

## No water, no food

The scarcity of water is a bitter experience of many farmers in semi-arid areas. In this issue, we feature some of the methods farmers can use to harvest water, store and use it efficiently during the dry season.

In the next *TOF* issue in July 2013, we will give you information on drought resistant crops including new seed varieties. *Pages 4 & 5*



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## Dear farmers

The direction and growth of the Agricultural Sector, as with other sectors of the Kenyan Economy, is largely determined by decisions made by policy makers at top-level government. Whereas there have been policies and programs aimed at transforming agriculture into a vibrant sector to contribute to growth of the national economy and the quality of life for more than 80 per cent of our population, few of them have had substantial impact on small-scale farmers. This is largely due to their lack of relevance and full implementation.

Take, for example, the crisis of seed shortage facing the potato industry. Despite consistent advice from scientists and other stakeholders, the government has yet to change guiding law to allow informal seed production systems to enable small-scale farmers to conveniently access quality seeds. The Seed and Plant Varieties Act Cap.326 so far prohibits this.

Instead, decisions are made that seem to serve interests of a few individuals at the expense of thousands of farmers who continue to wallow in poverty. Perhaps, due to such interests GMO seeds and food have been imported into the country despite prohibition by the law (National Bio Safety Act). We hope the new government will seriously look into these issues in a more transparent and focused manner in order to revive this important agricultural subsector.

## Africa to pay for poor soils

**TOF** | About two-thirds of African farmers depend on agriculture for their livelihoods. The level of agricultural production, therefore, directly affects economic growth, social improvement and trade in Africa.

As the region's population continues to grow rapidly, outpacing the growth rate in other regions of the world, its agricultural land is becoming increasingly degraded. Farmers are intensifying land use to meet food needs without proper management practices and use of external inputs.

### Chemical fertilizers not the solution

The resulting depletion of nutrients from soils has caused stagnation and decline in crop production in many African countries. In some cases, notably in the East African highlands, the rate of depletion is so high that even drastic measures, such

as doubling the application of fertilizer or manure or halving erosion losses, would not be enough to offset nutrient deficits. Unless African governments, supported by the international community, take the lead in confronting the problems of nutrient

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depletion, deteriorating agricultural productivity will seriously undermine the foundations of sustainable economic growth in Africa.

This alarming statement from the IFPRI should be taken seriously. *The Organic Farmer* magazine will emphasize the importance of soil fertility with a series of articles from the next issue of the magazine until end of the year.

## Reform the potato industry

**TOF** | Due to the grabbing of public land meant for potato seed multiplication, the country can only produce 1 per cent of its certified seed requirements.

The spread of bacterial wilt to all potato growing areas means that farmers have no source of clean planting material. More than 95 per cent of the farmers now use potatoes from their farms as seed, further spreading the disease.

Moreover, the Ministry of



Agriculture has allowed importation of certified potato seed from Holland, which local farmers cannot afford to buy.

*Page 2 & 6*



## Good bull, good cow

Every dairy farmer wants a cow that is capable of high milk production. It is advisable to start with what you have and improve them using proven bulls that can transmit the desired traits to your future cows. Sire catalogues capture summarized information on the genetic potential of bulls. It is important that farmers are aware of the terms and abbreviations used in catalogues to select the right bulls that have the right genes for producing milk in the next generation of cows. Selecting bulls based on the cost of the semen is a recipe for failure.

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# Vested interests cripple the potato industry

Despite shortage of certified potato seeds, the government is reluctant to allow the informal sector to produce potato seed.

**Peter Kamau** | The potato bacterial wilt is spreading and it is now countrywide. This has led to a situation that would need much more awareness about the damaging effect of this disease. Concerning methods on how to resolve the potato seed crisis, scientists and major stakeholders in the potato sub-sector on the one hand and the government on the other appear to be pulling in different directions.

Having realised the potential danger facing the potato industry, stakeholders in the potato industry, together with the government developed a potato seed master plan to guide and streamline the industry in the year 2009. Among the recommendations in the document is the development of informal seed production system, in which selected farmers are trained on clean seed production.

## 12 years for certification process

The informal seed production system needs much less time than the formal one, which involves a long certification process according to the Seed and Plant Varieties Act Cap. 326



requirements. This Act requires that the Kenya Plant Health Inspectorate Service (KEPHIS) inspects and certifies any seed before it can be sold to farmers. Any new seed variety may take up to 12 years in trials before it can be released to farmers. Currently, the formal seed production system can only produce about 1 per cent of all the seeds required by farmers in the country.

Donors, including the former German Development Agency GTZ (now GIZ), the International Potato Centre (CIP) and USAID supported the informal seed production programme. These organisations trained more than 5,000 extension workers in potato growing areas with the aim of training selected farmers to produce clean seed. The seed was then sold to potato growers who were not able to get sufficient seed from KARI and the Agricultural Development Corporation (ADC) multiplication farms.

## Why potatoes from Netherlands now?

Instead of supporting this programme that took seven years to develop. Ministry of Agriculture ignored this effort that cost the government more than Ksh 100 million. They came up with their own policy document, the National Root and Tuber Crops Policy, which lumped potatoes together with other tuber crops

such as cassava, sweet potatoes, yams and cocoyams that are in less demand in the market.

Stakeholders in the potato industry, including KARI, farmers and even the donors, strongly opposed this move. They saw it as a government attempt to downgrade potatoes, Kenya's second most important crop after maize. But what has stirred a new debate within the potato industry is another initiative by the Ministry of Agriculture to import potato seed from Netherlands following an agreement between the Kenyan and Dutch governments.

## Reservations over imported seeds

Stakeholders in the industry have questioned the rationale behind this initiative, taking into account that the country has the capacity to produce enough seed, if the seed master plan was implemented. Researchers are worried that imported seed can easily introduce new diseases, especially taking into account the weak regulatory authorities that have allowed the importation of GMO seeds and even foodstuffs into the country. Farmers will also not be able to buy the seed as it will be more expensive than the locally produced ones.

Experts within the Ministry of Agriculture say the only sustainable method to alleviate the problem of seed shortage is to

allow the informal seed production system. This would need a change of the current law. The Seed and Plant Varieties Act Cap. 326 stipulates that all seeds have to be inspected and certified by KEPHIS before they can be sold to farmers. The reality is that more than 95 per cent of all potato seed used by farmers is obtained from the informal seed production systems.

## Lack of political will

In Ethiopia however, farmers are now producing seed for sale to other farmers through the informal system; the program is funded by USAID.

Even in the most developed countries such as Britain, the informal seed production plays a very important role in provision of quality seed to farmers, accounting for more than 30 per cent of all seeds used by farmers in the European nation.

The KARI National Potato Centre Director Dr. Jackson Kabira last year wrote to the Agriculture PS Dr. Romano Kiome advising the government to urgently review the current law to allow the informal potato seed production system to operate in the country.

But it seems that there is lack of political will on the part of the government to make bold changes that would help farmers obtain quality seed for potato production. ■

**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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# Breeding without bull selection is a gamble

Many farmers consider the price of semen as the most important criteria for quality. This can lead to weaker, less productive animals.

**Job Kiprotich** | Genetics play an important role in dairy production. Breeding has a huge effect on the success of dairy farming. Increase in milk yields is a function of two major things: improved quality of animals through selective breeding and good management, including balanced feeding, good housing, access to water, friendly handling of animals and careful prevention and treatment of diseases.

Genetics and management go hand in hand. Without good breeding, the production of your animals will be limited even with the best management. Without good management, high quality animals cannot realise their productive potential.

Breeding offers the farmer the opportunity to enhance traits and productivity of the next generation of animals. But

wrong breeding decisions will lead to decreased milk production, poor health and a shorter lifespan.

## No time for research

Many farmers think of semen only when their cow is already on heat and must be served instantly. The urgency of the moment means the farmer will have to put up with whatever semen the AI technician has in store. There is no time to study the genetic merits of the bulls on offer. Instead, the price is used as the only criterion: Many people think that a high price is an indicator that the bull is of better quality. Although this is not necessarily the case, crafty inseminators use this belief to lie and defraud the farmer. This is why it is important for dairy farmers to learn to read and understand the information given in bull catalogues.

Success in dairy farming is not about luck or gambling. It is the effect of understanding how it works. To maintain and improve production levels, dairy farmers have to take bull selection seriously. A bull contributes 50% to the genetics of its



Swiss brown



Charolais



Holstein-Friesian

daughters! Farmers must know which traits are being introduced into their stock by the bulls they choose. Milk quantity and quality are especially highly influenced by the bull sire. A dairy bull is judged mainly according to the milk yield of its direct female relatives (mother and daughters). The bull passes the traits of their milk production on to their daughters.

*Next month: Linear type classification of dairy cattle*

## facts & figures

- Dairy cattle in Kenya produce about 70 percent of total national milk output (more than 3 billion litres).
- There are about 3.5 million head of Friesian, Ayrshire, Jersey and Guernsey breeds and their crosses, and 9.3 million indigenous animals.
- Estimated annual per capita milk consumption ranges from 19 kg in rural areas to 125 kg in urban ones.
- About 55 percent of the milk produced in Kenya enters the market. Most (more than 75 percent) is marketed through informal (unlicensed) channels, with about 30 processors and other formal milk marketers handling about 400 million litres a year, much of it in liquid form. (Source: FAO)

## Understand the information provided in the bull catalogue

Genetic indices are used to measure an animal's ability to pass its genes on to the next generation. Bull (sire) catalogues carry the information that helps farmers to choose the right bulls and to ensure progress from one generation to the next.

Genetic indices are classified into:

- Production traits
- Trait type (linear and composite)
- Management traits

Here are some of the terms and abbreviations in genetic summaries of bulls that dairy farmers need to be familiar with:

**Reliability (R - %):** Production reliability is a measure for the accuracy of the animal's evaluation. The higher it is, the more likely that the daughters will inherit the described traits. Reliability depends on the number of daughters that have contributed to the bull's proof and their distribution across herds. The milk yield of about 30 daughters in 30 different herds must have been evaluated in order to obtain a reliability of about 70% for a bull's PTA for milk yield. Avoid bulls with low reliabilities

Ayrshire	
CODE NO. AV. 158	
NAME: MADARAKA S BIONIC BOY	
C. SCORE: VT. 88	
K.S.B. NO. PED. 11908 VOL. LXIII	
DATE BORN: 02.01.2002	
BREEDER: KISIMA DAIRY FARM	
Comments: Good dairy character, high capacity and frames.	
SIRE: LOW MILTON BIONIC BOY EX 17983 PEAM(00) PEAF(00) P% TPAP(00) P% +318 +241 +0.18 +13.0 +0.01 In 47 daughters in 20 herds	G.S. MAR-RAI-MADGE'S BOY E MI
DAM: KISIMA SIRIKWA 9TE Produced 26128 Kg milk in 6 lactations. Highest lactation: 5th at 9229 Kg milk in 399 days	G.D. LOW MILTON KETTY 47 VG Produced 22316 kg milk in 4 lactations. Highest lactation: 3rd at 6575kg milk with 5.43% fat in 305 days
	G.S. HAGALUND (CAIS 109) BVE: +31kgM, 75% BVE in 4 daughters.
	G.D. KISIMA SIRIKWA 1ST Produced 15237 kg milk in 4 lactations. Highest lactation: 8th at 4503 Kg milk in 205 days

A summary of one of the traits of the bulls in the Kenya Animal Genetic Resources Bull Catalogue.

of lower than 65% or use them with caution.

**Predicted Transmitting Ability (PTA):** This is an index for production, specifically for the milk yields (expected milk quantity, fat and protein quantity and percentage). This is the predicted merit to be passed on to the offspring. For example, PTA for a bull could be expressed as follows:  
+ 655kg milk,  
+48kg fat  
+0.08% fat

+33kg protein  
+0.07% protein  
Reliability 87%

This bull's daughters are expected to produce (on average and in their first lactation of 305 days) 655 kg more milk, 48 kg more fat and 32 kg more protein compared to the daughters of an average bull (PTA 0). The fat and protein percentage of the milk is also likely to be higher than average (+0.08% / +0.07%). Of course, all this will very much depend on management.

**Somatic Cell Count (SCC):** This index is used to help reduce the incidence of mastitis which is a frequent disease in dairy cows. SCC is expressed as a percentage and generally falls within the range of +30 to -30. Negative figures for SCC are desirable as they indicate a reduction in the cell counts.

**Lifespan (LS):** Is expressed in terms of lactations and generally falls within the range of -0.5 to +0.5. Daughters of a +0.5 sire are predicted to survive, on average, 0.5 lactations longer than daughters of a bull with a lifespan index of zero. In other words, they are likely to produce milk for about 150 days or even more.

**Fertility Index (FI):** This is a prediction of female fertility. It falls within the range of -15 to +15. On the higher (positive) range, a sire's daughters are expected to have shorter calving interval.

**Calving ease (CE):** Expressed on a scale of -3 to +3 with positive figures indicating that calvings are likely to be easier, and negative figures indicating more difficult calvings. Select bulls with positive index especially for foundation cows.



# Grow more food with less water

**TOF** | Where water is a scarce commodity, people suffer, especially the farmers, for instance the ones in Kitui, Makueni and some parts of Machakos, who have to cope with the shortage by saving water from limited rainfall. As the population keeps growing the situation will

worsen resulting from weather changes caused by global climate change. Thus, we have to find ways of growing more food with less water. One way out of this dilemma, is taking management measures to reduce losses and to increase the efficient use of the available water.

## Keep scarce rainwater in the soil

There are various methods farmers employ to cope with the scarcity of rainwater. The most obvious one is to harness run-off water and to reduce evaporation and retaining soil moisture as long as possible. To achieve this, there are two simple rules of the thumb, which farmers should observe:

1. Protect the soil from direct sunlight and from the erosive force of rain. This is done by covering it with mulch or cover crops and planting trees along farm boundaries. This reduces evaporation, run-off and erosion, keeps the soil moist, and suppresses weeds.

2. Soil with a high content of organic matter keeps moisture longer, supports infiltration of rainwater and enhances the water holding capacity. Use compost and manure and reduce tillage in order to accumulate organic matter in the soil.



*Organically-grown maize with compost and cover crops between the maize (left). Conventionally-grown maize without cover crops (right).*

## Mulching

Mulch is a layer of any material, usually vegetative matter like crop residue, prunings from trees and shrubs and other plant materials, spread on the soil surface. Mulch retains soil moisture, balances soil temperatures, prevents erosion and provides organic matter and nutrients when it decomposes.

## Cover crops

To improve soil cover during the rainy season, maize and all other tall crops may be intercropped in the traditional way with beans, cowpeas, pigeon peas, groundnuts, desmodium,

pumpkins or others. Lablab and velvet beans (*mucuna*) produce large amounts of biomass. Cover crops may be cut down anytime to provide animal fodder or they may be planted after harvesting as an early crop at the beginning of planting season.

*A good cover crop: Purple vetch*



## Every drop counts

The most efficient way of using water is drip irrigation. The water runs directly to the roots; watering during the night prevents evaporation. This is on condition that the farmer is able to store rainwater in tanks. Unfortunately, many small scale-farmers in Ukambani do not have the cash for buying a water tank. Women, who have to walk for two or more hours to fetch one jerrycan of water for the house cannot be able to carry water for drip irrigation - even for a small kitchen garden using bucket irrigation (*see picture right*). From this point of view, small-scale farmers in Ukambani should be supported much more to put up water storage facilities.

The high prices for drip irrigation systems are another challenge. Farmers' groups or groups working together in a CBO could try to get the material for smaller drip irrigation systems at a cheaper rate by buying in bulk. The drip kit at Katumani costs Ksh 10,000 with a 250 litre tank. But it also depends with the distance, where the farmer comes from due to transportation costs.

## Planting in holes

When it is raining, water runs off and collects in holes. Two farming methods take advantage of this: the zai pits, developed

by small-scale farmers in the drought stricken Sahel countries and *tumbukiza*. Digging holes is a lot of work, but the good harvests

from these methods justify the effort! In Burkina Faso, farmers cover the zai pits with leaves to keep the soil moist.

### Zai planting pits

During the dry season, small pits, 20 - 30cm in diameter and 20 - 25cm deep, are dug into the soil. At the bottom of the pits, farmers place about two handfuls of organic material (farmyard manure or compost; conventional farmers add a small amount of fertilizer).

The seeds are planted in these pits before or right after the first rainfall. The zai pits collect and concentrate water at the root zone of the plant. They can be re-used for up to four crop seasons, only some manure or compost need to be added. It is important that the pits are dug at some distance from each other to allow sufficient catchment area for runoff water.



*Healthy maize growing in zai pits (above). A field with zai pits ready for planting (below).*



### Tumbukiza

This method is used to increase land productivity in dry areas. It is quite well known to Kenyan small-scale farmers. It is mainly used for planting of maize (nine seeds per pit) and for Napier grass (five to ten cuttings). Dig pits up to two feet wide and up to two feet deep at a distance of one to two meters. Mix the soil with manure, backfill (but not completely) and plant maize or



Napier grass inside. Water from run off will collect in the holes. Even in very dry times you can keep the plants growing with one bucket of water per hole every week. Compost and crop residues are thrown into the pits occasionally.

## Growing vegetables

Many small-scale farmers grow vegetables using old charcoal bags or maize sacks which do not last for long due to damage by the sun. Vertical bag gardens have a produce 10 times more than the yield farmers may get when they plant vegetables on the ground. They also use less water.

Real Impact, a company in Thika has invented a more durable bag that is UV-inhibiting and is reusable. The new bags can take up to 80 plants since it has a bigger surface area of 3.5 m<sup>2</sup>. A bag is selling for Ksh 1,000. Their contact is 0723 407 058 or 0720 803 564.







# counts



Bucket irrigation is suitable for vegetable production (above). This irrigation method can also be used in watering trees (below).



# s in vertical bags



# Water conservation pays

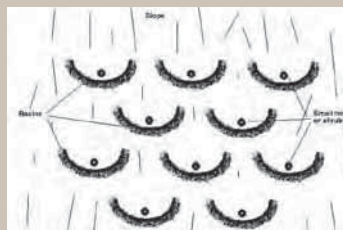
There are various methods for water harvesting and storage, apart from digging ponds and building dams. However, all of them need labour. In many African countries, farmers assist

each other to accomplish various tasks; in the end, all farmers can use one pond as their water source, at least for some time into the dry season. In Somaliland for example, extended families assist

each other in digging "berkets"-water holes, 8 meters long, 6 meters wide and 8 meters deep. The water collected in these berkets can sustain the families in the entire dry season.

## Half-moon structures

The pits on the right are dug at alternate positions to trap as much run-off water as possible for tree production. On gentle slopes, soil structures in the shape of half-moons collect rainwater and stop erosion.



## Plant strips

Contour farming across a slope are common in all farming areas. In moderate slopes, strips of vegetation are planted along the contours. These strips of grass, shrubs or trees, 0.5 to 2m wide, hold the soil together, retain water and prevent erosion. Nitrogen fixing bushes like gliricidia, leucaena or calliandra enrich the soil with nutrients and their branches can be used as high value fodder for animals.



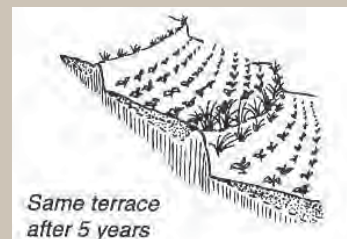
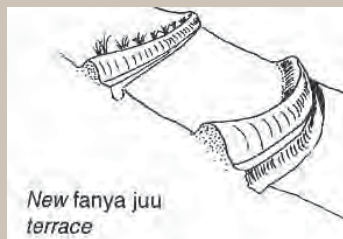
## Infiltration ditches

Infiltration ditches, 2 to 5 feet deep, are dug along the contour above a crop field. They retain water which will infiltrate into the soil and move slowly downslope and into the crop fields below the ditches.



## Bench terraces

In steeper slopes, bench terraces are advisable. These *Fanya juu* terraces are made by digging a trench along the contour and throwing the soil uphill to form an embankment. Fodder grasses or shrubs are then planted to stabilize the embankment.



## Pits and dams

Pits and dams are some of the best methods for water storage. But digging and building dams need not only labour, but some knowledge as well and for bigger dams, some money. In Kitui especially, there is another problem: Often, the water in dams has excess salt because of the minerals in the soil.



## References

- TOF module No. 8, water management; you can download the module (go to [www.theorganicfarmer.org/modules](http://www.theorganicfarmer.org/modules)), or you can get a printed copy (SMS your address and the keyword

- module 8 to: 0717 551 129).
- "Water from small dams" by Erik Niessen-Petersen, distributed by ASAL Consultants Ltd., P.O. Box 739, Sarit 00606, Nairobi, [asal@wananchi.com](mailto:asal@wananchi.com)

Tel : 020 2710296; 0733 619 066; 0722 599 165.

- [www.bigpictureagriculture.com](http://www.bigpictureagriculture.com), Thirty-five Water Conservation Methods for Agriculture, Farming, and Gardening.



## How to control bacterial wilt

Farmers can prevent bacterial wilt in their farms, if they follow some control measures.

*Peter Kamau* | Farmers in Kenya are still having a big problem in the control of bacterial wilt, a devastating disease that affects almost all potato-growing areas of the country. Bacterial wilt is caused by a bacteria known as *Ralstonia solanacearum*. It attacks not only potatoes, but also tomatoes and other plants from the potato family. The main way of spreading is through infected seed potatoes and it persists in warm soils for up to 4 years. This explains why crop rotation is very important.

### Symptoms

The first visible sign of bacterial wilt is wilting leaves. They appear like they lack water, even with sufficient irrigation or rain. Initially they will recover at night. Stems may show brown streaks and if broken, they produce a white, slimy mass of bacteria. Cut-open tubers from affected plants will show a ring-shaped white to brown discolouration of the flesh, about 4 - 5mm below the skin, with brownish-grey tissue up to 0.5cm on both sides of the ring.

### Use disease-free potatoes

With the spread of bacterial wilt to all farming areas, farmers have very limited sources of disease free seed for planting. Farmers can use a method called "positive seed selection" to select the healthiest seeds from their own crop:

- Look out continuously for diseased potato plants in your *shamba*. Uproot them together with the surrounding soil and burn them.
- Two weeks before harvesting, cut the leaves of the healthy plants to allow the potatoes to harden.
- Harvest the selected seed potatoes separately. Select the best ones that are the size of an egg. Avoid bruising them to prevent infection.
- Store seed properly in a cool dry place away from light.
- To plant, select a portion of your farm that has not been planted with potatoes or any other crop in the potato family for the last 4 years (see tips above).



A potato plant infected by bacterial wilt. Inset: A diseased potato tuber with a black ring and white spots.

The liquid emerging from stem-ends and eyes ('sore eyes') is a typical sign of bacterial wilt.

### Controlling bacterial wilt

- Avoid planting potatoes and any crop from the potato family (tomatoes, peppers, chillies, eggplants, black nightshade/*managu*, tobacco) in a field that has evidence of diseased potatoes for a period of up to 4 years. Bananas and groundnuts can also be hosts.
- To reduce disease pressure in your *shamba*, farmers should plant crops from other plant families such as cabbages, pumpkins, onions, carrots, lettuce, beans, peas, maize, sorghum or pasture grasses in rotation.
- The presence of root nematodes makes plants very susceptible to Bacterial wilt. Rotate regularly with nematode resistant crops: All cereals and grasses, onions, leeks, garlics, cassava and sesame.
- Farmers should buy seeds from known seed growers; infected seeds from your neighbours will transfer the disease to your *shamba*.
- Uproot diseased plants together with the surrounding soil and bury or burn them. Never put infected plants in compost heaps.
- Remove volunteer potatoes (those that grow from the previous potato crop); they may transfer diseases and pests to your next crop.
- Low-lying areas should not be planted with potatoes, use well-drained upper sections of your farm for potatoes. Water-logging affects potato growth and can also spread bacterial wilt. ■

## innovative farmers' corner

### A simple home-made water tank

A farmers' support organisation in Uganda helps build simple water tanks using locally available materials for rural households.

*Dominique Jaquemet* | TOF editors often talk with small-scale farmers about water harvesting or drip irrigation during field visits. The main problem farmers face in this regard is the high cost of plastic water tanks. It is encouraging to note that in Uganda and Western Kenya some farmers have learnt how to construct water tanks with locally available materials. The applied principle is simple and inspired by the traditional mud house; a plastic sheet keeps the basin waterproof. These are the materials needed:

- Wood poles (odd number around 11)
- Vines or bamboo strips
- Mud and cow dung
- Plastic sheeting (10 metres)
- Glue for plastic (e. g. contact adhesive)
- Thick bamboo

### Where to build the tank?

A mud water tank, in contrast to a plastic tank, cannot be moved. Therefore, it is important to choose the construction site carefully. For water harvesting, it is advisable to build the tank as close to the water source as possible. For instance, if one wants to harvest rainwater from the roof of the house,

then the water tank should be constructed close to the house. For drip irrigation, the tank should be built higher than the field to be irrigated so that the water flows by gravity (Page 4).

### How to build?

Fix the poles into the ground in a circle of 2 metres in diameter. Use wood that is not affected by termites. Fix the poles carefully, so they can resist water pressure. Weave vines or other flexible material around the poles up to around 1.6m high. Now create a smooth internal surface for the plastic sheeting using a flexible mud/manure plaster. Make the surface as smooth as possible to prevent the plastic being perforated. Instead of mud/manure plaster you can also use banana leaves or grass matting. Make sure that the lowest point of the tank is at the rim, so that the tank can be emptied conveniently from one side. Finally use the plastic sheeting and glue to make a tight plastic liner. ■



### facts & figures

**Costs:** Most of the costs farmers can incur when putting up the tank are for the plastic and the glue. The material costs for a 5,000 litre tank (2m diameter and 1.6m high) is around Ksh 2,500. A 11,000 litre tank can be built with a diameter of 3m and 1.6m high.

**Durability:** Many years, depending on the maintenance of the tank and also the material it is made of. Guard against sharp objects that can pierce the plastic sheet.

**Keep the mud wall dry:** The tank will not last long if the timber poles and vines get soaked or stand in water. Make sure water does not collect around the outer surface of the tank and avoid overflowing! A good design improvement

would be to have the plastic lining wrapping over the top of the wall and preferably covering the outer surface of the tank. This will protect the tank from getting wet and wearing off. The plastic should not be tightly pressed onto the wall to allow airflow and to avoid condensation.

**Maintenance:** If the internal surface starts showing anomalies, it is good to empty and remove the inner line and re-line the inside of the tank with mud to make the surface smooth again. When performing this maintenance, any sediment accumulated at the bottom of the tank can also be cleaned out.

Source: D. Ssemwogerere, P. Jukes and T. Fischer, 2009 and [www.aliases.org](http://www.aliases.org)

# Guava trees need a lot of sunshine

I have a few guava trees. Please give some information on how to grow it.

Guava trees are quite robust plants, but like all fruit trees, they do best in full sun and well-drained, rich soils. They can also tolerate slightly saline soils. They withstand temporary water logging, but it is better if they are regularly watered deeply, with dry intervals in between. If they lack moisture during fruit growth, the fruits may fall off before ripening.

Guavas can grow well when planted along hedges or as windbreaks. To make sure that they get as much sunshine as possible, it is good to plant them in lines from North to South (temperate regions) at a distance of between 5 to 10 metres between the trees. To keep them in good shape and productive, they should be pruned by removing water shoots on the branches and suckers and sprouts at the bottom of the stem.

## Seedlings

In many areas in Kenya, guavas grow wild as small trees and shrubs. Therefore seedlings from the local market are rather difficult to get in seed nurseries but not impossible to find. Trees can be grown from seeds.



They will germinate within 2 to 8 weeks.

It is also possible to get new trees through "marcotting" directly on the tree (debarking the stem or a tree and covering it to induce root development for propagation purposes). To do this, you choose a shoot with a stem at least as thick as a pencil, and with plenty of leaves. Remove the bark just below a node, completely and all around the branch, to a length of 5 to 10cm.

Cover the wound tightly with fertile moist soil and wrap it with a transparent polythene bag, which is wrapped tightly around the branch above and below the cut. When you see small new roots sprouting out of the cut, you can remove the polythene bag carefully, cut the branch

underneath the roots, and plant it like a seedling. Guava trees live for 30 to 40 years, but the productivity declines after 15 years. To prevent birds from eating the fruits, have them picked early. The wood of guava trees can be used as firewood and to make charcoal.

## Anthracnose threat

Anthracnose is a threat to all parts of the plant at any stage of growth; affected trees show small and irregular yellow spots that darken with time to brown, dark-brown or black. Anthracnose can be treated with copper fungicides. The fruits may be eaten raw or cooked. Guavas are marketable in bigger towns and are also used commercially to produce jams, jellies and juices.

## Sodom's apple as pesticide

How does Sodom's apple work if I use it as a pesticide?

In India, Sodom's apple is used to control termites. Parts of the plant are soaked in water for at least 24 hours and the filtered water is poured on the infested soil, particularly in cotton fields. Some farmers plant Sodom's apple randomly in ginger and groundnut fields.

The smell emanating from the plant acts as insect repellent. Branches are also used as a trap because they attract the red hairy caterpillar. The larvae are then collected and burnt. Spraying a watery leaf extract on groundnuts within 40 days of



Sodom's apple

germination can reduce the bud necrosis disease. Furthermore, leaves can be buried in the soil to control brown plant hoppers in nurseries as well as in rice fields. The latex (juice) has also been used against poultry fleas.

# The aphids on your plants are the problem, not the ants

I have black ants on various crops. What can I do?

The black ants do not harm your crops. The real problem are not the ants. They are just "milking" the aphids on the plant because they are feeding on honeydew produced by aphids. That means that you have to remove



Ants do not damage plants they only harvest honey dew from damage-causing aphids.

the aphids to get rid of the ants. Aphids can be treated using various methods:

## Neem spray

In the early stages of aphid infestations, neem extract can control the pest. Neem is effective but works slowly, so you have to spray several times at an interval of 3-4 days.

## Pyrethrum spray

Pyrethrum spray works faster, but will also affect the natural enemies of the aphids, so it must be used only on infested parts of the plants.

## Flour spray

A spray made from 2 cups of fine white flour well stirred into 5-10 litres of water may also be effective against aphids.

Beware! Plant extracts can be dangerous. Test an extract first on some affected plants, wait for 2 days, check for damage symptoms and dilute if necessary before going into large-scale



Ants 'milking' honeydew from aphids

spraying. Plant extracts must be stored in a dark place and not for more than 5 days.

Half-filled yellow basins with soapy water or yellow painted plywood spread with petroleum jelly or used motor oil, 6cm x 15cm or more in size, make good traps for aphids.

## Aphids on passion fruits

On passion fruit, aphids spread the woodiness virus (potyvirus). The affected leaves show light

and dark green mosaic pattern often with light yellow speckles. Infected fruits are small with very hard rind and small pulp cavity. To prevent further spread of the aphids, remove all diseased vines from the field, disinfect your pruning tools with household bleach, replant with virus free plants. Avoid planting bananas and cucurbits near passion fruit fields.

Answers: Laura Künzig





How much are you willing to pay for this dairy goat: Ksh 10,000, 15,000 or 20,000?

## Don't be taken in by empty promises!

**Job Kiprotich** | Farming presents exciting opportunities for business and wealth creation. With a growing population, better transport infrastructure, growing urban populations, enhanced regional linkages, demand for farm produce and value-added products is set to grow. Farmers take the opportunity of increasing their incomes and improving their livelihoods. People who want to venture into farming are asking which farming enterprises bring the best returns.

However, farmers and potential farmers need to carefully review all information at their disposal before making decisions on what kind of crop to grow or animal to keep. That is the only way to avoid losing their hard earned cash or making investments that eventually do not bring good returns as expected.

### Misinformation

There is a lot of hype and misinformation in a desperate move too woo farmers from one farming enterprise to the other. Most farmers in the process end up losing money when the promised returns are not realized. Public relations articles by development organizations, mainly NGOs keen on painting a positive picture of their impact in their field of operation are one of the reasons for the confusion among farmers. Take the dairy goats and rabbit keeping for instance. Such public relations articles exaggerate the figures of how much farmers are making from this kind of

businesses. Greenhouse farming is another good example.

The hype creates artificial demand for these animals. The more farmers are asking for these animals, the higher the prices climb. When the demand is highest, rabbits are sold for as high as Ksh 7,000. The sellers are promising ready markets, and the buyers are swallowing the bait - only to discover sometimes very late that the "ready market" promised does not exist. The sellers, who buys a rabbit for Ksh 1,000 and sells it at exorbitant price already makes a huge profit from an unsuspecting farmer who is eager to go into the enterprise in the hope of making good profits.

### Opportunistic prices

No doubt, rabbit meat is healthy, but the market is still small and needs to be developed. A rabbit breeders organisation in Thika, for instance, is always looking for rabbit meat, they pay Ksh 350 per kg. Farmer networks can help weed out those exploiting farmers in pyramid like schemes.

The same is happening with dairy goats. A friend tried hard to buy 20 dairy goats; He went to so many places and even visited official goat keepers - only to realize that the journey was in vain; the dairy goats on offer were small, poor emaciated animals which may never have given even a single litre of milk in their life! But hype and public relations people have done their job well; it is unbelievable, but dairy goats are being sold at prices as high as Ksh 25,000. The farmer cannot even be sure about the quality of animal they buy, especially if there are no records to prove if the animals are registered with reputable breeders organisations. ■



Farmers are cheated on availability of rabbit market.



## farmers forum

0717 551 129 / 0738 390 715

**Vegetables and Eggs Supply wanted:** Anyone who can supply fresh broccoli, cauliflower, celery, terere (1kg each) and a dozen quail eggs every two weeks in Thika? Contact [F](#) Jacinta Gichungu-Eshon on 0722 210 680 with the quotation.

**Grinding machine wanted:** Am looking for a machine used to grind or prepare chicken feed. If you know of any place contact 0713 721 691.

**Maize for sale:** I have 400 bags of maize at 3100 per 90kg. Anyone interested contact [F](#) Tallam Moses on 0720324263.

**Brooder equipments and incubators for sale:** We now stock brooder equipments and incubators/hatcheries from Europe of different sizes, from 24 eggs to 10,000 eggs. Please contact us on 0721 556 327 or info@mamamikeshatcheries.com.

**Rabbit market wanted:** Anyone who wants to sell or buy rabbit meat you can contact RABAK (Rabbit Breeders Association of Kenya). We buy 1 kilogram of dressed meat at Ksh 350. We also want farmers to register with us to help them in rabbit market. Call 0721 219 092 or 0722 277 523.

**Green house equipment for sale:** Now available in stock. UV Treated 200 microns greenhouse polythene sheet available in 5.5m by 102m roll and 8m by 102m roll. We also have high quality insect net covers to protect your greenhouse from pest intrusion. Dimensions in 2.5m by 102m roll. [F](#) Famas Agri Equipments Kenya offers free transportation within 45 km radius and discount on bulk purchases. Call our expert on 0727 943 108.

**Incubators for sale:** Fully automatic 48 eggs capacity egg incubator at Ksh 25,000. Plus free delivery within Nairobi, call 0724 702 512.

**Charcoal briquetting machines:** We make charcoal briquetting machines. The machine is electrical and easy to operate, making up to 500 kilos of clean energy fuel per day. Price Ksh 42,000. Contact [F](#) Moses Gachanja 0722 281 127.

**Broiler Chicken for sale:** I'm selling broiler chicken at Ksh 400 per piece. Weight is between 1.5 and 1.7kg. Free delivery to CBD, Ngong road, Mombasa road, West lands and

Hurlingham. Contact [F](#) Gillian Ilamaha on 0722 773 206 for delivery.

**Tomatoes wanted:** Searching for a tomato farmer who can deliver tomatoes in crates to South C and Mombasa Roads Imara Daima estate. Price per Kg is Ksh 80 currently. If interested inbox or reach [F](#) Wanja Farm Kariuki on 0733-723-753.

**Coffee seedlings for sale:** I have Batian coffee seedlings ready for planting. If interested get in touch with [F](#) Charles Kibe.

**Sweet corn seeds wanted:** Hello fellow farmers, I am looking for sweet corn seeds. Please help. Wish to plant on a 2.5 acre area. Please contact [F](#) Njoki Mugo.

**Rabbit skin for sale:** 200 pieces. Any buyer interested. Please contact [F](#) Anthony Macharia.

**Broilers for sale in Eldoret:** I have broilers for sale in Eldoret at 400 each, 1.5kg weight. Constant buyer required. Please contact [F](#) Caroline Barngas on 0726 472 340.

**To see the most recent advertisements or to place an advert, you can simply go to our online Farmers Forum section in our website.**  
[www.theorganicfarmer.org/farmers-forum](http://www.theorganicfarmer.org/farmers-forum)

### Farmers want tree Lucerne

In TOF issue No. 93, February 2013, we wrote about a 3-5m high shrub called Tagasaste (*Chamaecytisus palmensis*), better known as tree lucerne. It is a fodder tree, which provides the farmers' animals with high quality fodder and enriches the soil with nitrogen. In South Africa as well as in Australia, where farmers call Tagasaste the "living haystack", farmers have planted thousands of hectares with the tree lucerne. Its ten metre-deep sinker roots make the shrub drought resistant, therefore in can be used all year round to graze cattle, sheep and goats. One kilo (with around 10 - 12,000 seeds) costs Ksh 3,500. It would be a good opportunity for a tree nursery run by a farmers' group to have these seedlings.

Tagasaste seeds can be bought at the following address:

*Sunshine Tree Suppliers, Call Jackline on 0710 614 430.*