

The Organic Farmer

The magazine for sustainable agriculture in Kenya



Nr. 72 May 2011

Potential for meat goats

Kenya has a huge potential for goat meat production, with a population of about 8 million goats. Goats do well in arid and semi-arid lands where there is little pasture. However, Farmers need to keep high management standard in order to produce high quality meat. Page 3



Source: Baaland

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Maize seed options 8

Dear farmers,

Just when they were planning to start planting, Kenyan farmers are caught up in yet another scandal in the agricultural sector: They cannot get maize seed due to a countrywide shortage. The news is really disheartening taking into account that maize is the staple food of the majority of Kenyans. The shortage has very serious consequences for the country. The only option left for farmers is to either go for any variety available in the shops or to go back to their stores, get maize meant for consumption and plant it.

What could have gone wrong? The government and the Kenya Seed company, which supplies more than 80 percent of maize seed in the country, clearly know how much maize seed the country requires in a year; therefore they must have known about the looming shortage and taken contingency measures to ensure farmers do not experience any shortage, come the planting season.

The explanation given by the company that the shortage is a carry over of the drought that ravaged the country two years ago simply does not wash. Last year, there were adequate rains throughout the country. The year's production should have covered any shortfalls experienced two years ago. Being the dominant player in the maize seed market, the company has a social obligation to serve Kenyan farmers as a matter of priority. On this, the company has failed Kenyan farmers.

With the opening of the larger East African market, it is easy to tell where most of the seed meant for local use may have gone. Local seed is in great demand in the neighbouring countries, which can easily tempt any company to sell their stocks at higher price in those markets or to middlemen who can buy the seed in large quantities and later sell at a higher price in those markets.

Still the blame goes to the government. The Kenya Seed Company is still a government parastatal; that means that the government still has some form of control on what goes on in there. Maize seed availability is a sensitive matter that threatens national food security. Once again Kenyan farmers and consumers have been betrayed through poor planning and lack of foresight.

Tree planting

Our trees Our future



In this fifth article of our series "our trees – our future" we write about the best practice of planting trees. Page 4

All about egg candling

TOF - One of the requirements for successful chicken rearing is strict management of eggs, for both market and breeding. The easiest way of sorting eggs for both purposes is through candling. Candling helps the farmer to select the best eggs for incubation, thus eliminating the infertile or bad eggs and increasing hatchability. Page 6

Farmers, do you still want TOF?

TOF – In November 2010, we carried out research on readership of TOF magazine. We sent out a short questionnaire and repeated the same questions in subsequent editions. Our targets were:

1. To confirm if farmers' groups receive the magazines we send to them,
2. To determine whether the major distributors are handing out the magazines to farmers,
3. To find out if TOF really reaches our targeted readers who are the small-scale farmers in Kenya.

We have made it very clear in every issue of TOF since November 2010 that all farmers' groups and major distributors who do not respond to the questionnaire by 15th March 2011 will be cancelled from our mailing list. We have to do this because so many farmers' groups are in our waiting list, and for the time being we have to limit our copies to 21'000. Most farmers' groups which are getting TOF directly have responded, many of them wrote back to us. Thank you for the positive feedback.

Some farmers groups and a good number of big distributors have not answered the questionnaire. We con-

sider this silence as a sign of lack of interest in the magazine. We have therefore cancelled them from our mailing list. We think it makes more sense to deliver TOF to all farmers and institutions who are interested and value it.

Farmers, apply directly

Farmers' groups which have been receiving the magazine through NGOs that have not responded or other institution, are requested to apply for their copies directly from us. We do not want to punish these farmers just because these NGOs or institutions have ignored our appeals for a feedback. If farmers groups who were getting their copies through such individuals or institutions fail to get them, they can send us their group's name, a copy of registration certificate (if the group is registered), the number of members, names and phone numbers of the committee members, name of the contact person and the correct postal address. We shall repeat this information in our radio programmes on KBC (Thursdays, 8.15 pm) and Radio Milele (Tuesdays, 8.30 pm).

An easy way to make your own fertilizer

By making organic fertilizer, farmers can cut costs, build soil fertility, increase crop yields and income.

The Organic Farmer,

Plants tell you what they need. It is very easy to recognise if a crop does not get enough nutrients. A change in colour of the leaves is an indication that the crop has inadequate nutrients. So farmers should be ready to correct the problem before it is too late.

Lack of nitrogen, phosphorus and potassium is the most common deficiency; these nutrients are needed in larger quantities when plants are in the growing stage. Of course, we cannot emphasize enough that the most important step lies in managing soil fertility throughout the year. Feed the soil, which in turn feeds the plant: The continuous use of compost, livestock manure, green manure, cover crops, soil-applied rock minerals and well-planned crop rotation are paramount in building up soil fertility, resulting in healthy plants that can withstand pests and even diseases.

Foliar feed is effective

A farmer can support this process through feeding the growing plant directly – with foliar feed, commonly known as liquid manure. Foliar application gives nutrients to plants directly onto the leaves and the stems. Observed effects of foliar fertilization include yield increases, resistance to diseases and insect pests, improved drought tolerance, and enhanced crop

quality. In terms of nutrient absorption, foliar fertilization can be up to 20 times more efficient than compost or any other fertilizers.

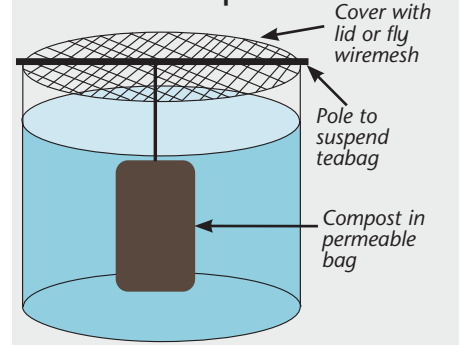
Making liquid manures

Liquid manures are prepared by dipping a bag full of manures and a variety of freshly cut plants with nutrients, pesticidal and medicinal properties suspended in a drum full of water. The sack is tied to a stick and lowered into the drum. The bag should contain about 30 to 50 kg of manure and plant material to 200 litres of water (see sketch). The farmer should hold one end of the stick and lift it up and down every 5 days to stir the mixture and speed up the release of nutrients. Usually, the solution has a strong smell because the excess nitrogen turns to ammonia, it is important to cover the drum to stop the escape of nitrogen. If the smell disappears, it means the liquid is ready for use. The water also turns brown showing that the mixture is ready for use. Dilute the mixture before use and sieve it well. Apply the liquid fertilizer every week until you notice changes in the crop.

Using plants only

If you make foliar feed from plants only, it is advisable to use many different plants, such as African marigold, stinging nettle, tomato leaves, neem, comfrey, sodoms apple, lantana, garlic etc. These plants help control pests, diseases and also add important nutrients that enable the production of a healthy crop without the farmers having to incur the costs of buying inputs.

How to make liquid fertilizer or compost tea






Spraying tips

For foliar feeds to work effectively, certain guidelines must be followed:

- To be efficient and to avoid crop damage, very dilute solutions of nutrient formulations are suggested. Highly concentrated sprays have the potential to burn plant leaves.
- Leave the water you use for diluting to stand in an open tank overnight; this generally renders chlorinated water harmless to beneficial microbial mixtures.
- Sieve it properly. Small, undissolved particles can quickly clog nozzles.
- Best effect is achieved when foliar sprays are finely atomized and when wind is minimal. Absorption is increased when sprays also reach and coat the undersides of leaves. This is where most of the plant's stomata are located.
- Apply foliar feed late in the evening or in the early dawn, when temperature is cool and wind is minimal.

How to identify nutrient deficiencies

Nutrient	Symptoms	Remedy
 Nitrogen (N)	Maize, beans and vegetables grow poorly, leaves are pale green. Sukumawiki, cabbage leaves have yellow tint. Lower leaves affected first. Flowering fruiting reduced or delayed.	Add adequate amounts of organic matter. Grow nitrogen-fixing green manures eg lablab, desmodium and Lucaena. Apply compost, animal manures and nitrogen-rich liquid manures.
 Phosphorus (P)	Maize, beans and vegetables show poor growth. Leaves turn bluish green with purple tint but not yellow. Fruits remain small. Can be mistaken for root damage or lack of nitrogen.	Apply mijingu rock phosphate. Use phosphorus-rich organic liquid fertilizers.
 Potassium (K)	Brown scorching of leaf tips that tend to curl, purple brown spots on leaf underside. Poor flowering and fruit set. Plants prone to diseases and frost damage.	Improve soil structure use plant-based potash fertilizers such as comfrey leaves or liquid. Add wood ash to compost and apply.

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

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Good management improves meat goats

Goats are very social animals and need space for physical exercise. A good goat keeper has to carefully observe their flock.

John Kibor

Meat goats are important economic resource for Kenya since it has a big chunk of the arid and semi-arid lands that is suitable for meat goat production. At the moment, it is estimated that Kenya has a goat population of 8 million, according to Ministry of Livestock Development records, itself a big economic resource base for people in the ASAL areas. Goats do well in low altitude areas, with lots of acacia to browse. They do not like cold wet climate. Unfortunately, many goat keepers pay little attention to their goats. They just let them roam and browse in the hills and bushes. A good farmer has to be keen with his flock!

Here are some tips to help improve the productivity of your goats:

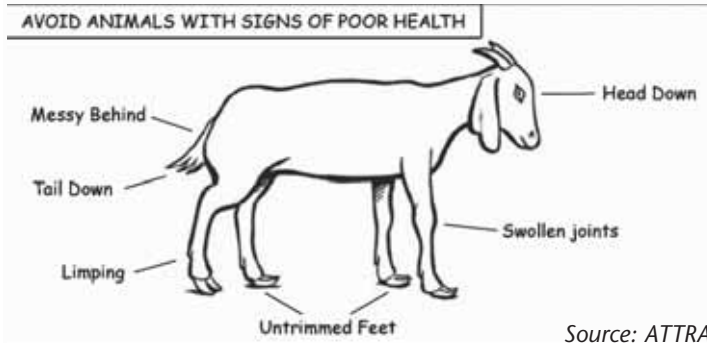
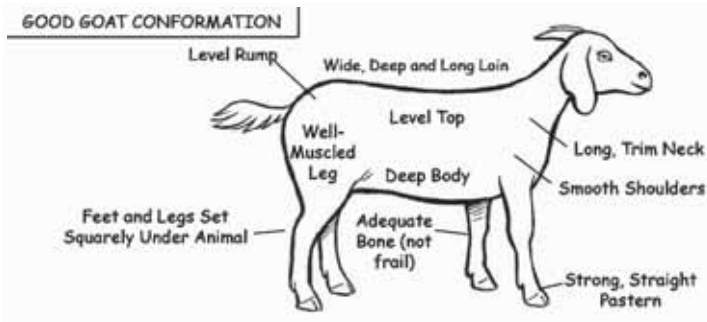
Housing: Goats are social and do well in groups. They need more space for interaction than sheep.

- If goats do not get enough space to move around, then productivity will be affected.
 - The goat shelter should protect them from rain, excessive heat and cold. A good goat house should have a sitting or playing pen (open space), a kidding space and a sleeping place where goats can shelter from the strong wind and rain – (see sketch).
 - Congestion in the goat house makes the animals prone to respiratory diseases. A spacing of 1.5 square metres per goat is ideal. Ensure good ventilation and natural lighting.
 - The goat house should be cleaned at least once every two days. Accumulation of droppings provides conditions for multiplication of disease-carrying agents.
 - Keep goats in their own house.
- Feed:** A goat's digestive system is designed to utilize forages. Enough feed must be available throughout the year. The most economical way to raise meat goats is to raise them on a mix of pasture and browse, with minimal supplements, reserved for the dry season when green matter is scarce.
- During the dry season, try and supplement with cereal, silage or leguminous hay like lucerne or desmodium. Since leaves contain more energy and protein than stems, good leafy hay of any type is desired. Pods and seeds of Acacia also make good supplements for meat goats.
 - Always take care of the nutritional needs of different groups of animals in your flock, for example, the lactating goats feeds up to three times higher than the dry goats.

Breeding: Put in place a good breeding program aimed at gradually improving your flock. Use quality bucks and breed with highly productive dams (female goats) that have desired traits that include fertility (twinning) and fast growth (feed conversion). Select bucks with wide chests, straight body, strong legs and no physical defects. Weak does/dams should be culled. Without a breeding plan, the goats will get smaller and grow slowly with each subsequent generation.

Castration: Male kids should be castrated within 14 days after birth. Castrate using a rubber-ring so that there is no cutting and thus, no bleeding. The ring may be a little uncomfortable for the kids, but it is very effective. Be sure to check that both testicles are in the scrotum below the band.

Parasite: Goats are very sensitive to internal parasites and will manifest stunted growth, susceptibility to disease, loss of weight and eventual death. Rotational grazing is very important to reduce pest infestation. Fleas and/or lice slow down animal growth, besides causing skin damage. These small insects can cause deaths in many goats kids. Any signs of infestation should be promptly dealt with.



Source: ATTRA

Medicine use: Avoid deworming in the first month of pregnancy, when drugs might cause abortion or birth defects. Also minimize treatments to slow development of resistance. Otherwise, rotate the drugs used.

Rearing orphaned goat kids

- Many goat kids die before two weeks because of insufficient intake of the mothers first milk which is essential in building body immunity.
- Ideally, a lamb should receive 50 ml per kg of bodyweight of its own mother's colostrum, within 1 hour of birth. This followed by about 150 ml per kg spread over three more feedings within the first 24 hrs. This is to promote passive protection of the lamb until its own immune system is functioning.
- Feed the milk to the kid using tubes or a bottle that they can suckle.
- Care should be taken so that the kid is not overfed, which results in abomasal bloating and death.
- A farmer can consider fostering such a kid with another lactating mother goats or artificial rearing where a milk substitute is provided. This can also be done for kids whose mother is overburdened, for example, in cases of triplets.



Source: Baaland

Veterinary assistance

Have a veterinary officer close to your animals. Routine check-up will reduce the risk of deaths from preventable and treatable diseases. If farmer's goat has been coughing for a year, the farmer needs a doctor more than the goat!



Goats should be provided with shelter to protect against wind and rain. They also need a fenced area where they can move freely.

All trees need good care to grow well

Many trees planted by farmers never grow to maturity due to lack of proper management.

Peter Kamau

The rainy season is also the time for planting trees. The first step in any tree planting exercise is to know the



types of trees to be planted in every part of the shamba. A wise farmer should have a variety of trees in their shamba. These can include fodder trees, fruits trees and

even trees to provide the farm with shade, firewood and timber in the future.

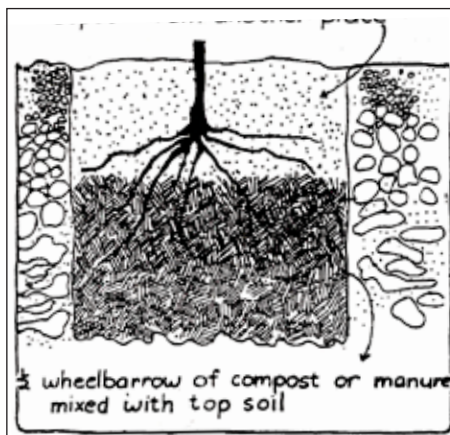
Choice of trees

Trees such as eucalyptus and pines should be planted away from crops and water sources because they affect crop growth and take up a lot of water. The best trees to plant with crops are grevillea, leguminous trees which fix nitrogen into the soil. Trees such as calliandra, lucaena, pigeon peas and sesbania sesban bring up other nutrients from deep down the soil into the surface, which also benefits crops. Farmers can buy seedlings of these tree varieties from private nurseries near them or from the nearest forest stations in their regions.

Spacing

Before you plant the seedlings, decide how far apart one tree should be from the next using the following guidelines:

- Create adequate space between trees to enable them get enough sunlight and reduce shading.
- Pawpaw trees, guavas or peaches can be planted 3 metres apart.
- Citrus trees such as mangoes, macadamia nuts etc should be planted 7 metres apart.
- Avocados require a spacing of 10 metres from one tree to the next.



Digging holes

Dig a hole 60 cm square and 60 cm deep about four weeks before you plant the tree. The holes must be square in shape so that the roots can grow towards the corners and then spread out into the soil. Dig about 30 cm of the top-soil and put it on one side. Continue digging the hole another 30 cm and put the bottom soil on the other side of the hole. Water the hole a few days before you plant the tree.

Now mix the top-soil with half a wheelbarrow of well-prepared compost and put this into the bottom of the hole. Add more top-soil from elsewhere before filling up the hole with the soil you got from the bottom of the hole. While filling up the hole, make it in such a way that it forms a basin around the plant in order hold water when it rains.

Planting bare rooted seedlings

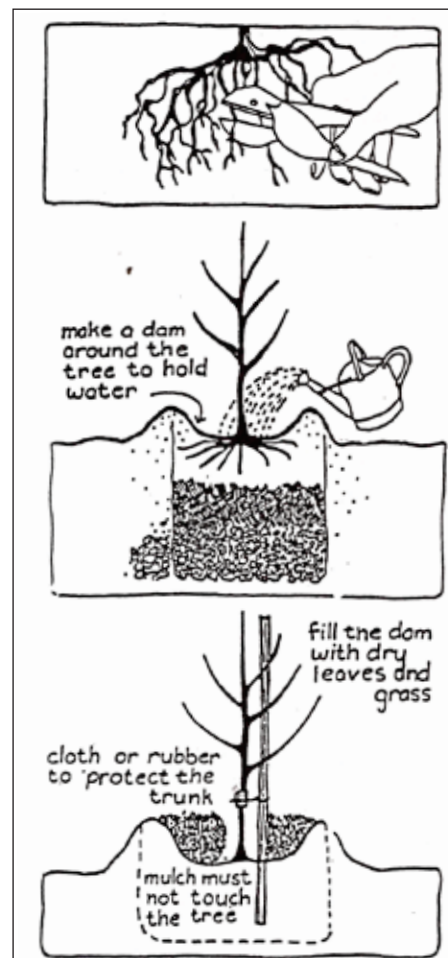
For seedlings that are not potted (bare-rooted seedlings) it is important to prepare them before planting, use the following guidelines:

- Water the nursery bed thoroughly the day before you remove them. This ensures the seedlings have plenty of water before planting.
- Remove the seedlings from the bed and separate their roots from the soil carefully, do not damage them.
- Cover the seedlings to protect them from direct sunlight. Keep them moist.
- Plant one seedling in each hole and fill with soil.
- Press the soil around the plant gently.

Potted seedlings

For potted seedlings farmers should remember the following guidelines while planting the seedlings:

- Do not uproot the seedlings until you are ready to plant them.



- Keep the seedlings in their pots and pack them in small boxes or crates for easy transport to the planting sites. Do not tie the seedlings.
- Tear off the polythene cover or remove them from their pots before you plant.
- Do not remove the soil around the seedlings while planting.
- Choose your planting sites carefully. Decide where each of the trees is to be planted.

Take care of your growing trees

Farmers sometimes act very funny when planting trees. As soon the seedlings are in the soil, they do not water them, they never control their performance, in short: They do not care for them. A large proportion of trees planted every year never reach maturity due to lack of regular attention and utmost care in order to grow normally to maturity. To enable the tree to grow up straight, it is important to tie it to a strong stick pushed into the ground. Do not tie the string too tight.

Animals for example cause great destruction of young trees. Before planting trees, farmers should make sure the area under trees is properly fenced off to keep away goats, sheep, cows and even donkeys. Every three months, spread two or three spades full of compost or manure around the

tree, as wide as the length of the leaves. Put mulch around the base of the tree but not too close to the tree trunk; mulch conserves water and provides organic matter.

Watering

If the rains are inadequate, water the trees once every two weeks. Some trees such as citrus trees need a lot of water to grow well; such trees can be watered every week, during the period of reduced rains.

Pruning

The main aim of pruning is to cut off some branches so that others will grow better and get enough sun. Prune the trees during dry days to avoid exposing them to diseases which is more common when it is raining. Never break off branches; use a panga to cut them off or use a handsaw for pruning.

Avocados can give you good income

Avocado is an important commercial fruit in Kenya both for local and export markets.

Theresa Székely

There are three main types of avocado trees which are suitable for different altitudes. Check which avocado varieties do best under your specific local conditions. Using seeds or grafted trees from healthy and vigorous local trees and from local nurseries is recommended, such trees will be more likely to do well at your site. In box 1, we have listed the most common varieties according to altitude type.

Seedling production

Seeds are collected from healthy mother trees and healthy, mature fruits. The extracted and cleaned seeds can be dipped into a fungicide solution and are then planted into seedbeds or into perforated polythene bags. Shade is important for germination. When seedbed seedlings are 20 cm high and have 2 pairs of well-developed leaves, they are uprooted, culled and transplanted into containers.

Grafting can be done after about six months. Grafted trees remain smaller and start flowering earlier (at 3 to 4 years after planting into the field) than un-grafted seedlings. The small trees will be ready to be transplanted into the field about three to four months after they have been grafted.

Tree planting and establishment

Soils should be deep, fertile and well aerated. Avocados do not like poorly drained, heavy soils and flooding or high water tables, and they will also not tolerate salty or very acidic conditions.

Avocado can be poisonous to livestock

Although avocado fruits are very good for human consumption, the whole plant seems to be poisonous to most animals. Poisoning has been observed in cattle, goats, horses, rabbits, mice, birds, fish, and others. All parts of the plant seem to be toxic (leaves, bark, fruit flesh and skins, seeds). Toxicity seems to vary depending on avocado variety, time of the year, and on other factors which are not known. In intoxicated animals, fluids may accumulate around the heart, in the lungs and the abdomen, and the heart muscle may fail. In lactating animals, cells in the udder tissue inflame and die, and mastitis signs and drastic milk reduction are typical. Our recommendation: Keep livestock out of avocado orchards and avoid planting avocado trees near animal enclosures! **tsz**



Common avocado varieties

1. **Hass and Fuerte:** These two varieties are used as scions (upper parts of grafted fruits). They are popular because of their high oil content.
2. **Puebla:** Used as rootstock by many farmers as it has no fibre and is resistant to diseases.
3. **Singapore:** This is a new variety that is fast growing reaching maturity in 14 to 15 months. It grows to a height of 2 ft.
4. **G5 and G6:** These two varieties are popular as they can do well in both highlands and lowlands. They can be grafted with all the other varieties to improve fruit quality.



Farmers are advised to buy seedlings from certified seedling producers. Our pictures above shows Hass avocado tree and Fuerte avocado fruits.

The most favourable planting time is at the beginning of the rainy season. Spacing between trees lies between 6 and 10 m, depending on soil fertility, climate, and variety. Planting holes are usually dug two feet wide and two feet deep, making sure to break hard pans and to allow good drainage and undisturbed root development. The excavated soil can be mixed with manure, compost and rock phosphate if available. Plant the seedlings carefully without damaging the roots at the same depth as it was in the container. Build a basin from soil around the tree for better irrigation and water harvesting.

After planting, seedlings must be irrigated immediately. Use 5 to 20 litres of water depending on the size of the seedling. Mulching can be very beneficial as it reduces moisture loss and controls weed growth. Irrigation will be necessary for some time. Another important measure is to protect each seedling against livestock and wild animals.

Irrigation of fruit trees

Irrigation is important during several stages of tree development and the fruiting cycle. During the first months of establishment, but also later during their first years of growth, trees must

be checked frequently and irrigated when they show symptoms of water requirement. Avocados develop long tap roots, but depending on the climate they may need some additional irrigation, especially during prolonged dry spells. During flowering, fruit set and fruit development sufficient moisture is critical for good fruit development.

Fertilization

For good productivity, it is beneficial to support avocado trees with manure regularly. Between 5 and 20 kg can be given per tree and per year. Be careful with nitrogen – it promotes leaf growth but not flowering, and avocado roots are sensitive to high salt concentrations in the soil. Phosphorous is usually also necessary, and potassium is important for mature trees that bear fruit.

Pests and diseases

Preventive measures are central: Choose an appropriate and fertile site, plant at reasonable distances, choose healthy varieties, control weeds, use mulch, do not over fertilize, and irrigate when necessary. Pests are usually not a problem in avocado production Kenya. Use neem products, pyrethrum preparations, tephrosia extracts etc. against insect pests such as fruit moths,

Continued on page 6

Sorting eggs for incubating and marketing

Candling is the process passing a light through the egg to observe embryo development.

The Organic Farmer

Chicken breeders have to be attentive: Not all incubated eggs will hatch. It is probable that only 90 percent or less of incubated eggs are fertile. Candling can be used to identify eggs that are infertile. Candling means shining a light through the egg to observe embryo development. White or pale eggs are more easy to handle than dark or speckled eggs.

Examine in a dark room

Simple candling instrument can be made by inserting a light into a small carton box. You cut a small hole to emit the light; it should be big enough that an egg can stand in this hole. If you switch on the light in the box, it will shine through the egg. Do this in a dark room, and you will observe the contents of the egg. If it has stayed for some days in the incubator, you have to be careful, but cooling that occurs for short periods (less than 10 minutes) during examination of eggs does not harm the development of the embryo. However, limit the exposure of the egg to the hot light source. The presence of embryos can be confirmed easily after 8 days to 12 days of incubation. The embryo is located in the large end of the egg, where blood vessels radiate under the surface of the shell.

Retain records of egg infertility or embryo death. Some mortality can be expected, however, unusual occurrences of mortality or certain characteristics of the mortality can be indicators of practices that can be corrected to improve hatchability.



A home-made candling box. Hold a light inside the box in a dark room. You can be able to see through the egg and decide if it is suitable for incubating.

How do I candle eggs?

Shine a bright light through the egg. It is more of a comparison, meaning all the eggs of the same age should look the same. It is something best learned by doing, and really, it is just as simple as you make it. You cannot hurt eggs



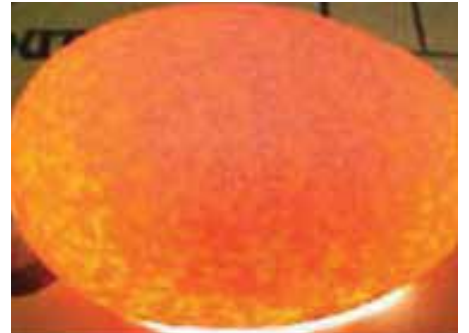
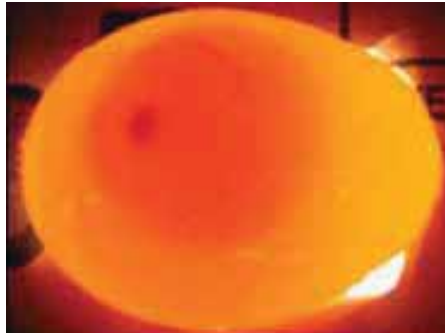
by candling them (short of dropping them). They can be out of the incubator for a half-hour without any harm. Candle every day if you like, after day 3 you should see something. At about 8 days, you can see the chick wiggling and kicking inside the egg.



Bad Eggs: The egg on the left shows a ring at 6 days. This ring is formed by concentrated bacteria which has invaded the eggs' membrane. It can become present very early, or after the chick has already started to form, as in the picture on the right. In the picture on the right the ring, or portion of it, can be seen at the bottom of the egg with the expired chick in the middle.



More Bad Eggs: The egg on the left shows a blood spot; it will not hatch. They will go bad and blow up, though. The egg on the right at 6 days shows "clear". It is infertile, or too old to germinate.



Yet Even More Bad Eggs: The egg on the left shows a blood spot incubated to 8 days. You can see the bacterial ring forming at this point. Soon this egg will start to "weep", and if it isn't caught in time, it will explode into a stinky mess. The egg on the right shows highly defined pores. Eggs that look like this under candling have a slim chance of hatching.



Good Eggs: On the left, you can see the "spider" of veins growing away from the yolk. This egg is at 6 days. You can see this spider in a smaller version at 3 days. The egg on the right is at 2 weeks. You can see the clear spot beneath, with the yolk and peep floating at the top. *Source: Pleyzier incubators, South Africa*

How to estimate a cow's age

I want to buy a cow from another farmer who is not keeping proper records. What signs can one read on a cow to know the number of times it has calved? Pius Wamalwa.

This is not possible. All you can do is to determine the age of the cow. There are two methods, either to control the teeth or the horn.

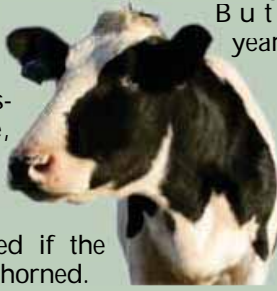
Teeth method

The age of a cattle can be estimated by examining the teeth (illustrated diagram below). This method is more accurate when animals are grazed for their entire life on soft feed. Under rough condition, such as desert rangelands, teeth are worn at a much faster rate. The best way to adjust the accompanying age chart is to examine the teeth of cattle with a known age and to compare with the diagram. Becoming








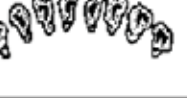
proficient at determining a cow's age by the tooth method requires practical experience and a lot of practice.

Horn method

The rings on the horns are less useful as a guide. At ten or twelve months the first ring appears; at twenty months to two years the second; at thirty to thirty-two months the third ring, at forty to forty-six months the fourth ring, at fifty four to sixty months the fifth ring, and so on. **B u t**, at the fifth the three first rings are indistinguishable, and at the eighth year. This might be complicated if the farmer has dehorned.



Handy guide to determining the age of cattle by the teeth

	At birth to 1 month	Two or more of the temporary incisor teeth present. Within first month, entire 8 temporary incisors appear.
	2 years	As a long-yearling, the central pair of temporary incisor teeth or pinchers is replaced by the permanent pinchers. At 2 years, the central permanent incisors attain full development.
	2-1/2 years	Permanent first intermediates, one on each side of the pinchers, are cut. Usually these are fully developed at 3 years.
	3-1/2 years	The second intermediates or laterals are cut. They are on a level with the first intermediates and begin to wear at 4 years.
	4-1/2 years	The corner teeth are replaced. At 5 years the animal usually has the full complement of incisors with the corners fully developed.
	5 to 6 years	The permanent pinchers are leveled, both pairs of intermediates are partially leveled, and the corner incisors show wear.
	7 to 10 years	At 7 or 8 years the pinchers show noticeable wear; at 8 or 9 years the middle pairs show noticeable wear; and at 10 years, the corner teeth show noticeable wear.
	12 years	After the animal passed the 6th year, the arch gradually loses its rounded contour and becomes nearly straight by the 12th year. In the meantime, the teeth gradually become triangular in shape, distinctly separated, and show progressive wearing to stubs. These conditions become more marked with increasing age.

Source: R.F. Johnson. The Stockman's Handbook by Ensminger, 2nd ed., page 539.

Wood ash as fertilizer

Since ash contains some elements of nutrients, can I keep on taking ashes to my farm for the nutrients to be absorbed and stored by the soils for the plants? James Kirego.

Yes, of course you can. Ash is a valuable fertilizer, if not used in excess.

Trees can limit competition from other
Why do some trees like cypress not allow other plants to germinate and grow under them? John Wasike, Kimilili.

This can have several reasons. Some trees grow a dense leaf canopy and produce so much shade that tree seedlings lack the light they need for good development. Other trees produce substances that affect the development of other plants underneath them. Some conifers, for example, create a very acidic environment in the topsoil of their root zones which is hostile to germination and growth of most other plants. The cypress belongs to this group of trees.

Tithonia as medicine

Since animals feed on Tithonia leaves, can I prepare a fresh solution of it and give it to my animals to boost their health? Anne Mafumbo, Bungoma.

You may try it, but be aware that the effect is very uncertain. Second, it will not help animals that are already sick or in very poor health. It may also be easier to feed any plant directly. You may even let the animals decide whether and how much to feed from particular plants. They usually have a good instinct and know which feeds are good for them and which are not.

Tithonia is not vegetable

Is it possible for me to use tithonia leaves as vegetables because of the soft green and tender parts of it? Jane Songa Bungoma

We have never heard of preparing and using Tithonia as a vegetable, and there is probably a reason for this. We advise you to be careful when eating anything that is not used as food traditionally.

Tithonia as feed

Can Tithonia, well harvested and dried under controlled shade, be used together with other leguminous fodder tree leaves like calliandra or desmodium to make a feed formulation ration?

If you harvest young tithonia shoots and dry and store them carefully, they will be a very good feed supplement if offered together with grass or hay. You may use tithonia in the same way as leguminous fodder plants such as calliandra, leucaena or desmodium. Tithonia leaves may not be as rich in proteins, especially if you use older shoots. Feed only in small quantities (20 - 25% of the total ration).

Plant other maize varieties

TOF - The season has started badly for Kenyan farmers. Farmers in most parts of the country may not get their popular maize seed varieties which may reduce maize yields. However, all is not lost for farmers, those who have not planted still have an option of planting some of the varieties available in the market.

Some of the high altitude varieties that farmers in high potential maize growing areas such as Trans-Nzoia and Uasin Gishu areas can go for include KH 600-11D, KH 600-15A, KH 600-16A and KH 600-14E from Kenya Seed Company, W699 from Western Seed Company or KH-600 E from Fresco Seed company.

The rains in some of the high altitude areas may not be very heavy according to weather forecasts- farmers in this regions can plant medium altitude varieties such as H513, H515 and H516 from Kenya Seed Company. There is also Ph3253, Ph30G97 and Ph30H83 from Pioneer Seed Company, PAN 67, PAN5253 from Pannar Seed Company, WH403, WH 502, WH504 and WH505 from Western Seed Company.

For those who planted certified seed last year and who are not successful



to get certified seed this year, the commercial maize they harvested can still be planted if it is carefully sorted out by removing broken grains, those which are rotting and the small ones in size. The maize can be treated with pesticides before planting to reduce pest damage. However the yields from such maize will be lower than the previous season. Experts warn farmers that such maize should not be planted again after harvesting

Organic farmers market

Organic farmers have a new market to sell their produce. The Organic Market is held every Saturday at the Rusty Nail restaurant Karen, Nairobi. Farmers can sell fresh fruits, pulses, cereals and value added products. All farmers participating are either certified organic farmers or those undergoing certification. Once you have met this requirement, you are required to pay a membership fee of Ksh 200. Every marketing day there is no fee to be paid but each stand is expected to pay Ksh 300 worth of farm produce, which is all collected by the organising committee and donated to two children's homes in Nairobi. After 20 marketing days, the Kenya Organic Agriculture Network (KOAN) pays a rebate of Ksh 6000 to each participant to plough back into their organic farming enterprise (that means that all you paid in to the organising committee is given back to you). Failure to attend one market day attracts a penalty of Ksh 500, two market days Ksh 1000 and so on. The organic certification process takes up to three years but the advantage is that you can still sell your produce when undergoing conversion from conventional to organic (For certification call Musa Njoka 0722 767 755). All farmers interested can get in touch with Farmer's Market Organising Committee (Call Lilian Marema 0721 654 683 or 020 261 0863).

Selling & buying

Kenbro chicks for sale: I sell Kenbro chicks of various ages. Day-old chicks, 2 month-old Ksh 400, laying age, Ksh 1,200. I'm in Kikuyu. Call Moses Gachanja 0722 281 127 email: mnjugus@yahoo.com:

Kenbro chicks for sale: Two months-old chicks at Ksh 400 each. Please call Margaret 0733 285830, email: mnthuo@gmail.com

Layers wanted: I would like to urgently purchase Kienyeji chicken layers only (5-6 months old) from a farmer who is good at animal husbandry. Please call Martin 0733 819 578 email: mwaikims@yahoo.com:

Broilers wanted: I need to buy a better broiler breed than Kenchic. Pattie 0738 122 396 or 0738 122 396

Farmers wanted: I am looking for outgrowers to do mini sweet peppers and onions tomatoes and vegetables organically in greenhouses. Oliver Ndegwa 0722 360 311 email: agrotunnel@gmail.com:

Chicks available: I have started a small hatchery for Kenbro chicks. You can do a booking for the chicks if required. Contact Margaret 0722 586 713 email: magkungu@yahoo.com

>>> from page 5: Planting avocados

thrips or scales if the damage is severe.

The following diseases can be serious:

Avocado root rot (a Phytophthora fungus disease) Trees produce sparsely, they have fewer leaves which are pale and wilted. Branches are sunburnt and die back. Roots decay and the whole tree dies prematurely. Affected trees should be uprooted and destroyed. Hot water treatment and fungicide treatment of seeds for seedling production are generally recommended as a preventive measure. There are two chemicals registered against this disease, Ridomil and Aliette.

Anthraxnose: Fruits develop dark brown, dry spots. Young fruits may drop. In more mature fruits, the infection remains hidden until the fruit is harvested and ripens. Usually, copper-based fungicides are used against Anthracnose.

Cercospora fruit spot: Small, pale-yellowish spots appear on the fruits and leaves. Later, they turn brown and crack, making it easy for other organisms to attack the fruits. This disease is also controlled with copper-based fungicides.

Fruit drop

Fruit drop is not a disease! It is common for many fruit species. Trees drop excess fruits that they will not be able to nourish until maturity. Avocados drop excess fruits when they are pea-

sized, and a second time when they have reached the size of an egg.

Harvesting avocados

Grafted trees usually start to flourish and bear fruit 3 to 4 years after they have been planted in the field.

There are some indicators of approaching maturity:

- In dark varieties, there is a change in colour from green to black or purple.
- On green varieties, the fruit stems turn yellow, the skin may appear less shiny, or the end develops rust-like spots.
- Some varieties develop a whitish appearance.
- Fruits that float on the surface when immersed into water are usually mature.

Markets

Handle all avocados with great care! Export markets, especially the European market, have very strict quality requirements which smallholders may find difficult to meet. Local markets are less complicated but also tricky, because avocados tend to mature all at the same time, making it unprofitable for farmers to sell them.

It is almost impossible for farmers to store or process avocados. Commercial avocado growers must therefore be linked closely to a good market.

Source: Jürgen Griesbach, 2005: Avocado growing in Kenya. ICRAF (World Agroforestry Centre), Nairobi, Kenya.