

**Dear Reader,**  
Early this year, Biovision Africa Trust launched its strategic plan for the year 2021-2024 with a clear vision of the path it will take in its mission to improve livelihoods of the small-scale farmers. Your enthusiasm as a reader of TOF Magazine through-out this year has been our motivation in producing this publication every month.

Through its various programs, the Trust has impacted the lives of many farmers across the continent. This edition of TOF has sampled two farmers whose lives have greatly improved through using the information featured in The Organic Farmer Magazine.

This year, farmers have been challenged in many ways especially since rainfall has been inadequate in most parts of the country. Farmers have been innovative in adopting farming techniques that help in increasing their food produce despite the scarce rains. In this edition, we share information on techniques such as Conservation Agriculture (CA) and agroforestry, elaborating why you should consider planting *Gliricidia sepium*; a tree with multiple benefits to livestock, the soil and human beings.

Read on for these and much more.

## TOF Magazine unlocks markets for hive maker in Machakos

By Caroline Mwendwa

Julius Mutuku's fortunes as a farmer changed for the better the day he met Antony Musili of Biovision Africa Trust in 2015. Mutuku had invested in pure pedigree dairy cows which he bought from Githunguri Dairy Livestock Farm, in Kiambu. "The dairy cows were a huge investment and I hoped to gain maximum returns but during the dry season, I struggled to feed them as is required. That is why, when the idea of switching to beekeeping came to mind, I thrust myself fully into it," he says.

Mutuku did not have prior plans to practice beekeeping. In fact, he feared bees after hearing many horrifying stories including those where people died of bees stings. However, this changed when bees raided his farm and made a hive out of a neglected plastic tin. "When I noticed a swarm of bees in a site close to my livestock, gyrating around a tin that was disposed in the farm, I was immediately bothered, afraid that they would attack my dairy cows," narrates Mutuku.

Afraid of the stinging insects, Mutuku kept his distance while still wondering what to do to get rid of them. The following day, he was expecting Musili, who had been his go-to person whenever he needed advice on his dairy cattle. He had come to guide him on silage making and in the process, Mutuku mentioned to him that he was at a loss over what to do with the swarm of bees that had invaded his farm. Musili asked to see the bees. "To my amusement, a swarm of bees had colonized a forsaken tin and all I could think of is how to move them to a more habitable structure," says Musili who forbid Mutuku from getting rid of them.

He advised him to make a wooden box and seek the help of an experienced handler to transfer them from the plastic tin to the wooden box. Despite having been moved to the wooden box, the bees migrated back to the plastic tin. After three days, bees had colonized both hives. After three months, a neighbour helped him to harvest the honey.



In the first season from two hives, Mutuku harvested five kilograms which he sold at Ksh500 per kilogram and used the remaining at home. Mutuku's interest in beekeeping peaked and that is how he sought to learn more about professional hive making and beekeeping as an enterprise.

### Hive making venture

Due to his growing interest, he influenced the members of his farmers group to invite experts from African Bee Keepers during one of their regular meetings. The experts honoured the invite, and spent a session training the group on the various benefits of honey, honey products and the by-products gotten when harvesting honey such as venom, bee propolis, wax, candles, oils, soaps and shoe polish.

After the group training, Mutuku was invited to African Bee Keepers in Nairobi, where he was further trained on how to make hives and take care of bees. After the training, he bought a professionally made Langstroth hive and took it home.

Utilizing the model of the hive and the skills he acquired during the training, Mutuku made ten Langstroth hives, which he exhibited in Nairobi, at his workshop in



Continued from Page 1

Umoja, and in Machakos, where he also owns a shop.

The first customer bought five hives and the second ordered ten hives. He sold one hive at Ksh6,000. The high demand motivated him to make hives more. He installed some of them in his farm bring his total number of hives to 17.

### TOF Magazine boosted his business

TOF Magazine has a platform that links farmers to markets. When Mutuku's details as a beehive seller were shared within the TOF platform, farmers from all over the country called requesting to purchase his professionally made beehives.

*"After my contacts were shared on TOF Magazine, I started getting orders for hives, wax, and people inquiring on how to install bees in their hives. Some requests came from places as far as Laikipia and Western Kenya."*

The growing demand for his services, gave Mutuku an opportunity to scale his venture. *"I sell one beehive with bees from Ksh15,000 to Ksh20,000,"* he says. Aside from the hives, Mutuku still sells honey and other bee products including candles, wax, propolis and bee venom, which is a highly medicinal extract that bees excrete through their stingers.

In 2019, Mutuku attended an agricultural exhibition event and his honey was rated position one in quality and his bee wax position two. For these two, he was awarded a certificate and a token of recognition.

Using profits from this enterprise, Mutuku has completed the construction of a permanent house for his family and no longer struggles to pay school fees for his three children. His firstborn has already completed college and the other two are in Form Four.

From one hive, Mutuku harvests 15 kilograms after every three months and sells a kilogram of honey at Ksh1000.

Having established himself in bee-keeping, Mutuku sold his dairy cattle, as he had committed his time to grow his hive making business leaving him with less resources to sustain healthy dairy cows. All around his home, Mutuku has planted flowers that attract bees, and because of the bee population around his farm, neighbouring farmers enjoy the benefit of satisfactory pollination of their crops.

Learn more about beekeeping here;

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



## Want to reduce production costs by up to 60 percent? Try Conservation Agriculture

by Nickson Wafula

Conservation Agriculture (CA) is a farming practice that is guided by three main principles namely, minimum tillage, crop residue retention (soil cover) and crop rotation. CA has overtime proved to not only increase the productivity of the farm but also significantly reduce production costs. It is one of the climate-smart agriculture (CSA) interventions since it enables farmers to increase food production while reducing greenhouse gases (GHG) emissions and also guarantees some level of resilience against shocks brought about by climate change.

### Farmer from Molo Sub County discovers the effectiveness of CA

Madam Eunice Mwaura, a farmer from Molo Sub County, Elburgon ward was introduced to CA by Mr. Joseph Turungi, a CA mechanization service provider. Mr Turungi was trained on CA by Participa-



Figure 1: Eunice impressed by her CA farm doing much better as compared to her neighbour's despite being planted at the same time.

tory Approaches for Integrated Development (PAFID), an implementing partner of the Farm to Market Alliance (FtMA) which focuses on helping smallholder farmers in value chain activities.

Before learning about CA, Eunice would sell products such as green maize together with maize stalks. She would cut down maize stalks which she would avail to livestock keepers as materials for making silage. This deprived her farm of the much-needed crop residue which acted as a permanent soil cover. As a result, she experienced challenges such as soil erosion and excessive evaporation in her farm, which hindered her from planting the following season. The officers from PAFID advised her to consider practicing crop residue retention and crop rotation which she implemented.



## Cost of Production

Initially Eunice used to spend over KSh80,000 on land preparation and weed control within her 6-acre farm. However, after learning of CA and realizing that she can cut costs by up to 60 percent, she did not hesitate to adopt the new approach as advised. She has managed to reduce production costs to KShs30,000 saving up to KShs50,000 on land preparation and weed control.

While doing conventional farming, it would take her up to 6-8 months depending on the variety of the maize. Molo being a high-altitude region it takes 8 months for maize to attain its physiological maturity.



Figure 3 Laborers planting beans on Eunice's CA farm with crop residue retained

"Maize under CA grows faster than that under conventional farming" Madam Eunice attests. This enables her to sell her green maize within 5-6 months freeing up her farm earlier for a rotational crop hence attaining the third principle of CA, that is crop rotation.

## Output

From her 6-acre maize farm, Madam Mwaura was able to sell her green maize at KSh 48,000 per acre earning her a total of KSh 312,000 from the farm. She is set to benefit more since she has planted beans as a rotational crop which will help fix nitrogen which in turn will benefit the farm for the next planting season. She also adhered to maintaining residue which conserves soil water hence helping the bean crop survive the short season erratic rains.

When selling green maize all the harvesting costs goes to the buyer and not the farmers. These costs include transport, labour and any other cost.

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<https://infonet-biovision.org/EnvironmentalHealth/Conservation-agriculture>



## Gliricidia sepium; the tree you need in your farm

By Purity Khandasi

The positive effects of planting trees and shrubs on the farm are known to many. The challenging part, however, is choosing the right kind of trees to plant in your field. Different kinds of trees have varying benefits and effects on livestock, the soil and the farmer.

### Gliricidia sepium

One type of tree that can be highly beneficial on a farm is the *Gliricidia sepium* commonly known as *gliricidia*, mother of cocoa or *quikstick*.

It is a medium-sized leguminous foreign tree that grows to about 10m to 12m. Its origins include El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, and the US where it grows as a tree or shrub. Currently, it is spread across the tropics due to its multiple uses and speed of growth.

The tree has smooth bark with a whitish-grey or a deep red-brown colour.

Its flowers are located at the end of its branches and can either be bright pink or lilac in colour.

### Planting

The tree can grow in a variety of soils including acidic and almost infertile soils.

It can be propagated by seedlings, cuttings, and direct sowing at the site; however, seedlings are the most recommended since they grow faster while stem cuttings are ideal for live fences.

The seeds can be directly planted in a tree nursery for about six to eight weeks before transplanting.

It is important to transplant the seedlings at the start of a rainy season. The spacing varies depending on the farmer's purpose of planting.

Continued on Page 4

Mode of Farming	Aspect	Quantity	@	Total Cost
Conservation Agriculture	Ripping	6	2000	12,000
	Planting	6	1500	9,000
	Controlled weed management	6	1600	9,600
	<b>Total</b>			<b>30,600</b>
Conventional Agriculture	Disc ploughing	6	2500	15,000
	Harrowing	6	1500	9,000
	Planting	6	1500	9,000
	1st Weeding	6	4000	24,000
	2nd Weeding	6	4000	24,000
	<b>Total</b>			<b>81,000</b>
<b>Difference</b>				<b>50,400</b>
<b>% Difference</b>				<b>62%</b>

## Continued from Page 3

For intercropping and managing soil fertility, there should be enough spacing of about three to four meters between the rows to allow the crop to grow well.

The tree does not require major management activities apart from pruning at 0.3 to 1.5m which stimulates leaf production and pollarding at 2m or above for optimal wood biomass production.

### Products

Every product from the gliricidia tree has benefits be it medicinal or general domestic use.

- The flowers can be fried and eaten as a snack.
- The branches can be used for fuel and wood.
- Its leaves are rich in protein which can act as fodder for animals which improves the animal's production of milk and meat. The leaves of the tree are poisonous to rats, hence the common name 'rat-killer'.

Please note that the leaves cannot be fed to non-ruminant animals like pigs, chickens, and horses as they can be highly poisonous.

### Benefits

- Fodder; contains a high crude protein level of 20 percent that is highly digestible and low in fiber and retains its leaves during dry seasons.
- Its flowers attract honey bees which are good for apiculture and forage for honey production.
- Provision of timber and fuel such as firewood and charcoal. Its wood burns slowly without sparking a fire and has little smoke.
- The plant is commonly known for its fixation of nitrogen through intercropping.
- It controls soil erosion.
- It is ideal for the production of green manure as it has 4 percent nitrogen in its leaves.
- The leaves are cut down and placed in the farm until the rainy season and in turn, improve the soil and organic matter fertility thus acting as organic manure.

#### Sources

<https://infonet-biovision.org/EnvironmentalHealth/Trees/Mother-cocoa>

<https://regreeningafrica.org/wp-content/uploads/2019/10/Gliricidia-sepium-Factsheet.pdf>

[https://en.wikipedia.org/wiki/Gliricidia\\_sepium](https://en.wikipedia.org/wiki/Gliricidia_sepium)



## Cassava brown streak disease (CBSD)

Scientific name: *Cassava brown streak viruses*

Type of pest: Viral

Host plants: cassava

### Introduction

Cassava brown streak disease (CBSD) is one of the most devastating constraints to cassava production. The disease causes loss in both the quality and quantity of tubers.

CBSD is now causing increasingly severe problems in high altitude areas of Uganda, Burundi, Rwanda, and parts of the Democratic Republic of Congo, unlike their earlier restricted distribution along the low land coastal areas in Kenya, Tanzania, and Malawi, and Mozambique.

### Damage

CBSD threatens the food security of millions of households. The most damaging effect of CBSD is root necrosis which causes yield loss of up to 70 percent while also making the affected cassava unsalable and inedible. In some of the worst affected regions, it can cause yield loss of up to 100 percent.

### What causes CBSD?

The disease is caused by two species of cassava brown streak viruses namely Cassava brown streak virus (CBSV) and Ugandan cassava brown streak virus (UCBSV) both belonging to the *Potyviridae* and genus *pomovirus* family.

Cassava brown streak viruses are transmitted through the planting of infected cuttings and an insect vector known as whitefly or scientifically as *Bemisia tabaci*.

### Symptoms

CBSD causes a diverse range of symptoms on leaves, stems, and cassava roots (tubers). Furthermore, the foliar symptoms vary between leaves on the plants, cassava variety, growing conditions, age of the plant and the virus isolate involved in causing the disease's symptoms which makes the diagnosis by untrained individuals difficult.

#### Symptoms on leaves

Symptoms are most visible on mature (lower) leaves of the plant. The leaves are characterized by chlorosis in secondary and tertiary veins. The yellow patches can enlarge to form bigger patches.

#### Symptoms on stem

Symptoms consist of dark brown streaks and spots on the upper green portions of the stem and



dead spots on leaf scars. The plant may show shoot tip death which can progress into stem die-back.

### **Symptoms on tuberous roots**

CBSD is characterized by rotting of the tubers making it harmful for food and feed consumption. The roots may appear to be constricted and reduced in size. The harvested tubers have yellow-brown necrotic spots.

### **Management of Cassava Brown Streak Disease**

#### **Use disease-free planting material**

The farmer should select stems from healthy cassava plants as planting materials since CBSD mostly spreads through the cuttings. Farmers should only plant cassava cuttings from certified seed multipliers. Farmers involved in seed multiplication should be properly trained in identification and CBSD management. Also, select cuttings from stem branches which are likely to grow into disease-free plants instead of the main stems.

#### **Plant Cassava Brown Streak Disease tolerant varieties**

Plant cuttings that are more tolerant to CBSD. For example, the TMS 30572 variety derived from the International Institute of Tropi-

cal Agriculture (IITA) is widely distributed in Africa. Other tolerant varieties such as MH95/0183, MM96/4271, MH95/0183, SS4, MM/0293, Kaleso, Shibe, Tajirika, and Siri can be bought from Kenya Agricultural & Livestock Research Organization (KALRO) found in Kenya. In Uganda, MH97/2961 and 0061(AKENA) shows tolerance to CBSD and can be found in National Crop Resources Research Institute (NACRRI).

#### **Roguing**

This involves the removal of infected plants during the early growth stage. Farmers should inspect the cassava plant at least once or twice a week for the first 2-3 months of growth to find and remove any diseased plant. All infected cassava plants should be uprooted and destroyed either by burning or deeply burying to avoid disease build-up and spread.

#### **Control insect vectors**

Monitor your plants regularly for the presence of whiteflies. Whiteflies can be controlled by encouraging beneficial insects in the field like beetles, spiders, etc. Spraying insecticidal soaps under the leaf surfaces help to eliminate whiteflies.

#### **Intercropping**

Intercrop cassava with maize, beans, or sunflower as trap crops for the whiteflies. Plant border crops like legumes in between cassava fields that are close to each other. Intercropping will also improve overall land productivity and may decrease the whiteflies population.

#### **Field hygiene**

All farm implements need to be sterilized over a fire or with bleach, especially when cutting cassava stems into planting materials.

#### **Early harvesting of tubers**

Do not leave tubers for more than nine months in the soil to avoid severe losses due to the necrosis of tubers.

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<https://infonet-biovision.org/PlantHealth/MinorPests/Cassava-brown-streak-virus-disease>

## **Farmer thrives in poultry business inspired by TOF Magazine**

**By Jean Paul Mackio**

Mr. Charles Owino from Nyakach sub-county in Kisumu County grew up in a village where most people rear chicken within their homesteads for eggs and meat. Poultry farming for commercial purposes is not a common practice in Nyakach as most people rear chickens with plans to slaughter them during festivities such as Christmas and New Year celebrations.

After losing his grandmother in 2002 who was the breadwinner of the family, Owino was left with the responsibility of having to cater for all his basic needs.

*"I was distraught after losing my grandmother and for a while, I did not know what to do or whom to turn to"* says Owino. Realizing that there was a gap in the poultry market, he seized the opportunity to start a venture, purely for profits hoping to make enough to fund his college education. Proceeds from his business complemented the support he got from relatives and in 2006, he completed his studies.

Having graduated with a Diploma in Purchasing and Supply Management from Kenya Institute of Management in Kericho, Owino was out tarmacking and all this while the only opportunities he got were unreliable and poorly paying. After a few months of doing casual jobs, he made up his mind to revive his poultry business.

Owino had previously interacted with *'The Organic Farmer'* magazine he accessed through his brother who is an ardent reader. The articles provided him with information on alter-

*Continued on Page 5*



native means of poultry farming that could earn him an income.

Initially, he would read some of the articles on the TOF magazine without giving much thought to their impact. But over time, he read several testimonials from farmers all over the country. At the same time, he accessed information on different approaches to organic farming and support given to farmers by Kenya Agricultural and Livestock Research Organization (KALRO). Given his familiarity with poultry farming, it did not take long to re-establish himself in the business.

Through TOF magazine, Owino was able to link up with KALRO, Naivasha which specializes in indigenous and kuroiler breeds of chicken. Consultations with a specialist from KALRO, Naivasha motivated Owino to settle on the kuroiler breed instead of the initial indigenous chicken breeds that he used to raise earlier on.

By the end of 2018, Owino had set up his poultry farm in Thur Bie village near Awasi town in Kisumu County with a clearer vision. He was targeting the increasing demand for eggs and meat within Kisumu County. His continued interactions with the TOF magazine and KALRO shifted his approach towards eggs production and by the end of 2019, he was only rearing the Kuroiler breed.

### About Kuroiler chickens

The kuroiler breed is a genetically enhanced chicken with roots in India. It is a result of a crossover between the Rhode Island Red females and broiler males. The kuroiler breed is a two-fold chicken that can be raised for both its meat and eggs. The breed has several benefits including an enhanced growth rate as compared to the normal chicken breeds. The kuroiler breed matures in



**“The decision to raise the Kuroiler breed was the best decision I have ever made. I currently bank around Ksh10000 to Ksh15000 in a month**

about ten weeks while indigenous chicken breeds take up to a year to reach their maturity. At the same time, the kuroiler weighs heavier at maturity than other breeds. The kuroiler breed is also cheap to maintain given its scavenging nature. They can feed on both plant and animal matter which reduces feeding costs. The chicken breed produces meat and eggs like the ones produced by indigenous chicken breeds in terms of nutrition, taste, and color. Finally, the kuroiler breed is a high producer both in terms of meat production and eggs production. The chicken produces about 150 eggs per year compared to 40 produced by indigenous chicken breeds within the same period. It also weighs about 1.5 kilograms more than other breeds of chicken.

*“The decision to raise the kuroiler breed was the best decision I have ever made. I currently bank around Ksh10000 to Ksh15000 in a month,”* says Owino.

He sells eggs around Awasi town in Kisumu County while delivering meat as per request

around his locale. He is working on an expansion plan that will allow him to supply both eggs and meat in Kisumu City and its vicinity.

### Challenges

Despite the immense success Owino has garnered, he faces challenges such as poultry diseases, high costs of production, and fluctuating costs of inputs. With constant interactions and technical support from field officers from Biovision African Trust Kakamega, Mr. Owino has been able to overcome the challenges tied to diseases and practices of poultry farming. Mr Owino is ecstatic with his progress since 2018. *“I can comfortably provide for my family, pay wages to two helpers and have some extra income that can allow me to do one or two things”.* He also suggests that the youth should be placed on the radar of organic farming opportunities through enhanced digitization of information dissemination channels.

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

<https://www.ziwanipoultry.com/kari-kuroiler-and-kienyeji-chicks-for-sale-in-kenya-poultry-farming-in-kenya-at-its-best/kuroiler-chicks-chicken-and-hatching-eggs-kuroiler-chicks-poultry-farming-in-kenya/>







However, urine can easily seep into the soil if there is no floor. The housing should have a solid floor that allows urine and dung from the livestock to settle during collection or to drain into a central collection point.

If you cannot have an enclosure with a solid floor, use plastic material which can hold up and prevent the loss of urine and dung through seepage.

In all animal housings, both dung and urine should be collected as frequently as possible, ideally once a day, to preserve the nutrients and to keep the area clean and safe.

For the sake of both animal and human health, it is always vital to protect yourself when handling manure by wearing gloves and overcoats, using long handle shovels and thoroughly washing your hands after handling animal waste.

## Simple manure management to retain nutrients

By Musdalafa Lyaga

The quality of soil to a large extent determines the amount of yields that a farmer will harvest within a given planting season. That is why a farmer should be well informed on the practices that can increase productivity in their farms. Over the years, many farmers have been accustomed to the application of synthetic fertilizers during farming which has led to complete degradation of soils. Synthetic fertilizers destroy nutrients as well as useful microorganisms while also increasing plants dependency on them. Such soils cannot produce in the absence of these fertilizers. This makes farming expensive and unsustainable in the long run. To avoid such a situation, farmers are advised to learn on how to make quality farmyard manure from their livestock waste matter and other materials within the farm. The manure can be used in the farm to enrich the soil.

Manure from livestock contains many important nutrients that are vital for plant growth. These nutrients make manure a valuable fertilizer that is easily available on many farms in Africa. It can be used to increase crop yields and improve soil

fertility at a cheaper cost compared to synthetic fertilizers.

To make sure animal manure contains the maximum nutrients, it must be properly handled and stored.

### How to maintain the quality and get maximum benefits of animal manure

#### **1. Keep your animals in housing with a roof that allows easy holding and collection of manure**

Animal manure contains a solid component; the dung and a liquid component; the urine that both contain valuable nutrients.

It is important to house your animals in an enclosure with a roof to protect them and the manure from sun and rain.

Dung and urine can be easily collected and accumulated after some time when the livestock is confined.



#### **2. Properly store manure to avoid nutrient loss through exposure to elements and contamination**

Once you have collected manure from the animal enclosure, store it in a way that preserves the nutrients and prevents contamination before the manure is used.

If it is dry enough, manure can be stored by stacking it in a heap, or it can be composted to further improve its quality.

Heaped manure can be compressed to reduce the loss of nutrients.

#### **3. Cover the stored manure to protect it from sun and rainfall**

If manure is not covered properly, nutrients will be washed away by rainfall or can be destroyed by the sun.

You can construct a simple roof over the manure heap using low-cost and locally available materials.

If a roof is not practical for you, another way to protect the manure is by covering it with a plastic sheet or with banana leaves which is a cheaper option.

Any material that prevents the manure from getting wet and protects it from the sun can be used as a covering.

Continued on Page 8



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Nairobi	102.7
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Location	Frequency
Taita	107.4
Narok	102.3
Nyeri	105.7
Machakos	93.8
Makueni	
Kitui	
Meru	105.1
Marsabit	88.3

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

Tuko Mbele Pamoja!

Continued from Page 7

#### 4. Store your manure on a waterproof surface to prevent nutrient leaching

Roofs and coverings reduce the loss of nutrients from manure during storage but when placed on bare soil, it can lose nutrients through leaching.

You can avoid this by constructing a floor beneath the manure heap. Floors should be constructed from solid, waterproof materials that eliminate contact with the soil surface and prevent nutrients from seeping into the soil.

The most recommended type of flooring is one made of concrete since it will prevent any leakage of nutrients into the soil.

If concrete is too expensive or not practical, you can place a plastic sheet beneath the manure heap. The plastic sheet should be sturdy enough and without holes.

#### 5. Composting of the manure to improve its quality and remove pathogens that cause diseases

In addition to building a roof and water-proof floor, active composting is a good way to improve manure quality and its safety for use.

During composting, heat is generated within the manure. The heat is important as it kills any pathogens and bacteria that can cause diseases.

It also destroys weeds and reduces the need for weeding on the farm later.

Also, during composting beneficial soil microorganisms eat the bulk materials in the manure that are not useful to plants while preserving the valuable nutrients. This makes the handling of compost much easier.

Composting can be done on any farm, no matter its size.

There are two common methods:

1. The heap method, which is suitable for areas that receive a lot of rainfall.
2. The pit method, which is good for dry areas.

#### 6. Use anaerobic digestion (AD) for biogas production and recycling slurry as a biofertilizer

Anaerobic digestion is a biological process where microorganisms are used to digest manure and other organic

waste to produce combustible biogas, which can be used for cooking, and nutrient-rich bio slurry, which can be used as fertilizer.

Using a biogas digester has health benefits, particularly for women and children, because cooking with biogas does not produce dangerous smoke that can cause health problems for the lungs.

Also, the bio slurry from the digester is a very good and nutrient-rich organic fertilizer.

<https://www.ilri.org/publications/program-climate-smart-livestock-systems-pcsl-futures-workshop>

<https://infonet-biovision.org/Publications/Soil-management-compost-production-and-use-tropical-and-subtropical-environments-Soil>



### FARMERS' FORUM

**William Masea** from **Nakuru** is selling **Hass** and **Fuerte** avocados.

**Wambua Okulo** from **Kenol Muranga**, is selling turkey.

**Roseline Alkacy** from **Busia** is selling **cassava**.

To reach the above call us at **0715 422 460**

#### Partner organizations



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