

Dairy goats

If well-fed with a balanced diet and kept in clean shelters with sufficient space for exercises, dairy goats do well. *Page 3.*



Photo: IN

How farmers use TOF magazine

In the next few months, we shall feature some farmers' groups and individual farmers who have been reading *The Organic Farmer* magazine since its launch in April 2005. What did they learn? Did they put the knowledge into practice? This will help evaluate how farmers utilize the information we give through this magazine. In this issue, we feature Gladys Nyambura, who picked up the idea of growing mushrooms. *Page 6*



into practice? This will help evaluate how farmers utilize the information we give through this

Plant trees for our environment

TOF - Once again, farmers across the country are already planting various crops to take advantage of rains that have just started. Apart from growing food crops, one of the most important activities that farmers can engage in during the rainy season is the planting of trees. It is the responsibility of every farmer to ensure that their farms have new trees every year. One way to do this is to set aside a part of their farm where various trees can be planted for future use. Alternatively, trees can always be planted along our fences.

More than 80 per cent of Kenyans rely on trees for fuel wood, fruits, poles, fodder, stakes, leaves, pods, medicinal herbs, gums resins etc. Besides, the trees provide us with the rain to grow crops, help to sustain water supply, reduce soil erosion, strengthen terraces, mark our boundaries, provide shade and also create a healthy



Availability of seedlings is not a problem: In all regions, farmers' groups and individual farmers maintain tree nurseries.

environment for us and even other living things to live in. That is why we should plant more trees at every opportunity in order to improve our environment.

icipe starts organic honey production

TOF - Intervention by icipe has improved beekeeping for members of the Mwingi District Beekeepers Self Help Group (CBO), and the entire Ukambani community. Organic honey production in Mwingi alone has increased from 2.5 tonnes in 2002 to 54 tonnes in 2011. The overall household income has increased by 15 % over the same period. *Pages 4 & 5*



Sunflower for animal feed *Page 2*

Dear farmers

With this issue No. 95, *The Organic Farmer* magazine (TOF) is now eight years old. On average, about 240'000 farmers, extension workers and students read TOF

8 years of TOF

monthly. The magazine was launched in April 2005 with a print run of 10,000 copies. Eight years on, we now print 30,000 copies every month, and the number of farmers' groups keeps increasing in the waiting list. Every month, 30 new farmers' groups apply to be put in our mailing list; we receive about 200 phone calls, SMS and mails asking for advice or seeking buyers and sellers.

To us, this is really encouraging and a good sign that there is a close working relationship between TOF and the farming community in Kenya. On the other hand, the publication of this magazine is experiencing financial challenges due to the huge number of copies that has to be printed and distributed every month. So you understand why we are exploring the possibility of introducing some form of cost sharing in an attempt to keep the magazine in circulation and to raise the number of copies.

We ask ourselves why farmers' groups, which have been receiving the magazine for the last eight years and benefitted immensely from the content, cannot contribute in order to assist new groups? Or: Why should organisations that receive batches of 600 or 700 copies not contribute towards its publication? We are also exploring the possibility of running advertisements as one way of supporting the production.

However, we thank our readers for their lively feedback and are looking forward to a fruitful working relationship in future. **Editors**

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Sunflower is a good source of animal feed

Sunflower provides high quality feed for livestock, it also produces healthy oil for people.

Peter Kamau | Most dairy farmers may not know the value of sunflower as feed for dairy cows and even chickens. The main source of feed for dairy cows is Napier grass, maize stalks and the little dairy meal concentrates bought from agro-veterinary shops. However, giving your animals feed that is balanced both in nutrients and in adequate quantities will ensure good milk production all year round.

Making your own feeds not only cuts the cost of buying, it also ensures a farmer has good quality feed. The quality of feeds in the market is not assured, nowadays millers have devised ways of constituting poor quality feeds which are then sold to unsuspecting farmers. Beekeepers growing sunflower have an added advantage of high quality honey because bees collect pollen from sunflower while pollinating them.



Sunflower is a good substitute for soya beans and other proteins sources. Sunflower seeds (below).

A good source of proteins
Sunflower meal is one of the major protein sources in livestock feed, especially dairy cattle, chickens and even pigs and rabbits. It has a high protein, fibre and oil content. It has a protein content of between 29-30% and a crude fibre content of 27-31% and lignin (9-12%) and lysine (3.5%). One good characteristic of sunflower is that

it does not have any ingredients that affect nutrition in livestock, although its high fibre and lignin (the hard, woody part of the sunflower plant) tend to affect its digestibility. Besides, sunflower is a good source of calcium, phosphorus and B vitamins.

Apart from dairy cows, sunflower can be fed to rabbits, pigs and chickens. The quality of sunflower fed to livestock depends on the way it has been processed. For example sunflower that is milled without removing the outer cover (also called husk or hull) has high fibre (between 27-31%) but low protein content (about 23%); but in highly processed sunflower where the husks are completely extracted, protein content can be as high as 40%.

Sunflower can replace other feed sources

Dairy cows produce more milk when fed on sunflower meal that is partially or fully dehulled. For rabbits, pigs and poultry, a sunflower meal that is high on fibre and lignin would be suitable since they require feed with less energy. But what farmers need to know is that sunflower is still nutritious even when fed to animals without much processing. Sunflower can



be substituted with soya beans or even ground nuts but farmers are advised to take a sample of the sunflower feed for analysis to ensure it has the right balance of fibre and proteins.

Sunflower recommended

According to studies conducted in Tanzania, sunflower added to maize bran at the rate of 31% and fed to Zebu cross-bred dairy cows increased milk yield from 6.6 litres per day to 8.1 litres per day.

In Zimbabwe, sunflower cake added to maize and urea-treated maize stalks at the rate of 4.4kg per day in Jersey, red Dane and cross-bred dairy cows in open pasture, increased milk yield from an average of 5.8-6.0kg per day. In similar studies in UK, sunflower meal supplemented with fish and bone meal maintained the same amount of milk in Friesian dairy cows when it was replaced with soybean and rapeseed meal.

Read more on how to plant sunflower on page 4.

How to prepare animal feed

Sunflower cake is a rich source of protein and can make quality livestock feed for animals on the farm instead of buying expensive commercial feed whose quality is unknown. 3.5kg of sunflower, when pressed and milled, produce 1 litre of oil and 2.5kg of seed cake.

Dairy cattle rations

- Mix 18kg of sunflower cake with 100kg of maize germ to make dairy meal.
- Give a highly productive dairy cow 4kg of the sunflower and maize germ dairy meal and 2kg to low milk producing cows.
- Apart from feeding concentrates, dairy cows should be given their daily ration of Napier grass, hay or any other

available good quality fodder to their satisfaction.

Ration for chickens

Chickens starter: Mix 22kg of sunflower cake with 100kg of maize germ.

Growers' mash: Mix 20kg of sunflower with 100 kg of crushed maize (gristed maize or *chenga*)

Layers mash: Mix 18kg of sunflower cake with 100kg of gristed maize.

NOTE: When formulating feed for dairy cows, farmers should ensure the sunflower content is not more than 20% of the feed ration. In poultry feed, the sunflower content should not be more than 7% of the total feed ration.

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. It is published monthly by *icipe*. The reports in the *The Organic Farmer* do not necessarily reflect the views of *icipe*.

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Feed your dairy goats well to be productive

Apart from clean housing and sufficient space, dairy goats require a balanced diet to remain healthy.

Maurice Rangoma | Dairy goats are popular with many small-scale farmers; the main reason being that unlike dairy cows, they are easy to feed and do not require a lot of space to rear. However, most farmers with dairy goats do not manage them well, so they cannot be healthy and productive enough to give good returns in terms of milk and meat. Like all other animals, goats require a balanced diet that has all the required nutrients such as proteins, carbohydrates (energy) and vitamins to maintain a good body condition. Below we give some important information on goat feeding which should help farmers to keep highly productive dairy goats.

Space for a run

In formulating a ration for dairy goats, it is important to note the best way to feed goats and that the rations will be presented to the animals in the stalls. But the goats should have sufficient space for a run; it is a pity to see how small the cages of goats usually are - they are kept like prisoners!

However, there are advantages of stall-feeding, because:



Goats require clean housing to remain healthy and productive.

- You do not need an expansive piece of land for grazing pastures.
- You can use many farm products, banana leaves, maize, maize thinnings, bean husks etc. for feed.
- It saves time and labour, you do not have to take goats out of the shamba for grazing or spend time looking after them.
- Death among the kids and goats is reduced because they can be easily looked after throughout the day.
- It is easier to plan and manage breeding.
- It keeps goats from eating crops and damaging the shamba.
- It makes manure collection very easy.
- It helps in controlling pests and diseases.

Common dairy goat feeds

Pasture & Fodder

- Napier grass - ¼ acre per goat per year
- Desmodium - interplanted with Napier grass or pure stand
- Calliandra - feed green or hay, 20 trees per goat.

- *Leucaenia spp*
- Sweet potato vines
- *Sesbania spp*
- Pigeon peas plant
- Natural grass

Crops residues

- Maize stalks
- Rice bran
- Sorghum stalks
- Bean straws
- Ground nut straws

Concentrates

- Dairy meal
- Jaggery sugar
- Cakes e.g. sunflower cake

Minerals

- Maclick super
 - Unga high phosphorous (powder 20 g per day)
- Water:** At least 8 litres of clean water per day.

A sample ration

Dairy goats rations are formulated from roughages mainly sourced from forages, water, minerals and concentrates. They should be fed according to body weight and physiological requirements. Dry matter amount is critical in feeding dairy goats. The dry matter requirement is 6% of the body weight.

A goat weighing 30 kg will require 1.8 kg of dry matter. Here is an example of an ideal daily ration for dairy goat:

- 5 kg of Napier
- 0.5 kg sweet potato vines
- 0.7 kg of calliandra
- 0.5 kg of desmodium
- 40 g of very high phosphorous
- 8 litres of clean water

facts & figures

• A good quality dairy goat costs Ksh 10,000 to 15,000 or even more. An important address for dairy goat farmers: The Dairy Goats Association of Kenya (DGAK) P.O. BOX 1218, Nyeri, dgak@wananchi.com, 061 203 10 19

• On average, a dairy goat produces between 2 and 4 litres of milk per day.

Good feeding enhances the fertility of dairy goats

Good feeding is important as it determines the state of animal at maturity, lifetime production, age at maturity and fertility of the animal. Before animals are mated, flushing is done. About 0.5kg dairy meal is given daily for 2 weeks before mating to improve the body condition. After successful mating, adequate feed should be given to avoid embryonic wastage such as abortion.

For female goats, the aim is to attain the earliest age at first mating. About 7 to 9 months is ideal. At this time, the females should be 60% of their mature weight. This will enable milk production by the age of one year.

Provide concentrate 300-400 grams per day when they are 3-4 months old. At 6-7 months of age when mating time is approaching feed at about 100-200g per day to trim



down over fattening during

mating.

Feeding bucks

Increase feed by 15-20% during mating. Start introducing concentrates 6-7 weeks before mating at a rate of 200-300g per day. This diet should be continued up to the 6th or 7th week after mating.

Feeding during pregnancy

During the first phase (1 month) the foetus (unborn kid) grows undisturbed. Just feed slightly above maintenance.

The second phase (2-3 months) is also called mid-pregnancy. The foetus changes slightly. If protein in the feed is low, feed intake will be low resulting in protein deficiency. Protein requirements are not high but deficiency can be detrimental to the foetus.

Third Phase (3-5 months) or late pregnancy is the most critical stage of the foetus develop-

ment. Although the feed intake is low good quality feeding is needed to meet the requirements of the animal. Underfeeding will result in low birth weight, low production of colostrum and reduction in milk production.

Steaming up is done during the last 60 days of pregnancy. This is important for building stores for use in early lactation. Feed up to 400-500 grams per day of concentrates.

Feeding for Lactation

Protein is required at around 56g digestible crude protein per day for milk synthesis. Energy is the most sensitive nutrient and is required in the diet which should be balanced. Minerals especially calcium and phosphorous must be in the ration in larger amounts than other minerals. Most diets have enough of vitamins A and D.

MR

In the next issue, we will write about feeding goat kids.



How to grow sunflower

Climatic requirements: Sunflower can do well in a wide range of soils but it does best in fertile, loamy soils. The plant has a deep taproot, which makes it grow even in areas with very

Continued from page 2

little amount of rainfall. An average of 500-750mm of rainfall is adequate for sunflower production. It can be grown from sea level to an altitude of 2600 metres above sea level.

Land preparation: The land should be well tilled to form a firm seedbed.

Spacing: Seeds can be planted at a spacing of 75cm by 30cm at the rate of 2kg per acre (5kg/hectare). Plant 3 seeds per hill and thin to 1 plant per hill when the crop is 10-20cm high.

Fertilizer application: Sunflower does well in fertile soils. Application of rock phosphate would be appropriate because sunflower requires sufficient phosphate fertilizer to grow well. Application of well-prepared compost would provide additional nutrients to the soil. If rock phosphate is used, it is important to add humic acid from products such as Humax or Black Majik because rock phosphate is a slow release fertilizer that requires humic acid to hasten its breakdown and uptake by the plants.

Weeding: Sunflower does well in a weed free environ-

ment. Weed the crop when it is 0.7 metres high (after about 4 weeks). The crop cover prevents weed regeneration later.

Birds' damage: Birds can damage up to 50% of sunflower if they are not kept away through scaring. To prevent bird damage farmers can take the following measures:

- Cut the sunflower at knee height just before it dries completely. Cut off the head (capitulum). Spike the head on the standing stem with face downwards.
- Remove the sunflower head after drying and store at home.
- Threshing can be done at home using sticks and sunflower seeds stored.
- Sunflower seeds should be dried to 10% moisture content before storage.

Varieties

There are two main varieties of sunflower, the dwarf and the tall varieties. The tall varieties are open pollinated and grow up to a height of 1.5-2.4m. Their yield is poor compared to hybrids. Some of the tall varieties in Kenya are Hungarian white and Kenya Fedha. Dwarf varieties are hybrids and grow to a height of 1.2m, they give a higher yield compared to tall varieties. The most common dwarf variety is H 8998. Farmers can buy seeds for planting from agroveterinary shops or the Kenya Seed Company depots. ■

facts & figures

Variety	Maturity	Yield/acre	Oil content
Hybrid 898	130 days	1.25 tons	Very high
Hybrid 8998	120 days	1.25 tons	High
K. Fedha	130 days	1.25 tons	High
K. Shaba	130 days	1.25 tons	High
Hungarian white	170 days	500 kg	Low

NOTE: 1kg of sunflower seeds costs Ksh 250. You require 2kg of sunflower seed to plant one acre.

icipe pioneers organic h

Modern beehives and improved honey processing methods have raised both the quantity and quality of honey produced, while raising income for beekeepers.

Peter Kamau | Beekeeping for honey production is a traditional economic activity of the people of Mwingi district in larger Kitui county, a semi-desert region in Eastern province that is prone to periodic drought and famine.

Traditional beekeeping that mainly relied on log hives hewn from valuable trees was not sustainable. Apart from the use of log hives, the traditional honey harvesting methods used by beekeepers involved burning of bees, destruction and wastage of honey combs and unhygienic handling, transport and storage of honey.



With assistance from icipe, Mwingi beekeepers have discarded their traditional hives for modern ones that produce more honey.

Exploited by middlemen

Lack of markets for honey was another problem facing beekeepers. Much of the honey produced in this region was sold to middlemen who paid very low prices to the beekeepers. In this scenario, beekeeping was practised more as a subsistence alternative to crop production and not as a commercial activity.

However the fortunes of Mwingi beekeepers have changed significantly since the entry of *icipe*'s Commercial Insects Programme (CIP) into the region in the year 1995. The aim of the project is to restore the ecosystem and reduce poverty through introduction of income generating activities to communities near forest boundaries.

More money from honey

icipe has concentrated on beekeeping for honey production and harvesting of wild silk for production of high quality silk for the textile industry.

Internal Control System (ICS)

To ensure that farmers' groups maintain organic standards, an Internal Control System (ICS) is put in place in all farmers' groups that undergo organic certification. The ICS is a system that guards the integrity and organic quality of items produced by contracted farmers. All persons dealing with the product are identified, registered, instructed on the requirements of organic certification and then contracted to start production.

A social control system

Each member in a group that has undergone training and organic certification has to ensure that other members of the group abide by the standards of organic production in the entire value chain (production, harvesting, transportation, processing, packaging and

storage) putting in place a certain degree of social control.

Expulsion for non-compliance

In beekeeping, any member who is found violating the set standards by a fellow member, e.g. by using synthetic inputs or chemicals in beekeeping is expelled from the project and their contracts cancelled by the Mwingi CBO, meaning that they cannot sell their products as organic. Members who contravene the rules by mistake

Read about Organic honey certification rules in the next issue

are suspended for one year.

Groups undergoing certification cannot sell their products as organic immediately; they have to undergo a conversion period of between one to three years. For Mwingi beekeepers, the conversion period is usually one year since their honey is produced in a natural environment, devoid of pollutants. ■

Honey production in Mwingi



Mwingi beekeepers are involved in the entire honey production value chain, from making hives to honey processing and marketing.

For beekeepers in Mwingi, the project was a godsend, "1kg of honey was going for as little as Ksh 50. Sometimes, the middlemen would come for honey when they knew we were about to send children to school; then they would offer to pay even less than the Ksh 50. We would have no alternative but to sell them the honey," laments Sabina Mutamboki, a member of the Mwingi Beekeepers Self Help Group.

More women go into beekeeping

The project is working to promote modern beekeeping methods among farmers in the region. On average, one beekeeper produces about 300kg of honey in a good season, a kilogramme of processed honey currently goes for Ksh 500. The involvement of more women in beekeeping is a key achievement for the Mwingi honey project.

To enable the farmers increase honey production and its quality, *icipe* has introduced modern beehives such as the langstroth while the Ministry of Agriculture supplied the beekeepers with Kenya Top Bar Hive (KTBH). The modern beehives have increased both the quantity and quality of honey produced. The farmers have also started rearing stingless bees near their homesteads.

Farmers now produce organic honey

The farmers were encouraged to form groups, which were later trained in modern methods of beekeeping. From the 6 beekeeping groups that existed before *icipe* came to the region, there are now 54 farmers groups with a total of 2,500 farmers. There is no widespread use of chemicals in farming in the Kitui county. It was therefore easy for the project to help farmers convert into organic honey production after training.

Through the Kenya Association of Organic Network (KOAN), the CBO was awarded an organic certificate

by the Institute of Marketology (IMO) of Switzerland in 2009. Mwingi honey has a unique taste; the honey scooped the top Prize at the Organic Trade Fair held in Germany in 2009.

Bees increase crop productivity

Intervention by *icipe* has shaped beekeeping to the benefits of Mwingi District Beekeepers Self Help Group (CBO), and the entire Ukambani community. Honey Production in Mwingi alone has increased from 2.5 tonnes in 2002 to 54 tonnes in 2011. Farmers with hives close to their farms have benefited from bees through pollination of their agricultural crops. In this regard research has shown that crop productivity has increased by 10-18 per cent. The

overall household income has increased by 15% over the same period. More than 300 farmers, mainly women, managed to produce over 1000 metres of silk cloth worth USD 15,000 (Ksh 1,290,000) between 2007 and 2011.

The Ministry of Livestock Development has donated land where the CBO has a honey processing facility as well as a marketing outlet. Buyers from Nairobi and other regions now buy honey from the CBO's shop. Weaving of silk cocoons is also done at the centre. The *icipe* Commercial Insects Programme has received support from the International Fund for Agricultural Development (IFAD), UNDP-GEF, Toyota Foundation and British High Commission among many other donors. ■



"Beekeeping has changed my life"

Joshua Munywoki Kimwele has engaged in beekeeping for the last 20 years. He used to own 20 traditional beehives from which he would harvest about 100kg of honey in a year. He would then sell the honey to middlemen at Ksh 50 per kilogramme. But his fortunes changed drastically in the year 2000 when *icipe's* beekeeping project came to his area and trained him and members of Kassanga Beekeepers Group, the majority of whom are women, on modern beekeeping.

Given free bee hives

The *icipe* honey project together with Ministry of Livestock Development donated 20 langstroth and Kenya Top Bar Hives (KTBH) and trained the group on modern methods of beekeeping. Today Kimwele has 80 beehives from which he harvests more than 500kg of honey that

he sells to the Mwingi Beekeepers Self-Help Group at Ksh 400 a kilogramme. *icipe* has given him an additional 45 stingless bee hives from which he produces high quality medicinal honey. Recently, he introduced 4 mud hives into his apiary (bee farm) that he hopes to use in future. Mud hives are conducive to beekeeping and produce more honey.

He plans to increase hives

Kimwele plans to increase the number of beehives to more than 300 in order to earn more from beekeeping. He maintains a high standard of beekeeping, complete with records of each of his hives including production in each season.

"Beekeeping has changed my life. It is easy because all you need is the initial investment and the routine maintenance of beehives to ensure a clean envi-



ronment, which helps to control pests and diseases", he says.

Benefits from beekeeping

With earnings from honey, Kimwele says he has managed to pay fees for his children. He has also built a permanent house, increased his cattle herd and built an apiary. He now plans to buy a machine for making comb starters because bees take a shorter period to produce honey if the hives already have comb starters. ■

Gladys Nyambura is not always happy with *TOF*

Reading *TOF* since the launch in April 2005, Gladys Nyambura appreciates the magazine, "but *TOF* should fight more for better prices of commodities."

Philomena Nyagilo | When Gladys Nyambura read the first issue of *The Organic Farmer* magazine in April 2005, she realized that the content was familiar. "I never used chemicals against pests and diseases, and I improved the soil in my shamba with compost, green manure and crop rotation," she says. "I did it because I wanted to eat healthy food. I had just started farming, so it was encouraging for me to read more about sustainable agriculture in *TOF* - and I still read it up to now," she says.

Nyambura lives on her 1.5 acres shamba in Kabete. A holder of

Farmers lack support

Gladys Nyambura is convinced that the government should invest much more in agriculture, since agriculture has a huge potential in alleviating poverty in the country. Food prices need to be stable, prices need to reflect supply and demand and to a degree, shortages are best managed by prices, but if left entirely to the market, food prices are inherently too volatile. Reflecting the uncertainties of production as well as the effects of demand elsewhere, which is created by globalized markets.

"Only political action and public response from governments can provide stable food prices for farmers," she says and adds: "Most farmers are hard working. They lack support, not money."

In this regards, she says that the magazine plays an important role. "The magazine has been instrumental and a source of information and education on most issues pertaining to agriculture." She advises farmers to invest in high value crops to be able to get good returns. "With the common produce like *sukumawiki* (kales), you end up making a huge loss. Farmers should also consult with each other and read the *TOF* magazine to expound on their knowledge," Nyambura adds.



Nyambura places mushroom substrate in her production unit.

a Bachelors degree in science from the University of Nairobi, she had been a teacher for 10 years but resigned and decided to become a farmer. "Farming is a risky business," she says. "It is related to natural calamities such as drought and floods, high fluctuation in the prices of input, exploitation by middlemen, and so on."

"I learnt mushroom farming from *TOF*"

After reading an article in *TOF* about mushroom farming, she decided to go into this business. Today, it is her main source of income. Every month, she sells 100kg of mushrooms at Ksh 500 per kilogram. "I could get Ksh 1,000, if I had two or three regular customers or hotels or shops to sell to. But they want a constant delivery. So I do not have any other option but to sell to brokers who pay much less," Nyambura explains. "So, when I complain about exploitation by middlemen, I know what I am talking about. If the broker is benefitting more than the farmer, something is wrong, for sure!" That is a reason why she is setting up a second mushroom production unit to produce regularly to meet the demand of her customers.

In her *shamba*, Nyambura does not use any chemicals. She is convinced that farming without using chemicals is possible, but needs more labour. "Unfortunately, nobody is willing to pay for these additional costs," she says. She criticizes the developed countries, because they ban certain chemicals, but allow the export of the same chemicals for use in the third world countries: "Of course, it would be the task of our government to ban the importation of these chemicals, but our government is not

interested in hazards brought by such chemicals, because some influential people are engaged in their importation."

"*TOF* should inform more"

However, it should be up to the farmer to decide which way they want to go. "I prefer to buy non-chemicals, even if they are more expensive," she says. In this regard, Nyambura says that *TOF* should do more research. "You should provide other solutions if what you promote does not work. Let me give an example: I have tried neem, as you have proposed, but it did not work. So I had to look around by myself for another solution. This should be your responsibility to give us alternatives, if you are really committed!"

According to her, *TOF* may not be aware that many small-scale farms are managed by women, who do not have time to make plant extracts, due to the time-consuming procedures involved. The extracts do not

act immediately. "Some small-scale farmers have the money for buying the organic inputs which are in the market, unfortunately they do not know the exact product to ask for. So it would be of great benefit if *TOF* would mention them!"

"Fight for higher prices"

TOF should as well fight for higher income for farmers! "The price farmers are getting for their products are too low," she states. "In the long term, this will become a problem," she adds, "if you look around, you hardly find young farmers, they prefer to work in towns where they can get a stable income. Even if it is low, for them it is better than the hard work on the shamba! They would come back to their shambas if they really could earn an income that is sufficient to sustain their families."

She sees the same problem in credit facilities. "Women are neglected, it is easier for men to get credit, even though everybody knows that they are not as reliable as women in terms of repayment. Men expect free money!"

From her point of view, the government should do much more for women farmers, and she continues with a smile: "Even *TOF* should write more about these problems!"

On the other hand, farmers should plan carefully. She sold her cow because she didn't have a farmhand to take care of it; this was too expensive for her. Having sold the cow, she decided to buy a dairy goat, which gives her enough milk, she has an additional five meat goats for sale.

Let's cook mushrooms!

- Slice mushrooms into thin stripes including the stem (the stem is rich in fibre).
- Fry your onion or garlic and capsicum, dhania, tomato, etc. with oil, preferably corn oil (which has no cholesterol)
- Fry the onion until brown.
- Put your sliced mushrooms into the fried onion.
- Continue stirring your mushrooms until all the water is evaporated (use medium heat)
- Add salt to taste plus any other ingredient of your choice.
- Continue stirring until the mushrooms are brown in colour. Do not add water. If you need soup, add milk to the mushrooms instead.
- Serve with ugali, chapati or rice.



Water conservation is key to dry land farming

We appreciate *TOF* very much and have been reading the magazine for many years. Unfortunately, you rarely bring information on farming in semi-arid areas like Kitui. I really would like to know how to keep the soil moist. Joshua Musyoka, Kitui

Joshua, you are right. Frankly speaking, it is very hard to give advice to farmers in regions where there is lack of the most important resource in farming: water. There is as well, lack of information and limited research on crops that do well in dry areas. Kenya, like most other countries with a combination of highlands and arid areas has concentrated on the highlands with high rainfall because this is likely to give the quickest and most cost-effective return. According to FAO, there is lack of interest, low research commitment and the complexities of challenges results in a shortage of technology that can be applied to improve agriculture in semi-arid regions.

The building of dams, securing water catchments and supplying farmers with drip irrigation systems could assist the farming community in semi-arid areas. Unfortunately, we are not able to influence this, but in the coming months, *TOF* will publish articles targeted at farmers in semi-arid areas like Kitui.



How to keep the soil moist

Where rain is not sufficient, farming strategy must be directed towards minimizing any loss or wastage of rainfall. If the soil surface is hard and crusty, the rates of infiltration are low, leading to high run-off and hence less utilization of the rainfall. Surface crusting may hinder the emergence of seedlings. Deep cracking of soils can lead to increased loss of moisture by evaporation, and to cultivation problems.

This means that the soil should be covered as much as possible, with mulch, compost, grass and even crop residue. However, farmers are in a dilemma: They need crop residue such as maize stalks for use as animal fodder

or for making compost. But covering the soil is the only way they can reduce soil erosion and evaporation.

Using planting pits

Another way of growing crops such as maize, sorghum or Napier grass is the tumbukiza method. In this method, you dig a hole (60cm x 60cm x 60cm deep), fill it with composted manure and top soil to 40 cm. Plant the seeds and cover the hole with grass or any other kind of mulch.

Of course, digging the holes requires some labour input and is hard work in areas with dry soil, but at the end, it pays off: The moisture remains longer in the soil, and when it rains,

the water remains in the hole. During the dry season, you can water the holes once per week to keep the crops from drying. *Tumbikiza* method can also be done by use of trenches instead of pits, trenches give more food and fodder.

Plant early

There are two other basic requirements for good crop production: Early planting is one of them; the other one is choosing fast maturing varieties. KARI/Katumani has developed maize, beans and sorghum varieties, which take three months to mature. The harvest from these varieties might be a little bit less when there is drought, but you can still get some food. ■

Do I need to vaccinate my chickens?

In one of your previous magazines you wrote that the sap of aloe vera keeps chickens in good condition and free from diseases. Does this mean that I do not need to vaccinate them?

We may not say yes or no, but it depends on the conditions under which the birds are kept. We know some farmers who never vaccinate their chickens. However, they keep the poultry house and the chicken run clean; they use neem, diatomite and pyrethrum to fight mites, fleas and other pests. These help to keep chickens free of diseases.

Controlling diseases

Experienced farmers feed their chickens with green vegetables (hanging bundles of Sukumawiki in the chicken run where the birds can pick and eat the leaves). They also supply the chickens with water twice a day containing some drops of aloe vera sap and EM1. They also



add vinegar once every week to the water to control bloody stool symptoms (at a dosage of half a cup of vinegar for 5 litres of water). When they buy new chicks, they separate them from the rest of the flock to ensure they do not infect the flock with diseases.

You can try this method. Isolate some day-old chicks. It is just as important that you take care of them and that you observe them carefully. On the other hand, vaccines are not so expensive; losing a flock may cost you much more. We advise you to consult an experienced veterinary officer as well for more information.

The most important vaccinations

Marek disease: This vaccination is usually administered to young chicks in the hatchery.

Newcastle disease: Usually applied at 2 to 3 weeks, at 18 weeks, then after every 6 months.

Fowl typhoid / Fowlpox: Administer at 8 weeks in high-risk areas and at 18th week in low risk areas.

Gumboro disease: Usually applied in drinking water at 4th and the 14th day.

Where can I take a sample of my soil to be tested?

You need to take several soil samples from the affected parcel. To do this, select four or even six spots in the farm; from each spot, dig about a half-foot deep hole and take a little of the top soil and also the sub soil and mix them well. Go to the other spots and do the same, ensuring that the soil is well mixed. Finally, mix all the samples into one sample weighing about a half or one kilogramme. Put the soil in a paper bag, ready for test in a soil laboratory. Most KARI research centres in the country have soil test facilities. If you cannot get a KARI centre near you with these facilities you can send your soil sample to the KARI National Agricultural Laboratories (KARI-NARL) along Waiyaki way in Nairobi whose address is given below:

KARI-NARL, P.O. BOX 14733-00800, Tel 020 4443 376, 020 4444 144 ext. 264, 0722 539 273



Photo: D. Jacquemet

Angarika at his well managed fish pond in Vihiga

Discover value of information

Hesbon Angarika has improved his income through fish farming.

Dominique Jacquemet | After reading an article in *The Organic Farmer* magazine, Hesbon Sawia Angarika in Lyiadiuwa, Vihiga District, realised that his farm was suitable for fish farming and decided to build a fish pond. A permanent river that passes next to his farm turned out to be a great asset.

Before he started to do fish farming, Angarika wanted to know more about fish farming than he had read in *TOF*. He visited the local Farmers Resource Centre, where he accessed information from the InforNet-Biovision website and other sources about investment costs, fish management and potential markets, where he could sell the fish.

With the help of his neighbours, Angarika constructed a pond measuring 15 x 30 metres. It is fed with water through a small channel from the river. The base of the pond is lined with lime and ash to prevent water seepage as recommended.

Fish management

He bought about 1000 tilapia and 30 mudfish fingerlings to stock the pond. One fish fingerling costs Ksh 3. To feed the fish he buys fish feeds in town. 1kg of feed costs Ksh 40. He feeds

the fish daily at the same time, in the morning at 10 am and in the afternoon at 3 pm. During the first three months, he gives the fish 1kg of feed per day; in the fourth and fifth month he increases this to 3kg and after 5th month he feeds them 4kg per day. In addition, he also gives them greens such as the gallant soldier weed.

At around 8 months, he harvests about 800 fish. He sells one kilogram at the local market for Ksh 150. Before he restocks the pond with young fish, he clears the pond and lines its base with lime and ash to waterproof it. As a pioneer fish farmer in his village, he has become the chairman of a fish farmers group that has 18 members.

Reinvestment into farm

With the first earnings from his fish farm, he bought a pig and a heifer. With the income from the second harvest, he rented an additional plot to grow fodder for his cows. He admits that he has not been able to feed them properly. He hopes that with proper feeding, they will start to provide him with adequate milk for domestic use and sale. He has further diversified and also grows local vegetable such as *terere* (amaranthus) and some tissue bananas. He intercropped maize with soya beans, which has improved his maize yield and solved the problem of striga weed. ■

"High yield and good income"

"There is renewed interest in fish farming in Kenya. Farmers in suitable areas across the country are again turning to fish farming as a way of producing high quality food, either for their families or for the market, and as a way of earning extra income".

Quoted from: A New Guide to Fish Farming in Kenya by Charles C. Ngugi, James R. Bowman, Bethuel O. Omolo, published in 2007. The informative publication can be downloaded for free: http://pdacrsp.oregonstate.edu/pubs/featured_titles/Kenya_Manual.pdf

farmers forum

0717 551 129 / 0738 390 715

Dairy cows wanted: Any one selling good dairy cows for zero grazing, preferably in South rift? Quote price and your farm location. Please contact ■ Benard Kidew

0724 869 376.

Sweet yellow passion fruits for sale: Please contact Mugo Kaniu on 0722 794 144.

Aloe vera extract wanted: Please contact Rhoda on 0720 113 412.

Fertilised eggs wanted: I would like to buy 2 trays of fertilised eggs, preferably Kenbro or layers. I stay in Nairobi Area. Please contact ■ Robert Muraya.

Broilers for sale: We are selling mature broilers at Ksh 750 per bird, interested buyers can contact Catherine Luombo on 0728 859 116.

Potatoes for sale: Kisima Farm has certified potato seed. We offer the "Best of the Best" seed potatoes at competitive prices. Please contact ■ John Kibet on 0721 325 269.

Indigenous seedlings for sale: Cypress, grevillea, casuarina, pine, Kei apple and others. Interested buyers can contact David Ambani on 0727 003 932.

Dried sukumawiki for sale: If you need dried *sukumawiki* well packed in polythene paper please contact ■ Candy Obiogumu on 0725 690 778.

Ayrshire dam and bulling heifer for sale: The dam peaks at 30kgs/day three months after calving. It is pregnant. The breed is from the reputable Sanctuary farm, Naivasha and is registered with Kenya Stud Book (KSB). The heifer is an offspring of Sabaki (CAIS). The price is Ksh 250,000. Please contact Maurice Onyango on alegosiaya@gmail.com or 0723 585 907.

Rabbits and leeks for sale: I have rabbits and leeks for sale. Please contact ■ Kui Seniour.

Beans for sale: Please contact ■ Buoga Jared Omondi.

Milking machine wanted: If someone has information about where I can get a one bucket milking machine and cost, please contact ■ Basigwa Moses.

Rice for sale: Anyone in need of retail or wholesale supply of Mwea Pishori Rice, get the best bargains from Ebullient Supplies Ltd. Wholesale at Ksh 120; Retail at Ksh 135. Contact Debbie on 0725 913 349 or Wycliffe on 0723 669 189.

Land wanted: I need 5 acres of land for one year lease near Eldoret, Soy or Nzoia Scheme, please contact ■ Erick Ngosia.

Fertilised eggs, indigenous chickens wanted: I am looking for someone who can supply Kenbro fertilised eggs, preferably about 400 or more every week. I also require improved indigenous chicken from KARI. Please contact ■ Alexander Alex on 0721 747 719.

Chickens: Our poultry farm deals with dual-purpose chickens like Dorep, Kenbro and our hybrid *kienyeji* named 'taste yangu'. We sell their chicks as well as their chicken meat, call Fundi Wycliffe on 0720 046 770 0720 046 770.

Dairy goats for sale: Please contact ■ Allan Kango.

Rabbits: For rabbit meat, please call Sungura Kenya, 0734 923 776/0721 219 092 (local consumption and big quantities).

Rabbits wanted: I need 3, four month old rabbits (1 male and 2 females), which should be unrelated ■ Kelvin Kamoni on 0710 821 117.

Chicks for sale: We have chicks of various chicken breeds for sale to interested farmers. Dasco Enterprises on 0719 808 222.

Kienyeji eggs wanted: If you can deliver 50 trays of Kienyeji eggs daily, please contact ■ Winnie Ruto on 0786 583 153.

Mango seedlings wanted: I need grafted mango seedlings. Please contact ■ Favoured Estar Mukoya.

Seedlings for sale: Kuvita Welfare S.H.G located at Kutus has Moringa oleifera seedlings at their tree nursery for sale, please contact the chairman on

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
yagrein.blogspot.com
livestockkenya.com

 [facebook.com/groups/-farmingkenya](https://www.facebook.com/groups/-farmingkenya)