture. It may be too late to prepare hay or silage now, but after harvest, a lot of crop residue from maize, beans and other crops will be available this month and December. A wise farmer can make good use of these residues and improve their nutritional value by properly conserving them.

### Planning ahead is the solution

Farmers should never wait for the dry season to start preparing fodder. It is always better to do this when there is plenty of green foliage on the farm. Excess grasses and legumes should be harvested during the rainy season. If they are slightly dried and stored, they provide high quality fodder during the dry season. Maize, Napier grass, fodder sorghum and fodder legumes can be chopped to make silage. Fodder trees give large amounts of high quality fodder, which is cheaper than buying hay or even feed concentrates.

### Tumbukiza and fodder shrubs

If you have planted Napier or other fodder shrubs using the *Tumbukiza* method (in pits), you may start to add water at the rate of 1 to 2 buckets into every pit every week as soon as the rains stop. The pits retain water better during the dry season and the grass will keep on growing. Fodder legumes such as leucaena, calliandra, lablab, desmodium or purple vetch can still be harvested for some time into the dry season. They can be used dried or wilted and will supplement the low protein and mineral content of low-value feeds such as maize stalks.

### Collection of crop residue

All crop residue such as maize stalks, bean residues or mature pasture grasses should be collected and dried as early as possible, if possible while they are still green. You may start to strip the lowest maize leaves as soon as the cobs have produced silk. Go through the field every week and strip the lowest leaf of each plant for feeding

## Treatment of maize stalks

Maize stalks are available in plenty after harvest. They contain only a few nutrients, and animals find them tough to chew while in this state. There are some methods farmers can use to make it more palatable for their animals:

- Chopping increases acceptability of residues.
- Soaking in water increases residue intake.
- Crop residues are poor in minerals. Sprinkling them with mineral salt is therefore useful and increases intake.
- Soaking in diluted molasses overnight increases intake and provides energy.
- Leguminous fodders are rich in minerals and proteins and increase digestibility of crop residues. They should be supplemented at a rate of not more than 30% of the ration. This corresponds to 10 to 15 kg of fresh leaves (or 3 to 5 kg of dried leaves) per day per cow.
- Concentrates like dairy meal or seed cakes improve protein and energy content of the ration and support milk production.



or for drying and storage. Take care not to remove the leaf directly below a cob and the one above it. When the cobs have reached the soft dough stage, the maize can be cut above the top of the cob. These procedures will not affect maize yields. After harvest, you do not have to waste time collecting the remaining crop residue! You will see, this is work that is worth investing in!

### Conservation of crop residue

The next step is to store the residues under dry and shaded conditions that

conserve their nutrients. A good structure such as a store is best. You should at least prepare stacks in the shade of a good tree. Direct grazing of animals on crop residue is wasteful: Nutrients are lost quickly in the rain and sun, and the animals trample on the residue, spoiling it through urine and droppings.

Therefore, put the fodder in a trough or on a stack where a large percentage of it can be consumed. This saves you money you may have to spend later in buying extra fodder.

## Using polythene bags to store fodder

During the wet season there is always excess fodder that animals cannot finish eating. Farmers can either store it as hay or put it into silage bags. Here is how to use polythene bags to store silage:

1. Chop the fodder into small sizes as explained above. Spread a sheet or canvas tent onto a flat surface. Place 100 kg of chopped fodder on it. Spread it evenly on the canvas.
2. Dilute 3 kg Kasuku tins of molasses in 3 litres of water. Sprinkle it on the fodder while turning it.
3. Tie one end of a 2-metre long polythene bag (1.5 metres wide, 1000 gauge) polythene bag. Put the fodder into polythene bag, press and compact it as much as possible. Compact it more while adding until all the fodder fits into the bag. Tie the top of the bag while allowing all remaining air in the bag to escape. Place some weight e.g. a stone on of the bag to make it more compact. Place the bag in a safe place away from sunlight or rain. The silage is ready for use after two months. It can be stored longer as the farmer wishes.
4. Expel the air after every time you open the bag to remove silage and tie it tightly to avoid spoilage. Polythene bags cost about Ksh 110 per metre while molasses costs Ksh 300 for a 20-litre jerrycan. In a day an average dairy cow (550 kg body weight), producing 10 to 15 litres of milk requires 16 kg of silage, 4 kg of fresh Napier grass, 6 kg of grass (Rhodes, Kikuyu etc) and 6 kg of concentrates. All animals should have an unlimited supply of water throughout the day.



# Striga control requires a lot of effort

*Striga is a devastating weed. Changes in crop management can reduce it to tolerable levels.*

**Theresa Székely**

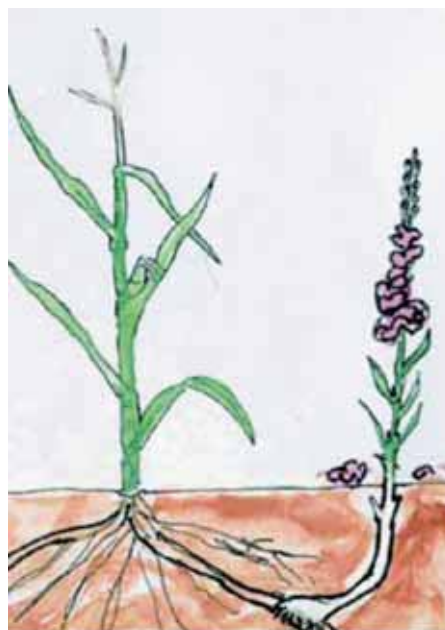
A farmer in Mwituha Bunyore asks: "What makes striga a deadly weed, reducing yields in high percentages and spreading like a bush fire even when soils are not fertile? How can we best eradicate this weed?" This is really a good question, and many farmers are asking us the same.

The problem with striga is its way of life: it is a parasite that can only grow where cereals are planted (maize, sorghum, millet, rice). Striga prefers dry regions and soils of low fertility. Its seeds can hibernate peacefully in the soil for years – but when cereal seeds start to germinate next to them, they will immediately wake up and start germinating too. They attach to the roots of the crop seedlings, subdue them, and take nutrients, minerals and water from them. The result is well known: Stunted crop growth, reduced flowering and poor harvest. Each striga plant will produce thousands of tiny seeds that survive in the soil for many seasons.

## Several measures necessary

After many years of extensive research on striga it is clear that control is best achieved by using a combination of several measures. It is also important to know that a striga problem can not be brought under control within a single season. Affected farmers should consider changing their usual crop management by applying and adopting some of the practices listed below. Many of them are investments in soil fertility. They will not only reduce striga, but also improve the yields of all other crops. Below are viable control tips for this malignant weed:

1. Uproot all striga plants when they start to flower and before any seeds can be shed.



The striga weed attaches itself to the maize roots to take away nutrients. Photos NRSP



2. Crop rotation. On striga infested land, always plant at least one non-cereal crop before cereals, e.g. during the short rains. Legumes such as soybean, bean, groundnut, lablab, cowpea, pigeon pea or chick pea are preferred, cotton or sunflower can be grown in rotation. Striga will germinate, but die soon, because it cannot grow on these crops. In heavily infested fields, it is recommended to plant green manure or fodder crops, e.g. desmodium, crotalaria, sesbania, leucaena, calliandra, or fodder grasses like Napier grass for one or more seasons and to plant cereals only every three or four seasons.

3. Improve soil fertility. Apply manure, compost, and other fertilizers. Apply green manures, cover crops and mulches from tithonia, lablab, mucuna etc. Mulching with crop residues (e.g. stover) is very effective. Plant fertilizer trees e.g. crotalaria, sesbania, tephrosia, gliricidia etc.

4. Intercrop cereals with legumes. A

very effective example is 'Push-pull' (see the box below).

5. Plant striga tolerant crop varieties if they are available.

- Maize: KSTP94, Nyamula, Joy, Njamuomo. 'IR' maize requires application of a specific herbicide.

- Sorghum: SRN-39, IS-25403, Ochuti, Seredo.

6. Irrigation and moisture conservation techniques suppress striga. Mulching, intercropping with leafy plants, dense planting, early planting and planting in pits are therefore beneficial.

7. Clean all land preparation equipment after working in striga infested fields

8. Herbicides like Dicamba or Roundup have to be applied before flowering to prevent seeding.

## Test new methods small-scale

If you want to find out whether a new method is worth applying, test it on only a small part of your *shamba*. Manage the remaining area as usual and observe and compare the two sections continuously. In the case of striga management and soil fertility problems, you will have to cultivate your experimental plot according to the methods you want to test over several seasons. Soil improvement takes time, but will be permanent once you identify the best methods and keep on applying them.

For further information:

Contact J.K.Ndufa or COSOFAP Coordinator, P.O.Box 5199 Kisumu

[http://www.kari.org/fileadmin/publications/tech\\_notes/TecNote19\\_20060810.pdf](http://www.kari.org/fileadmin/publications/tech_notes/TecNote19_20060810.pdf)  
KARI Technical Note No. 19, March 2006  
Options for Striga management in Kenya

## Push-pull against striga

Push-pull, the well known strategy against stemborers developed by ICIPE, is also an effective method against striga infestation. Maize is intercropped with *Desmodium uncinatum* and / or *D. intortum*. Desmodium seems to be even more effective than other legumes in reducing striga and increasing maize yields.

- Plant desmodium in rows between the maize rows.

- Desmodium can be planted from seeds and from vines. You may use Desmodium seeds for the first time and cut vines from the plants in the following seasons.

- If you have a stemborer problem as well, plant three rows of Napier grass around the maize-desmodium intercrop to attract stemborers away from the maize to the Napier grass.

- It is beneficial to plant Napier grass before the rains and desmodium and maize early with the first rains.

- Desmodium can be trimmed when it starts to overgrow the maize. Use it for mulching or as feed for livestock.



# Rinderpest is finally eradicated from Africa

*The declaration of rinderpest-free Africa is a major victory for scientists and livestock owners.*

**John Cheburet**

Kenya and the world have achieved an extraordinary feat. Rinderpest, a highly contagious livestock disease that once wiped out millions of cattle in Africa has finally been eradicated. It is the second disease to be totally eradicated after small pox.

Rinderpest, also called cattle-plague, is an infectious viral disease that affects cattle as well as numerous wildlife. It is caused by the rinderpest virus (RPV), which is similar to the human measles virus, another very contagious disease. History has it that rinderpest led to massive deaths of livestock and wild animals in Africa and Asia throughout the 18th, 19th and 20th centuries. The disease posed a great economic risk to millions of small-scale farmers and pastoralists in Kenya and East Africa. It was a long fight



*Rinderpest has been considered one of the world's greatest natural disasters. In the late 1800s, rinderpest spread to Africa through cattle imports from India, killing an estimated 90 percent of domesticated cattle. Outbreaks in Africa continued throughout the 1900s. The mortality rates were of close to 100% in extreme cases; the disease destroyed 70 million or 14 millions heads of cattle and caused net economic losses of up to KSh 75 billion for Africa.*  
Source FAO

"In 1994, another strain of the rinderpest virus, the Africa lineage 2 rinderpest virus, was detected in East Africa after an apparent absence of more than 30 years," says the UN Food and Agriculture Organization FAO in its 2010 action report.

To counter the disease, the Global Rinderpest Eradication Program (GREP) was launched in the same year to coordinate efforts to assist the veterinary services of rinderpest-affected countries eliminate the infection, half vaccination and to provide evidence of rinderpest eradication. The target was to have the diseases eradicated by 2010.

## Good news for East Africa

Within 15 years, the GREP programme has been successful in reducing the rinderpest enclaves from six to two, the latter being the two regions in Africa:

- the border region between Kenya, Southern Sudan, Ethiopia and Uganda, and
- the border region between North-Eastern Kenya, Southern Somalia with and Southern Ethiopia, also called the Southern Somali pastoral ecosystem.

According to Felix Dr. Felix Njeumi, Animal Health Officer at FAO, "the last major rinderpest outbreak occurred in 2001." Though average mortalities of 30% mortalities in a population were reported, scientists are confident that the virus is extinct.

The global eradication of rinderpest is a major milestone for science, Kenyan participation in the campaign and farmers and nomadic pastoralists who are the major beneficiaries. Rinderpest has for a long time been a disease of great economic significance. But now, livestock owners need not worry anymore as the global eradication of rinderpest is expected to be declared before the end of 2011.

## Other infectious diseases

Lessons from rinderpest eradication programme should inform the prevention and management of other highly infectious diseases like black water,

anthrax, lumpy skin newcastle, including the foot and mouth disease. While foot and mouth disease is not normally fatal to adult cattle, pigs and sheep, it is weakens animals and causes significant loss of productivity.

Before total eradication of an epidemic is declared, taking of blood samples from livestock in the affected areas is done on a regular basis. Public awareness campaigns are also undertaken in all endemic areas to ensure the livestock owners are alert and able to report any new cases or suspected cases of disease outbreaks. If no new cases of the disease are reported after a set period, then a disease-free status is declared.



## Dr. Walter Plowright

If there ever was a single person the people of Sub-Saharan African origin and perhaps the rest of Africa owed their lives to, one who is surely to be high on that list is Dr Walter Plowright. He was a young veteran attached to the East African Veterinary Research Organization in Muguga by the UK government in the 50s, when he began his work on a rinderpest vaccine along with his colleague R.D. Ferris. They worked on the vaccine from 1956 to 1971 when they eventually came up with a cheap, effective version of the vaccine that could be easily grown and distributed. Dr Plowright died on 19, February 2010 aged 87 years.

## Prevention strategies for other diseases

- Infectious diseases spread very fast. The key to controlling an outbreak is to detect, and diagnose infected animals as early as possible. Such animals can be isolated and treated on time, thus preventing further spread of disease.

- Routine vaccination plays a critical role in the control of livestock diseases. Eayt Coast Fever, foot-and-mouth, Newcastle e.t.c are animal diseases where routine vaccination is the best control measure.

- Good nutrition is an important measure; access to adequate and balanced diet builds body immunity, making animals healthy and productive.

- Abattoirs should be set up in pastoral areas to prevent transfer of animals from one area to another in search of markets, which increases the risk of diseases. This will ensure that animals are slaughtered as close as possible to areas where they are raised. In this regard, government investment in modern slaughter houses makes sense.

- The creation of disease-free zones and livestock identification limits international spread of diseases and enables farmers to meet the high quality standards set by international markets. At the moment, Kenya cannot export meat to the European Union countries because of diseases like East Coast Fever, Bovine Pleuropneumonia, anthrax among others.

## Groups get funding after i-TOF training

**TOF** - Our extension workers in the i-TOF centres of Kangundo, Gatuto and Buyangu/Majengo are recording great success in their service to farmers. They are not only contacted by farmers' groups for training in compost making or bee keeping or the improvement of kitchen gardens, as the following story by Peter Murage from i-TOF Gatuto illustrates.

### Two-day training

"One bright good day in June this year, I was called by the Mukui Common Interest Group and Kiamumu Organic Farmers' Group. These two groups in my region requested me to train them on project proposal writing. They wanted to apply for assistance from a fund run by three partner organizations, the Kenya Forest Service, Water Resource Management Authority and the National Irrigation Board. These organizations had invited farmers' groups to write project proposals that would help them develop their natural resource base.

This was an entirely new topic I was being asked to train. By good luck, in April 2010, I had attended a workshop at the Lengo Agricultural Centre in

Eldoret. The main topic of the workshop was the preparation of a business plan and proposal writing. So, when these two groups called me for such a training, I quickly went through the notes and the material I had brought from the workshop in Eldoret. I held two training sessions where I gave them an indepth brief on project proposal writing.

### They got funding

Mukui Common Interest Group wrote a proposal requesting for funding of their tree nursery project while Kiamumu Organic Farmers Group wrote one for rabbit rearing. Two months after presenting their proposals, the two groups happily informed me that their proposals had been accepted. Mukui C.I.G received Ksh. 204,700 to expand the tree nursery project while Kiamumu got Ksh 430,700 for their rabbit project.

I am happy about this result, for two reasons: First, that these two groups succeeded and can use the money to solve environmental problems, improve food security and boost their income. And secondly, that I contributed to this success!"

*Peter Murage, Gatuto*



## Training in i-TOF Centres free of charge

If a farmers' group is interested in training, they should get in contact with our i-TOF Centres directly. The following are the regions where they are located, including their contact addresses:

### i-TOF Centre Western Province

Location: Majengo,  
Extensionist: Alfred Amusibwa,  
Contact: 0724 331 456  
Email: itof7@organickenya.org

### i-TOF Central Province

Location: Gatuto/ Kagio  
Extensionist: Peter Murage  
Contact: 0724 331 375  
Email: itof2@organickenya.org

### i-TOF Eastern Province

Location: Kangundo town  
Extensionist: Victoria Mutinda  
Contact: 0724 331 405  
Email: itof1@organickenya.org

## Other sources of information

Infonet, an information platform for African farmers and sponsored by the Swiss foundation Biovision, offers information in various parts of Kenya. The service is free of charge. Farmers can contact:

Place	Institution	In charge	Telephone No.
Wangige	Wangige farmers information centre	Sara Wangui	0724 456 420
Katoloni, Machakos	KARI Katumani Katoloni Mission CBO	John Mutisya (caretaker)	0726 692 479
Kinangop	Murungaru	Joseph Mwaura	0717742147
Eldoret	Lengo Agricultural Centre	Eliud Makokha	0721 307 577
Kisii	Gechochi Women Group, Kisii	Evelyne Onganga	0713 560 449
Busia	Singi Farmers Group	William Buluma	0713 332 568
Kakamega	Muliru Farmers, Kakamega Forest	John Atsango	0726 591 277
Kilifi	Ministry of agriculture	Eunice Mwanyanya	0722 448 354
Mwea	Kendat	Elijah mwangi	0722 897 577

## When is compost ready?

How do I know when my compost is ready for use?

The material should have a dark brown colour, a crumbly texture, and a pleasant smell. Plant parts are not recognizable any more, with the exception of twigs and stems that do not decompose easily. The material that is decomposed and stabilized and is ideal to be used for planting. Depending on the outside temperature, the moisture in the heap and the material used for composting, this stage can be reached after one to three months after you turned the heap. If you want to use the material earlier, you should spread it out superficially as mulch to encourage further decomposition on the field.

## Trees need deep soil

How well can citrus and mangoes grow on rocky places?

Like most fruit trees, both mangoes and citrus, require a relatively deep soil (deeper than one metre) that is well drained. Each tree needs an area of between 7 x 7 and 15 x 15 meters for good development, depending on tree size and soil quality. If you can fulfil these requirements in spite of the rocks, you may try growing fruit trees. It is a good sign if fruit trees are already established and doing well there. Rocks usually indicate that erosion is high and that soil formation is reduced, so soil and water conserving measures and good grass cover will be important in your case.

Mango is quite drought tolerant, but citrus usually requires irrigation during the dry season. Both trees may need irrigation during fruit development, so irrigation water should be available, especially if the soil drains quickly. But before you start planting, inform yourself about the requirements of the cultivars, which are available and do well in your region!

## Use compost manure

Is it advisable to use poultry manure directly after removing the manure from the poultry cage to plant potatoes or any other crop? Peter Thiong'o, 0710 858 317

All fresh animal manures contain high amounts of ammonium which may cause "burning" of crops. Fresh manures may also contain pathogens that are dangerous for people. Composting eliminates both these risks and it is more pleasant to apply composted material. If you apply fresh manure, use only small amounts and spread it thinly on the soil surface around plants that are already established. Composted manure can be used for everything, e.g. for seedlings and at planting, and should be mixed into the topsoil.



## Overcrowding leads to cannibalism

Why is it a common practice for pigs, cows and other animals to feed on one of their young ones or even just kill intentionally after birth? Gavalaji secondary school Vihiga

First I would like to say something very clearly here: Animals have a very strong natural instinct to protect and defend their youngsters and often risk their own life to defend them against dangers. Killing their own offspring is a very exceptional behaviour restricted to exceptional circumstances. If you observe such behaviour, you have to presume that the animal is suffering from severe stress that makes a normal reaction impossible.

Maternal cannibalism is most often seen in sows and is usually limited to their first litter. There is a natural component in it: giving birth is an upsetting event, and aggressive behaviour can be connected with it. Usually, this aggression is aimed at defending the newborn against outsiders. Pigs are very excitable animals, and a sow can get so overagitated that she snaps at

anything that comes near her. Newborn piglets may then be killed accidentally by her biting or be crushed by her excited movements. However, dead piglets are usually left untouched by the mother, while eating them is abnormal behaviour.

Very often, the reasons for abnormal behaviour can be found in inappropriate animal husbandry. In this case, animals may reject their newborn and may even get aggressive against them. A farmer can do much to prevent this!

### Measures against cannibalism

Avoid overcrowding in the first place. All animals want to give birth in a quiet and separate place or pen. This place must be spacious, dry, and clean. Sows must be given straw or other natural bedding material, allowing them to prepare their own nest before giving birth. They will then be much calmer. Do not forget to keep and feed all pregnant animals well and according to their needs – healthy mothers are less likely to have difficulties during and after giving birth.

## Even donkeys produce manure!

Do donkeys' droppings have any crop nutritive elements? I heard that they are dangerous when come into contact with injured skin. Is it true? Elias Biegion. 0736 511 159, 0726 500 191

Donkey manure is just as valuable for crops as any other animal manure. What you may have heard is the fact that donkeys are very sensitive to tetanus and will die quickly if infected. They share this susceptibility with human beings. However, their droppings are not more infectious than the droppings of other animals, on the contrary.

Tetanus bacteria grow in the intestinal tracts of most animals and man, and they are delivered to the soil with their droppings. There they remain infectious for many years. All animals including humans are therefore at risk to get infected if they have skin injuries.



Donkeys are especially in danger of getting tetanus, because they often have wounds from mistreatment, inadequate harnesses and heavy work. Animals that can cope better with an infection will survive and may go on dropping tetanus bacteria, while donkeys will simply die if not vaccinated. Just as people can protect themselves by vaccinations, donkeys should also be vaccinated against tetanus.

## Burning destroys soil

Since burning of soil gets it disinfected, can we do it on our farms as in relation to the question answered on charcoal earth (TOF 56, January 2010)?

When preparing charcoal, not much soil is burnt, at least not on purpose, but the tree material. Secondly, charcoal production does not include an open fire, but a controlled heating under exclusion of air and oxygen. The soil is enriched as particles and some ashes from the tree material fall on it. But if you just burn the soil or a thin layer of weeds, organic matter and nutrients from the soil will burn too, go up in smoke and disappear into



the atmosphere. Another part is mineralised and washed out quickly by rain. This is called "soil mining", because this process impoverishes the soil very effectively.

## Pests develop resistance

After spraying chemicals for a long time to our crops, the pests seem to resist. Why? What about plant extracts?

Your observation is absolutely correct. This effect can be observed whenever chemicals are applied regularly. Among pests, as in all living species, there are individual differences, not all of them are genetically identical. This means that certain individuals may be able to resist a certain poison, because their metabolism is slightly different.

Now imagine that at a certain time there is only one resistant insect in a population of ten thousand. This individual will not be killed if it is sprayed. Instead, it will stay healthy and be able to mate. Its offspring will have a high chance to be resistant against this certain chemical, too. Insects can multiply quickly. Within few generations and years, the resistant individuals will form a majority, because only the non-resistant individuals die when the chemical is applied, while the resistant ones will breed successfully.

Most chemicals act through a single mechanism in the body of pests. This means that it is relatively easy for insects to achieve resistance. Plant poisons, however, often contain several insecticidal compounds, and resistances are observed less frequently. On the other hand, plant extracts often do not show a very strong immediate effect, and they often have to be applied more frequently than chemicals.

## Manage dairy cows by mobile phone

*iCow, Su Kahumbu's new mobile innovation, enables farmers to monitor their animals' health, feeding and breeding.*

### Su Kahumbu

Marriage between technology and agriculture are not new concepts, but are seen as the driver of growth in the agricultural sector in most developed countries. But what of Africa? A continent depending on and consisting of millions of small scale farmers. What has technology done for us?

The costs of many technologies are beyond the reach of our farmers, and simply over scaled in size, considering the small land sizes in which we operate. However, there are opportunities in every situation if we look closely enough.

### Benefit of mobile phones

As farmers we may not have machinery but many of us have mobile telephones. So how do we marry mobile telephony with agriculture? Only when we look out of the box and really examine the mobile phone. M-Pesa has taught us that mobile phones can be used as a bank. So with this in mind, accepting that a mobile phone is more than just a phone or a bank, I began to look closely at how I could use the mobile phone to serve the agricultural sector, especially small scale farmers in Kenya. And this is how iCow came into being.

### Importance of record keeping

We all know how important it is for a farmer to keep records of his cows in order to maximize on the cows potential. To begin with in order to stop inbreeding he needs to know approximately when the cow is coming on heat so that he can call an AI (artificial insemination) service provider on time.

He must then record the day the cow was served and watch that she does not start bulling (showing signs of needing a bull) at certain dates after insemination in order to determine if she is in fact carrying a calf. He must also record and remember that 3 months later he should conduct a PD Test (pregnancy determination test) in order to prove that she is pregnant.

In short: In order to maximize the breeding opportunity of a cow, a farmer must keep records, and know how to look for the heat signs of his cow and how to calculate the days from calving to insemination.

If we are lucky we may have a cow calendar, a purpose made calendar to help us record these dates, but it usually is a lot of record keeping and many farmers simply do not have the time to do it.

### Use your mobile phone!

So this is where iCow comes in. iCow is a mobile phone application that helps farmers who own



cows. It does this by calling the farmers and giving them tips and instructions on how to look after their cows at certain periods of the cows fertility cycle, including 'heat' and pregnancy determination. And it does more:

- It teaches farmers how to identify and treat mastitis and milk fever.
- It alerts farmers when to start growing feed and how to make silage.

- It alerts farmers when they need to start drying off their cow, and how to do this too.

- It teaches farmers how to look after and feed young calves.

- And finally, it keeps a record of your cows cycle that you as a farmer can access whenever you like. This is hugely beneficial when a farmer wants to sell a cow and show the buyer his records there and then, on the spot in front of the cow.

### Register with iCOW

All the farmer needs to do is register himself and his cow into the iCow service by calling a special iCow number on his mobile phone. There will be a small fee for this service that is yet to be determined. The system will then call the farmer at predetermined intervals exclusive to the particular cow he entered. It is as simple as that. The iCow service will send approximately 20 voice prompts per cow per year and a farmer may enter as many cows as he likes into the service.

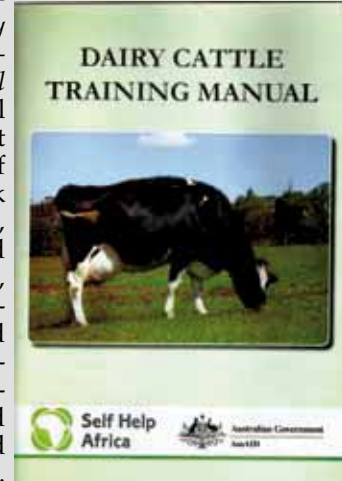
Imagine receiving a phone call reminding you to look out for heat signs of your cow, or a call giving you information on mastitis, prevention and cure. Imagine knowing that every month you will receive a call or two guiding you towards the best management of your cow?

The date for the launch of iCow with Safaricom is end of November 2010. I am very interested to hear your views on iCow and your ideas too on perhaps other areas of information you would like available on the new service.

## A useful book for dairy farmers

The Self-Help Africa (Kenya), an organization that works with farmers in Nakuru and Naivasha districts, has published training manual for dairy farmers.

The handbook: *Dairy Cattle Training Manual* covers all important areas of livestock farming, from breed selection, feeding, diseases and management, marketing and even record keeping.



Farmer's interested in getting the manual can get in touch with the organization through the address:

The director, Self Help Africa (SHA) Kenya, P.O. Box 2248-20100, Nakuru, Kenya. Tel. 254 051 221 229 1  
Email: Kenya@selfhelpafrica.org  
www.selfhelpafrica.com

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