

# The Organic Farmer

The magazine for sustainable agriculture in East Africa



Nr. 83 April, 2012

## The many effects of the dry season

TOF - There have been numerous complaints by farmers that milk production has gone down because of the long dry spell. The truth is plain and simple. Most of our farmers do not invest in good fodder conservation; either they do not have sufficient land to stock fodder that will last for at least six months, or because of lack of cash to buy fodder for storage before the dry season begins.



Reduced milk production is only one consequence of fodder scarcity. Another important effect of animal malnutrition during the dry season

is low fertility levels, as we explain in this issue. Cows are not able to come on heat regularly, farmers lose income through delayed calving. *Pages 4 & 5*

## Planting requires proper planning

TOF - Maize production is becoming a very tricky area for farmers due to depressed and unpredictable rainfall. This staple crop requires adequate and well-distributed rain to grow well.



Apart from planting maize varieties recommended for your region, it is important to isolate a portion of your land where you can plant drought resistant maize

varieties just in case the rains fail. Farmers can also stagger their planting times to reduce their losses in case the rains fail; they can plant one portion of land in early April and another in late April or even early May.

Planting a variety of food crops is also a good insurance measure. If one crop does not do well, the others may survive and become your source of food. *Page 8*

## 8 years of service to farmers

With this issue (No. 83) of *The Organic Farmer* magazine, we are now in our 8th year since we started TOF in April 2005. At the time we printed 10'000 copies. We have now increased the number of copies to 25'000 copies this month; on average, every issue is read by between eight to ten people. In all these years, we have answered thousands of questions via phone, SMS or in the magazine. Hundreds of farmers'

groups now discuss our articles and new ideas we give them every month; they keep the magazine in files as a kind of encyclopedia and consult it when they need advise.

Farmers' groups interested to get TOF shall apply to *The Organic Farmer* P.O Box 14352, 00800 Nairobi or call us on 020 251 92 33, 0717 551 129, 0738 390 715.

Whenever writing to us, either to advertise a product through a letter for use in our website, magazine or radio programme, kindly provide your full names, address, telephone and your location so that those wishing to sell or buy products can find it easier to contact you.

A sweet cash crop



Page 2

### in this issue

How to build up a meat goat flock	2
Working together pays	3
All about seed beds	6



### Dear farmers,

Assuming that the current weather forecasts are correct, some parts of the country, especially the arid and semi arid areas, may not receive adequate rainfall during the upcoming long rains season. The high potential areas, however, should get normal rains, according to the weathermen.

In the last few weeks, farmers have complained about lack of subsidized fertilizer. A court order stopped the NCPB from distributing such fertilizer following an intervention by a procurement company; Ksh 4,000 and more for one bag of fertilizer is far beyond the means of so many small-scale farmers. This is, more or less, the same scenario year after year.

Farmers could avoid this cycle of exploitation by building up soil fertility over a longer period of time – using available on-farm resources such as crop residue, compost and farmyard manure. During the growing season, they can support their maize as well as other crops with liquid manure and foliar feed to boost their growth. We admit, this requires investment in terms of time and labour, but eventually, one saves money! We admit as well: Chemical fertilizers help the plants to grow. But they do not improve soil fertility. So the question is: What happens to the crops if no fertilizer is available, or if it is too expensive?

Maybe small-scale farmers should change their mindset to that of business people and perform an experiment, for instance with their maize crop. They can divide their land into two portions. On one, they use their own natural resources, on the other plot, they plant maize by using chemical fertilizers. They have to properly record the costs for these inputs.

After harvesting, they can compare the cost versus output on both portions of land. Farmers may get a little bit less maize yield on the naturally planted plot than on the one with chemical fertilizers. But if farmers take the trouble to examine the cost of fertilizer and of other inputs, they may find out that it is not easy to make any reasonable profit from maize production, especially when the price of maize remains the same every year.

# Strawberries, a good market garden crop

*Strawberries have a short shelf life, therefore a farmer should have a ready market to grow them.*

**Simon Degelo**

Nowadays, farmers have to be innovative if they want to make money. As prices they get for products such as maize and beans are not favourable any more, smart farmers look for high value crops. Probably the most delicious of them: Strawberries. Because people love these red berries, they generate good prices, and are not difficult to grow.

## Begin with a small plot

What can be tedious, however, is to find the planting material. Sometimes strawberry seedlings can be found at roadside nurseries or are sold by farmers at local markets. It is advisable to buy potted plants, even though they are more expensive than the unpotted runners, as the former show better results. Once you have a few plants, you can easily multiply them yourself as they produce lots of runners. So, it is easiest to start strawberry farming on a small plot of land and gradually increase it by transplanting runners, when you see that this crop works well for you.

Strawberries don't need long daily exposure to the sun as they naturally grow in forests. So you can intercrop them with bananas, mangoes or other trees. However, the orchard should be very light because the strawberries need at least three hours of direct sunlight per day.

This precious crop should not be planted in a place where crops belonging to the tomato family, such as Irish potatoes, eggplants, have been previously grown. This is because such crop (solanaceae family) can transmit some diseases, which heavily affect strawberries.

For the same reason, strawberries should not be grown close to these crops. On the contrary, intercropping with beans, spinach or onions can be very beneficial.



*The mulch between the strawberry lines protects the berries and keeps the soil moist.*

## Strawberries like organic matter

Strawberries should be cultivated in beds of 1m in width and 25 cm in depth, with gaps of 1/2 m in between to make a path that allows easy access for watering and weeding.

Prepare the soil with loads of compost. Strawberries love it not only for its nutrients but also for its organic matter which makes the soil softer and increases its capacity to hold water. Because this crop has shallow roots, you don't need to work the compost very deep into the soil. Plant it in four rows per bed at spacing of 25 cm, paying attention the correct planting depth: The soil should cover the roots completely but not the onsets of the stems. The seedlings should be planted in the evening, not during full sun, and watered immediately.

## Protect them with straw or hay

There are many varieties of strawberries. The ones normally cultivated in tropical areas, usually are the continuous-flowering types. They bear fruits all year round, but need daily watering by can or drip-irrigation.

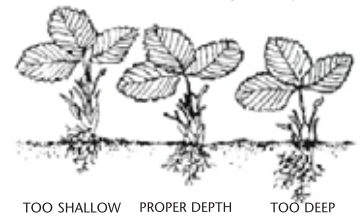
Can watering should be done in the evening or early morning.

As soon as the strawberries start flowering, straw or hay should be spread around the plants as mulch. This is not only important to protect the soil from drying up and to improve its fertility, but it helps to separate the berries from the soil and thus reduces the risk of rotting. Strawberries are not very prone to insect pests. However, ants might feast on the ripe fruits. A thick layer of ashes around the plants keeps them away and helps against snails, as well. More of a problem are fungal diseases, in particular during the rainy season, as most fungi like humid conditions. The leaves as well as the fruits can be affected. As a preventive measure and cure, plant extracts

can be very useful (both, fermented or non-fermented). In more severe cases copper or sulfur might be used.

## Good market price ...

If a high yielding variety is chosen and managed properly, it can yield as much as 3 kg per square meter in one season. The strawberries should be picked continuously as they get ripe. The moment of picking also depends on the purpose: For immediate consumption or processing they should



be fully red, for transport and for sale, they should be picked if two thirds of the fruit is red.

Unlike bananas the berries do not continue ripening once they are picked. The current price for 1 kg of strawberries in the local market is approximately Ksh 300. In supermarkets in the major towns or for export, they are sold at between Ksh 500 to Ksh 700 per kilo. The only problem is that it is hard for farmers to get into these markets as the quality standards are very high. Also, it is difficult to transport strawberries as they are very fragile and they can only be stored unchilled for a maximum of two days after harvest. However, at 6°C they have a shelf life of up to a week.

## ... look for market before you start!

Because strawberries start rotting so quickly it is important to think about how to market your berries before you start producing them in large quantities. As an alternative to the tedious sale of fresh fruits, delicious jams can be made from strawberries. Value addition could therefore enable farmers to earn more from the crop.



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# How to build up a meat goat flock

*A meat goat enterprise creates cash income from the sale of extra kids and culled adults.*

**Wesley Ngeno**

When starting a meat goat enterprise, a good understanding of the goats and the goat market will enable you to adapt a suitable production plan that includes appropriate breeds, numbers and farm size.

## Select carefully

Never build your stock with animals from a sale yard that have been culled by other farmers. There is always a reason, to escape the problem as to why they were culled, because you do not want to transfer those problems to your stock!

Some of the signs to look out for in healthy animals include: shiny coat, lively manner, easy movement (no limping, no swollen joints or misshapen udders), no abscesses, proper conditioning (not too fat or excessively thin), firm and pelleted dung, and well-shaped udder and teats.

## Feeding

Feed costs account for up to 70 per cent of the total cost in a meat goat enterprise. To reduce costs, adequate year round browsing and/or grazing with only mineral supplementation is the most economical way.

During the dry season, inadequate feed is the most limiting factor. According to KARI Mtwapa, farmers can supplement by using silage and hay, crop by-products such as maize stalks, forages from leucaena, calliandra, gliricidia, clitoria and centrosema, harvested cassava leaves left under the sun for 1 day to reduce poisoning, pruned mango tree branches, cow peas, local



bran from pound maize and other grains as energy supplement.

## Water

On the minimum, an adult goat should take 2 litres of water per day. It is advisable that clean water is made available to the animals such that they take as much water as they like. Dirty water carries disease-causing agents.

## Parasites

**Worms:** Worms interfere with normal growth of goats. Some of the signs indicating worm infestation include: Diarrhoea, weakness, swollen neck, loss of appetite, sunken eyes and finally death. Deworm goats at the beginning and at the end of rains, when worm build up on the ground is high. You can deworm after every 2-3 months.

**Ticks:** To control ticks, wash your goats every two weeks with water containing acaricide using a piece of cloth or a hand sprayer. Wear hand gloves for protection against the acaricide. Use at least 1.5 litres of the mixed acaricide for each adult goat.

## Breeding

There are four main characteristics,

which make a goat both suitable and profitable for production: adaptability to environment, reproductive rate, growth rate, and carcass value. When selecting foundation goats, pick animals that would mostly satisfy these criteria.

Cross breeding - mating individuals of different breeds - is recommended. It results in hybrid vigor; the superiority of the crossbred offspring to the average of both of its parents. Using crossbred females and producing crossbred kids can maximize the hybrid vigour.

Inbreeding causes small goat size, deformed kids and stillbirths. Inbreeding is mating closely related goats, for example father to daughter or granddaughter, or brother to sister. Keep not more than 2 breeding bucks in your flock for every 50 ewes and exchange them every year with unrelated bucks. Use bucks that are at least 1 year old. Castrate or separate bucks not intended for breeding.

A serious farmer will have a keen eye on animals in the flock with the highest twinning rates.

## Meat goats are good companions with cattle in the pastures

Goats can easily graze with cattle or sheep if they are in conditions where they can browse within a fenced area. Goats are browsers, and so they will eat shrubs and tall weeds, cattle eat tall grass, while sheep eat shorter grasses. Goats tend to prefer hilly grounds, while cattle prefer to stay in the flat lands. It wouldn't harm to see cattle and goats grazing together because it makes good economic sense.

Grazing a combination of these different livestock can help you to manage risk, and promote plant diversity on the grazing grounds. A good combination would be goats and cows, or goats and sheep. Sheep and cows would not make a good combination because sheep eat on the lowest grasses (near the ground), and would most likely lead to overgrazing the pastures. The cows might also starve, especially during the dry season when the growth

rate of pastures is much lower.

## Good fencing is important

Goats have been known to be rowdy and destroy the environment by eating young trees. However, this does not have to be the case. Breeds like the Kenya Dual Purpose Goat has been bred to be docile and so a farmer doesn't have to worry so much about the rowdy nature of goats. With good fencing, they can be contained.



## High demand for goat meat

The goat meat industry is growing in Kenya. Their meat fetches the highest prices during the festive seasons, mainly Easter and Christmas, when customers are willing to pay premium prices for quality meat. By combining goats with other cattle in the pastures, a farmer can get a slice of this growing market.

With the economic climate changing and dairy farmers feeling the pinch of the cost of feeds and other inputs, we all need to be looking for ways to maximize our profit potential, while fully utilizing our resources. Goats kid in high multiples, on short cycle. Meat goats are low maintenance livestock, and can thrive in quite poor conditions.

# Lack of quality nutrition affects cow fertility

*Farmers concerned about the infertility of their cows should check their feeding management: Poor diet mainly influences reproductive ability in cattle.*

## *The Organic Farmer*

"The performance of cows in terms of low milk yields, low calving rates, late age at first calving and long calving intervals were observed and attributed to low levels of nutrition and management". This is the conclusion of a study about the smallholder dairy sector of Zimbabwe. It is confirmed by scientists from local and international livestock institutions.

A comparison of individual farmers with members of a dairy cooperative in Limuru revealed that individual farmers had a much lower average herd calving interval compared to the farmers of the cooperative which provided their members with Artificial Insemination (AI), veterinary support, feeds on credit and other services.

Apart from undetected heat (*see text below*), other factors such as disease, genetics and climate may influence oestrus (heat), conception and calving rate. However, inadequate feeding and nutrition is undoubtedly the most important cause.

### **Exotic breeds more vulnerable**

The reduction of milk production due to lack of feed, especially green forage during the dry season, is simple to explain. Since more and more small-



scale farmers are using AI to upgrade their cows, they have as well to understand the connection between lack of sufficient and good quality feed and reduced fertility. Even more, because small-scale farmers tend to change to

exotic high yielding cattle breeds which are very sensitive to insufficient feed. Research in South Africa showed that local breeds stopped sexual activity after losing one third of their initial weight.

With delayed calving or repeated AI farmers lose money; alone from this point of view it is better to call professionals for AI services than cheaper quacks. An indication for all these problems are the many letters from farmers to TOF magazine complaining that their artificially inseminated cows did not get pregnant and asking how they should cope with their cow's infertility.

### **Balanced diet**

The cows are not entirely to be blame for low fertility. Lack of appropriate feed weakens the cow and makes it more vulnerable to diseases that invariably affect the cow's reproductive system. Reduced energy intake affects oestrus (heat), and subsequently reproductive ability in cows. That means, poorly fed dairy cows cannot come on heat at the expected time because their bodies are not in good condition for conception. Cows must be fed with a well-balanced diet of carbohydrates, proteins, minerals and vitamins. The above mentioned research in South Africa showed also that undernourished cows, after having regained sufficient body mass, resumed sexual activity and conceived as rapidly as cows which were fed well throughout.

## Heat detection requires experience

Profitable reproductive performance of a dairy herd requires continuous observation for heat detection and good timing of artificial insemination. Failure to detect oestrus (heat) is a major factor contributing to low fertility. Not only in Kenya. According to a study of the US-american PenState University, approximately half of the heats are undetected on dairy farms in the United States. In addition, research based on hormone levels in milk shows that up to 15 percent of the cattle presented for insemination were not on heat. All this results in eco-

nomical loss because of extended calving intervals and additional insemination expenses. Therefore: Record all heats, whether the animal is to be inseminated or not. Heat detection will improve if future heats can be anticipated. And abnormally long cycles and long intervals from calving to first service can be monitored.

Normally, heifers go into heat once every 17 to 25 days. A cow will show the first signs of heat within 3 to 4 weeks after calving. The best time to serve a cow is between 45 to 90 days after

calving. Any insemination done before 45 days after calving will give a lower chance of pregnancy.

### **Primary signs of heat**

**Standing heat:** A cow standing to be mounted by other cows or by a bull is the most accurate sign of oestrus (heat). It is the most sexually intensive period of the estrous cycle. Cattle need space and must be allowed to interact. This is not possible in prison-like zero grazing units and if only one cow is kept. The average duration of standing heat is 15

*continues on page 5*

## Factors affecting oestrus behaviour

Various factors related to environment, cow health and nutrition can affect oestrus behavior.

**Housing:** Housing arrangements that allows cattle to interact throughout the day provide more opportunity for mounting and standing behaviour to be expressed and detected.

**Footing surface:** Mounting activity occurs more frequently when cows are on soil or on grass rather than concrete. Slippery and muddy conditions and lack of space severely inhibit mounting activity.



**Feet and leg problems:** Cows with sore feet or legs exhibit less mounting activity; they walk away trying to avoid pains.

**Temperature:** Cows show more mounting activity in cold weather than in hot weather.

**Mounting time:** Most mounting occurs in early morning or during the later evening hours. A cow seen on heat before 6 am should be inseminated the same day, while a cow seen on heat after midday should be inseminated early the next day.

## What you need to know about sexed semen

*Sperm sexing is a new technology that is still in development. The demand in Kenya is growing.*

Wesley Ngeno

It is a revolutionary technique where the semen is sorted to give a higher concentration of either the male or female bearing sperm. It allows farmers to serve their cows with semen that will give either male or female calves. The technology for sorting the sperm is not yet available in Kenya but semen dealers are already importing sexed semen.

### Expensive technical process

If a farmer uses the female sperm, it increases – almost guarantees – the chances of getting a heifer calf, and obviously heifers are in demand at the moment because farmers want to increase the number of heifers and lactating cows in their herds to increase milk production. However, sexed semen costs more than normal semen. This has nothing to do with superior genetic quality; rather, it is a very expensive technical process to sort the semen.

What most farmers do not know or are not told by the semen marketers is that sexed semen has much lower conception rates. The vitality of sexed semen is reduced. And in a bid to cut the production costs, the semen is packed in smaller straws, which translates into small volumes of semen being packed per straw. This results in a diminished number of semen to fertilize the egg.

### Used on heifers

It is recommended that farmers use sexed semen on heifers and not on lactating cows. Remember, for every 100 cows served successfully on sexed semen, 20 may give birth to bulls, so do not be surprised if you get a bull calf even after using sexed semen. Also, the first insemination might not work. It is important that the heifer being served is healthy and has access to a balanced diet. This increases the chances of conception. A farmer must use an experienced AI technician so as to increase the chances of getting a cow pregnant within 1 or 2 inseminations. The major distributors of sexed semen in Kenya include Coopers, Worldwide sires, and Semex the costs range from around KES 5,600 – 8,000.

*continued from page 4*

to 18 hours, but heat duration may vary from 8 to 30 hours.

### Secondary signs of heat

These signs may occur before, during, or after standing heat. Farmers should watch this specific cow more closely for standing behavior.

**Mounting other cows:** Cattle that exhibit this behaviour may be in heat or approaching heat.

**Mucus discharge:** As an indirect result of elevated estrogen levels, mucus is produced in the cervix and accumulates with other fluids in the vagina before, during, and shortly after oestrus.

**Swelling and reddening of the vulva:** During heat the vulva swells and the interior becomes moist and red. Generally these symptoms appear before heat and remain for a short period after heat.

**Restlessness:** Cows in heat are more restless, spend less time resting and feeding than the other herd mates.

**Sniffing genitalia:** This and licking the vulva of other cows occurs frequently with cows in oestrus.

## Maize disease identified

*Fungus is to blame for the maize disease in Bomet; there is no economical treatment*

Simon Degelo

In the February issue of *The Organic Farmer* magazine we reported a new crop disease, affecting maize fields in the Bomet region in Rift Valley. Back then its cause was still unknown, but now scientists of the Kenya Plant Health Inspectorate Service (KEPHIS) have identified the fungus *Cephalosporium acremonium* as the cause of the disease known as Leaf Stripe, according to Dr. James Onsando the managing director of KEPHIS. However, researchers at Kenya Agricultural Research Institute (KARI) doubt this finding. They are still working on the samples collected in the field to identify the cause. Experts in KARI say a number of factors could be responsible for the disease.

Treatment of the affected crops is so expensive. Fungicides that are effective are too expensive to be used by most farmers. Therefore prevention is the way to go: Leaf Stripe disease can be carried as spores on the seeds, which then infect the seedlings soon after germination. Therefore, KEPHIS advises dressing of the seeds with Carbendazim or Benomyl, which is not contained in the usual seed dressings. The fungi can also survive in the soil and infect subsequent crops. This makes crop rotation an effective measure to control the disease: In affected areas, a minimum



of two seasons without maize and any other grassy crops, like sorghum, sugarcane or millet should be planted after maize. Drought stress and insect pest infestation have aggravated the disease in Bomet, therefore effective control of stem borers and thrips is important. To avoid drought stress during the early stage of maize growth, when it is most susceptible to infection by the fungus, the crop should not be planted too early.

Observation by KEPHIS scientists has shown that not all varieties are affected to the same extent. It is advisable for farmers to discuss with their neighbours about the seeds they used and the damage they experienced.

*Farmers in the affected areas, please report to us your experience with this new disease. Send us an SMS containing the maize variety you are growing, district and the extent of infection to 0717 551 129.*

## Cassava adapts to changing climate



Climate change is a serious threat for Africa's farmers: Higher temperatures, less rain and decreasing predictability of rainy seasons already have a negative impact on the harvests, which will get even more severe in future. Most crops, like maize, beans, sorghum and banana will suffer, as international researchers recently found. But there is one exception: Cassava will thrive even better because it loves high temperatures and is largely resistant to drought. Therefore more of it should be planted to ensure food security when the climate is changing. This is true in particular in eastern Africa where this root is still considered a poor-man's-crop by many farmers.

# Group reaps benefits of working together

*Matetani Network Group is one of many in Ukambani glued together by innovation and commitment.*

## Philomena Nyagilo

"The success of our group can be traced to individual initiative and group commitment," boasts the chairlady, Regina Ngatho. This is really true! The group, located in Isinga Matetani, has learned from mistakes and is a good example to small-scale farmers on how to overcome poverty through co-operation and group commitment.

Overwhelmed by poverty, 35 women and 5 men came together as a group in the year 2001 with the aim of farming together to improve their livelihood in the village. After the devastating drought that struck the region, resulting in complete crop failure, this group saw the growing of watermelons as an opportunity to make some much needed money during the usually unproductive dry season. Watermelons don't require much water to grow, and they fetch good price at the market.

To begin the project, each member gave a contribution of 50 shillings for the purchase of the seeds. The seeds were then distributed to all the members. However, at the end of the first cycle, the group had a total failure: The members did not have the required knowledge and experience about the fruit. They were not aware that the best defense against watermelon woes, such as gummy stem blight, is planting disease resistant varieties, rotating crops, and spacing plants to permit good air circulation.

### Change in 2007

Despite the setback, the group continued working together to improve their livelihood. In 2007, the members decided to shift to organic farming. They booked trainings with the i-TOF field officer Victoria Mutinda; they not only got the needed knowl-



edge for organic farming, they as well learned that farming is a business and that they have to plan for the crops properly. That same year they decided to replant watermelons and were successful. They harvested healthy fruits, sold them as a group, earning more than Ksh 45,000.

The following season they changed to onions, kales and cabbages. Since they sold the vegetables in bulk, Matetani Network Group made good money. Each member had an individual benefit, and the group made some savings. They meet every week, they read *The Organic Farmer* together, translate the articles to the women who are not able to read and discuss new initiatives.

### A good business with chairs ...

The group sought to diversify its source of income and decided to purchase 200 chairs and a tent. Each chair cost Ksh 600 and the tent Ksh 5,000. Now, they generate income by hiring them out at funerals and weddings at a price of Ksh 10 per chair and the tent at Ksh 2,500 per day. They are now aiming to purchase an additional 300 chairs.

### ... and chicken

Mid last year, the group went into poultry business to cater for their other

basic needs. They now have more than 20 hybrid chickens, and each member has 20 to 30 indigenous chickens for their own needs. The secret of this new business: The group sells the eggs as a group. Each week, they distribute a total of five crates to a local kiosk in Kangundo, each crate goes for Ksh 280. In a month, the members get a revenue of Ksh 5,600.

### Strong as a group

"Matetani Network Group is now a group overwhelmed by success rather than poverty," says Regina Ngatho. "Empowering the women and making them think of production for market has made a big difference. They can now feed their families and have extra income that has enabled them to send their children to school."

She adds that in every business venture there are limitations. "Land imposes the biggest limitation on small scale farmers," adds Regina. "Therefore farmers need to generate high income per acre to be profitable, since the average cost of production per acre is higher on small farms. And when small scale farmers work together as a group and can rely on each other, all members benefit. Together we are strong and can improve our livelihood."

## i-TOF Centre

In August 2009, The Organic Farmer magazine opened the information and input centers (i-TOF). Since then, thousands of farmers have been trained on environmentally sound farming methods; this service is free of charge.

In the past few weeks we have received a number of requests from farmers asking for training.

### Book for training

If a farmers' group is interested in training, they should get in touch with the i-TOF Centres directed by Victoria Mutinda in the regions where they are located including their contact addresses.

**i-TOF Western Province**  
Location: Malengo  
Extensionist: Alfred Amusibwa,  
Contact: 0724 331 456  
Email: itof1@organickenya.org

**i-TOF Central Province**  
Location: Gethio  
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  
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## Correction!

### Ration for indigenous chicken

On page 3 of our March 2012 Issue of *The Organic Farmer*, we gave the wrong calculation on formulating feeds for indigenous chickens. The formulation should be done as follows:

Whole maize	= 33 kgx 8.23 ÷ 100 = 2.70 kg
Maize or wheat bran	= 14 kgx 7 ÷ 100 = 0.98
Soya bean	= 7 kg x 45 ÷ 100 = 3.15 kg
Omena	= 7 kg x 55 ÷ 100 = 4.40 kg
Maize bran	= 10 kgx 7 ÷ 100 = 0.70 kg
Lime	= 6 kgx 0 ÷ 100 = 0.00 kg

**Total amount of crude protein 10.68 kg**  
Percentage of total crude Protein in the ingredients = (10.68 ÷ 70) x 100 = 15.25 %

## Nursery bed or direct planting?

Must all seeds be planted in a nursery bed?

No. Big seeds, like maize, pumpkin or melon, can easily be sown directly to the field, but for small seeds, like tomatoes or spinach, it is advisable to use a nursery bed. This way, you can make sure that they get enough water without getting washed away by heavy rains.

## Cuttings or seeds?

Between cuttings and seeds, which one is the best to go for while considering the best seeds for planting?

This depends on the crop. Some crops like sweet potato or cassava hardly ever produce seeds and therefore are propagated by cuttings, while others, like maize or tomato are impossible or hard to propagate by cuttings. Some crops, however, can be propagated by either way, e.g. stevia or strawberries. Just find out what's easier for you. One advantage of propagation by seeds is that less bacterial or viral diseases are passed on to the seedlings.

## Fertilizer for my seed bed?

Is it important to establish seeds in a nursery bed using any form of fertilizer, be it organic or synthetic?

It is important not to apply any fertilizer. Young seedlings need soil low in nutrients, but they love loose, airy soil. Therefore, it is advisable to add some sand, sawdust (not from eucalyptus),



Seedlings on a raised seed bed.

chopped straw or cocoa fibre to your nursery bed. Compost can be added, if it is made without manure, and earthworm droppings can be profitable as well, because they are poor in nutrients and have a good structure.

## Nursery? Seed bed?

What is the difference between a nursery bed and a seed bed?

Nursery bed and seed bed are the same. It is a part of a shamba that is reserved to nurse seeds.

## Green manures provide nitrogen

Can one rely only on green manures and harvest abundantly?

Except for legumes which can take nitrogen from the air and fix it into the soil, the cultivation of green manure can not supply your soil with nutrients directly. Therefore, the cultivation of



Leguminous green manures such as mustard (above) and desmodium (left) add nitrogen to the soil apart from increasing organic matter that helps improve soil structure.

green manure should be combined with the recycling of nutrients in the form of manure or compost, because all the nutrients in the harvested crop residue are removed from the shamba and not recycled, which will affect the nutrition of your future crops.

In the case of nitrogen, leguminous green manure can be a very efficient and cheap source that makes artificial N-fertilizers unnecessary. And there are many leguminous plants which can be intercropped with maize or other plants.

However, the main benefit of green manure is that it adds not only nutrients but also organic matter to the soil. This feeds the soil organisms and helps them to do their useful work for your plants. Through the addition of humus it also facilitates the uptake of nutrients for the plants, fights soil acidification and increases the amount of water that can be stored in the soil. Last but not least, the cultivation of green manure covers the soil and therefore protects it from erosion and drying out too fast.

## Test the viability of your seeds

How can I determine the viability of my seeds which have been stored for more than a year and not yet planted?

There is a simple test: Just take a few seeds and wrap them in a moist tissue. Keep it moist and observe the seeds. After a few days, depending on the species, they should have germinated. If you have fresh, good quality seeds at least three quarters should usually germinate.

## Fresh seeds germinate better

How can I ensure 100% germination of my seeds in a nursery bed?

Not every seed will germinate, but if you enrich the soil as described above and use fresh high quality seeds, you should experience good results. Furthermore, it is important that the seeds are watered carefully; water regularly but moderately not to wash the seeds away. It is also important not to drop too many seeds in an area. Otherwise the young seedlings will compete for light and will be weak.

## Soaking seeds

Why do some people soak seeds in water before planting?

The uptake of water is the first phase of germination. It indicates the seed that the rainy season is starting and that it can start growing. As big seeds need a long time and large amounts of water to be soaked completely, they profit of soaking before planting.



## Weeding removes competitors from crops

How does weeding contribute to soil fertility?

Weeding does not contribute to soil fertility, but it reduces the competition for the crops: When the weeds are growing high, they can shade the crops and their roots compete with them for nutrients. However for soil fertility it is not ideal when it lies bare due to weeding. Therefore it is best to cover it with "good weeds" like lablab, desmodium or alfalfa, which do not grow too high and can even add nitrogen to the soil. *All answers: Simon Degelo*

## Get more maize with good management

*Farmers can get more maize yield per acre if they adopted modern maize production methods.*

### The Organic farmer

The months of March and April are such an important period for the farmer. The way you undertake land preparation, planting and use of various inputs including the general management of the crop is very crucial as it determines what you will harvest at the end of season.

Maize is the main crop planted by small-scale farmers across the country. But its management has been very poor. Ideally, a well-managed maize crop should give a farmer an average of 20 to 25 bags an acre. However most farmers can hardly produce 10 bags an acre, mainly due to lack of the right inputs, poor crop management, and the changing climatic conditions. Farmers should take care of the following factors if they expect to get a good maize harvest:

**Avoid mono-cropping:** Due to lack of knowledge and adequate land, the majority of farmers have used the same field to plant maize for up to 30 or more years. Maize is a heavy feeder, which means that it removes from the soil all the major nutrients such as nitrogen, potassium and phosphorus leaving it with very little in terms of nutrients that can sustain its proper growth.

To go round this problem farmers apply DAP fertilizer when planting and add CAN fertilizers for topdressing. However this does not solve the problem because chemical fertilizers increase soil acidity. Maize cannot do well in acidic soils, so whatever amount of fertilizer a farmer uses, maize yields cannot increase. Addition of organic fertilizers such as compost together with rock phosphate can solve this problem (it is advisable to add humates such as black majik® or Earthlee® when using rock phosphate to speed up the release of nutrients by the crop).

Rock phosphate does not contain nitrogen, which the maize requires in large quantities to grow well. To go round this problem, farmers can apply organic foliar feeds that provide nitrogen such as TwinN® (Lachlan). For those farmers practising conventional agriculture, addition of foliar feeds such as Boostergro® synergizer® or phosgard® (Juanco) can provide nitrogen. Add vitazyme® (Lachlan) during every foliar feed application for good results. The foliar feeds should be applied after every three to four weeks until the flowering stage.

Foliar feeds do well when the moisture level in the soil and leaves is adequate. Application of slurry around the base of the growing maize crop can



also correct nitrogen deficiency. One single maize plant takes away 8.7 g of nitrogen, 5.1 g of phosphorus and 4 g of potassium from the soil. The farmer should ensure that their maize has adequate fertilizer throughout the growing period in order to get the desired maize yield.

### Other production requirements

To get a good maize yield, maize has other requirements, which must be met. Some of the important requirements are outlined below:

**Water:** To grow well, maize requires adequate water depending on the variety that the farmer has planted. Where farmers depend on rain, maize requires between 450 to 1000mm of rain depending on the variety. One millimetre of water is required for every 15 kg of maize produced. One maize plant consumes 250 litres of water from the time it is planted to the time it matures.

Farmers must therefore ensure that as much water as possible is retained in the soil to provide adequate moisture for the maize to grow well. One method they can use is to stop the burning of crop residue during land preparation and to earth up the soil when weeding to prevent loss of moisture from the plant base. Mulching can also conserve moisture and prevent evaporation.

**Weeding:** Weeds compete with maize for nutrients and light. It is of utmost importance to control weeds to ensure the maize field is weed free.

**Compost application:** Farmers should ensure any farmyard used is fully decomposed. Well-prepared compost can be applied and worked into the soil as fertiliser for the growing plants or at planting time. Farmers practising conventional farming can get good maize yields if they applied 2.5 tonnes of manure or compost, mixed with 15 kg of DAP per acre at planting time instead of using DAP alone.

For products from Lachlan, call Tel: 020 207 3912 or Cell: 0722 209 474.

## Selling & buying

**Mushroom training:** Jomo Kenyatta University, mushroom Growing Resource Centre undertakes training courses for farmers interested in mushroom production. The courses will be conducted on the following dates:

April 25th to 27th 2012, May 23rd to 25th 2012, June 20th to 22nd 2012, July 25th to 27th 2012, August 15th to 17th 2012, September 19th to 21st 2012, November 22nd to 23rd 2012 and December 5th to 7th 2012. The University Charges Ksh 10,000/ per course. Trainees have to pay for their accommodation and meals. Interested farmers can get in touch with the institution. Contact: JKUAT Enterprises Ltd Tel. 067 52 420, 0736 524 200 0724-256 696 email: md@jkuates.jkuat.ac.ke

**Kenbro chicks for sale:** I have slightly more than 120 Kenbro chicks, which are 5 weeks from Kenchic Ltd. They are fully vaccinated. The price is Ksh300. John Thiari 0716 603 121, Lanet, Nakuru.

**Rabbits wanted:** A group in Kirinyaga county in Baricho town wants to buy 20 mature does. Any sellers can contact Dr Kirago 0722 892 710.



## A tribute

On page 7 of our March 2012 issue, we used this picture of Charles Munyari, working on compost at his farm in Subukia. We regret to inform our farmers that Charles Munyari died two days after we used this picture, following a short illness. Mzee Munyari has been an active organic farmer and a very committed and reliable distributor of *The Organic Farmer* magazine in Subukia valley since we started its publication in April 2005. He ensured every issue reached all the farmers as soon as he received them and was always concerned whenever there were delays in sending the magazines. He was a good example to other organic farmers in his region and assisted them with advise, based on his knowledge in sustainable agriculture. Charles Munyari will be missed by all who knew him.