

The Organic Farmer

The magazine for sustainable agriculture in East Africa



Nr. 82 March, 2012

New maize disease

A serious disease is destroying maize fields in Bomet. Up to now, its cause has not been discovered, but it is suspected to be a virus.

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Dear farmers,

The livestock sector in Kenya contributes to more than 30 per cent of all the agricultural commodities sold in the market, accounting for about 10 per cent of the country's GDP. Despite this tremendous contribution to the economy, very little support is given to this crucial sector by the government.

When it privatised most of the services it used to provide to the sector, farmers were left to rely on unclear regulatory mechanisms. This has over the years exposed them and especially small-scale farmers to many challenges that include open exploitation by private providers of goods and services, whose only motivation is to maximise profits at the expense of the farmer!

The least the farmers would have expected of the government is to put in place a regulatory framework that would control the quality of animal feeds produced in the country.

Additionally, failure by the government to ratify the feed policy that was drafted by the Ministry of Livestock Development almost four years ago, has led to the entry into the industry of many fake feed manufacturers. The consequence is the flooding of low quality feeds into the market.

Animal feeds take up to 80 per cent of the cost of livestock production. Their quality is therefore very critical to livestock productivity and profitability. Feed manufacture should meet the most basic requirements in terms of nutritional value for each category of animal in terms of energy, protein and vitamin content for optimum production.

The Kenyan government should therefore put in place a comprehensive animal feed policy that would facilitate the production of raw material for animal feed production in the country.

Such a policy would encourage farmers to grow such crops as sunflower, soybeans, cotton and rapeseeds whose by-products can be used in animal feed manufacture. As the situation stands right now, much of raw materials has to be imported at a great cost, which in turn is passed on to the farmer.

Hatari! Fake feeds

TOF-Kenyan poultry and dairy farmers continue to record huge losses due to the poor quality of animal feeds being sold in the market. Regulatory bodies such as the Kenya Bureau of Standards (Kebs) do not have the capacity to regulate feed manufacture. The Kebs labels on many feed packages are nothing more than a decoration: The description about vitamins and minerals shown in the package is different from the feed content.

TOF has received many complaints from small-scale farmers. Our survey has discovered that



most of the backstreet feed makers are selling very poor quality feed to farmers. In place of maize germ, some feed makers simply grind maize cobs or maize bran, which is not palatable and is of poor nutritional value. Most of the fishmeal (omena) used in making feed is full of sand, sometimes deliberately added to increase weight. Most

of the poor quality feed goes for as little as Ksh1500. Due to the high cost of feeds, farmers are lured by the low feed prices. However, they only discover that they have been cheated after recording low egg and meat production.

The benefit of indigenous chicken

To survive these hard times, farmers have to rethink their production strategies. For example, the production of hybrid chickens is becoming uneconomical due to the high cost of feeds and declining market prices. Wise farmers are now going for dual-purpose breeds such as Kenbro or indigenous chickens, which fetch better prices in the market. Feed for these breeds can be made at home.

See page 3

Are you getting your TOF copy?

Many farmers groups are unable to receive copies of *The Organic Farmer* magazine for one reason or the other. We know that many addresses have changed due to closure of post office rental boxes or transfer of persons who receive the magazine on behalf of fellow farmers; or some institutions keep TOF in their offices instead of distributing the magazine. If your group is affected, do not keep quiet. Farmers should raise any issues or problems they face in accessing the magazine. This will help us to streamline the distribution of the magazine and ensure it reaches every part of the country. Write to us on the following address: The Organic Farmer P.O. Box 14352, 00800 Nairobi, send us an e-mail (info@organickenya.org) or call us on following mobile numbers: 0738 390 715, 0717 551 129, SMS: 0715 916 136



Stevia,
a sweet crop

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Organisms that maintain soil fertility

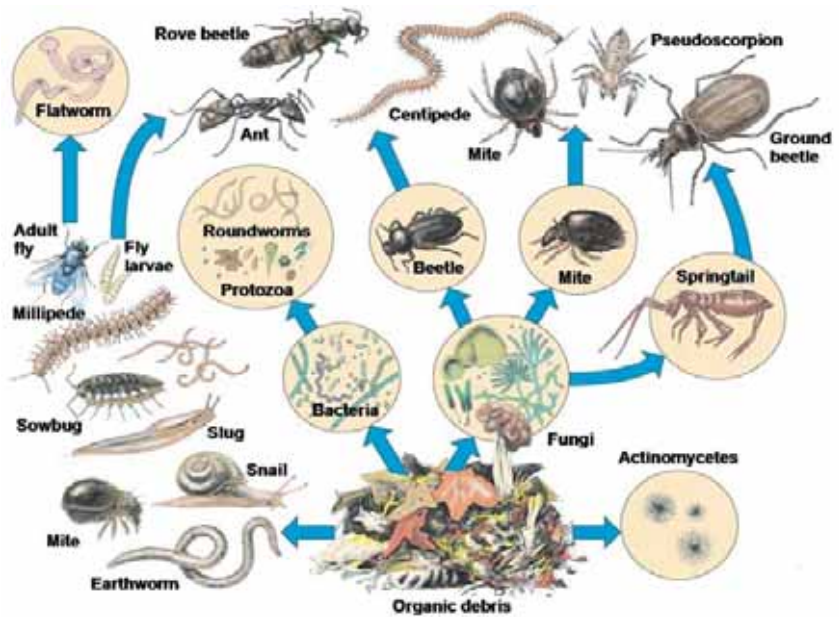
Soil fertility is not only about nutrients, but also protection of important organisms in the soil.

Simon Degelo

In the last two issues we have discussed the importance of minerals and their proper balance to nourish crops. But soil fertility is not only about nutrients. The industrial agriculture tends to ignore that, looking at soils as a sponge that is be "filled" with nutrients. But in reality soils are an ecosystem hosting thousands of different organisms, many of them essential for the growth of crops. However, synthetic fertilizers do not nourish them – instead, when applied in big quantities, they suppress or even kill these tiny organisms that leave farmers with a dead soil.

Small animals help farmers

There are many benefits of this "national park" in the soil: Every attentive farmer knows about earthworms and their positive work in the soil. They eat dead plant residue and turn it into a perfect fertilizer. While making tunnels through the soil, they bring air to the roots of the crops and make the soil more permeable for water as well as for plant roots to penetrate.



However, most of the organisms in the soil are hard or impossible to see with the naked eye. Many species of tiny insects eat plant waste. Bacteria and fungi degrade it further and release its nutrients and turn it into humus, while many of them are specialised in their interactions with plants and help them to extract nutrients from the soil.

Humus improves the soil

The humus itself is very beneficial to the soil: The nutrients attach to it and because of this they are protected from being washed out or leached to lower soil levels. This way, they are kept available for the plants. Humus also helps to improve the soil structure. This is in particular important in regions of soil that have a high clay content: This soils get very hard if dry but very muddy if wet and therefore get eroded very quickly. If the humus content can be increased, the soil gets more crumbly and contains more pores (small holes that allow air and water into the soil). Through this process, the soil can take up water more easily and is less prone to erosion. The water can be stored for a longer time and is more available for the crops. The plants will find it easy to drive their roots more easily into the soil.

Fight acidity

High humus content can prevent

soils from another problem: Soils in tropical regions are often very acidic (low in pH). Acidity poisons plants and makes it impossible for them to take up some important nutrients from the soil. Decades of cropping with heavy chemical fertilizer application make the problem even worse, as the addition of artificial nitrogen contributes to the acidification of the soil.

Good soil is priceless

So, there are many reasons to improve the organic matter in your shamba. The good news is that organic matter can be increased with materials from your own fields or with methods that you can easily apply yourself – no need to spend lots of money in the agrovet shop buying fertilizers. Compost making and application requires more work for the farmer compared to spreading bags of DAP or NPK to your shamba. These methods should be familiar to regular TOF readers (see box for overview), as we have discussed them several times in our magazine.

However, when you apply them, do not expect your soil to improve in a day. But if you follow the right methods for several seasons, their fertility will gradually increase, and you will observe its colour turn darker because of the humus which is black in colour.

Put more organic matter into the soil!

Compost

Adding compost is one of the most important methods of increasing the fertility of the soil

Mulching

Instead of composting you can add plant material like maize stalks directly to the soil. This is less work and has additional benefits, protecting the soil from erosion and drying out too quickly.

Green manure

Plantation of green manure is a very good way to improve soil fertility. If leguminous plants are used, they even add nitrogen to the soil, for free.

Conservation agriculture

Through techniques of conservation agriculture, like minimum ploughing, the disturbance of the soil organisms is reduced and the organic matter can be increased.

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

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

Editors Peter Kamau, Peter Baumgartner

Administrator Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania - icipe, Charles Kimani - farmer, Wangige, Joseph Mureithi - KARI, Henry Kiara - ILRI, Christian Borgemeister - icipe, Sunday Ekesi - icipe

Address *The Organic Farmer*

P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 251 92 33, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org



Avoid poor quality feed, prepare your own

With the right ingredients portions, farmers can make their own quality feed to improve poultry production.

The Organic Farmer

With the rising cost of poultry feeds, farmers rearing chickens are increasingly finding it difficult to make profit from poultry keeping. While it is difficult for farmers to formulate feeds for hybrid chickens such as broilers and layers, they can do so for their indigenous chickens or dual-purpose breeds such as Kenbro under intensive management system. This can be done using the Pearson Square method.

However, this is only possible if farmers have the right quality of ingredients or raw material for formulating feeds. The Pearson Square method relies on the Digestible Crude Protein (DCP) as the basic nutritional requirement for feed. The most common ingredients used are whole maize, maize germ, cotton seed cake, soya beans, sunflower or omena (fishmeal).

Example 1- Feed for layers

Assuming that the farmer wants to make feed for their chickens using the Pearson Square method, they have to know the crude protein content of each of the ingredients used in feed making. The farmer may use whole maize (8.23 % DCP) Soya (45 % DCP) Omena (55 % DCP) and maize bran (7 % DCP) Sunflower (35 % DCP). To make a 70 kg bag of feed for layers, a farmer would require the following ingredients:

- 34 kg of whole maize
- 12 kg of Soya
- 8 kg of omena
- 10 kg of maize bran
- 6 kg of Lime (as a calcium source)

Each category of chickens has its own requirements in terms of nutrition. For example, feed for layers should have at least 18 per cent crude protein. If one was to formulate feed for layers, then they would have to calculate the percentage of digestible crude protein in each of the ingredients to ensure that the total crude protein content is at least 18 per cent to meet this nutritional requirement. To find out if the feed meets this standard, a farmer can do a simple calculation as follows:

Whole maize	= 34 kg x 8.23 ÷ 100 = 2.80 %
Soya bean	= 12 kg x 45 ÷ 100 = 5.40 %
Omena	= 8 kg x 55 ÷ 100 = 4.40 %
Maize bran	= 10 kg x 7 ÷ 100 = 0.70 %
Lime	= 6 kg x 0 ÷ 100 = 0.00 %
Total % of crude protein	13.30 %

To get the total crude protein content of all these ingredients in a 70 kg bag, you take the total crude protein content of the combined ingredients, divide by 70 and multiply by 100 thus, $(13.30 \div 70) \times 100 = 19.0\%$. This shows that the crude protein per-



centage in the above feed formulation is 19.0 % which is suitable for layers. Before mixing the feed, whole maize including the other ingredients has to be broken into the right sizes through crushing or milling to make it palatable for the chickens. Add 250 g of table salt on every 70 kg bag of feed.

Feed for chickens meant for meat

Chickens meant for meat production require feed with a higher content of DCP. From the first to the fourth week, the chicks require feed with a DCP content of between 22 to 24 per cent. From the fourth to the eighth week, the chicks require feed with a protein content of 21 to 22 per cent crude protein. To attain this requirement, farmers can formulate feed using the same method given above. To make a 70 kg bags of feed, they will need to have all the right the ingredients in the proportions given below:

Whole maize	= 40 kg x 8.23 ÷ 100 = 3.20 %
Omena	= 12 kg x 55 ÷ 100 = 6.60 %
Soya beans	= 14 kg x 45 ÷ 100 = 6.30 %
Lime	= 4 kg x 0 ÷ 100 = 0.00 %
Total % of crude protein	16.10 %

To determine if a 70 kg bag of feed has adequate crude protein content for birds meant for meat production, the same methods is used: $(16.10 \div 70) \times 100 = 23\%$.

The feed given in this example has a total crude protein content of 23 % which is adequate to feed chicken in this category. In every 70 kg bag of feed, add 250 g of table salt.

Ration for Kienyeji chickens

Indigenous chickens are less productive in terms of egg and meat increase. They may not require intensive feeding and management. For this category of chickens, farmers can constitute feeds with a DCP of between 15 - 16 %. They can use the following formulation to make feeds for the indigenous chickens:

Whole maize	= 34 kg x 8.23 ÷ 100 = 2.80 %
Soya bean	= 12 kg x 45 ÷ 100 = 5.40 %
Omena	= 8 kg x 55 ÷ 100 = 4.40 %
Maize bran	= 10 kg x 7 ÷ 100 = 0.70 %
Lime	= 6 kg x 0 ÷ 100 = 0.00 %
Total % of crude protein	13.30 %

Percentage of total crude Protein in the ingredients = $(10.68 \div 70) \times 100 = 15.25\%$. For farmers rearing hybrid layers and broilers, it is advisable to buy already constituted feeds from reputable companies that sell quality feed. The main reason is that it is very difficult for farmers to constitute micronutrients such as amino-acids, trace minerals, fat and water soluble vitamins that these breeds of chicken require for proper growth.

To be sure that their feed is of the right quality, farmers can send a sample of the constituted feeds for testing and advice to KARI Naivasha, which has modern equipment for testing feed quality. A sample costs Ksh 1,000 to test.

Send samples by courier to the following address: KARI Naivasha P.O. Box 25, 20117 Naivasha, Tel. 0726 264 032. Results are ready within a day.

Some tips on how to feed chicken

An egg-laying chicken requires 130 g of feed per day (provide clean water at all times).

- 1 chick requires 2.2 kg of feed for 8 weeks (thus 100 chicks = 2.2 kg x 100 = 220 kg. Chicks should be allowed to feed continuously and given adequate clean water at all times). If they finish their daily rations, give them fruit and vegetables cuttings to feed on.
- 1 pullet (young chicken about to start laying) should be fed 4.5 kg of feed for two and a half months until the first egg is seen. It should then be put on layer diet. Supplement with vegetables, edible plant leaves or fruits peelings in addition to the daily feed rations.

- All ingredients used must be of high quality and palatable. Never use rotten maize (Maozo). Chickens are very susceptible to aflatoxins poisoning.
- When using omena as an ingredient, ensure it is free of sand and seashells. If you use maize germ, it should be completely dry.
- Feed should be thoroughly mixed to ensure the ingredients are uniformly distributed. It is preferable to use a drum mixer instead of a spade for mixing.
- Note that even after giving them the formulated feeds, chickens should be put on free range to scavenge for other micronutrients not provided for in the feeds.

Earn more: Improve honey quality

Most of the honey produced locally is of low quality due to poor harvesting, processing and storage.

The Organic Farmer

Local beekeepers are unable to exploit the available market opportunities because the honey they produce is of poor quality. In all the major honey producing towns in Kenya, it is a common feature to find people selling honey in the open-air markets. Unsuspecting customers do not know that the honey is of very inferior quality because of the careless harvesting methods used by beekeepers. A kilo of good quality refined honey now goes for between Ksh 400 and Ksh 500 in the local market.

Very few beekeepers know how to handle honey, right from harvesting, processing and storage. Adulteration of honey is the other big problem. Most honey traders and processors add sugar, molasses and even starch in order to increase the quantity of honey; this spoils quality and makes it difficult to sell it in foreign markets where prices are very good. In this issue, we try to educate farmers on how to handle honey through these three very important stages to ensure they reap



Well maintained beehives, good equipment and proper handling are conditions for harvesting clean honey. (Photos PeLu/In)

maximum benefits from it.

The quality of honey is determined by the following factors, which every beekeeper should be able to address:

Timeliness in harvesting: This depends on proper timing by farmers. Harvesting should be done immediately after the flowering period when the bees will have collected enough pollen. The bees should be given time to process the honey –if done too early, the honey will contain unprocessed pollen which damages the taste of honey; Pollen residue lowers the quality of honey.

If done too late, the beekeeper may harvest less honey as bees will have consumed a large proportion of the honey they will have made. Recommended times for harvesting are mainly between May and June after the onset of the long rains and September/October period (after the onset of the short rains). The beekeeper has to keep on inspecting the hives daily to determine the right time for harvesting.

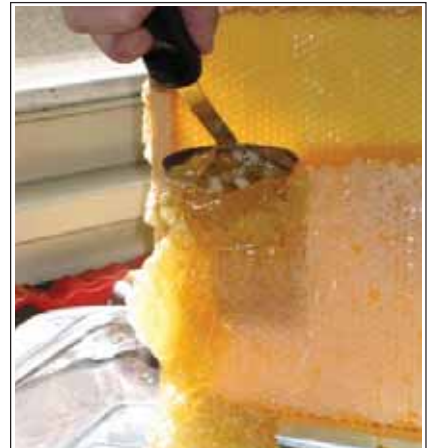
When all the honey combs are well sealed with snow-white beeswax (capped), it means the honey is ready for harvesting. Combs with brood (unripe honey) or pollen should not be removed during harvesting.

Equipment used in honey harvesting: Honey harvesting and extraction should be done using the right equipment to ensure the best quality honey is harvested. The beekeeper should have a bee suit or protective gear, which consists of an overall, for covering the body, gloves (to protect the hands) and gumboots for covering the feet.

A bee smoker is also essential to control bees and keep them calm during honey harvesting. Bee equipment determines the quality of honey. Some beekeepers use foam material, human hair, wild fungal material, cypress and tephrosia leaves- some of these material is poisonous. It spoils the quality of honey and is dangerous to consumers. The equipment used for honey harvesting has to be as clean as possible to avoid contamination.

The type of hive used by beekeeper: The honey harvesting method depends on the type of hive used. There are three common types of hives used by beekeepers in Kenya; the Top-bar hive, the Langstroth and the traditional bee hives. The main idea behind honey harvesting is to identify the combs in the hive, which have ripe honey, free it of bees and harvest the honey for processing.

The quality of honey is higher in both Langstroth and Top-bar hives because it is easier to remove the honeycombs and extract the honey. It is not possible to maintain hygiene when harvesting honey from traditional hives because of the way they are made; as a result,



Keep honey clean

When harvesting, handling and storing honey, beekeepers should observe the following measures:

- Do not mix pieces of honeycombs with honey when harvesting.
- Wash your hand gloves and maintain personal hygiene when handling honey.
- Use containers that are properly cleaned. Do not store honey in containers previously used in storing food, cooking oil and other contaminants.
- Do not store honey in poorly sealed containers or smelly environments.
- Honey should never be stored in direct sunlight. It should be stored in a cool dry place.

the honey becomes mixed with wax, brood and other impurities.

Moisture

One of the most important factors when harvesting honey intended for sale is to maintain the optimum moisture content. All honey is hygroscopic in nature (it absorbs water). When kept in an open container, honey will take in the water from the air and start fermenting. Most of the honey sold by the roadsides and open-air markets is exposed to moisture from the time of harvesting to the time it is being packaged and marketed.

The best honey has a moisture content of 18 per cent and below. Most buyers of honey insist on moisture content of between 18 and 20 per cent. The water content is measured using a hydrometer or refractometer. In the hive, bees ensure the water content remains low by making vibrations or buzzing sound to reduce the moisture content. The bees seal the "ripe" honey with snow-white wax (beeswax). An experienced beekeeper should be able to tell the difference between the unripe honey (brood) and the ripe one (capped) honey. Capped honey is fully covered with beeswax showing it is ready for harvesting.

A sweet plant called Stevia

A new crop is promising to sweeten farmer's life and can become a new source of income.

Simon Degelo

Since last year, soaring sugar prices trouble Kenya. The high prices give the farmers a particular headache, as their loose cash to spend on sugar often is very limited. A plant called sweet leave or Stevia promises to end this bitter issue. One leaf of it is enough to sweeten a cup of tea. And the best about this plant: It grows well in Eastern Africa and allows you to cultivate your own sweetener that doesn't cost a single shilling.

However, the western world has recently discovered the plant for other reasons: People there appreciate that stevia doesn't charge their body weight and fits the healthy and natural lifestyle. No wonder that big companies have come up with ways to extract the sweet components of the plants and use it in soft drinks, making the plant a potential new cash crop to tropical countries.

How to plant Stevia ...

While it is relatively easy to cultivate Stevia, it can be hard to get the plant material. Usually the plants are propagated as cuttings, but if you can't find any or your shamba is too remote for them to arrive before the heat damages them, you can use seeds as well. As the seeds are rather small, it is advisable to germinate them in pots before you transfer them to your shamba.

Stevia

*Stevia or sweet leave is called *Stelvia rebaudiana* with full scientific name. It originates from central and south America where it has been used for its sweetness and medical properties for thousands of years.*

Its sweetness comes from the so called steviol glycosides. These substances are hundreds of times as sweet as sugar but gives no energy to the body. In western countries stevia extracts are used as sweetener, to fight caries, obesity, diabetes and high blood pressure.



If you want to cultivate more than just a few plants for your own use, plant them in rows with spacing of 40cm between rows and 25cm between plants. Prepare the soil with some compost, working it into the surface layer of the soil. Don't add artificial Nitrogen fertilizer or liquid manure, as the plant grows best with moderate N-levels. It is advisable to heap and mulch the soil around the plants to protect the shallow roots from drying out. For the same reason it is best to plant stevia in the shade – under a tree would be ideal and intercropping

with maize could be worth a try. Water the plants regularly, but moderately, because the plants are as sensitive to overwatering as they are to drought.

Furthermore, the plants are prone to breakage by wind, which can be prevented by supporting them with a stick or by clipping the tips of the plants every 3-4 weeks to make the plants grow stronger. Similarly, flowers should be cut regularly unless you want to harvest seeds. However, you will not have any problems with pests in your Stevia plantation because most insects hate its taste.

The sweet leaves can be harvested continuously. However, if you want to sell your stevia, you will get the best harvest if you wait for about three month and cut all the branches of the plants about 10cm from the base. The plants will subsequently re-grow. You should only redo the heaps around the plants before the rainy season to avoid standing water, which would damage the root of the plants. Such, the plants only need to be replaced after a few years when they lose their vitality.

... and to harvest it

The easiest way to dry your sweet harvest is to bind small bundles of branches and hang them at a sunny and airy place. If you have lots of stevia you can hang the bundles at a line like your laundry. It is important that the weed dries in less than twelve hours; else it loses some of its sweetness. When the leaves are dry, strip them from the stems which are less sweet. The leaves can be used as a whole, be crushed or ground for easier dosage. Stevia seedlings can be obtained from the Network for Ecological Farming in Africa (NECOFA). Neema Plaza, Opposite Stadium, P.O. Box 819 Molo 20106, 051 721 048, 071 563 92 23

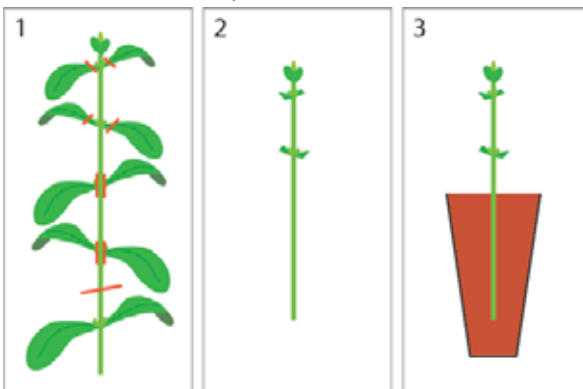
Propagation of Stevia

To plant Stevia through seeds, only use fresh seeds that are black or dark brown in colour. Any bright coloured seeds are not viable. Even if you have best quality seeds, only a fraction of them will germinate. Furthermore, plants from seeds vary heavily in its sweetness. Therefore it is important to sort the plants to have a sweet harvest.

Once you have big plants, the easiest way to propagate them is through roots splitting: After the harvest, take big plants with several stems and split them with the according roots through cutting or ripping apart and replant the parts.

If you need big number of plants, cutting is the way to go. Therefore, cut the top 8cm of the stems with 3-4 big leaf couples. Remove all the leaves of the lower half of the cuttings. On the upper part only cut the

big leaves without damaging the small leaflet emerging over the big leaves, they will become the branches of your new plants. Put the cuttings into a container with water such that half of each is in the water. After one week, roots should develop and the cuttings can be planted into pots. Mix sand or sawdust to the soil if possible and keep the pots in a shady place and water regularly until they are big enough for transplantation to the shamba.





A passion fruit orchard belonging to a member of Chebugundi progressive group.

Group gets business after training

The success of a farmers' group in Nandi shows the economic impact of the i-TOF trainings.

Alfred Amusibwa

The twenty six farmers of the Chebugundi Progressive Self-Help Group in the Nandi hills are quite active, eager to improve their livelihood and willing to go organic! In March last year, they invited an *i-TOF* field officer in Western Province to be trained on various sustainable agriculture production methods and the principles of organic farming.

It was a good decision, since some weeks later; a fruit-canning factory approached them from Eldoret to grow passion fruits for supply to the factory. There was one condition given by the factory though: that the group should use organic methods in growing the passion fruits. So the *i-TOF* training had come just at the right time, and the farmers were sure that they would meet the factory's conditions.

Soil fertility and composting were the first topics to be covered. The group set it as a rule that all members had to make a big heap of compost to be prepared for use on their farms whenever

they got seedlings of grafted passion fruits from the nursery.

When it was time to plant, every member had enough compost to use. Today this group has become an important supplier to the factory. Up to now, they have supplied 13,000 kgs of passion fruits worth Ksh 910,000 as a group. They even expect more as the fruits are still ripening and the prices have gone up due to the shortage caused by the drought at this time.

"The increased income has changed our lives," says Philip Lagat San'g. "Our farms have benefitted, we are able to invest and increase production in our shambas."

Farmers ask for more training

Having realised the benefits of organic farming, they have received more *i-TOF* trainings: The trainings have equipped them with skills to control pests and diseases in an organically way. They have also received training on animal feeding, especially hay and silage making. They appreciate the services provided by *i-TOF* and are never tired of spreading the organic farming message to other farmers in the region. They even look forward to further collaboration and information from the *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 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

Answers in brief

Buying fishing nets

Where can we buy a fish net?

Contact a lady called Diana from Monasa on (0722 971 300, 0733 254 819). You can arrange to pay them through Mpesa. They will make the delivery after payment.

Keeping many fish varieties

Can one keep more than 3 varieties of fish in one fish pond? Samson Luvala, Ivwaha Self Help Group.

It is possible. Keeping more than one type of fish is called polyculture but one must understand the feeding habits of the fish, some fish eg catfish are predators of other fish, therefore their population must be kept low.

When to feed fish

How can I know whether my fish are starving in the pond? John Samson.

When you visit a fish pond, they will aggressively jump out of water anticipating feed if they are hungry. You can then feed them.

Where to get fingerlings

Where can we get fingerlings for stocking in our ponds?

Depending on the area the farmer comes from and the type of fingerlings for tilapia and catfish you can get them from Sagana Aquaculture Center in Central and Eastern province trout fish you can get them from Kiganjo trout hatchery. In Western Kenya DOMINION farms supplies tilapia fingerlings. It is also possible to get tilapia fingerlings from other farmers in Kenya who are now rearing fish as a part of the government's economic stimulus programme.

Use manure in fish ponds

Apart from cow dung what else can be put in the fish pond to facilitate the growth of planktons?

You can use manure from chickens, goats or even dead plant material. Inorganic fertilizers such as DAP can also be used to fertilize ponds and enable phytoplanktons (fish food) to grow.

Right fish pond depth

Does the depth of a fish pond affect the newly born fingerlings in the pond? Abulala George from Vyalo Horticultural Group.

Pond depth affects the growth of phytoplanktons since the sunlight cannot reach the bottom of the pond if it is too deep. A depth of 60-100cm is recommended.

Controlling predators

How can we keep away predators like snakes or frogs from entering my pond. George Abulala

Avoid bushes growing around the pond to keep away snakes. Frogs are difficult to control but they coexist with fish.

The benefits of covering the soil

How can soil be covered permanently and yet other management practices are supposed to be carried out on the very same land?

This would depend on the other management practices to be carried out on the land, and whether the practices are done manually or using machinery. The most disruptive management practice to be carried out on soil that would effect soil coverage is ploughing. It also depends on the understanding of the word 'covered'.

Understanding why we are covering the soil is important. Ultimately we are "covering" the soil to protect it from erosion, nutrient depletion, drying out, compaction etc.

We can do this in many ways:

1. With a cover crop that in most cases is the crop we are investing,
2. With mulch, which may be around the base of the crops or covering land that is yet to be planted,
3. With shade netting, and
4. With shade trees.

Each case will differ according to requirements and capabilities of the farmer. In an ideal situation zero tillage may be used where practices such as ploughing are not done- in this case soil stays permanently covered with residues from the outgoing crop before the incoming crop is introduced.

Ploughing

Where land is ploughed, naturally the soil cover is disrupted for the period it



takes to plough. However, it is advisable to cover the soil as soon as possible afterwards to avoid soil damage by the sun and water erosion. Many farmers in developing countries are turning to mechanized zero tillage farming, where special implements on the tractors rip and plant rather than plough, harrow and plant. It is proving to be cheaper and resulting in higher yields.

... and zero tillage

In zero tillage practices, protection and building of the soils results in reduced management needs and costs, which results in increased yields. Weeds are suppressed, thus less labour and time is needed to weed; soil nutrients increase, thus healthier crops, soil micro-organisms increase and build better soil structure that are more resistant to climate change challenges. Our future crop production requires that we meet the challenges of climate change face on. Protecting our fragile soils is a must.

Reduce ploughing, prevent weeds

If we stop ploughing, wont the weeds increase? Each gram of soil contains millions of weed seeds. To germinate, the seeds need access to light and sun. Ploughing results in turning soils and bringing buried weed seeds to the surface where they get the right environment to germinate. Therefore, ploughing encourages weeds!

Mulching on the other hand keeps the surface of the soil away from light, reducing weed germination. Reduced ploughing while mulching soils from the top reduces weed germination further and results in healthier soils as well as the bonus of less labor for weeding. More importantly: Ploughing destroys micro-organisms that we rely on for productive soils (*see page 2*).

Ploughing destroys soil organisms

Ploughing land was once described to me as the equivalent of demolishing kiosks. They will eventually return due to demand and supply, but meanwhile businesses have been disrupted and inconveniences caused.

Different micro-organisms live at different depths in the soil. When we plough the soil, not only do we bring the weed seed to the surface, we also disrupt the optimum conditions of these very important micro-organisms. The resulting impact is the soil must go through a recovery process before it can return to its optimum condition.

Compacted soil may need light tillage to introduce air into the soil structure, but this role is normally provided for by micro-organisms. Introducing chemicals and pesticides to crops damages the microorganisms that are in effect labourers that we do not have to pay for. A good farmer encourages these micro-organisms in their soils.

Soil and crops

Are we conserving soils or the crop that is being established?

We are conserving soils. If we get the soils right, the crops will do just fine. If we get the soils wrong, our crops will suffer.

Su Kahumbu



An infected maize crop: The disease can destroy an entire maize field in a short time.

An unknown maize disease has been discovered in Bomet and could spread to the rest of the country.

Simon Degelo

A mysterious disease is destroying maize fields and threatening farmers in parts of the Rift Valley province. The disease was first reported in Bomet county in September last year. Since then, it has spread into the neighbouring districts of Chepalungu, Narok South and Narok North. It is feared the disease could spread to the whole of Rift Valley province, which is the main maize producing area in the country.

Farmers are worried

One of our readers, Alex Ngetich from Kaporuso in Bomet county says that his home region is heavily affected. Some of his neighbours have lost their entire crop which they had planted late last year. Luckily, he has been spared so far, but he doesn't take this for granted: "I am really worried," he says. Often symptoms only develop while plants are tasseling, leaving farmers with little or nothing to harvest.

The disease can occur at any time between the seedling stage and the time when the cobs start to develop, according to Dr. Z.M. Kinyua, the chief plant pathologist at KARI, National Agriculture Laboratories (KARI-NARL). At first, symptoms are inconspicuous but when the plants are inspected carefully, small yellow spots that develop into streaks that run parallel to the leaf veins are visible. These spread quickly, the leaves turn yellow and start dying from the margins. If the plants reach maturity, the cobs are underdeveloped and the maize cobs are covered with mouldy material.

Cause could be a virus

The KARI has collected samples and is analysing them to determine the cause of the disease. Dr. Kinyua suspects that a virus could be responsible for



the damage. However, no final results have been found yet. In the meantime, all that farmers in affected areas can do is to shift from maize growing to other crops. This way, they can avoid the risk of losing their source of food. Diseased plants should be uprooted and burned as soon as first symptoms are found. As soon as we get more information on the disease and how to control it, we will disseminate it through our magazine, radio programmes and the website.



Selling & buying

Tree seedlings for sale: We have the following tree seedlings for sale to farmers; grevillea, Prunus Africana, Dorbea, Podo falcus, Cedar juniperus, cypress and many others. Interested farmers can call us on 0723 686 960 ask for Daniel Thenya.

Kenbro chicks and eggs for sale: I have 2-3 week old Kenbro chicks for sale at Ksh 100 per chick and Ksh 25 per egg. Contact Francis Kuria 0722 401 139.

Poultry and fish for sale: Kili Enterprises have day and week old kienyeji, Kenbro chicks, turkey and fish fingerlings for sale to interested farmers. Contact: Lilian at kili.enterprises@gmail.com

Incubators for sale: We have both improved paraffin and automatic incubators for sale to interested farmers. The incubators have a capacity of between 120 to 2000 eggs. After sales service and training is provided to farmers. Contact: Kaki incubators 0725 552 920, 0738 792 224.

Ostriches, quails and chickens for sale: We have three-month old ostriches for sale to farmers, 2-6 month, quails and Kenbro chicks and chickens weighing between 1 and 3 1/2 kg. Contact Kaki incubators 0725 552 920, 0738 792 224, email: genkago@yahoo.com, www.facebook.com/kakiincubators.

Bamboo seedlings for sale: I have bamboo seedlings for sale to interested buyers. One seedling goes for Ksh 30, email: info.mtkenya@gmail.com

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