

Dear Reader,  
The year 2020 has not been easy for many farmers, having begun with a locust invasion that left many with huge losses. This was closely followed by the Covid-19 pandemic that continues to threaten the stability of our economy. With most operations paralysed, schools closed and the rules discouraging public gatherings, the TOF Magazine project was hard hit, as many farmers could not receive their copies. However, with every hurdle come lessons and innovation.

Despite the challenges that the agricultural sector faces, farmers keep producing food, adapting and innovating to stay afloat. We are grateful that we can once more reach you with our monthly editions. Your keenness to learn from the articles and give feedback that informs our content, has kept us going through the year.

The COVID-19 pandemic has proven the critical role of good nutrition in building immunity against illnesses. We continue to feature content on new ways to make nutritious meals using produce from your farm.

In this edition, we feature articles on dairy goats rearing. We tell you how to grow and cook pumpkins.

Learn how to make your own organic pesticides and see how in Nakuru County, Gilgil farmer Rachael Wairimu is using the TOF magazine to improve her farming.

Read these articles and many more in this issue. We wish you a happy festive season!

## Dairy goat rearing for increased health and wealth of farmers

**Goats and sheep were the earliest domesticated animals in human history. Goat milk not only fetches a higher price than cow milk, but it is also more nutritious**

By Walter Akillah

Dairy goat keeping is lucrative for farmers moving away from traditional dairy cow rearing. Kenya's dairy sub-sector contributes about eight per cent of the Gross Domestic Product (GDP) with an annual milk production of 3.43 billion litres (297 million from goats). Dairy breeds include species such as Alpines, Saneens, Toggenburgs, and Anglonubians.

Saneens have a black spot on the nose, are bigger than the Toggenburgs and can produce up to six litres of milk a day. Anglonubians is a British breed that is brown, and big-bodied. Toggenburgs are white and can be easily identified by their white legs.

The Alpine is medium to large sized, and can be white, grey, brown or black with good milk production. It originated in the French Alps.

In Kiambu County, Simon Makamu, a 35-year-old small-scale farmer started rearing goats for milk three years ago on his half-an-acre piece of land in Ngenda Village in Gatundu South. Mr Makamu mainly rears the Saneen breed, which he recommends for any small-scale farmer.

All his goats have ear tags to help in the identification and tracking of their lineage.

"Different colours of ear tags are used to trace the father records. One can also easily identify if it is male or female," says the farmer.

### 3.43b

**Annual milk production from Kenya's dairy sub-sector, which contributes about eight per cent of the country's Gross Domestic Product (GDP)**



Over the years, farmers have tried a crossbreed of Saneens and Toggenburg to increase milk production. A normal goat produces at least two to three litres of milk a day. However, farmers should seek expert advice before doing any crossbreeding. The following 9 tips will help you take good care of your goats:

1. Never subject your goats to wind. Windy conditions encourage pneumonia-causing bacteria such as *Pasteurella multocida* to breed.
2. Build structures using materials that maintain warmth such as off-cuts. Line the walls with plywood and place carpet papyrus reeds beneath the iron sheet roof to keep the house warm at night. Ensure the goat house is parallel to the direction in which the wind blows and that it has proper ventilation. Raise the goat pen above the ground a little less than knee height. Build the floor of the pen with wooden slats and leave half-inch spaces between the slats so that the droppings can fall between and onto the ground. Doing this ensures that your goat does not sleep on wet ground or on its droppings or urine. It helps prevent pneumonia and worms.
3. Separate male and female goats to avoid milk having a bad smell. The smell comes from the male goats, more so during the mating season. Goat milk picks odours easily and should therefore be stored in a clean, covered container in cold temperatures.



## Home made pesticides

Learn about organically prepared recipes that can be used to eliminate almost all types of common garden pests. Pg. 2

4. Allocate enough sleeping space for each goat. When goats are too squeezed, they produce methane gas during digestion at night, and ammonia during the breakdown of urine, which can cause self-poisoning leading to death. Also, separate young goats from adults to avoid the adult goats trampling on the young ones.
5. Keep your goats in a shaded area when it's hot and don't take them out when it's too cold or rainy.
6. Keep feeding troughs dry so that mould does not develop on the feeds.
7. Deworm all animals before mating and pregnant ones before they give birth. Young ones should be dewormed at three months when they stop suckling. It is also important to deworm before the start of the rainy seasons.
8. Feeding: Free-range goats will often have a variety of feeds to browse. However, care should be taken when zero grazing your goats. Goats love variety in feeds. Cows will eat Napier grass for years but goats need to be subjected to different feeds to enable them to eat more, for better health and milk production. Give them different types of feeds and edible materials in the course of the day. This makes them eat better. A goat's diet should contain protein, dry matter, minerals, vitamins, salt and water. Ensure that goats get between 16 per cent and 18 per cent crude protein from feeding.

**Dry Matter:** Provide your goats with dry matter such as dry Boma Rhodes or Lucerne hay, which should be harvested immediately after flowering, as that is when it has the highest nutritional value. Other feeds such as sweet-potato vines and green maize stova are great for creating variety. Source your forages from reputable suppliers. Some forages, for example, those from areas frequented by pastoralists can introduce diseases into your farm. Feed your goats on silage in a controlled manner. Too much molasses in silage can result in acidosis (a carbohydrate fermentation disorder of the rumen making the rumen become acidic and can lead to low feed intake or death). Do not feed your goats on overgrown and hairy Napier grass. It makes them cough and they will eat poorly.

**Grains (energy) and concentrates (minerals & vitamins):** Concentrates such as dairy meal provide vitamins and minerals, which increase milk production, while grains such as maize give the much-needed energy. Where possible,



feed each goat on half-a-kilo of dairy meal for the first litre of milk it produces and 250gm for every additional litre. Dairy meal concentrate and grains should, however, be controlled because too much will result in lactic acidosis and diarrhoea, which can cause death. To determine the ideal amount of dairy meal required for each goat, the farmer should "challenge" it. This is best done after kidding as follows: Start by giving the customary 500g of concentrate and keep adding 250gm per week as you monitor the corresponding increase in milk. Keep doing this until the point at which additional concentrate does not result in increase in milk production. Then maintain that amount of concentrate.

**Salt:** Always provide a salt block for the goats even when you have powdered salt in the diet for those using a total mixed ration (TMR).

**Water:** Goats don't like wet feeds but they drink a lot of water. About 85 per cent of milk is water. Therefore, provide clean drinking water at all times.

9. **Choose the right dairy goat breed:** Local goats produce little milk but can survive in the hot climate, with low quality forages and fodder and to some extent, they resist some common

diseases. Farmers prefer the imported dairy breeds because they have superior qualities that make them attractive. They produce a lot of milk and some are larger than local ones. However, care should be taken, as they sometimes do not adapt very well to our harsh weather. These dairy goats are normally mated with local goats to get "a better milk producer" than the local goat but which is easier to raise than the pure dairy types. This is called crossbreeding.

#### **Breeds commonly reared in Kenya include:**

1. Toggenburg, Saanen, Alpine, and Anglo-Nubian.
2. Anglonubians have a thin coat and large ears. They thrive in warm areas and do not tolerate cold.
3. The Alpine goat is hardy and adapts easily to most climates. In Kenya, the German Alpine has been bred to produce the Kenyan Alpine, which thrives in central, eastern and western Kenya.
4. Saanens do not like hot climates. They require good housing and good quality pasture. Ensure you keep this breed under the right conditions.
5. The Toggenburg breed is vigorous, and is a very good forager. This breed is meant for cooler areas, but with good care, it does well in Kenya. It eats a lot and cannot produce milk

if it is not fed properly. Keep them disease-free, and avoid exposing them to direct sun for too long. Compared to indigenous goats, Toggenburgs are susceptible to pneumonia.

#### **Diseases that affect dairy goats:**

The most common ailment in goats is a pneumonia called Contagious Caprine Pleuropneumonia, (CCPP), which can be prevented through vaccination. Also, ensure that wind does not blow through the goat house.

**NB: One sign of a goat's wellbeing is an upright tail. If it is 'hanging' it means that your goat could be feeling unwell or be uncomfortable for one reason or the other.**

#### **Financial benefits of goat rearing**

1. Goat milk retails at between Ksh80 and Ksh200 per litre compared to cow milk, which fetches between Ksh30 and Ksh70 per litre.
2. Goats require less feed, labour and space compared to cows.
3. They eat many different plants, making it easier and cheaper to source for their feeds
4. Their droppings provide good manure for organic farming.
5. They require less water than a cow.
6. Apart from milk they provide meat, which retails at a higher price than beef.

#### **Advantages of goat milk:**

1. 100 per cent goat milk is a good source of Riboflavin, and Vitamin B which is important for energy production and protection of energy producing cells.
2. Goat milk has fewer allergenic proteins, making it easier to digest.
3. The fat globulins in goat milk are easier to digest because they contain a higher proportion of short and medium-chain fatty acids.
4. It is suitable for lactose-intolerant people because it contains lower amounts of sugar lactose.
5. It's a good source of calcium and widely known for its role in maintaining the strength and density of bones.
6. It is a good source of potassium, an essential mineral for maintaining normal blood pressure and heart functions.
7. Goat milk has long been used in the treatment of ulcers as it soothes the digestive tract. It has also been used in the treatment and management of eczema (also called atopic dermatitis, is a condition that makes your skin red and itchy).
8. It compares very well with human milk and is closest to "mum's" milk, making it a good alternative.

According to a Kiambu farmer Makamu, well-fed dairy goats mature quickly and will give birth (kid) twice a year with higher chances of producing twins.

"I started with two goats and now have 12. I would advise farmers to keep goats. They eat little and can provide you with a good income," he says.

<https://infonet-biovision.org/AnimalHealth/Goats>

## **Gilgil farmer discovers smart tech from TOF Magazine**

### **Rachael Wairimu learnt about organic farming when she desperately needed it**

**By Caroline Mwendwa**

From a distance, her farm appears ornamental due to the rich variety of crops she is growing. Various vegetables, tree tomatoes, apples, and bananas fill the farm and free-range chickens roam around. Rachael Wairimu is a cheerful woman, whose homestead is always filled with laughter from her grandchildren.

"When I came to this place, I was scared because it was awfully dry. I came from Kiambu, a wet region where my mother grew all sorts of vegetables. I wondered what could grow in this desert," she reminisces.

Many years down the line, Wairimu has learnt about many technologies from the TOF Magazine and got training from the BvAT outreach team. Today, her garden is as green as her mother's despite the dry weather in Gilgil, Nakuru County. In the few minutes we spend with her, she immerses us into her world of farming and tells us about her transformation from a conventional to an organic farmer.



*Ms Rachel Wairimu admires vegetables growing in her organic garden.*

"I had reached a point where every season was frustrating. Buying farm inputs had become expensive and my yields were unsatisfactory. I also felt like I was infusing too much chemical substances into the crops I was feeding to my family and this was disturbing.

"One day, a friend invited me to visit her farmers' group. They were expecting some visitors from Biovision Africa Trust, an organisation that teaches farmers to farm better, organically. The visitors changed my whole approach to farming".

"The visitors taught us how to grow food organically, and showed us technologies to increase water retention in the dry season. I went home determined to try and started with small portions of land preparing them for planting as instructed, using manure and mulch to retain moisture and growing medicinal plants to protect the crops from pests. My first harvest from the organic portion was encouraging".

The next season she practised crop rotation and intercropping and her yields improved.

"I have never looked back. I found other farmers with similar interests and formed a group, Karamaro Seed Savers Network, through

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which we have been undergoing training. We also meet to discuss ideas to implement on our farms," she explains.

The group comprises 20 farmers and receives a copy of the TOF Magazine every month.

"We work closely with field officers from BvAT and have learnt many new technologies, to increase yields and cut costs of production," she adds.

Her soil is fertile and her farm is always full of produce.

#### Technologies she learnt

"I read an article in the magazine on making organic manure. Since then, I have never bought commercial fertilisers. I have cows and trees that we prune, which provide sufficient materials to make compost, which we apply on the farm," says Wairimu.

"When I invited the experts to test the soil on my farm, the results showed that it had all the nutrients in the right quantities."

Wairimu also learnt how to make plant extracts and use them to control pests. In addition, a BvAT field officer taught the group members how to differentiate between beneficial and harmful insects.

Having learnt about the danger of mono-cropping, she grows a variety of crops such as spinach, managu, dhania, sagaa and oats. She also has 200 tree tomatoes, 20 banana trees, pawpaws, apples, avocados and two pomegranate trees, which produce more than 300 fruits. She keeps cattle, chickens, and rabbits and is planning to start rearing dairy goats.

"Through the magazine, I learnt how to make my own chicken, dairy and rabbit feeds. This has reduced my costs," she adds. She sells her surplus and makes over Ksh20,000 a month, which caters for home expenses.

"I feed my family from the farm. I don't buy food. Even better, my family consumes a balanced diet," says Wairimu.

To deal with the shimmering heat in Gilgil, Wairimu uses leaves and farm residue to cover the soil to prevent moisture loss. This helps her soil to retain water for longer and enables her to harvest throughout the year.

"Since I learnt about mulching and minimal soil disturbance, I do not throw away leaves after pruning my trees. I also buy leaves from neighbours who have pruned their trees."

"Farmers should stop farming routinely and farm smart," she says, and urges them to intercrop in ways that keep the pests away. Her plea to urban residents is for them to embrace technologies such as vertical gardens to plant vegetables.

"After discovering vertical gardens, my worry about dryness of this region ended. With vertical gardens, it is easy to keep the soil moist even when dry seasons persist," she adds.

Wairimu asks farmers to be conscious of the long-term effects of chemicals on food produced. She urges them to start organic farming on a small portion of their farm and expand gradually.

"Once you start using these techniques, you will never desire to invest in chemical farm inputs. Despite the labour you will need to put in, the yields and benefits are worth it. Organic farming though tasking is rewarding," she adds.

**Caroline Mwendwa is the Project Officer, The Organic Farmer Magazine, [cmwendwa@biovisionafrica.org](mailto:cmwendwa@biovisionafrica.org)**

## Pumpkins. A superfood that can greatly boost your health

**Their sweet flavour, mashy texture and nutritious value make them a favourite for many mothers weaning their babies**

**By James Kamau**

Pumpkins are delicious and versatile fruits. Their sweet flavour, mashy texture and nutritious value make them a favourite for many mothers weaning their babies. The highly nutritious fruit that comes in a variety of colours, is a vine plant in the squash family that produces edible fruit, leaves, and seeds.

It can stretch to over 10 metres and provides good ground cover. It is also an excellent companion plant for legumes and cereals and works well as a vine plant layer in forest gardening since they have shallow roots and can be supported in growth as they are climbing plants.

#### Ecological requirements:

They thrive in low altitudes up to about 2500 meters above sea level with mean temperatures of 18-27 degrees Celsius. They require well-drained fertile soil with a neutral pH and do well where medium to heavy application of compost or manure is done. They are sensitive to water logging which encourages the development of leaf diseases. This drought-tolerant crop can produce about 5 tonnes per acre depending on soil fertility, spacing and variety.

#### Good in your diet

Pumpkins have tough skin and require some effort to slice. Once cut, scoop out the seeds and stringy parts and slice it as desired. Nothing goes to waste. The seeds can be boiled, dried, and roasted to make a delicious and healthy snack.

The fleshy part can be boiled, blended/ mashed and fried (optional) to make pumpkin soup. The fruits and seeds are full of powerful antioxidants. Eating them can help solve dietary deficiencies and may protect you against various health problems. The numerous health and nutritional benefits are what make the pumpkin a superfood.

#### Health benefits of pumpkin fruit and seeds

- *The pumpkin is medicinal in various ways. For example, it is used to destroy parasitic worms. The complete seed, together with the husk, is used to remove tapeworms especially for children and pregnant women, whose treatment using other drugs can put them at risk.*
- *The fruit enables the kidneys to rid the body of excess fluid, reduces fevers and helps in indigestion. When smashed into a pulp, the fruit is applied to burns and scalds, and boils. It is also used in the treatment of migraines or prolonged headaches.*
- *They contain antioxidants such as carotenoids and Vitamin E that can reduce inflammation and protect your cells from harmful free radicals. Excess free radicals can cause oxidative stress that can lead to chronic illnesses like heart disease and cancer.*
- *Consuming pumpkins regulates blood sugar.*
- *Its high levels of calcium strengthen bones.*
- *Eating pumpkin fruit and seeds reduces the risk of stomach, breast, lung, prostate, and colon cancers.*
- *They improve urinary functions and may relieve symptoms of Benign Prostatic Hyperplasia (BPH), where the prostate gland gets enlarged.*



- Their high dietary fibre promotes good digestive health.
- They are rich in zinc, which improves sperm quality. High levels of tryptophan amino acid promote sleep.
- The high beta-carotene in pumpkin is converted into Vitamin A, which strengthens your immune system, fights infections and improves eyesight.
- It is also rich in lutein and zeaxanthin, which lower risks of age-related macular degeneration (AMD) and cataracts;
- It is rich in Vitamins C, E, iron, and folate that boost immunity. Vitamin C is essential for the formation of collagen, a protein that keeps skin healthy.
- It aids weight-loss because you can consume more of it compared to carbohydrates like rice and potatoes, but still take in fewer calories.

#### Who should not eat pumpkin?

- It is mildly diuretic, which means eating a lot of pumpkins may increase the amount of water and salt that your body expels through urine. Expelling too much water and salt may be harmful to people taking medicines such as lithium. Diuretics can impair your body's ability to remove lithium and cause serious side effects.
- People who experience allergies after consuming it.

**Note:** Many pumpkin-based junk foods such as pie and candies are loaded with added sugar and do not offer the same health benefits as consuming the fruit or seeds.

#### Growing pumpkins

- Pick a site with enough sunlight and with rich soil that is well drained and not too soggy. Apply lots of compost and aged manure, as they are heavy feeders. They require lots of space. However, where it is limited, plant them at the edge of your garden and guide the vine along the side.
- Plant seeds in rows or "pumpkin hills", which are the size of small mounds to encourage faster growth and improves drainage and pest control.
- Mix well decomposed manure 30cm to 135cm into the ground or put a two- to four-inch layer of compost.
- Plant the seeds 1-inch deep, four to five seeds per hill. Space hills four to eight feet apart.
- Your plants should shoot in five to 10 days.

- When the plants are five to seven centimetres tall, thin them out and leave two-three plants per hill.
- When planting in rows, sow seeds six to 30 cm apart. Thin after germination to one plant every 20cm to 90cm.

#### Caring for pumpkins

- Where possible, protect plants early in the season to prevent insect problems by using row covers. Remove covers before flowering to allow pollination.
- They need lots of water after pollination when the fruit visibly begins to grow.
- However, keep foliage and fruits dry, as dampness will increase incidences of rot and other diseases.
- Mulch your crop to keep in moisture, suppress weeds, and discourage pests. Do not over-cultivate to avoid damaging their shallow roots.
- Avoid using insecticides to kill pests. Instead, use organic methods and apply only in the late afternoon or early evening, when blossoms are closed for the day. Place a bee house in your garden to improve pollination.
- Pumpkin vines are very delicate. Any damage to them may lower the quality of the fruit.

#### Growing the perfect pumpkin

- Regularly apply manure or compost mixed with water to sustain growth.
- Pinch off the fuzzy ends of each vine after a few pumpkins have formed to stop vine growth and direct the plant's energy to fruit growth.
- Pruning the vines helps with space management and allows the plant to focus on the remaining vines and fruits.
- Gently turn the fruit, as it develops to encourage an even shape.
- Place a thin board or heavy cardboard under ripening pumpkins to protect them from decay and insect damage.

#### Pests/diseases

Pests and diseases that affect pumpkins include squash bugs, cucumber beetles, aphids, squash vine borer, powdery mildew, and anthracnose. Inadequate sunlight, too much fertiliser, poor weather at bloom time and reduced pollination can also hamper fruit development.

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#### To prevent infestation of various pests:

- Use certified disease-free seeds.
- Treat own seeds in hot water for 20 minutes at 135 degF (43 degC).
- Plant resistant varieties, if available.
- Destroy volunteer cucurbits and weeds in the field.
- Practise crop rotation with non-related crops. Use of long rotation periods (3 to 4 years).

#### Harvesting

- Harvest pumpkins when fully mature. Its skin will turn a deep, solid colour when ripe.
- Thump the pumpkin with a finger. If the skin is hard and the sound hollow, then it is ripe. You can also press your nail into the pumpkin's skin; it is ripe if it does not puncture.
- Harvest pumpkins on a dry day after the plants have died back.
- To slow decay, leave an inch or two of stem on pumpkins when harvesting.
- To harvest, carefully cut the fruit off the vine with a sharp knife or pruners; do not tear. Sever 3 to 4 inches from the fruit to increase the pumpkin's storage period.
- Carry them gently to avoid bruising.

#### Curing and storage

- Cure in the sun for a week to toughen the skin and then store in a dry room with a temperature of 12 to 13 degrees Celsius.
- Pumpkin seeds should be stored in clean airtight containers and should last for six years.
- Pumpkins fruits can last three and seven months when stored in cool well aired and dry stores. Regularly check for soft spots or other signs of rot from time to time. Throw away rotting pumpkins or cut them up and add them to the compost pile.

#### Marketing:

They are popular in all Kenyan markets and a small half kilo pumpkin will retail starting at Kshs20 to Ksh40. Large fruits will sell at between Ksh100 and Ksh200. Traders can also slice the fruits into small slices which each retailing at Kshs20.

#### Recommended varieties

The common varieties available in Kenya include white giant from South Africa, Israel giant, Egyptian giant, squash, and dola.



<https://infonet-biovision.org/PlantHealth/Crops/Pumpkin>



## How to prepare simple home-made organic pesticides

By James Kamau

Using these recipes, almost all types of common garden pests can be eliminated. Liquid dishwashing soap in most recipes can help the pesticide to stick to the plant and the soil around it.

#### Powdery mildew control

Mildew is rampant when it is cold. Therefore, farmers should ensure that they spray the solutions weekly.

**Milk spray:** Mixing one litre of milk with one litre of water and spraying on the plant and soil around it controls mildew.

**Baking soda spray:** Bicarbonate of soda prevents bacteria spores from forming. Mix one tablespoon of baking soda with one tablespoon of vegetable oil and add one tablespoon of liquid dishwashing soap. Mix with one gallon or three-and-a-half litres of water and spray.

**Liquid dishwashing soap spray:** It is recommended that you use liquid soap. The spray melts the outer shell of most insects. It works against some pests, including aphids, scales, mites, and thrips. Mix liquid dishwashing soap with water in a mild solution and then spray on the crops.

**Neem spray:** Neem leaf juice and neem oil spray are toxic to over 100 species of insects and contains components present in over 50 different pesticides. It is one of the most powerful pesticides in the world. Mix 150ml of organic neem oil with ½-tablespoon liquid soap and ½ litre of warm water, then stir slowly and spray the mixture. Scale up the mixture to the size of the garden.

**Tobacco spray:** Tobacco is toxic to pests such as caterpillars and



aphids. It also kills some bacteria in the soil. Use natural organic tobacco.

**NB:** Tobacco pesticide should never be used on plants of the solanaceous family, such as tomatoes, capsicums, and eggplants. Mix tobacco in water and let it sit for at least 24 hours until the liquid turns brown. Put in a sprayer and apply on the plants.

#### **Tomato and nightshade leaf spray**

Nightshade and tomato leaf spray contains compounds that are fatal to most insects that invade gardens. Mash the leaves using a pestle and mortar or blend them and soak in warm water, then strain and spray on the crops. You can mix it with a very small amount of liquid dishwashing soap for a longer lasting effect.

#### **Hot pepper and chilli spray**

The active ingredient present in all varieties of hot pepper that gives them their 'heat' is capsaicin. It is fatal to some pests like mites and white flies, and other species of flies and ants. Mix blended hot pepper with water and little liquid soap. Do not spray on a sunny day. The best time for spraying is in the evenings and during cold weather. The spray can cause the crops to be scorched in the hot sun.

#### **Garlic oil spray**

Garlic oil repels pests such as white flies, aphids, and beetles. Onion and garlic, garlic mint and pepper sprays all work in the same way. Soak minced garlic in organic vegetable oil or olive oil overnight. You could also mince garlic with onion or garlic with mint and pepper in a blender or mash them. Add liquid dishwashing soap and mix with water. Spray in the evening, and never on a sunny day.

#### **Dust mite and flea repellent**

**Cloves, eucalyptus and rosemary:** Mix cloves and eucalyptus

or rosemary and soak overnight, then mix with a little water and spray.

**Chopped-up banana peels:** Burying chopped-up banana leaves under the soil repels aphids and adds potassium to the soil.

**Coffee grounds:** Coffee grounds repel most pests. They are used to control ants.

**Pyrethrum spray:** Pyrethrum is a broad-spectrum insecticide used to control bugs, caterpillars, beetles, aphids, flies, mites, whiteflies, thrips and leafhoppers. Mix 20g pyrethrum powder with 10 litres water. Soap can be added to make the substance more effective but it is not vital. Strain and apply immediately as a spray. For best effects apply in the evening.

**Sodom apple and African Marigold:** To manage aphids and other common pests on vegetables, chop Sodom Apple fruits and African Marigold leaves and soak them in water for two weeks. Add some liquid soap to the mixture. Extract the liquid and use it on your crops.

#### **Farmer's experience**

Mr Andrew Nguni, a 37-year-old farmer from Gilgil in Nakuru County, grows sukuma wiki, potatoes, beans, asparagus and maize on his three-acre farm.

Over time, however, he realised that despite putting in a lot of effort his yields kept dwindling.

"My yields kept dwindling every season until I discovered what I was doing wrong," says Nguni, a TOF ambassador in Gilgil.

After meeting Mr Francis Maina of Biovision Africa Trust and discussing this with him, Nguni realised that his challenges sprang from resistant pests, especially aphids that attacked his crops and were expensive to control.

His soil, too, had degenerated and become infertile due to over-reliance on synthetic fertilisers. He would constantly purchase farm inputs and pesticides, but had little to show in terms of increased harvests. The problem was so intense that his harvest could barely last to the next season.

"Being a farmer, it always feels odd when I run out of produce and end up having to purchase maize, vegetables and potatoes," he adds.

Mr Maina introduced him to organic farming and trained him to prepare an extract from Sodom apple and African Marigold to repel aphids and other pests.

"I use the extract on my vegetables. They are healthy and taste better," says the father of three, who no longer has to purchase pesticides or worry about chemicals on his farm.

"I chop the Sodom apple fruits and African Marigold leaves and soak them in water for two days. I then add a bit of soap to aid in stickiness. I sieve the mixture and fill it in a spray bottle and spray on my crops," he explains.

This solution has kept pests away and Mr Nguni gets good harvests every season. He can now feed his family from his farm yields and have some surplus for sale.

"My organically grown potatoes are physically attractive and do not ooze the white fluid from the pores, even after being stored for a long time," he explains. He uses farmyard manure, and mulching on his soil which increases fertility and moisture retention.

He has also learnt the importance of crop rotation and uses this practice to keep the soil fertile while managing pests.

<https://inonet-biovision.org/search/site/plant%2520extracts>



Location	Frequency
Nairobi	102.7
Kakamega	91.5
Bungoma	
Busia	
Malindi	106.3
Location	Frequency
Webuye	95.9
Garissa	88.7

Location	Frequency
Taita	107.4
Narok	102.3
Nyeri	105.7
Machakos	93.8
Makueni	
Kitui	
Meru	105.1
Marsabit	88.3

Location	Frequency
Nakuru	104.5
Gilgil	
Kisii	91.3
Kisumu	105.3
Mombasa	105.1
Kericho	90.5
Eldoret	91.1

Tune to Radio Maisha every **Thursday at 7.30 PM** through any of these Frequencies nearest to you to receive Kilimo Hai, TOF Radio Swahili farmer programs. TOF Radio and Radio Maisha partner to bring you these educational programs.

## TOF Radio thanks programme listeners

Thank you for supporting TOF Radio

By Musdalafa Lyaga

The TOF Radio team is grateful to everyone who has supported and listened to the Kilimo Hai programmes on ecological sustainable agriculture this year. The programmes have triggered conversations and inspired many farmers.

We have been on air for the past 12 years with the help of generous friends and sponsors such as the Biovision Foundation of Switzerland. We put so much thought, time, research, and hard work into our farmer programmes and the feedback we have been receiving through SMS and phone calls is invaluable to us. This year, we have received over 6,000 SMS and 2,000 calls, commending our programmes and seeking to know more about the topics already aired. Through the Kiswahili station, Radio Maisha, and the national broadcaster Kenya Broadcasting Corporation (KBC) regional stations, Ingo FM, Minto FM, Mwatu FM and Coro FM, TOF Radio reaches more than a million small-scale farmers.

Understanding our farmers' needs is the main focus when preparing the radio programmes. TOF Radio journalists Musdalafa Lyaga and Charles Kimani work closely with farmers, scientists, researchers, extension workers and their programme colleagues. By visiting farmers and extension personnel who work with them at the community level, the Journalists learn about their experiences and challenges and how they are overcoming them. The many agricultural

### From our listeners...

"Morning Kilimo Hai? I am proud of your service to the nation. Thank you and be blessed," - **Nyamweya Obed, agricultural extension officer, Nyamira County**

"Greetings to the radio presenter Kilimo Hai! We are grateful for the information you continue to give us. Our farming group looks forward to your weekly programmes," - **M. Liaka Kimilili, Bungoma**

"Hi! I'm a farmer in Naivasha doing herbs and spices and I listen to your radio programmes and wow! I am now looking at farming from a different perspective. Thanks a million!" - **John Kamau Muturi**

"Good evening BIOVISION! Bravo for how you ensure farmers get useful knowledge," - **Reuben Kibet Kapcherop**

"What will you be discussing in tomorrow's programme? Your show is taking us to the next level, thank you!" - **Samuel Wachira Murigu**

innovations developed by researchers and small-scale farmers contribute significantly to improving food security and reducing poverty. TOF Radio reinforces what is good about small-scale farming and helps farmers to find solutions to their day-to-day challenges. It enables individuals, groups and communities to tell their own diverse stories and share their experiences by presenting a unique vehicle for bridging the gap between research and the farm.

To enable access to all our past programmes, the TOF Radio Team is uploading them on our website <https://theorganicfarmer.org/tof-radio/>.

We hope you enjoy our programmes. We also urge you to tell us what you like and what you do not like. Also, share your success stories with other farmers to learn from and make a difference in everyone's life in Kenya.

Next year we plan to introduce TOF Radio Community radio programs. The project will work closely with commu-

nities, researchers and extension service providers to generate and validate content on value chains, specific to the community. It is aimed at triggering conversations on specific value chains among community members.

We will also increase awareness among consumers of organic produce by airing programs on utilisation of various farm products through which we hope to stimulate markets and increase incomes of organic farmers. As we break for the holidays, we wish you a merry Christmas and Happy New Year 2021.

### December Farmers' Forum

Virginia Wanjiru from Kirinyaga is selling bananas. To purchase them, call **0723 594 141**

Would you like to learn value addition for honey or buy honey products such as body and hair products? Call Mr Wanyama Bwire **0703 363 770**

#### Partner organizations



To contact us on the "tusemezane" platform or ask a question, kindly call or sms +254 715422460

#### TOF partners on the web:

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