

# The Organic Farmer

The magazine for sustainable agriculture in East Africa



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## Milk prices confound dairy farmers

*Farmers cannot understand why milk processors buy milk at very low prices and sell at double the price.*

### The Organic Farmer

Milk is a commodity like any other, its pricing should follow the rules of supply and demand. During the dry season, prices go up as the supplies dwindle due to lack of fodder for dairy cows. The prices go down when the rains come when pastures regenerate due increased production from farmers.

But the upsurge in consumer milk prices over the last few months at a time when there is adequate supplies from farmers have left both the producers and consumers baffled. Currently, most processors are paying between Ksh 22

and Ksh 30 for a litre of milk after a deduction of Ksh 4 for transport from collection points to the milk factories. However the consumers are now paying more. A ½ litre of milk is now going for Ksh 40 per litre.

Many small-scale farmers see the huge difference in pricing as a rip-off by milk processors. In their view, this gap is too big. The processors themselves argue that they have to collect the milk, process, pack it and redistribute it to the retailers.

Most small-scale milk producers have discovered a way out. They sell the milk directly to hotels for Ksh 40 to Ksh 50, or to middlemen at between Ksh 35 and Ksh 40. In one of the next TOF issues, we shall have a deeper insight into the Kenya's milk industry.



## Indigenous or exotic chickens?

More farmers are going into rearing of indigenous chickens. They have realised that they feed less and are more resistant to diseases. In this issue we compare the cost of rearing indigenous and exotic breeds to help farmers decide which breed is more profitable to keep. See page 3.

## Making your own feeds for cattle

The cost of feeds is an issue of great concern to farmers. Feeds account for between 70 and 80 per cent to the cost of production. Many farmers want to cut down on feed cost without compromising the milk production levels in their dairy cows. One way they can do this is to make their own feeds. Feed making is not difficult if the right raw material are available. Some feed manufacturers sell low quality feed that does not have the right ingredients. Others have been known to grind maize cobs and sell it

as maize bran. Making your own feeds does not only reduce the cost of buying feeds, at least the farmer is also sure of the quality. See page 4

Do not tie your calf. Allow free movement. Page 5



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## Dear farmers,

In any successful farming enterprise, proper planning is one of the key areas that farmers need to prioritise in order to attain their production targets. Failure to plan is the major cause of poor returns in most farming operations. Before a farmer starts any new venture, it is important that they sit down and find out if it is viable or not, having looked at risks that can affect production or profit.

But the situation in most farming areas is quite different; farmers hardly plan what they intend to do either in crop or animal production. Most of the farmers wait to see what the other farmers are doing and then emulate them. If a farmer has made good money from selling cabbages, all the other farmers rush into cabbage growing and only end up flooding the market and earning very low prices for their cabbages.

If we look at livestock keeping, the situation is similar. There is a growing craze for high yielding or "grade cows" as they call them. High yielding cows such as Holstein-Friesian, Ayrshire or Jerseys require a high level of management that most local farmers cannot meet.

The common site in most farms are emaciated, poorly housed animals in small, dirty cages smeared with green sludge from their own dung mixed with urine and rain water. They are only fed small quantities of Napier grass and banana leaves.

It is not wise for farmers to go for such high yielding dairy cows. Indeed they can do better with improved traditional breeds that do not require a lot of care and which are not prone to diseases; such animals require less feed and can give adequate milk for both home consumption and sale.

The same goes for chickens, instead of going for purely exotic breeds that feed a lot and require good management, farmers can earn more from improved indigenous breeds that are now popular and fetch better prices in the market. Indigenous chickens eat less and do not require a lot in term of initial capital to start.

All these calls for proper planning and evaluation before one can start any farming project. Failing to plan is planning to fail, as they say.

# No crop has more proteins than soya beans

*Soya beans are a multipurpose crop; they have high nutritional value, enrich the soils and can be used in animal feed.*

## The Organic Farmer

It is hard to understand why many farmers are hesitant to plant soya beans. They are easy to plant, can be stored for years when properly dried, they have medicinal value against cancer and contain all the nutrients required by the human body including proteins, fat, carbohydrates, vitamins and minerals. Of course, most farmers are aware about the high nutritional value of soya beans. But unlike other food crops such as maize and beans, soya beans need processing into flour before it is consumed.

Soya beans are a healthy food and free of cholesterol. They contain more proteins than any other food crop. Soya beans is the only vegetable with a complete protein. 1 kg of soya beans has the same nutritional value as 2 kg of meat or 40 eggs. Its oil is easily digested in the body. People grow it for blending with traditional food crops such as maize or sorghum to make highly nutritious porridge or ugali. No wonder, that soya beans are one of the main food crops in Asia for the last 5,000 years.

### A crop for all regions

Soya beans do well in all maize-growing areas. They like humid climate with plenty of rain during the growing period (35-60 cm of rain is adequate), but can tolerate drought conditions after the seedling stage. However, they can perform better when the rainfall is well distributed during the growing period.

They like well-drained, fertile soils. Farmers should add one handful of farmyard manure or well done compost



*Soya beans being dried*



per hole, but are advised to mix it with soil to avoid direct contact with the seeds. Plant two seeds per hole, 5 cm deep, 5 -10 cm apart within the rows which are 45 – 50 cm apart. On average, one needs 25-30 kg good quality seed per acre. To be sure that the seeds germinate, it is advisable to mix them with rhizobium inoculants , one packet for 100 kg of soya seed. If the soil is poor, potassium can be added at the rate of 20-32 kg per acre

**Test the seeds!** Before planting, test the viability of the seeds to ensure they will germinate. This is necessary because soya bean seed loses its viability 6 months after harvesting. This test can be done by planting 100 seeds, if 75 of the seeds germinate, then the viability is acceptable.

**Choose the right variety!** Farmers are advised to confirm varieties suitable to their areas before purchasing seeds. There are many varieties of soya beans that have been developed in Kenya to suit the various climatic regions and soils in the country. The Gazelle variety is mainly grown in parts of Central Province and Laikipia region. The SCSi and Nyala varieties have been found to do well in Kitale area. Alternatively, farmers can obtain high quality seed including rhizobium from Kenya Seed Company agents near them. Most other seed companies also stock seeds.

**Nitrogen factory!** Soya beans are ideal

for intercropping with maize, since they contribute to soil fertility by fixing nitrogen through rhizobium bacteria in the roots. According to research, maize and sorghum yields can be increased by up to 25 percent if intercropped with soya beans. Therefore, soya beans can also be planted in rotation with a well-fertilized cereal crop such as maize, wheat or barley to provide fertilizer. When you intercrop soya beans with maize, plant two rows of soya between the maize rows. In this case, there is no need of applying extra fertilizer as the beans can use the fertilizer applied to maize.

**Avoid competition!** A threat to the young crop comes from weeds that grow faster than soya bean plants. They can crowd out the soybean plants and keep necessary sunlight from enabling the soybean plants to grow strong and healthy. Therefore weeding is important, this crop should be weeded two times during the growing period.

**Good returns!** Different soya bean varieties mature at different times. The early maturing types take about 75 days while the late ones take about 100 days. Harvesting should be done when the leaves turn yellow. Yields of up to 11 bags weighing 90 kg each per acre can be obtained, depending on the soils, care, variety and region where it is planted.

**Keep them dry!** The beans should be stored in a cool dry place to ensure the seeds are not spoilt (preferably at 10% moisture content). To minimize mould growth, soybeans should be stored at the lowest temperature possible. Cleanliness is also extremely important. As human food, it can be stored for up to 3 years without chemical dressing or change in nutritional quality.



*Chapati made from soya flour.*

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# Indigenous chickens give better returns

Unlike exotic breeds, they consume less feed and are tolerant to most diseases. There is a ready market.

## The Organic Farmer

Poultry keeping has many benefits for small-scale farmers. But farmers need not keep chickens just for their own home consumption in terms of eggs and meat. They need to rear them to generate a reasonable income to improve their income. For a long time now, farmers with an eye on the market believe that one can only keep hybrid or exotic breeds for this purpose. Indigenous chickens, if well selected in terms of breed can bring much more income, if not better than the exotic breeds. One of the factors a farmer should look at when going into poultry production of either indigenous or exotic chickens is the cost of production and the market including prices of each of these breeds.

### Advantages of indigenous breeds

Indigenous chickens have many advantages over exotic breeds. One advantage is that indigenous chickens can be fed on home-made feed rations and they can also be allowed to free range, therefore cutting down the amount of feed that the farmer has to give them. Unlike exotic breeds, indigenous are tolerant to many diseases, which reduces the veterinary costs. Although exotic breeds are highly productive in eggs and meat, the



cost of keeping them including management is a big challenge to farmers. This makes indigenous chickens much more attractive to keep.

Recently, researchers have come up with more productive indigenous breeds such as the Improved KARI Naivasha breed, which lays more eggs than ordinary indigenous breeds. An exotic breed such as the Leghorn can lay up to 300 eggs in a year, but the improved indigenous breed from KARI can produce 220 - 250 eggs under good management. Below is a comparison of the gross profit margins between exotic breed and improved indigenous chicken breed, which can help farmers make a decision on which type of breed is more economical to keep.

### Gross margin for 300 exotic layers

No.	Item	Cost (Ksh)
1.	300 day-old chicks @Ksh 90 per chick	27,000
2.	5 bags of wood shavings @ Ksh 150	750
3.	Paraffin for 8 weeks and 5 bags charcoal	7,000
4.	10 bags of chick and duck mash @ Ksh 2,800, 20 bags of growers mash @ Ksh 2,450 and 17 bags of layers mash @2,750	123,750
5.	Vaccination (Newcastle), Gumboro, dewormers and antibiotics	2,600
6.	Transport, water & labour costs	23,400
7.	Price fluctuation at 5 %	9,000
8.	<b>Total project costs for the first 4 months</b>	<b>193,550</b>
9.	<b>Monthly expenses from 5th to 20th month</b>	<b>53,067</b>
10.	Income: Sale of 255 egg trays @ Ksh 270	68,850
11.	<b>Monthly profit margin</b>	<b>15,783</b>
Accounts for the period of 20 months		
12.	<b>Total investment for the first 4 months</b>	<b>193,550</b>
13.	Monthly expenses from 5th to 20th month (14 x Ksh 53,067)	849,072
14.	Expenses total (item No. 12 + item No 13)	1,042,622
15.	<b>Total income from 5th to 14th month (14 x 68,850)</b>	<b>1,239,300</b>
16.	Profit from eggs sales (item No. 15 – item No. 14)	196,678
17.	Proceeds from selling 300 layers at culling stage @ Ksh 250	75,000
18.	<b>Total profit after 20 months (item No. 16 + Item No. 17)</b>	<b>271,678</b>

### Gross margin for 300 indigenous (*kienyeji*) layers

No.	Item	Cost (Ksh)
1.	300 chicks @ Ksh 80 per chick	24,000
2.	5 bags of weed shavings @ Ksh 150	750
3.	10 bags of home made chick mash @ 1700, 16 bags growers mash @ Ksh 1,700 and 16 bags layers mash @ Ksh 1,800	72,000
4.	Vaccines Newcastle, Gumboro, dewormers and antibiotics	2,600
5.	Transport, water, labour	23,450
6.	Prices fluctuation at 1.25 %	1,600
7.	<b>Total project costs for the first 4 months</b>	<b>129,600</b>
<b>Monthly cost from 5th to 20th month:</b>		
8.	16 bags of home-made layers mash @ Ksh 1,800 from the 5th to 20th month	28,800
9.	Dewormers	180
10.	Transport of raw materials	1,700
11.	Cost of 1 labourer if there is no family labour	5,000
12.	Fluctuation of prices 5 %	1,785
13.	<b>Total monthly expenses</b>	<b>35,680</b>
14.	Total monthly income from sales of 210 trays of eggs @ Ksh 450	94,500
15.	Monthly profit (item No. 14 - item No. 13)	58,820
<b>Accounts for the period of 20 months</b>		
16.	Investment (total expenses in the first 4 months ( <i>see item No. 7</i> ))	128,600
17.	Expenditures from months 5th to 20th month (16 x 35,680, item No. 13)	570,800
18.	<b>Total expenditures (Item No. 16 + Item No. 17)</b>	<b>699,480</b>
19.	<b>Total income from egg sales (210 trays eggs @Ksh 450 per tray x 16)</b>	<b>1,512,000</b>
20.	Proceeds from selling 300 layers at culling stage @ Ksh 500	150,000
21.	<b>Total income for 20 months (item No.19 + item No. 20)</b>	<b>1,662,000</b>

**Note:** The figures given are based on the improved breed of indigenous chickens. Prices of raw materials are subject to change depending on availability and region.

# How to cut down your animal feed costs

Farmers need to make their own feeds in order to reduce their production cost and make profit from dairy farming.

## The Organic Farmer

The cost of feeds is a very important factor in dairy cow management. Although many small-scale dairy farmers would like to improve their animals' milk production, they are constrained by the high cost of feeds. Without proper feeding dairy cows cannot produce milk to their optimum level. A dairy cow's daily feed ration should contain 75 per cent forage, 24 per cent and 1 per cent minerals and an unlimited supply of water.

### Make your own feed

While it is easy for farmers to get fodder, concentrates and minerals have to be bought. They therefore increase the cost of production for the farmer. Apart from having the best fodder sources, a wise farmer needs to cut down the cost of buying animal feeds from the shops. One way they can do this is to prepare their own concentrates on the farm if they can get the necessary raw materials.

Another reason why it is important for farmers to make their own feeds is the quality of feeds being sold in the Kenyan market. The feed industry has been invaded by many opportunistic feed manufacturers who make fake feeds or feeds of low quality.

### Fodder trees

Another way in which farmers can avoid the use of concentrates is to plant fodder trees and shrubs and feed them to their lactating cows. Research shows that 3 kg of fodder from plants such as calliandra, leucaena, desmodium, sweet potato vines and other legumes have the same nutritional value as 1 kg of dairy meal. Farmers can considerably cut down their production costs if they use these fodder trees to feed their livestock.

It is important that farmers know that

### Good to know!

3 kg of leaves from calliandra, leucaena, desmodium, sweet potato vines and other legumes have the same nutritional value as 1 kg of dairy meal.



Calliandra



Sweet potato vines



Lucerne

dairy cows need a balanced diet of energy giving feed, proteins, and vitamins. The diet contains 75 % of energy sources, 24 per cent proteins and 1 per cent minerals. Cows get most of their energy requirements from roughage (plant material). They require energy for body maintenance, milk production growth, weight gain and reproduction.

### Sources of energy

The main sources of energy are grasses and maize stalks. Fodder grasses include Napier grass, Boma Rhodes grass, Kikuyu grass, Guatemala grass, Nandi Setaria among others. It is therefore inadequate to feed your dairy cows with Napier grass alone. A mature cow requires 85 kg of quality fodder in a day.

### Proteins

For microorganisms in a cow's stomach (rumen) to break roughage (plant material) into nutrients that the animals can use, they need proteins. If the feed does not have enough protein, the cows show signs of poor growth, reduced milk production, loss of weight and late maturity. The amount of protein in fodder depends on the type of plants from which the feed is obtained; for example legumes have a higher protein content than grass; young and fresh plants have a higher protein content than older ones.

Young green pasture or fodder has plenty of vitamins. Good protein sources can be found in desmodium, lucerne, sesbania, bean straw, mulberry, calliandra (do not feed fresh calliandra as it brings smell in milk; let it dry before feeding). Other sources include sweet potatoes vines, sunflower and *omena*.

### Minerals

The most important minerals for dairy cows are calcium (Ca) and phosphorus (P). A balanced mineral supplement in form of powder or block lick should always be available for dairy cows to lick.

## How to formulate dairy meal

The increased cost of raw materials has at times forced some of the reputable feed companies to use cheap or alternative raw materials that is often of lower nutritional value, affecting the productivity of animals given such feeds.

Assuming that the farmer wants to prepare a 70 kg bag of dairy meal concentrate, the main raw materials he would need are given below:

1. 10 kg of wheat bran, 34 - 40 kg of wheat pollard
2. 6 kg of lime
3. Dairy premix
4. Mola Plus® or Milk Plus®
5. Common salt
6. Any of the following: Cotton seed cake (13 kg), sunflower cake (14 kg) or Soya (12 kg).

A dairy cow requires concentrates with a Digestible Crude Protein (DCP) content of between 14.5- 16.5 per cent. To work out if the above ingredients meet this requirement we have to calculate the amount of crude protein in each of the ingredients we have mentioned above as follows:

Wheat pollard	= 35 kg x 16	÷ 100	=	5.60 kg
Soya	= 13 kg x 45	÷ 100	=	5.85 kg
Lime	= 6 kg x 0	÷ 100	=	0.00 kg
				<b>11.45 kg</b>

To know the percentage of total crude protein of the combined ingredients in a 70 kg bag, you take the Total Protein (11.45) divide by 70 and multiply by 100 in the following way:  $11.45 \div 70 \times 100 = 16.36\%$

The three rations therefore will have a crude protein content of 16.35 per cent which is adequate in terms of the various nutrients needed by a dairy cow. It is important to add dairy premixes, Molaplu® or Milk Plus® to provide the missing micronutrients (these can be bought in agrovet shops) in the feed and some salt to add taste to the feed and encourage the animal to eat it.

The cost of dairy meal at the moment is Ksh 1500, in most towns. If the farmers were to make their own dairy meal it would cost about Ksh 900 depending on the prevailing prices of raw materials.

# Taking care of your calves pays off!

*The first months of a calf's life are crucial for later health, fertility and productivity.*

*Theresa Székely*

It pays off to take good care of a young stock. Female dairy calves are your future dairy cows. Good calf management means a world of a difference: disease resistance, higher fertility and more milk later in life.

## Care of the mother is important

Good calf management starts with good care of the mother. When the milk yield starts to decrease, low quality feeds like crop residues can gradually be introduced into the diet gradually. Cows are dried off two months before calving. These two months ensure that a cow is in good condition to give birth to a healthy calf. The udder needs to recover and prepare for the next lactation. To support drying off, stop feeding concentrates for at least 2 weeks. Crop residues can be the main diet now, as fat cows are more likely to have problems at calving time. Ketosis in particular is a high and fatal risk, and only very thin cows should gain some weight now. (Ketosis is a fairly common disease among adult cattle. It occurs in dairy cattle because of their inability to digest enough nutrients to meet their energy needs. Some typical symptoms happen to be a decreased appetite, marked weight loss, decreased milk production, nervousness, and hard, mucus covered faeces). Offer a good quality mineral mixture during this time.

Three to four weeks before calving, a dairy cow's stomach needs to be prepared for the high fodder and concentrate quantities required after calving. This is called "steaming up". Resume feeding concentrates in increasing amounts: by the time of calving, the cow should get 4 kg concentrates per day. At the same time, reduce mineral supplements to a minimum! This will prevent milk fever through activating the calcium stores in the bones. Resume feeding minerals only one week before



calving. During the last two weeks of pregnancy, the cow's appetite is reduced and feed intake must be encouraged with high quality forage.

## Calving

The natural instinct of a cow is to give birth in a secret and protected place away from the rest of the herd. After a few hours, she will leave and return to the herd, but she will visit her calf frequently for feeding. The calf will follow its mother and join the herd after three days. Supporting this behaviour ensures a good start in life!

- House the cow in a separate, clean, dry and spacious pen shortly before calving.
- When she is about to give birth, clean and disinfect your hands as well as the hind quarters of the cow.
- After the calf is born, allow the cow to lick it. She should remove all mucus from its nostrils, mouth and eyes.
- Cut and tie the naval cord then and disinfect it with iodine.
- The afterbirth (placenta) should come out within 12 hours after calving.
- In case of a difficult calving or retained placenta, call a vet officer.

## The first week

Encourage and help the calf to suckle immediately after birth. The milk from the first days after calving – the colostrum is special as it contains antibodies which immunize the calf and protect it against diseases which are present in the environment. Immunization is most effective during the first few hours! Without colostrum, a calf will grow poorly and be prone to diseases throughout its life; it may even die within a short time. A calf should drink at least 4 litres of colostrum within the first 12 hours. In case of difficulties, you may milk some colostrum and hand-feed it to the calf, but do it hygienically!

Leave the cow together with the calf for 3 days, or until the calf has suckled and the cow has calmed down. Allow the cow to visit her calf about every two hours. Later, allow the calf to suckle 4 to 5 times a day. This will also help to prevent milk fever in the cow.

## A calf's handling and housing

Calves are very susceptible to diseases and require careful handling. Their environment must be dry and clean so as to protect them from the cold, rain and hot sun. This prevents calf pneumonia and other common infections. Frequent cleaning and dry bedding are essential to prevent diarrhoea. Keeping calves in groups is beneficial, as cattle are social animals. Provide adequate space for movement, at least 2 square metres for each calf in a pen, and regular access to an outside area and grazing.

## Second week to weaning

- Begin to offer good, fresh fodder or good hay. This allows the rumen to develop, and the calf can get used to digesting fibrous feeds. Sweet potato vines are one of the best fresh forages for calves, as they are easy to digest and are rich in protein.
- From the second week, appropriate concentrates can be introduced gradually
- Provide a mineral lick
- Provide clean drinking water at all times
- Calves should be left to graze

## Feeding options

Calves can be fed naturally, by allowing them to suckle from their mothers, or from a bucket or other equipment. We recommend natural suckling to small-scale dairy farmers. Here are the reasons for this.

- The calf develops much better. Health problems like diarrhoea are rare and



*A new born calf needs good bedding.*

*continued: page 6*

## Agribusiness lifts farmer after training

Joel Kanyi has transformed his farming into a successful business after putting into practice his i-TOF training.

**Peter Murage**

Mzee Joel Kanyi is a member of Kathuiria Poverty Reduction Project. After attending i-TOF trainings, Joel opted to implement some of the skills he acquired from the training. First of all, he dug a small water pond to harvest water for his newly established organic garden. During the rainy season, the pond collected enough water to irrigate his garden and to sustain his projects.

At the same time, Joel decided to go for some niche products. He planted arrow roots, strawberries, passion fruits, and *moringa oleifera* trees. These are crops the farmer planted immediately after the completion of water pan project; he was convinced that he was sure of getting enough water to last him the dry season.

### Good income with arrow roots...

Last season, Joel harvested a lot of arrow roots and sold them in the local market. "Due to its scarcity, I was able to sell large Arrow root at Ksh 50, therefore I have all the reason to expand the area under the crop," he says. He is a good example to many farmers who still believe that arrowroots can only do well in wetland areas or along riverbanks. "Farmers only need information on how to reorganize their resources to produce enough food for domestic uses and for sale," adds Joel.

### ... and Moringa leaves

The farmer utilized his earnings from the sales of arrowroots to improve his bee apiary which was in bad condition. Eight hives out of 13 in the apiary are already occupied after he applied



the skills he gained from i-TOF training. He is also earning an extra income from moringa powder which is a good remedy for many ailments including high blood pressure. The farmer has planned to start production and supply of passion fruits to the local market.

Joel is now proud of the achievements he has made after attending i-TOF trainings. He hopes that his enterprises will generate enough income to enable him to install simple drip irrigation system for proper water utilization. Other farmers are frequently visiting him to learn.

## >>> from page 5: Calf rearing

mortality rate is lower.

- Suckling is easiest to manage and requires no labour and no equipment. Bucket feeding is management intensive and a health risk for the calf because of high hygiene requirements.

- Milk is at the correct temperature and there is no chance of contamination through unclean equipment.

- Cows produce more milk when they are suckled in addition to being milked than when they are milked only: The effect of better stimulation!

**And don't worry:** a well fed dairy cow produces much more milk than her calf requires. A simple way to feed the calf is to leave two teats unmilked (during the first 2 months), and later on one teat. Leave the calf with the mother for one or two hours, and separate them until the next milking.

### Weaning and managing

A calf's weight should have increased

by at least 2 ½ times its birth weight before it is weaned. If you provide good forage and concentrates starting from the second week, it is easy to wean a calf after about 4 months. Continue feeding good quality fodder as much as the calf will take. In addition, feed about one kilo of an adequate concentrate per day. Growing animals have high nutrient requirements! Provide access to water and a mineral lick at all times.

At the age of six months, a heifer's needs cannot be met by feeding good quality fodder only. However, where only poor quality fodder is available, you should supplement it with good quality concentrates available. There are several very good reason for this: Well-fed, healthy heifers are ready for mating earlier and will also produce more milk after calving.

**In the next issue, we feature about common calf problems and diseases.**

## Answers in brief

### Compost should be dry

What should farmers do if the prepared compost is wet and planting is due?

Good compost should be dry. Wetness is a sign that the compost was not well covered during preparation. Covering compost prevents water damage through leaching and evaporation of nutrients.

### Living organisms in compost

Composting encourages multiplication of living organisms in the soil and the compost it self, are these organisms not pests to the target plants?

Living organisms in the soil include earthworms, centipedes, millipedes, ants and beneficial bacteria among others. These organisms are not pests, they help break down plant material, aerate the soil and release important nutrients that help improve and enrich the soil.

### Liquid fertilizer and plant teas

What is the difference between liquid fertilizers and plant teas?

Liquid fertilizers and plant teas are one and the same thing. They are all prepared from plant extracts to control pests or provide nutrients to planted crops.

### Composting period

How long will it take before my fertilizer is ready?

Depending on the size of the heap. A small compost heap of about 1 cubic metre can be ready in about 3 weeks if it is well made and turned regularly.

### Liquid fertilizer and pesticides

Can I mix both liquid fertilizers and natural pesticides?

Yes, most plant extracts contain fertilizers and natural pesticides. For example you can combine tithonia leaves with chillies or African marigold, garlic etc. to prepare plant extracts with plant nutrients and pesticidal properties. For spraying, you can use a knapsack sprayer, but ensure the extract is strained to remove impurities which can block the nozzles of the sprayer before using it.

### Compost best in a heap

What is the difference between putting your compost material in a hole rather than a heap?

Compost in a pit takes a little bit longer before it is ready for use mainly because of the low temperature in a pit. It is also subject to leaching if runoff water gets into the pit. On the other hand compost in a heap can take a shorter period because temperatures are slightly higher than in the pit. If well-covered the compost loses less nutrients.

### Sand in bird feed

What do birds benefit from eating sand?

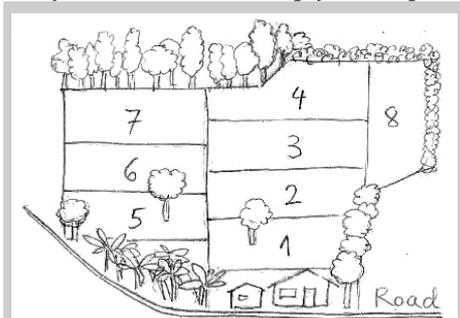
The stones in the sand help break down the feed in the gizzard and speed up the digestion. Sand and grit is therefore very important in a bird's digestive process.

## Crop rotation even on small *shambas*

You have told us not to be planting the same crop on the same piece of land every year no matter how small the land is. Why?

This is fundamental knowledge used by most farmers all over the world. It is the result of centuries of farming experience and observation. It is also simple to understand. Ask yourself the following two questions:

- if you wanted to attract for example cabbage pests like the diamond back moth and cabbage diseases like black rot, what would you do?
- if you wanted to multiply these pests



### Do not trust your memory!

For most people, it is impossible to remember all the crops they planted on each of their plots during the past years. Therefore, you need at least a small booklet where you can note down what you planted every rainy season. Make a sketch of your farm which shows all your plots and give them a name or a number. Then list for each plot which crop or intercrop you planted there.

and diseases at a very fast rate, what would you do?

It is obvious that all you have to do is to plant cabbage over and over again on the same spot, or in a greenhouse.

So these specific pests and diseases need their specific host plants to multiply. Cabbages have different pests and diseases from maize or tomatoes. Only few pests and diseases can survive on several different crops. And all pests and diseases must survive the dry season, after the crop has been harvested and the field is free from crops. They have found a way of doing so by remaining hidden in the soil, or inside crop residues in the field. If you plant the same crop again the next planting season, they will be very happy that you served them their favourite food for feeding and breeding again.

This is in short why it is wise to plant some other crop than the one you planted the previous season in any plot of your shamba. Pests and diseases caused by bacteria, viruses, fungi, nematodes, or insects accumulate in places where they find food. Microorganisms usually survive in this place for some time even without feeding from their host. It means that after planting cabbage, the soil from this plot is infested with cabbage disease causing pathogens for several seasons. This is why you should wait even longer than one season before you plant the same crop on the same plot again. Maize can be planted every second season. But for most vegetables, the best interval is three to four years.

## Yams need fertile, well-drained soils

My yam crop is being destroyed at the roots by pests, what can I do?

Try to find out what the reason for this could be. A common pest of yam tubers is the greater yam beetle, a brown or black beetle about one inch long and with 2 prominent knobs on the head. It produces tuber holes. It can be avoided to some extent by planting as late as possible in the season.

Yam scales are yellow to whitish when still young, adult ones more pinkish-brown and cone-shaped with a white patch at the tip. These may be difficult to fight. Make sure your yam is planted in fertile, deep, and well-drained soil. Heavy, water-logged soils promote tuber rots and pests. If you use irrigation, make sure the water is not salty, because yam does not tolerate saline soils.



Nematodes attack yam crops quite often. You can avoid this by planting Mexican marigold between the yam plants or other repellent plants.

### Don't recycle maize

Can I plant the seeds of maize that I harvested last month and dried?

Of course you can. But it depends very much on what kind of maize you planted. Hybrid maize will usually deliver a very weak result because of its special genetics and breeding method. Maybe you could compare the seeds you dried with certified maize seeds. Plant them separately but under the same management, then you will see the difference.

### Cuttings or seeds?

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

This is left to your experience, and depends also on the type of plant. Seeds are usually used for annual, uniform crops, while cuttings are more used for perennial plants. With cuttings you can be sure to obtain a plant with the same properties as their mother plant.



## Sneezing and coughing chicken

My chicken sneeze and cough. What could be the problem?

Your question does not explain a lot! But we suppose that your chicken are suffering from the Chronic Respiratory Disease. It is a disease with medium mortality (10-30% of the flock). It is common when chicken are in overcrowded places without fresh air. Apart from a general weakness, the symptoms of the Chronic Respiratory Disease are:

- A thick yellow pus under the chicken's eyelids.
- A thick liquid running from the eyes and nostrils.
- Puffy eyes.
- Sneezing and coughing.

If a flock is affected by Chronic Respiratory Disease, put them in a bigger space with more fresh air. Put all the sick ones in a warm, airy place and give them Terramycin powder in their drinking water. Mix 2 teaspoons of powder into 5 liters of water, and make sure the chicken drink this water immediately.

**Note:** Before buying Terramycin powder, look at the expiry date on the label. If it has expired, the powder will have no effect on your chickens.

## Local vegetables, check the market!

Can one commercialize on producing and supplying to the market some of these local vegetables?

If there is a market for any of them and you can be able to sell at a convenient price, you should of course go ahead with it! But first make sure you have reliable partners and or buyers for your produce.



Black nightshade (*managu*) plant.

## Transplanting seedlings requires skill

*The way you plant seedlings determines their vigour, future vitality and health.*

### The Organic Farmer

Once in a while, a farmer may need to transplant seedlings – be it cabbage, sukumawiki or trees seedlings from a nursery to the shamba. How the transfer is done determines the vigour, future vitality and health of the particular plant. The way you pull the plant from the soil, how you handle it during transfer and the way it is planted is very important for the survival of the plant.

### Hardening seedlings

Hardening seedlings is a very important process, usually done before the actual transplanting or transfer of the seedlings to the garden. To harden is to expose the plant to the conditions or the environment it is likely to face outside the nursery or in the shamba. One method farmers can use is to withhold watering the seedlings for one week before the transplanting day. When seedlings are hardened, they not only become physically hard, but they also build energy reserves that can be used to boost growth when conditions improve.

### Transplanting stage

The general rule for seedlings transplant is to wait until the plant has developed 3-4 true leaves. The first leaves



to emerge after you plant seeds are called cotyledons; they are different in colour from leaves that grow after. The purpose of the first leaves (cotyledons) is to provide stored food to the seedling for a short period when the plant is too young to make its own food. The true leaves later grow and start generating energy from sun's rays (photosynthesis) that feeds the plant for the rest of its life.

### Transplanting time

- The best time to transplant is when the sky is cloudy (without sunlight). Plant seedlings in the evening when the sun's rays are weak; the seedlings will recover during the night and be ready for the strong sunlight the following day.
- For tomato seedlings, bury part of

**Tilapia fingerlings for sale:** I have tilapia monosex finger Tilapia fingerlings for (weight 600 gms in 7-8 months) catfish fingerlings (grows to 1.5 kgs in 8 months) and can be used for feed formulation. Contact Silverfish Aqua Farm 0722 655 606/0733 655 606

**Broilers for sale:** I have 500 broilers ready for sale at a wholesale price of 270/= per kilo, each weighs about 1.4kg

**Goat milk for sale:** Interested? Contact me on 0724 154 176, Nakuru

**Sukumawiki for sale:** I have sukuma wiki ready, encouraging large orders in 10 kg units, please call Moses Agina 0722 630 719.

**Training on rabbits:** I am interested in rabbit keeping. Anyone with information on where to get credible training and start up can contact me. Eric Amisi Email evidzas@gmail.com

the stem when transplanting into the garden; new roots will grow along the buried section of the stem. If the seedling is too tall, dig a trench and plant seedling sideways at an angle, one part of the stem and leaves should be above the soil surface.

- For potted plants, push up the bottom of the plastic potting and squeeze the sides a little to release the root system (rootball). Water the plants after the transplant to help settle the soil around the roots. Watering seedlings with compost teas will give the seedling a strong start.

## Health Information

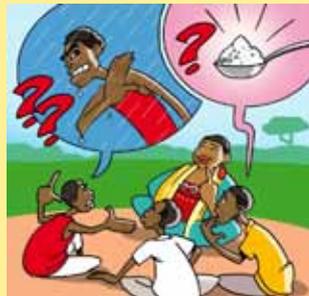


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iAfya's Mama Fatuma explains... **How does one get Malaria?**



Mama Fatuma is amazed at all the wrong stories about how people get malaria.



You can only get malaria if you are bitten by an infected mosquito, mainly at night.



Sleep under treated nets provided by the government. Do not use the nets for other purposes.



Now you have a torn net! The mosquitoes will get you.



With fixed nets, you are better protected from mosquitoes.



Look out for our next issue on: **Signs and symptoms of malaria?**