

Beware! Fake maize seeds in the market

Farmers will have to be extra careful when buying maize seed to avoid being cheated.

The Organic Farmer | More and more black market dealers are entering into the business of selling commercial maize as seed. It has become a lucrative venture for even well-known, established agrovet shops and supermarkets across the country. Like every year, TOF warns farmers in advance to avoid being cheated and to ensure they buy genuine seed to get good maize yields.

Carjacking in Naivasha

This year the situation is even more trickier for farmers: This is because last year, a Kenya Seed Company lorry transporting seed packaging bags to Kitale was carjacked in Naivasha, and the driver killed. The bags have not been recovered to date. What this means is that the bags, which bear a genuine Kenya Seed trade-mark, will be packed with any commercial maize and sold to unsuspecting farmers as genuine seed this year!

So farmers will have to be extremely careful. It is a requirement by KEPHIS that all stockists display this year's licence at a place in their shops where every farmer can read it. Farmers are advised to demand to see the KEPHIS licence for this year before buying any seed. There



is also a tag inside the seed bags showing that the seed is inspected by KEPHIS. Careless farmers may end up buying fake seeds if they do not verify the packaging. (Quality of the dye and quality of stitching.

It is advisable that farmers buy their seed early enough from genuine Kenya Seed depots or established outlets know to sell genuine seeds.



Seed Information Service

The Kenya Seed Company has a mobile information SMS service to help farmers identify seeds suitable for their areas. Type your division and send it to 3000. You will get a reply. Alternatively, you can call the company's help lines: 0716 647 693 or 0733 854 713.



Dear farmers

A tour of Agricultural Development Corporation (ADC) farms in Kitale by TOF in December last year was an eye opener to the potential of the agricultural development in Kenya. The farms are centres of excellence where both crop and animal production are practised under a high level of management. They exemplify the best practices that can transform agriculture in Kenya.

The farms rear some of the best livestock breeds in the country. Apart from keeping pedigree and high-grade cattle, sheep, goats, pigs poultry and bees, ADC farms are also the main producers of certified seed for maize, pasture, vegetable seeds and horticultural produce such as oranges.

But huge tracts of ADC land were grabbed. This undermines the corporation's capacity to carry out its mandate of keeping the country supplied with the best livestock breeds as well as certified seed for our farmers.

We hope that laws in the new constitution will protect important national assets such as the ADC farms. The Corporation should also be well funded to ensure the various technologies in use are passed on to small-scale farmers to help them improve production and income.



High quality fodder all year round

TOF- Thousands of Australian farmers and their South African colleagues rely on a fodder called tree lucerne or Tagasaste. It provides high quality and protein-rich fodder for livestock and enriches the soil with nitrogen. *Page 5*

Is rearing chickens profitable? *Page 3*



Growing demand for rabbit meat

TOF | For marketing, rabbit keepers can now rely on one organisation: The Rabbit Breeders Association of Kenya (RABAK), based in Thika. The association maintains a network of representatives in various parts of the country, where rabbit keepers can get assistance in selling their animals. *Page 3*

in this issue

Maggot as chicken feed 6



Benefits of crop rotation 7

Collars to fight tsetse fly 8

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Make the right choice of seed for your region

Wrong seed varieties reduce your maize yield. Beware, fake seeds have also flooded the market.

Peter Kamau | The planting season is just about to start. If the weather does not change drastically this year, the outlook is very good for most farmers because adequate rains mean a good harvest. One of the most important inputs every farmer should have by now is quality maize seed. Do not wait until the planting season to buy your maize seed because good quality is hard to get. It is as well important that farmers buy seed that is suitable for their regions. Otherwise the maize will not perform well. And a last point: Cases of farmers being duped into buying fake seeds during the planting season are on the increase, as already noted on page 1.

Controlling diseases

Maize is increasingly becoming prone to diseases. The most serious disease at the moment is the Maize Lethal Necrosis (MLN) Disease that was dis-

covered last year. The disease is caused by a combination of viruses and has spread to almost all parts of the country. Scientists say the disease is transmitted through seeds and maize pests such as thrips, stemborer, flea beetles and other pests. Farmers are advised to plant only certified seeds from established companies to avoid transmission of the disease. Controlling pests will protect your maize crop from the disease if your maize was not affected last year.

Practise crop rotation

If your maize was affected by the disease, do not replant maize in the same shamba this year because the disease is still in the soil and it will contaminate your maize crop. Instead, farmers who were affected by the disease are advised to plant other crops such as potatoes, beans, peas, sorghum or any other crop that is not in the maize family.

Farmers who use the previous year's maize as seed are especially warned! The maize may be diseased and will only re-introduce the disease into the



Besides good soils and water, quality seed determines your crop yield.

shambas that may not have been infected.

Beware of MSV ...

In mid-altitude areas, most of the maize varieties are prone to diseases such as the Maize Streak Virus (MSV). It is devastating and can cause up to 80 per cent loss. In affected areas farmers are advised to go for maize seed varieties that are tolerant to the virus. Western Seed Company has varieties that are resistant to the disease. These include WH403, WH502, WH504 and WH505.

... and striga

Maize in some areas such as parts of Western Kenya and South Nyanza is colonised by the parasitic weed, striga that is difficult to control. The Push-



Striga

Pull method however controls the weed. There are as well some varieties that are resistant to the weed, such as WH 502 from Western Seed Company or KSTP from KARI. Alternatively, farmers in such areas are advised to plant *Ua kayongo* H1, which kills germinating striga weed seed giving maize a chance to grow.

Maize for different climatic regions

Most dealers will sell you the varieties they have on stock and not what is suitable for your region. Do not rely on agrovet shops for advice. Consult an agricultural extension office in your region for advice. Alternatively consult the seed information service using your mobile phone (see page 7).

Late Maturing Varieties

H614D, H626, H625, H629, H6210, H6213, and H9401 from Kenya seed and WH505 from Western Seed Company.

These varieties can only do well in areas with heavy and well distributed rainfall. These varieties are grown in high altitude areas (1500-2300 metres above sea level) Late maturing varieties give more yields than both early maturing and medium maturing varieties.

Medium maturing seeds

H513, H515 and H516 from Kenya Seed Company and WH403, WH502, WH504 and WH505 from Western Seed Company.

They do well in high altitude areas, which have two rainfall seasons; they can therefore be grown two times in a year.

Early maturing varieties

Katumani B, DLC1, DH01, DH03, DH4 and Western Seed Company's WS 103, WS909 and WS202.

They are not suitable for areas with high rainfall such as the Kenyan highlands. Farmers in such high rainfall areas can only grow these varieties and sell them as green maize because they tend to rot if they mature when the rains are still on.

Tips for seed buyers

- Buy your maize seed from licensed stockists and ensure every seed bag you open has the KEPHIS tag label (see page 1).
- Most of dyes (colours) used by fake seed manufacturers tend to stick to the fingers during handling. Genuine seed maize has colourfast dyes that do not stick to the fingers and clothings.
- Do not buy seed if the seed bag seal is tampered with.
- Keep certified seed in a cool dry place away from direct sunlight.



Dye used in fake seed comes off easily on contact with hands.

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

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Rabbit keeping? Identify the market first

The demand for rabbit meat is growing. RABAK is assisting farmers to go into rabbit keeping as a business.

Philomena Nyagilo | In 2002 Moses began rearing rabbits as a hobby. Initially, it was just a pair of rabbits in his home in Thika. He gradually noticed that rabbits are easy to rear: They grow fast, consume a minimal amount of feeds, are less labor intensive but reproduce more than any other animal. To date, Moses is a rabbit farmer with many different rabbit breeds.

Frustrated farmers

Apart from their significant health and the value of rabbit meat for domestic consumption, keeping meat rabbits is an economical option for small-scale farmers, providing them additional income. After *The Organic Farmer* magazine published an article in July 2007 on rabbit keeping, a lot of farmers rushed into this venture. In the two years that followed, TOF got an average of ten letters and phone calls per week from rabbit keepers desperately asking for information on where they could sell the rabbits.

Most of these farmers gave up in frustration. They did not follow the advice given by TOF, and which is still valid: A prospective rabbit breeder looks for market first before going into the business. Other farmers failed because they only saw an opportunity for quick money, but did not have any knowledge on how to keep rabbits, how to feed and to treat them when they fell sick.

Growing demand for rabbit meat

At the time, there was little awareness about the health benefits of eating rabbit meat. This situation

has changed sharply, as James Njeru explains. He is a veterinary officer and the coordinator of the Rabbits Breeders Association of Kenya (RABAK), which has its head office in Thika. RABAK has created a viable rabbit enterprise for its members. The association helps the farmers secure markets for rabbits. They slaughter them and the meat is inspected before being packaged for the market.

At the moment, the association gets orders from supermarkets, restaurants, and even butcheries as well as individual consumers. Notably, the demand is higher than they can supply. RABAK sells on average 100 to 130 kg of rabbit meat every week; the association is trying to expand their market.

The farmers are paid Ksh 300 per Kilo of meat upon delivery to RABAK. After the meat is sold, the skin is preserved to make items like sandals, handbags, belts etc. which fetch more than fur when sold without value addition. Concerning this aspect of business, RABAK is looking for a specialist who can make the best designs for the production of slippers, handbags, belts, purses etc. from rabbit skin.

RABAK maintains a close network of collaborators in many counties. Rabbit keepers can contact them or if they need advice (see table below). RABAK offers free training on the larger field of rabbit keeping; farmers only need to meet the transport cost of the RABAK specialist for training on rabbit keeping. James Njeru acknowledges that, for one to be successful, it is good to join networks or associations that enhance farming enterprises and value addition. Interested farmers can get in touch with RABAK on 0734 923 776. ■



New Zealand white is the best rabbit breed for meat.

The RABAK network

Rabbit farmers can contact the RABAK county representatives/officials for more information about rabbit keeping and marketing. Please refer to their contacts below.

Name	County	Contact
1. Gatheru W. Beth	Kiambu	0723 725 983
2. Gitu Geofry	Kiambu	0721 707 640
3. Mwangi Evanson	Kiambu	0715 325 423
4. Mugure Dorothy	Kiambu	0722 357 924
5. Magothe Margaret	Kiambu	0721 420 400
6. Martin Peter	Kiambu	0727 503 959
7. Njeru James	Kiambu	0734 923 776
8. Njuguna Wallace	Kiambu	0720 799 714
9. Waiganjo Peter	Kiambu	0721 219 092
10. Wanjiku Beth	Kiambu	0722 505 506
11. Ochenge Joseph	Nairobi/Rongai	0721 913 498
12. Kamunge Mary	Nairobi	0721 667 124
13. Mbaabu Phinihs	Nairobi/ Meru	0721 559 126
14. Agola Caroline	Nairobi/Kisumu	0721 667 124
15. Wangechi Purity	Nyeri	0729 748 028
16. Githinji n. Peter	Nyeri	0724 201 759
17. Kanyenga Julius	Muranga	0723 072 769
18. Ndaiga W. Elijah	Muranga	0728 130 892
19. Kiruki Peter	Kajiando	0722 339 382
20. Olive Marshow	Kajiado	0714 669 750
21. Mwaura Isaac	Nyandarua	0728 670 489
22. Kanja W. Francis	Nyandarua	0735 492 922
23. Thuo Clement	Kirinyanga	0710 198 576
24. Kanyi W. Lucy	Kirinyaga	0722 731 582
25. Mwaniki Joseph	Kiambu	0715 069 451
26. Kamau W. Peninah	Eldoret	0722 621 753
27. Adero Morris Phylis	Nakuru	0714 697 540
28. Nafula Gladys	Nakuru	0716 596 647
29. Njambi Kezia	Nakuru	0724 701 737
30. Njagi Anderson	Embu	0722 367 627
31. Abiud N. Charles	Embu	0722 742 324
32. Ciomiti Annah	Embu	0721 421 255
33. Kathure Lisper	Meru	0728 505 500
34. Njuguna Michael	Machakos	0724 301 726
35. Wambua Sammy	Machakos	0720 865 826
36. Wanjihia Xaviour	Kiambu	0720 599 271
37. Kamau W. Mary	Thika	0726 951 462
38. Mwaura W. Alice	Kiambu	0720 303 049
39. Munyotah Steven	Kiambu	0720 171 091
40. F. Wangyika	Nanyuki	0720 048 013
41. Mathare M. John	Mombasa	0720 076 500
42. Nganga M. Alice	Naivasha	0721 663 281
43. Cyombua Monica	Embu	0720 171 091

facts & figures

- Rabbits Breeders Association of Kenya (RABAK), P. O. Box 630-01000, Thika, telephone 0734 923 776 or 0721 219 092, Email: info@rabak.or.ke, Or chairman@rabak.or.ke, www.rabak.or.ke

- RABAK pays the farmers Ksh 300 per Kilo (dead weight of meat, less offals, legs, skin and head) upon delivery

- More information: www.infonet-biovision.org, Rabbits. Farmers without access to internet can order this paper. Send us an SMS to: 0715 916 136, keyword rabbits and your postal address.



Apart from low-cholesterol meat, rabbit skin is used to make various leather products. Photos: PN



Record keeping shows both profit and loss

Is chicken rearing profitable? When TOF visits farmers' groups and raises this question, a good number of them do not have a clear answer, simply because they rarely keep records. On this page, **Dominique Jaquemet** features two poultry farmers; one of them gets her main

Poultry as the main occupation

Celestine Imbuhila is a small-scale farmer in Kakamega. The 29 years old mother owns 2 acres of land, from which she sustains her one child and six other dependants. Recently, she started growing passion fruits after reading an article in TOF. Besides growing a variety of local vegetables, she keeps three indigenous ducks for her family. Celestine gets her main income from chickens (100 chicks, 20



Celestine Imbuhila

pullets, 100 hens, 10 cocks). She performs the whole value chain: Breeding eggs, raising the chicks and feeding the pullets. She has the infrastructure for every stage of production.

Making poultry feed

The hens breed the eggs in nests in a big chicken shed, which recently has been improved to protect them from predators such as the mongoose. After hatching, the mother and her chicks are transferred to a warm kitchen so as to protect them from the cold at night. Later the pullets are kept together until they attain the right age for egg laying.

To improve the feed for the layers, Celestine mixes the following ingredients with a machine:

Item	Quantity	Ksh/kg	Cost (Ksh)
Layers mash	70 kg	36	2,500
Sunflower cake	15 kg	70	1,050
Cassava mix	10 kg	60	600
Gristed maize (chenga)	30 kg	80	2,400
Fish meal	15 kg	50	750
Improved layers mash	140 kg	52	7,300

Celestine uses three different feeds for the chickens, which she buys in town. In four weeks she needs the following:

- **Chicks:** They are fed on chick mash only, her 100 chicks consume 80 kg in four weeks (a chick requires 2.2 kg of feed for 8 weeks).
- **Pullets:** The 50 pullets consume about 100 kg growers mash in four weeks (a pullet needs 4.5 kg feed for 12 weeks)
- **Cocks and hens:** The cocks and the laying hens take about 364 kg of improved layers mash in four weeks (an egg-laying hen requires 130 g of feed per day).

Vaccination is important

To maintain the health of her chickens, Celestine administers the following vaccinations: Newcastle plane and gumboro. Before migration to the next stage, her chicks get antistress applied as eye drops.

Since Celestine is breeding chicks, she doesn't sell eggs, except when she has a surplus. In four weeks, she sells between 70 and 100 pullets at an age of about 2 to 3 months. Rarely does she sell adult hens (at an age of 4 to 6 month) and cocks. "I could market much more," Celestine says. "There is a high demand for chickens in my area". From her estimates she can sell more than 200 chickens per month, but she cannot cope with this demand due to the use of hens for incubating eggs. Her vision therefore is to buy an incubator. The challenge in this is that it will require electricity and she is not yet connected to the national power grid. She has started to save money to pay for power connection.

income from poultry farming, while the other one keeps chicken to boost her income. Both of them are TOF readers and got some ideas from our magazine, and both strictly keep records and know exactly what the returns from their birds are.

Additional income from chicken

Rebecca Mulema is farmer and an adult education teacher from Kakamega. The 33 year-old mother tends her 1 acre shamba, feeding her four children and three other dependants.

As one of the first in her neighbourhood she started growing tissue culture bananas and now sells seedlings. Besides growing a variety of local vegetables, she has a few goats and cows and some chickens). She likes to keep indigenous chickens, because they are much easier to rear compared to exotic ones. She keeps the chickens below the goat shed, which is why her shed was cheaper to build unlike Celestine's.

Rebecca sells some of her eggs while she reserves the rest for her hens to hatch. The chicks are kept separately, whereas her pullets, hens and cocks share the shed.

Home-made feeds

She feeds the chickens using her own maize and two other different feeds, which she buys in town. Her 36 three-week-old



Rebecca Mulema

chicks feed on 5 kg of chick mash per week. The 20 pullets and 30 hens and 3 cocks together get one kilogram of maize every day and additionally 5 kg of layers mash per week.

Rebecca sells about 20 pullets per month. She can sell most of them to her neighbours. The same is true for the 30 eggs she sells per week. After hatching, her chicks get poultry feed added to the water. She applies the recommended vaccines.

Gross margin for Rebecca Mulema

Item	Quantity kg/month	Price Ksh/kg	Total Ksh
Chick mash (36 chicks)	20	50	1,000
Layers mash	20	50	1,000
Own maize	28	27	756
Vaccination			500
Expenditures			3,254
Chicken sales	20	600	12,000
Egg sales	120	10	1,200
Total income from poultry			13,200
Profit			9,944

Gross margin for Celestine Imbuhila

Item	Quantity kg/month	Price Ksh/kg	Total Ksh
Chick mash (100 chicks)	80	50	4,000
Growers mash (50 pullets)	100	50	5,000
Mixed layers feed	364	52	18,980
Vaccination			600
Expenditures			28,580
Chicken sales	85	500	42,500
Profit			13,920

Farmers discover the value of tree lucerne

The tree lucerne provides livestock with high quality fodder and adds nitrogen to the soil.

Felix Mbitu Murimi | The grass in the photo on the right does not look so fresh, but the seemingly well-fed cattle do not exhibit signs of starvation; the reason being they browse on the small trees or rather bushes called the tree lucerne. Tree lucernes are multipurpose trees: They improve soil fertility, enrich it with nitrogen and enhance rainwater infiltration. What is even more important is that the tree lucerne supplies farm animals with high value fodder. In Australia, farmers refer to the tree lucerne as "the living haystack."



Cattle in South Africa browsing tree lucerne, planted to provide quality fodder during dry season.

10 metre deep sinker roots

The correct name of tree lucerne is *Tagasaste* (*Chamaecytisus palmensis*). It is a small spreading evergreen tree that grows 3-5m high and has a remarkable root system. It is somehow like an underground-irrigation system, which recycles and washes out nutrients:

- The 10-metre deep sinker root (taproot) sucks up moisture and nutrients from deep down, which are then spread out via the network of horizontal feeder-roots.
- These nutrients are then made available to the plants and other organisms closer to the surface. Like all leguminous plants, the tree lucerne has nitrogen-fixing nodules in its roots, which fertilize the soil. That means, nutri-

ents that have leached down into the soil/clay are brought up to the soil surface and made available to plants once more; plants around the tree legume benefit. Tree lucerne harvests a lot of nitrogen out of the atmosphere into the soil.

More over, this multi-purpose tree acts as an insurance, especially in times of drought or during lean times. Tree lucerne can survive in areas with as little as 200 mm annual rainfall, though it requires at least 600 mm for good leaf production.

Efficient fodder bank

What makes tree lucerne unique? This evergreen legume fodder shrub can be used all year round to graze cattle, sheep and goats. One can also prune the branches and feed them to animals in zero grazing systems. The tree grows extremely fast, responds well to severe pruning and recovers quickly.

The leaves are highly palatable to animals. The nutritive value of the leaves is equal to Alfalfa (lucerne). Its leaves provide a protein-rich food (20 to 30 percent crude protein content) with high digestibility (77 to 82 percent), which all animals can safely browse without any risk of bloating; there are no reports of toxic components. This explains why Australian and as well South African farmers plant thousands of hectares with tree legumes to feed their animals all year round.

Tree lucerne's leaves are high in vitamin A and can increase the yellow colour in egg yolks when fed to poultry. As bee forage, the flowers of this tree

legume are an excellent source of nectar.

How to plant tree legume

One can use cuttings or seeds. The seeds are hard coated and must be treated before planting. Soak them in bleach, one cap of Jik with 1.5 litres of water for 3 to 4 minutes, then rinse them well in cold water before soaking them overnight in cold water. If there is no Jik available, soak the seeds in warm water for 1 to 2 days. They should be sown immediately after treatment. It is advisable to raise the seedlings in a nursery; they can be transplanted when they are 45 cm tall. Add some well rotten compost.

Shrubs should be protected from browsing by livestock for at least 2 to 3 years as they might kill the plant by feeding on the bark. However, it can be pruned during this time to encourage sprouting of multiple stems. Once the shrubs are well estab-



South African farmer planting tree lucerne seedlings

lished, they can recover well from browsing. Tree lucerne has immediate and long-term nutritional values and benefits – high protein levels for instance, has no maintenance costs and a life span of 60-80 years.

facts & figures

- Seeds for the tree lucerne or *Tagasaste* are available at the World Agroforestry Centre, United Nations Avenue, Gigiri, PO Box 30677, 00100 Nairobi. Telephone: +254 20 722 40 00 Email: worldagroforestry@cgiar.org Interested farmers should ask at the gate for the nursery, where they can get the seeds for the lucerne tree. Carry with you the scientific name: *Chamaecytisus palmensis* and your personal ID for entry.
- Yields: Per hectare per annum of dry feed from 11-16 tonnes with good rains. This estimation would be for plantings of approximately 1300 trees per hectare.
- More information: <http://lucernetreefarm.wordpress.com>

Benefits of nitrogen-fixing trees

TOF has reported quite often about the benefits of nitrogen-fixing trees. The very common and well-known ones are calliandra, desmodium, gliricidia, leucaena and sesbania sesban. Most of them are deep rooted, which allows them to gain access to nutrients in sub-soil layers. Their constant leaf drop nourishes the soil with highly valuable nitrogen. The extensive root system stabilizes soil; constantly growing and atrophying roots add organic matter to the soil while creating channels for aeration.

Long-term research in Malawi and Zambia for 12 to 15 years discovered that the yields of maize planted together with nitrogen fixing trees increased by up to 70 percent. Studies in Nigeria revealed that leucaena, planted together with maize, increased the rainwater intake in maize fields by more than 200 per cent.

More about lucerne

There is a difference between the tree lucerne and ordinary lucerne such as Alfalfa. More about this in TOF March 2013.

Cutting flowers and hair

Kepha Amulabu has diversified his activities and made the best out of his small piece of land.

Alfred Amusibwa | What can a farmer do with a quarter acre of land? Many farmers would do little and continue to live in poverty. Others would use their brains and creativity to make the best out of it. Kepha Amulabu chose the second option. Kepha is an active member of the Twajijenga Self Help Group in Kimilili. After the group got some training from Alfred Amusibwa, the *i-TOF* field officer in Western, Kepha started a tree and flower nursery.

In TOF October 2012, we featured the story on Kepha. For him, the article opened a market avenue for his tree seedling and flower gardening enterprise. More and more farmers and teachers visited him, buying trees and flower seedlings. One of them was an official from the Ministry of Agriculture in Kimilili who was curious to see what Kepha was doing in the small farm. They were amazed with whatever they saw on the ground; they wanted to know where he got the knowledge and the ideas for a tree nursery and floriculture. Kepha, of course, mentioned the training offered by *i-TOF*, which empowered him. The official did not have much to offer him, but just encouraged him to continue with the good work.

Got more contracts

A big break for him from a visit by a US-based neighbour who owns a compound nearby. Kepha got a contract to landscape the customer's compound. Using his beautiful flowers and the beautiful trees, he was able to come up with a plan, of how he could beautify the compound, because of his hard work, it took him a month and he was done with the job. He was paid well. He used some of the money to buy a cell phone 0708 906 944. The contract opened his way into more business.

Various sources of income

When the owner of the compound returned from USA, she found her compound sparkling clean and very beautiful. She was very happy to the extent that she wanted to buy Kepha a dairy cow to keep. Unfortunately, Kepha had not planned for the management of a cow due to the small size of his farm.

He was told to establish enough fodder/pasture for the animal considering that a dairy cow requires at least one acre land to have enough feeds, he is in the process and just waiting to be given the animal. However, the lady decided to buy him a shaving machine kit to open a barber shop and become a part time barber so that he could use the money he earned to sustain his small business as he awaited the purchase of the animal.

Plan to expand

The seedlings sales and the barbershop gave him an additional income, which encouraged him to save money through M-pesa. This money gave him strength, morale and determination to keep on and work even harder. He used part of his earnings to pay for a relative's burial expenses, the rest he invested in buying potting material for the tree and flower seedlings and to buy more compost manure from the neighborhood. Kepha says that he had bought the farm for Ksh 35,000. He confi-



dently says that the amount has already been recovered through flower and tree seedling sales, he is even confident of buying more land because he is now making good money from the business. He plans to dig a bore-hole so that he can have access to adequate water.

He is now able to pay school fees for his 13 years old son. Kepha has many thanks for the *i-TOF* training for the knowledge he has acquired, and the information from TOF copies, which he receives monthly. He is grateful for being featured in one of the TOF issues because it has boosted his business. ■

innovative farmers' corner

Maggots – nutritious chicken feed

This year, two British brothers David and Jason Drew will invest Ksh 100 million in a factory near Stellenbosch (South Africa). The factory is for the production of an alternative to fishmeal and soya animal feeds. The basic raw materials they will use are protein-rich fly larvae or maggots, just before the insects turn into pupae. To produce a ton of Mag-meal, as they call the meal of dried and milled larvae, about five tons of maggots are



A house fly lays about 1,200 eggs in her lifetime which develop into maggots (below).



required. At the moment, the small pilot plant near Stellenbosch with an output of two tonnes per week is producing Mag-meal only for research and development purposes. In the planned factory, the Drews will produce 25 tonnes per day.

The systematic use of maggots as a supplement to other feeds for chicken and fish is not new; the only new innovation is the plan for an industrial production on a commercial scale. In Benin, West Africa, thousands of small-scale farmers feed maggots to their chickens. A catholic priest, Father Pater Godfrey Nzamujo, introduced this method in Benin in the late 80s, in order to support small-scale poultry farmers.

There may be more appeal-

ing ways of producing chicken feed; but the use of fly eggs is a cheap and an easy method of supplying chicken or fish with high valuable protein-rich feed. Maggots should be fed especially to young chicks from day old to eight weeks of age since they require quality protein sources for optimal growth.

In their study "Utilization of house fly-maggots, a feed supplementing the production of broiler chickens", South Korean scientists discovered that the supplement of chicken feed with 10 to 15 percent maggots was the most efficient in terms of average weight gain for the 4-5 week old broiler chickens. It also significantly increased dressing percentage, breast muscle, and thigh muscle.

How to grow maggots

Blood or a piece of carcass from any dead animal is mixed in a pot with cow dung. Water is added and the pot is then placed away from the house or public place due to its heavy smell.

The flies will lay their eggs in the mixture and maggots will hatch and feed on them; one housefly for example, can lay 1,200 eggs in its lifetime of 16 to 24 days; it is a good consumer of almost all abattoir waste. During the day, the pot should be covered with a wire mesh, otherwise birds might pick the maggots. But in the night the pot should be closed to retain the heat necessary for the development of maggots.

After 5 to 10 days, depending

on the temperature, the maggots will be ready to pupate; this is the time to harvest: Collect the maggots by gently pouring water into the pot. The maggots will float and you can collect them and feed them directly to the birds.



A hi-tech maggot production unit. For more information go to www.blacksoldierflyblog.com

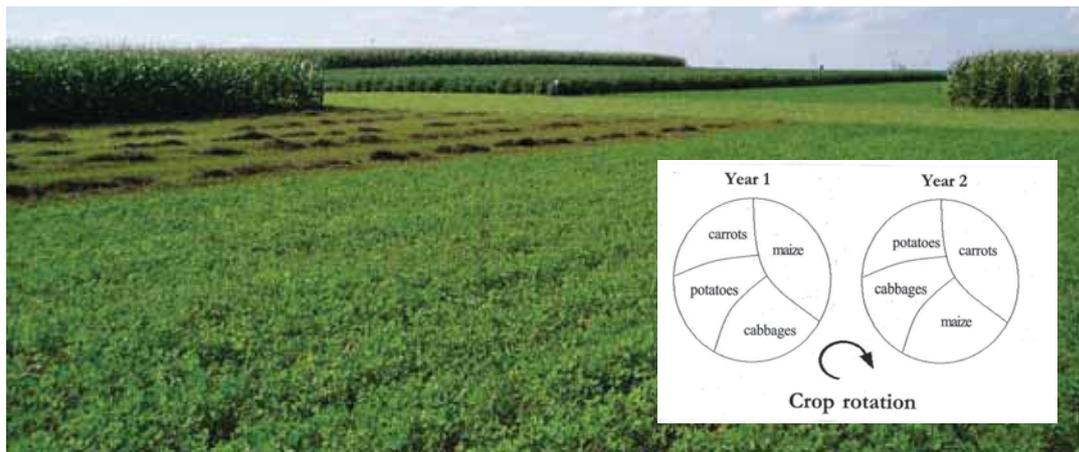
Crop rotation is important for soil fertility

How can I practice crop rotation on a small piece of land?

Very many farmers send us similar questions. A short while ago, one farmer wrote to us complaining that his shamba is only one and a half acres, he thought it was too small for crop rotation. Is crop rotation really possible on a small piece of land?

Our answer is quite clear: Yes, it is possible! One can use this method even on small *shambas*, so long as the farmer knows how crop rotation works. Let us first of all examine three major reasons why we should practice crop rotation:

Nutrients: Different plants require different types of nutrients. If you plant the same crop on the same piece of land, crop health deteriorates every subsequent year. Why? The crop takes



away the same nutrients from the soil. Consider this example. Vegetable crops in the brassica family (cabbage, broccoli, kale) are heavy feeders, which require plenty of nitrogen for rapid leaf growth. At the end of their growing season it is beneficial

to replant the area with legumes such as peas, beans, and lentils. Legumes have fewer nutrient demands and actually initiate a process where they fix nitrogen into the soil improving its availability for future crops. In short: Rotating crops increases

soil fertility.

Roots: Different crops have different root sizes. Deep roots, for instance loosen the soil, enhance aeration and rainwater seepage into the soil.

Pests and Diseases: Most pests prefer specific types of crops. They are usually attracted to suitable host plants by visual characteristics such as smell, taste, and other chemical signals. They multiply on this crop and survive in the soil or in crop residues on the field. Planting the same vegetable on the same place means, you offer them once more a valuable source of nourishment and they will multiply even more. When their favourite crops are replaced through rotation, the destructive organisms have their breeding cycles disrupted

It's a question of planning

You can avoid the problem by practising crop rotation. Divide your shamba into three or four pieces and rotate the planned crop after each season. Make a small plan, write down what you have planted in season 1 so that you can decide what to plant in the season 2. The table on the left shows good preceding and subsequent crops. Rotations are most effective when combined with such practices as manuring, composting, cover cropping, green manuring, and short pasturing cycles.

Together, these practices create soil quality improvements such as increased soil aggregate stability, decreased crusting of soil surfaces, and increased granular structure. Better soils guarantee healthy plants, which are more resistant to pests and diseases. Again: Crop rotation is the central tool that integrates the maintenance and development of soil fertility. **FMM**

Source: TOF Module number 2 Crop Rotation

Good preceding and subsequent crops for some common crops

Good in the preceding season	Current crop	Good to plant afterwards
All crops are good	Maize, sorghum, millet	All crops except carrots
All crops except wheat, barley, oats	Wheat, barley, oats	All crops except wheat, barley, oats
Rotate rice with: maize and other grains, legumes, sweet potatoes	Rice	Cowpeas
Maize, grains, spinach, carrots, onions	Beans	Irish potatoes, tomatoes, cabbage, onions, maize, grains
Maize, grains, grasses, legumes, spinach, onions, sunflowers	Irish potatoes	Cabbages, spinach, onions, pumpkins and squashes, sunflowers, soybeans, maize, grains, lettuce
Legumes (and all families except nightshades and cucurbits)	Tomatoes	Cabbages, maize, grains, grasses
Maize, grains, grasses, legumes, tomatoes, Irish potatoes, onions	Cabbage family	Only maize, grains, grasses, leeks
Cucurbits (pumpkins, butternut etc) onion family, spinach family, grains, grasses	Carrots	Maize, grains, grasses, beans
Cucurbits, spinach, lettuce, sunflowers	Sweet potatoes	Legumes, maize, rice, grains, grasses
Onion family, Irish potatoes, carrots, peas, grains, grasses	Spinach	Groundnuts, soybeans, all crops except spinach family and lettuce
Grains, French beans, Irish potatoes, spinach	Onions	All crops except onion family
Irish potatoes, onion family, spinach, legumes, maize, grains, grasses	Pumpkin, squashes	Root crops (but not Irish potatoes):
Carrots, sweet potatoes, yam, cassava		
Spinach, maize, grains, fodder grass	Groundnuts	Grasses, cotton
Maize, grains, rice, Irish and sweet potatoes, sunflowers, spinach	Legumes	Irish potatoes, tomatoes, cabbages, squashes, maize, grains, cotton
Maize, grains, spinach	Sunflowers	Irish potatoes, maize, grains, legumes



A cow fitted with a tsetse fly repellent collar. Photo: A. Bengelstorff

A collar that repels tsetse fly

Scientists from *icipé* successfully repel tsetse flies from cattle with the scent of an antelope.

Anja Bengelstorff | Mwanaasha Salim and her fellow villagers from Kipambane in the Shimba Hills in Kenya's coastal region have neighbours that threaten their existence: The tsetse fly that transmits sleeping sickness. The human sleeping sickness is caused by the trypanosome parasite carried by the tsetse fly. In livestock, it causes the disease known nagana. According to *icipé* researchers, three million livestock die every year from this disease that is transmitted by the parasite. Determined to develop a solution for the tsetse problem, the EU provided a grant of 1.5 million Euros. Since then, Mwanaasha Salim's three Zebu cows have gained both weight and value.

Natural repellents

Scientists from *icipé* have developed a mobile tsetse fly repellent technology to fight tsetse bites: The tsetse repellent collar. The repellents are obtained from odours of animals that the tsetse fly avoids such as the water buck, a big antelope species common in tsetse-infested areas of Eastern Africa but which is rarely bitten by the flies. The researchers have been able to produce repellents through optimisation of natural repellents found in the urine of cattle. These repellents have been used to develop repellent collars for protection of cattle. The knowledge has been patented by *icipé*. In areas such as Kipambane location, where the collars have been worn by cattle, the incidence of the disease in livestock could be reduced by 90 per cent, according to *icipé* researchers.

The collars were used alongside the tsetse traps, an earlier inven-

tion by *icipé*. These are made of different coloured pieces of clothes, blue to visually attract the flies after which they land on the black target and are then caught at the top of the trap into a plastic cage where they die of heat. However, as those traps are stationary, they lose their effect once the cattle move away.

"Before my cows carried the collars, they refused to graze in the mornings and evenings," says Mwanaasha Salim, therefore losing valuable time for feeding and ploughing the land. This has now changed. Even her children have it easy herding the cows which have gained significant weight. The family also saves money that would have been spent on drugs to treat infected animals.

Will farmers buy collars?

More than 260 farmers participated in the project *icipé* scientists say was a success. But in a few months time, the project will come to an end. The farmers are willing to buy the collars and chemicals – on condition that both are retailed for less than the cost of treating an infected animal. Should *icipé* be unable to find a suitable partner to continue with the project, Mwanaasha Salim's cows might be the last to carry the tsetse fly repellent collars.



A tsetse trap developed by *icipé*.



farmers forum

0717 551 129 / 0738 390 715

Turkeys for sale: I have nice healthy turkey birds for sale, weighing about 5 kgs. I am just left with around 50 birds to clear before end month. Silvano, email: smelea@yahoo.com

Tomatoes for sale: I will be harvesting my tomatoes from my greenhouse effective January 2013. Contact Alice Ndulu 0725 690 778

Dairy goats: ■ Lelgut Dairy Farm are selling some of their pure German Alpine dairy goats and their crosses, kindly visit our Facebook account/photo album for more pictures. Do let us know if you are interested by emailing us on lelgut-dairyfarm@yahoo.com

Quails for sale: We have over 2000 plus quails plus eggs and looking for a market, we can supply eggs too, 1 day to 1 month old, and mature quails for meat. Contact 0735 855 997, info@stuartholdings.co.ke (■ Stuart Farm) Nicholas Oture

Dairy cow wanted: I want to buy a good dairy cow, preferably a first calver, of good health and producing between 20-30 litres a day. Please contact me urgently. Paul 0707 548 028

Dorper sheep wanted: Do you know where I can buy dorper sheep for breeding? 0738 460 396

Info on indigenous chickens: Who has a successful history with rearing and selling *kienyeji* chickens to share with me for free please? 0710 450 596 ■ Philip Samson

Organic chickens: We run an organic poultry farm in Embu county. We breed dual purpose

chickens like dorep, Kenbro, sasso & our hybrid *kienyeji* nicknamed 'taste yangu', we sell their chicks as well as their chicken meat. Kirata poultry farm, Thiggingi 0750 046 770

Rabbit meat for sale: Both for local consumption or even in bulk/large quantities. For rabbit meat please call 0734 923 776/0721 219 092. ■ Sungura Kenya

Fodder trees for sale: We have calliandra, leucaenia each @ ksh 10. Fruit tree seedlings and others available at Forest Action Network (FAN) Njoro. Contact: 0727 145 592. Email: njoro@fan-kenya.org

Certified potato seed wanted: I am looking for certified potato seed *sangi* variety to plant in Nyandarua. Any idea where I can get them? ■ Njeru Wa Wang'ombe

Peacock wanted: I am a farmer in Mombasa and I am looking for a pair of peacock chicks. ■ Brian Mutua Sonko

Goat: Patrick Wawire from Kamukuywa has a male grade BOER Goat meant for serving females. Patrick 0718 184 904.

what others are doing

In this section we provide our farmers with additional information about what other institutions in the field of agriculture (production, marketing etc).

 icow.co.ke
spore.cta.int
gaia-movement.org
organiclifestyles.tamu.edu
http://yagrein.blogspot.com/

 facebook.com/groups/-farmingkenya

Warning: Pesticides killing bees

TOF | In mid January, the European Food Safety Authority (EFSA) warned about the use of the three pesticides: Clothianidin, imidacloprid and thiamethoxam. According to the European Union's food safety watchdog, these pesticides pose serious risk to honeybees. EFSA concedes that more research is needed in order to link them to the phenomenon known as Bee Colony Collapse Disorder, which has seen bee populations in recent years fall sharply across Europe and North America. The European Union has declared that if clear scientific evidence of adverse effects of the three products is confirmed, it will immediately take the necessary steps.

Beekeepers in Europe and the US have for many years demanded a ban on clothianidin and imidacloprid, both of which are primarily produced by Bayer's agricultural unit Bayer CropScience (Germany), and Syngenta's thiamethoxam, the active ingredient in Cruiser OSR, produced by Syngenta (Switzerland). These chemicals are used worldwide for seed treatment. Fears over the effects on bees led France to withdraw approval in June last year for Syngenta's Cruiser OSR, used for treatment in rapeseed crop. In Kenya, the insecticide thiamethoxam and imidacloprid are distributed by Amiran under the name Medal 25 WDG and Killitac 20% EC respectively.