

Dear Reader,

Welcome to this edition of The Organic Farmer magazine, where every story reminds us that sustainable agriculture begins with knowledge and flourishes through innovation, resilience, and community.

This month, we explore simple, low-cost innovations that help farmers produce more while caring for the environment. Learn how to make nutrient-rich bokashi manure using locally available materials and discover how everyday farm waste, including eggshells, can be transformed into valuable organic fertilizer. These technologies not only reduce production costs but also promote healthier soils and more sustainable farming systems.

Knowledge remains one of the most powerful farm inputs, and nowhere is this more evident than in the inspiring journey of Dominic Wetoto. His story illustrates how continuous learning and access to reliable agricultural information can transform an ordinary farm into a thriving enterprise. His experience is a reminder that every farmer's greatest asset is not just land, but the willingness to learn.

This edition also celebrates resilience. We share the remarkable journey of Rosebella Kimaruti, whose life was transformed through poultry farming after overcoming immense personal hardships. Her story is a powerful testament to agriculture's ability to restore dignity, create livelihoods, and renew hope.

We also spotlight a family that is redefining traditional gender roles by working together as equal partners in farming. Their experience demonstrates that inclusive decision-making strengthens households, improves productivity, and creates more resilient farming enterprises.

Beyond production, agriculture is ultimately about people. Our feature on ethical treatment of farm workers challenges us to recognise that those who labour on our farms are among our most valuable assets. Read on for these and much more.



NUTRITION

Proper Feeding of Goat Kids for Healthy Growth and Weaning

By Dr. Ruth Waaineina

THE FIRST FEW weeks of a goat kid's life are critical in determining its future health, growth, and productivity. Proper feeding during this period not only reduces mortality but also promotes faster growth, stronger immunity, and earlier weaning. Farmers who follow recommended feeding practices can raise healthier kids while reducing the amount of milk required from the doe. The most important feed for a newborn kid is colostrum, the first milk produced by the mother after birth.



Farmers who follow recommended feeding practices can raise healthier kids while reducing the amount of milk required from the doe

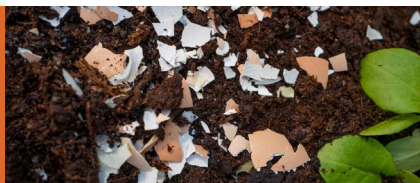
Colostrum is rich in antibodies that protect the young animal against diseases during its early life. Because a kid's ability to absorb these antibodies begins to decline within six hours of birth, colostrum should be fed as soon as possible and within the first 24 hours.

Ideally, a newborn kid should receive 30 to 60 millilitres of colostrum within the first two hours after birth, followed by additional feedings throughout the day.

After the colostrum-feeding stage, kids should be given warm milk or a suitable milk replacer at a rate equivalent to 10–12 per cent of their body weight each day. The milk should be divided into at least two portions daily, although younger kids benefit from more frequent feeding.

Farmers can feed kids through suckling, bottle feeding, or bucket feeding. When suckling is practised, the kid should be allowed to nurse in the morning and evening. During the first week of life, milk feeding should gradually increase to meet the kid's growing nutritional needs.

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Recycling egg waste to make organic fertilizer

Helping farmers improve crop growth while reducing farm waste **PAGE 3**

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Kid should have access to one to two litres of clean water daily, depending on age and environmental conditions.

From the third week onwards, milk feeding can gradually be reduced. The number of milk feedings may be lowered from four to three times a day while increasing the kid's access to solid feeds. Between the fourth and ninth weeks, kids can receive between 290 and 350 millilitres of milk three times daily while freely consuming forage and other solid feeds.

As the kid approaches weaning age, milk intake should continue to decrease. Between the tenth and eleventh weeks, a total of about 700 millilitres of milk can be provided in two feedings per day, supplemented with hay and grain.



During the twelfth and thirteenth weeks, one feeding of approximately 350 millilitres of milk per day is sufficient before complete weaning.

Introducing nutritious forages such as sweet potato vines can improve growth while reducing dependence on milk. Observations have shown that kids supplemented with sweet potato vines generally gain more weight than those relying solely on suckling. At 90 days of age, for example, kids fed sweet potato vines reached an average weight of 8.4 kilograms compared to 5.6 kilograms for kids that depended entirely on suckling. This demonstrates the potential of strategic supplementation in promoting faster growth and reducing feeding costs.

Good kid-feeding practices lay the foundation for productive goats. Ensuring timely colostrum intake, providing adequate milk, introducing quality solid feeds at the right time, and maintaining access to clean water and minerals can significantly improve survival rates, growth performance, and the overall profitability of goat farming.

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NUTRITION

Sorghum tea, beverage packed with nutrients

The innovation focuses on transforming sorghum grain into a convenient powder tea beverage that can be packaged in tea bags or sachets for easy preparation.

By Dr Martin Njogu and Ms Felister Mbaka

SORGHUM HAS LONG been grown in many parts of Kenya and other African countries, especially in arid and semi-arid regions where crops such as maize often struggle due to low rainfall. Despite being highly nutritious and drought tolerant, sorghum is still largely consumed in traditional forms or sold as raw grain at relatively low market prices. This limits the income farmers can earn from the crop and reduces its commercial potential.

A new innovation in food processing is helping change this narrative through the development of a flavoured sorghum tea beverage. The product combines sorghum with natural herbs and spices such as ginger, lemongrass, and rosemary to create a healthy, refreshing, and caffeine-free drink that appeals to modern consumers while still embracing local tastes and traditions.

The innovation focuses on transforming sorghum grain into a convenient powder tea beverage that can be packaged in tea bags or sachets for easy preparation. The sorghum is carefully processed into a tea base and blended with selected herbs and spices to improve flavour, aroma, and nutritional value. Ginger adds a warm spicy taste and is widely known for supporting digestion and boosting immunity. Lemongrass contributes a refreshing flavour and calming effect, while rosemary enhances aroma and contains natural antioxidants.

This product presents a major opportunity for value addition in the food and beverage sector. Instead of selling raw sorghum at low prices, farmers and entrepreneurs can benefit from processing the grain into a higher-value product with a wider market appeal. The innovation also creates opportunities for small and medium enterprises (SMEs) involved

The beverage helps preserve and modernize indigenous crops by presenting them in forms that attract younger consumers and urban markets

in food processing, packaging, branding, and distribution.

The flavoured sorghum tea beverage also responds to the growing demand for healthy and natural drinks. Many consumers are increasingly looking for beverages that are free from caffeine, artificial additives, and excessive sugar.

Sorghum tea provides an alternative that is both nutritious and locally produced. Since sorghum is naturally rich in carbohydrates, proteins, dietary fibre, iron, zinc, magnesium, and antioxidants, the beverage retains important nutritional benefits that can support healthier diets.

Beyond nutrition and business opportunities, the innovation also contributes to climate resilience and food security. Sorghum is one of the most reliable crops under changing weather conditions because it can survive with less water compared to many other cereals.

Promoting sorghum-based products therefore encourages farmers to grow crops that are better suited to harsh climatic conditions while



ensuring communities continue to have access to nutritious foods.

In addition, the beverage helps preserve and modernize indigenous crops by presenting them in forms that attract younger consumers and urban markets. Packaging the tea in modern sachets and tea bags increases convenience and makes it easier to market in supermarkets, restaurants, cafés, and export markets.

Overall, the flavoured sorghum tea beverage demonstrates how local agricultural products can be transformed into innovative, health-oriented products with strong commercial potential. By combining nutrition, climate-smart agriculture, and entrepreneurship, the innovation

HUMAN CAPITAL

The Forgotten Asset on the Farm

Why Ethical Treatment of Workers Determines Agricultural Success

By Francis Mwangi

FARMERS OFTEN INVEST heavily in quality seeds, high-yielding livestock, fertilizers, machinery, and modern infrastructure. Yet one of the most important assets on any farm is frequently overlooked, the people whose labour keeps the enterprise running.

Across agricultural value chains, labour remains a critical factor of production. Without dedicated workers, crops would not be planted, livestock would not be cared for, and produce would never reach the market. Yet despite their central role, farm workers are often among the least valued and least protected contributors to agricultural success.

The consequences are becoming increasingly visible. Labour is becoming scarce and expensive, while many young people are turning away from agriculture in search of opportunities elsewhere.

On many farms, the burden of labour falls on ageing workers, even as the sector struggles to attract skilled and energetic youth.



Employers and employees should agree on wages, payment schedules and working conditions from outset, with contracts documented where necessary

The irony is hard to ignore. Agriculture remains one of the largest employers and a key pillar of food security, yet many workers continue to face poor working conditions, inadequate pay, and limited recognition for their contribution.

A productive farm begins with ethical labour management. This starts with fair recruitment practices, where workers clearly understand their roles, responsibilities, and terms of engagement.

Employers and employees should agree on wages, payment schedules, and working conditions from the outset, with contracts documented where necessary. However, ethical treatment goes beyond wages and paperwork.

Many workers underperform not because they lack commitment or skills, but because they operate in environments where they feel undervalued, disrespected, or mistreated. Abuse can take many forms: physical, psychological, verbal, sexual, or emotional. Such treatment damages morale, reduces productivity, and erodes trust between employers and employees.

Respect should be the foundation of every working relationship. Workers who are treated with dignity are more likely to take pride in their work, care for farm resources, and contribute positively to overall productivity. Safe working conditions are equally important. Farm workers should not be exposed to unnecessary risks or

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hazardous substances without adequate protection. Employers have a responsibility to provide personal protective equipment and ensure that workplaces are safe and healthy.

Beyond the field, ethical treatment includes providing decent living conditions where accommodation is offered. Workers should have access to adequate housing, sanitation facilities, rest, medical care, and the freedom to practise their beliefs and express their views without fear.

One of the most overlooked challenges in agriculture is the disconnect between farm assets and investment in people. It is not uncommon to find a dairy cow worth over KSh 100,000 housed in a well-designed unit complete with comfortable bedding, while the worker responsible for its care sleeps on a bare floor.

Some farm workers go to bed hungry on farms that produce plenty of milk, eggs, fruits, or vegetables. Such contradictions send a powerful message: that the worker matters less than the livestock or equipment they manage. The cost of this neglect can be significant.

Low wages and poor treatment often lead to low morale, high staff turnover, absenteeism, and in some cases theft of farm products or inputs. These losses ultimately affect productivity and profitability far more than many employers realize.



On the other hand, farms that invest in their workforce often reap substantial rewards. Fair pay, recognition, opportunities for training, and respectful treatment foster loyalty, accountability, and improved performance.

Workers who feel valued are more likely to protect farm assets, embrace innovation, and contribute to long-term success. As agriculture evolves, social inclusivity must become a priority across value chains.

Ethical treatment of workers is not merely a moral obligation, it is a business imper-

ative. The future of agriculture depends not only on better technologies, improved breeds, or higher-yielding crops, but also on how we treat the people whose labour sustains the sector.

When workers thrive, farms thrive. Investing in people may well be the most profitable investment a farmer can make.

Francis Mwangi is a Livestock Officer at KALRO Centre, Kisii.

INNOVATION

TOF Magazine Reader Finds Abundance Through Innovative Farming

By Caroline Mwendwa

FOR DOMINIC WETOTO, a farmer from Busongo in Mumias East, Kakamega County, knowledge has been the foundation of his farming success. A passionate reader and firm believer in lifelong learning, Dominic spent years searching for practical agricultural information that could help him improve productivity on his farm.

"I knew I had the potential to create wealth from farming. I just needed the right knowledge," he says.

His quest for information earned him the Best Reader Award at the Kakamega National Library. It was there that he discovered The Organic Farmer (TOF) Magazine, a publication that would transform his approach to farming.

"When I found TOF Magazine, it felt like it had been written specifically for farmers like me. The information was simple, practical, and easy to apply," he recalls.

Dominic became a devoted reader, regularly cycling 35 kilometres from his village to collect new editions from the Biovision Africa Trust office in Kakamega. Over the years, he has implemented numerous technologies featured in the magazine. His farm now showcases water-harvesting trenches, integrated trees, companion cropping, and diverse enterprises that have improved both productivity and resilience. Before adopting these practices, things were very different.



Dominic Wetoto displays the valuable information resources that have guided the transformation of his farm.

"I used to practice monocropping because that was all I knew," he explains. "Since I could not afford synthetic fertilizers, my yields remained low year after year." The situation worsened when his farm became heavily infested with striga weed, a parasitic plant that severely affects maize production.

INSPIRATION

Farming brought my life back

Farmer beats all odds to rise from despair to a thriving poultry enterprise

By Caroline Mwendwa

THESE ARE THE words of a thriving entrepreneur who once contemplated ending her life. As we settle down for an interview on her neatly mowed lawn, Rosebella Kimaruti greets me with a warm smile that lingers a little longer than expected. Around us, healthy trees sway gently in the breeze.

Colourful flowers brighten the compound, while a calf grazes nearby and flocks of chickens roam freely. Looking around, you would never guess the challenges that have shaped this journey. The farm radiates abundance, calm, and hope.

Rosebella's journey has been anything but easy. "My story is long, but I will try to shorten it," she says with a brief laugh before falling silent for a moment.

"I had only been married for three years when I separated from my husband. Suddenly, I was left alone to raise my three sons without any source of income."

Seeking refuge at her parents' home did not bring the comfort she had hoped for.

"There came a time when producing maize became almost impossible because of striga," he recalls.

Fortunately, one edition of TOF Magazine featured an article on push-pull technology, a biological farming method used to control both striga weed and fall armyworm.

"The article explained how push-pull technology could solve both problems. I decided to try it."

The results exceeded his expectations. Within two planting seasons, the striga infestation had dramatically reduced, and maize production began to recover.

Today, Dominic practices crop diversification, growing maize, cassava, sweet potatoes, beans, bananas, indigenous vegetables, medicinal herbs, and fruit trees such as mangoes and avocados. He also keeps poultry and grows fodder crops for sale. To improve soil fertility, he uses green manure and natural pest management techniques learned through TOF Magazine. He has also embraced seed saving, preserving seeds for crotalaria, jute mallow, black soybean, peas, and jack beans.

"I realized that many farmers are unable to diversify their crops because they lack the resources to buy different seeds. Seed saving has been a game changer for me,

allowing me to grow a wider variety of crops on my farm at little cost," he says.

Another innovation on his farm is azolla cultivation, which provides a low-cost protein supplement for his poultry and helps reduce feed expenses.

The diversity of enterprises on his farm has strengthened household food security while creating multiple sources of income.

"I used to think successful farming was only for people with a lot of money," Dominic says.

"But TOF Magazine taught me that with the right knowledge, any farmer can turn soil into wealth."

His story demonstrates the power of practical agricultural information and how a willingness to learn can transform the livelihoods of small-scale farmers.

I realized many farmers cannot diversify because they lack money for different seeds. Saving seeds has helped me grow more crop varieties at little cost



"When I went back home, my brother chased me away," she recalls. At the time, Rosebella was barely 25 years old. Faced with the responsibility of providing for her children, she did whatever she could to survive. She started a small business selling chapati and tea, an enterprise that required very little capital.

"I would prepare chapati and tea and hawk them along the roads, in the market, and anywhere I could find customers. People nicknamed me 'Sufuria Moto,' meaning 'hot pot,' because I was always carrying hot tea and fresh chapati."

Even with relentless effort, the income was rarely enough. "There were days when I had to choose between buying food, paying rent, or taking my children to school. Food always came first."

The difficult choices often came at a heavy cost. At times, the family was evicted because rent had fallen due before she could raise enough money. Her children's education was frequently interrupted as she struggled to make ends meet.

The relentless financial pressure and uncertainty took a severe emotional toll on her. At one point, overwhelmed by the challenges and feeling as though there was no way out, she nearly lost hope and even contemplated ending her life.

However, she found the strength to persevere, and was determined to keep fighting for her family's future. "I tried many different businesses, but I was always afraid of taking loans. I feared being unable to repay them."

Years later, with the little education they had acquired, her sons grew up and left for the city in search of casual employment opportunities.

Around the same time, a compassionate well-wisher who had witnessed Rosebella's determination offered her a life-changing opportunity: support to acquire a half-acre

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piece of land. That small parcel of land would become the foundation upon which she rebuilt her life.

A Mother's Gift Becomes the Seed of Prosperity

Shortly after settling on her new land, Rosebella's mother came to visit. As is customary in her community, she brought a chicken as a gift.

The bird was intended to be slaughtered and shared as a meal. However, Rosebella Kimaruti had long harboured a dream of keeping poultry. Instead of cooking it, she decided to rear it.

What began with a single chicken gradually grew into a thriving poultry enterprise, as Rosebella passionately reared the chicken and ensuring the eggs it lay are brooded and hatch into chicks.

Innovation Breeds Success

Today, Rosebella is a respected poultry farmer in her community, known for hatching and selling chicks. Her compound is constantly bustling with activity.

Chickens, guinea fowls, and chicks of all ages occupy different sections of the farm. Through creativity and resourcefulness, she has developed low-cost solutions that allow her business to thrive.

Recognizing the need for proper brooding facilities, she improvises chick housing using recycled containers.

"I collect wood shavings and place them inside large water containers that have been perforated for ventilation.

They provide a warm and comfortable environment for newly hatched chicks, and they cost me almost nothing," she explains. This innovation has significantly reduced her production costs while ensuring the survival of young chicks.

Over the years, the flock multiplied into hundreds of birds, transforming a simple cultural gift into a source of wealth and stability. Today, she sells day-old chicks at KSh 150 each, while mature chickens fetch KSh 1,000 or more depending on size and breed.

The proceeds from poultry farming have enabled Rosebella to gradually build a permanent house and establish a productive farm. She grows bananas, sweet potatoes, cassava, millet, pawpaws, avocados, and other crops that contribute to both household nutrition and income.

Strengthening the Business Through Training

Poultry farming requires constant vigilance. Disease outbreaks can wipe out an entire flock within a short period, causing devastating losses.

Through regular visits from extension officers from Biovision Africa Trust, Rosebella has gained valuable knowledge that has strengthened her enterprise.

She has been trained to formulate homemade poultry feed using locally available



My motto is simple: never give up, even when life becomes harder than you think you can bear, keep going. Hope never disappoints

ingredients such as maize flour, maize bran, omena, and sunflower seed cake. This has helped reduce feed costs, one of the largest expenses in poultry production.

In addition, she has learned the importance of timely vaccination and disease prevention. "I also know how to manage some poultry ailments using plant-based remedies, thanks to the training I received from Biovision Africa Trust," she says.

Before receiving this support, Rosebella frequently lost birds to common diseases such as Newcastle disease and fowl pox. Now, she is better equipped to prevent and manage such challenges.

A Future Filled with Hope

The mother of three, continues to expand her poultry enterprise and remains optimistic

about the future. "I feel secure now," she says with a smile.

"I no longer worry about food or shelter." Her farm provides much of what her household needs. Bananas, cassava, maize, fruits, eggs, chicken meat, milk, and other nutritious foods are readily available, ensuring a balanced diet throughout the year.

"I have enough food from my garden and enough protein for my family. We eat well." Looking around her vibrant homestead, it is clear how much has changed.

Where there was once uncertainty, there is now stability.

Where there was despair, there is now purpose. Rosebella Kimaruti's story is a powerful reminder that resilience can overcome even the toughest circumstances.

"My motto is simple: never give up," she says. "Even when life becomes harder than you think you can bear, keep going. Hope never disappoints."

These words carry special weight coming from someone who once contemplated suicide. Today, she is grateful that despair did not overshadow her determination to keep moving forward.

When she thought her life was falling apart, farming gave her a new beginning. Now, her compound is teeming with life.

INSPIRATION

Couple shows how challenging gender roles improves livelihoods

The positive changes that followed were made possible because Mulala was willing to challenge traditional stereotypes and support his wife's participation in training

By Caroline Mwendwa

FOR MANY YEARS, 40-year-old Jackline Nyanga Masai and her husband, Nelson Mulala, relied on their small piece of land to grow staple crops such as maize and cassava. Like many smallholder farmers in rural Kenya, they practiced monocropping, planting the same crops season after season.

Over time, declining soil fertility led to poor harvests, leaving the family with barely enough food for consumption and little or nothing to sell for income. With five children to raise and educate, meeting household needs became increasingly difficult.

Paying school fees was a constant challenge, placing immense financial pressure on the family. Things began to change when Jackline joined Eshimichi Dairy Farmers Group, a cooperative made up largely of dairy farmers. Through the group, she gained access to training opportunities offered by Biovision Africa Trust (BvAT). During a farm visit, BvAT field officer Pamella Otieno identified significant untapped potential on Jackline's farm.

"When I visited Jackline, I realized there was tremendous potential to improve productivity. What she needed most was the right knowledge and skills. Her farm reflected the situation of many other members of Eshimichi Dairy Farmers Group," recalls Pamella, who is based in Kakamega.

The trainings were conducted on the farms of different group members. Attending them required Jackline to spend time away from home, creating a challenge because she had young children who needed care. Rather than allowing this to become a barrier, her husband Mulala stepped in and took responsibility for childcare whenever his wife attended training sessions.

"I witnessed firsthand how household gender roles can influence a family's quality of life," says Pamella. "The positive changes that followed were made possible because Mulala was willing to challenge traditional stereotypes and support his wife's participation in training."

The training introduced Jackline to practical and affordable farming techniques, in-



Jackline Masai and husband Mulala receive TOF Magazines after training on kitchen gardens

cluding compost making and the establishment of kitchen gardens. These skills would soon transform the family's livelihood. She learned how to establish productive kitchen gardens using resource-efficient methods such as mandala gardens, cone gardens, and vertical sack gardens. These approaches enabled the family to grow a diverse range of nutritious crops, including amaranth, kunde (cowpeas), sagaa, black nightshade, kale, spinach, bananas, fruits, maize, and cassava. The impact was immediate. The family now enjoys a steady supply of vegetables throughout the year, significantly improving household nutrition. Surplus produce is sold to neighbours, generating income that helps meet daily household expenses.

"The kitchen garden has become a reliable source of food and income," says Jackline. "Sometimes the earnings are enough to contribute toward school fees."

In addition to agricultural skills, the group training covered table banking, food storage, proper food preparation and portioning to reduce wastage, and nutrition education.

These lessons helped the family improve both financial management and food utilization. Today, feeding the family is no longer the constant struggle it once was. Beyond the economic benefits, the changes have also strengthened relationships within the household.

"When there was no income, I had to ask for money for every small household need," Jackline explains. "If there was no money available, it often led to tension and disagreements. Now, I can meet many



Jackline Masai harvests vegetables from her garden

household expenses on my own and even contribute to our children's education."

Looking back, both Jackline and Mulala believe their progress has been built on mutual support and shared responsibility. In many communities, childcare and household duties are considered the sole responsibility of women, limiting their ability to participate in training, leadership, and income-generating opportunities. Mulala chose a different path.

"I am happy that I supported Jackline by staying home to take care of the children while she attended training," he says. "The knowledge she brought back has greatly improved our household. We are now food secure and earning income from our land in ways we had never imagined."

His support extends beyond childcare. Together, the couple works on the farm, preparing compost manure, weeding, tending the kitchen garden, and harvesting produce.

"We work as a team," says Jackline. "Whether it is making compost, weeding, or harvesting vegetables, we do it together."

Their cooperation has created a more harmonious home environment where responsibilities and resources are shared. Mulala notes that this level of partnership remains uncommon in many households, often limiting their development.

"When women are denied opportunities to learn and gain exposure, the whole family loses," he says. "But when they acquire knowledge on food production, nutrition, and household resource management, everyone benefits. Families eat better, incomes improve, and there is greater peace in the home because women become more economically empowered."

Mulala encourages other men to support their wives whenever opportunities for training and learning arise. He believes that men should not only allow women to participate but should also help implement the ideas and practices they bring home.

For the Mulala family, a simple decision to share responsibilities opened the door to new knowledge, improved food security, additional income, and a happier home. Their story demonstrates that when families work together and invest in learning, even a small piece of land can become a source of transformation and hope.



Mulala's willingness to challenge tradition and support his wife's training made the positive changes possible

RECYCLING

Recycle egg waste to make organic fertilizer

For many small-scale farmers, the rising cost of farm inputs such as fertilizers has become a major challenge. At the same time, many households and farms throw away useful organic materials like eggshells and plant residues that can still benefit crops. One simple and affordable solution is turning these waste materials into organic foliar fertilizer. This innovation uses eggshells, comfrey leaves, milk, and water to produce a nutrient-rich liquid fertilizer that can be sprayed directly onto crops. This method is easy to prepare using locally available materials and helps farmers improve crop growth while reducing farm waste.

Why eggshells and comfrey

Eggshells are a rich source of calcium, which helps plants build strong cell walls, develop healthy roots, and produce good-quality fruit. It can also reduce disorders such as blossom-end rot in tomatoes. Comfrey on the other hand is a fast-growing plant known for its deep roots that absorb nutrients from the soil. Its leaves contain important nutrients such as nitrogen, potassium, phosphorus, and trace minerals that support healthy crop growth. When combined and fermented, these materials release nutrients into a liquid form that plants can quickly absorb through their leaves.

Materials needed

Farmers can prepare the fertilizer using simple materials available at home or on the farm:

- Crushed eggshells
- Fresh comfrey leaves
- Milk
- Clean water
- A plastic bucket or container with a lid
- A stick for stirring
- A sieve or cloth for straining
- A knapsack sprayer or hand sprayer

Procedure

Step 1: Collect and prepare the eggshells

Collect eggshells from the kitchen, hotels, bakeries, or poultry farms. Wash them to remove dirt or egg remains, then dry them under the sun.

After drying, crush the eggshells into small pieces or powder using a stone, bottle, or grinder. Smaller particles break down faster during fermentation.

Step 2: Harvest the comfrey leaves

Cut fresh comfrey leaves and chop them into smaller pieces. This increases the surface area and helps nutrients release faster into the mixture. If comfrey is not available, farmers may also add other nutrient-rich green materials, but comfrey gives the best results because of its high nutrient content.

Step 3: Mix the ingredients

Place the crushed eggshells and chopped comfrey leaves into a clean plastic container.

Add:

- 1 part milk
- 3 parts water

The milk helps promote microbial activity during fermentation and supports nutrient breakdown.

Stir the mixture thoroughly.





Step 4: Allow fermentation

Cover the container loosely to allow gases to escape while preventing dirt from entering.

Keep the container in a cool shaded place for about 10 to 14 days. Stir the mixture once every day or every two days.

As fermentation takes place, the nutrients from the eggshells and comfrey dissolve into the liquid.

Step 5: Strain the liquid

After two weeks, strain the mixture using a cloth or sieve to separate the liquid fertilizer from the solid materials.

The remaining solid residue can be added to compost pits or directly incorporated into the soil as organic manure.

Application procedure

Before use, dilute the foliar fertilizer with clean water to prevent crop damage. Mix one litre of fertilizer with five litres of water, then pour the solution into a knapsack sprayer and spray it onto the leaves, where the nutrients are quickly absorbed.

For maximum effectiveness, the fertilizer should be applied either early in the morning or late in the evening when temperatures are cooler. Spraying during hot sunny hours is discouraged because the leaves may scorch, and some of the nutrients may evaporate before the plants absorb them properly.

For best results, apply the foliar fertilizer every one to two weeks as part of regular crop management.

This organic foliar fertilizer is especially useful for crops with high nutrient demand, including:

This organic foliar fertilizer is especially useful for crops with high nutrient demand, including tomatoes, kale, cabbage, spinach, maize, capsicum, and traditional vegetables. It can also be used in fruit trees and kitchen gardens.

Benefits to farmers

This fertilizer helps farmers reduce farm input costs because it is made from materials that are often discarded as waste, reducing the need for expensive commercial fertilizers. It also improves plant growth by supporting healthy leaves, stronger stems, better flowering, and improved fruit formation.

Since it is applied directly to the leaves, plants absorb nutrients more quickly than with some soil-applied fertilizers. The calcium from eggshells strengthens plant tissues, helping crops resist diseases and physical damage. In addition, this innovation promotes environmental conservation by recycling organic waste into useful farm inputs and supports sustainable organic farming practices.

Important tips for farmers

Farmers should always use clean containers to avoid contamination and should not seal the container completely during fermentation. It is also wise to test the spray on a few plants before large-scale application, avoid over-spraying young seedlings, and store the fertilizer in a cool, shaded place.

Conclusion

Simple innovations like recycling eggshells and comfrey leaves show that farmers do not always need expensive inputs to improve production. With locally available materials and basic knowledge, small-scale farmers can produce affordable organic fertilizers that improve crop health and increase yields, while protecting the environment.

COMPOSTING

How to Make Bokashi Manure

A Simple Guide to Fermented Organic Fertilizer

BOKASHI MANURE IS an organic fertilizer made through the fermentation of organic materials. The term “bokashi” originates from Japan and refers to fermented organic matter.

Unlike conventional composting, bokashi relies on a controlled fermentation process that takes about two weeks, producing a nutrient-rich soil amendment that enhances soil fertility and crop performance.

Bokashi is made using locally available organic materials, making it an affordable and environmentally friendly alternative to synthetic fertilizers. Farmers can prepare it using livestock manure, poultry droppings, charcoal dust, bran, rock dust or wood ash, rice husks, molasses, and yeast. Additional organic materials such as kitchen waste can also be incorporated to enrich the final product.

Each ingredient plays a specific role in the fermentation process and soil improvement. Livestock and poultry manure provide essential nutrients for plant growth. Charcoal dust contributes carbon, which improves soil aeration and porosity, helps regulate soil temperature, and absorbs harmful pathogens.

Rock dust supplies important minerals needed by crops, while wood ash can be used as an alternative to reduce soil acidity. Rice husks increase silicon levels in the soil, strengthening plant tissues and enhancing crop resilience. Where rice husks are unavailable, farmers can substitute them with chopped stalks from maize, sorghum, millet, wheat, or other locally available crop residues.

Molasses serve as an energy source for beneficial microorganisms that break down organic matter during fermentation. Yeast acts as a catalyst that accelerates the fermentation process. In situations where yeast is unavailable, virgin soil collected from a naturally forested area can be used because it contains abundant beneficial microorganisms.

Preparing bokashi begins by layering farmyard manure, charcoal dust, and bran. Separately, water is mixed with molasses and yeast to create a liquid solution. This mixture is then sprinkled over the heap while thoroughly turning the materials to ensure uniform distribution.

The moisture content of the mixture is critical. A simple test can be used to determine the correct consistency. When a handful of the material is squeezed, it should form a ball without crumbling or releasing excess liquid. If the material falls apart, it is too dry and requires ad-

ditional moisture. If water drips out, it is too wet and should be aerated or mixed with dry materials.

As fermentation progresses, the temperature of the heap rises, indicating active microbial activity. Bokashi fertilizer should be turned twice daily, preferably in the morning and evening. Regular turning ensures proper aeration and uniform fermentation throughout the heap.

After fourteen days, the fermentation process is complete and the bokashi is ready for use.

However, because the materials are only partially broken down, the manure should not be placed in direct contact with seeds or plant roots as it may cause scorching.

Instead, it should be incorporated into the soil before planting. For example, when planting maize, bokashi can be placed in the planting hole and covered with a layer of soil before sowing the seeds.

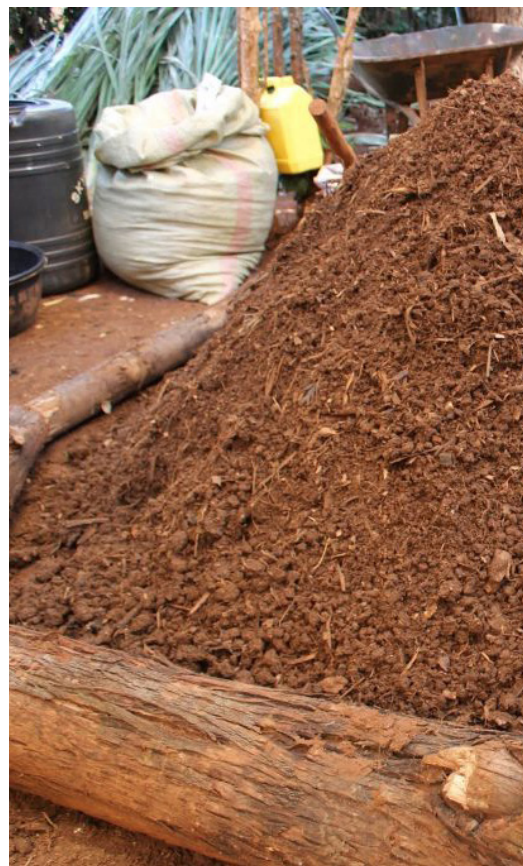


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The use of bokashi manure offers numerous benefits to farmers. Crops grown with bokashi often exhibit improved resistance to pests and diseases, greater tolerance to drought, and enhanced nutrient uptake.

Bokashi also increases the soil's ability to retain water, promotes faster crop maturity, and contributes to better taste and nutritional quality of harvested produce. Most importantly, regular application improves overall soil health by increasing biological activity and restoring soil fertility.

With its reliance on locally available materials and its ability to improve crop productivity while reducing dependence on chemical fertilizers, bokashi manure presents a practical and sustainable solution for farmers seeking to build healthy soils and resilient farming systems.



FEATURE

How radio transformed a farmer's life in Busia

For years, Moses had struggled to improve his yields, often hindered by limited access to agricultural extension services due to poor road networks in his area. But everything changed the day he listened to the first episode of *Kilimo Hai*, a Biovision Africa Trust-supported program that airs every Monday and Friday at 10:00 a.m.

WHEN MOSES IGWALANG first heard about the Biovision Africa Trust radio program on Emuria FM, he tuned in out of sheer curiosity. The advertisements promised new lessons for farmers, and he wanted to learn something different. What he did not know was that this single decision would mark a turning point in both his farming journey and his influence within the community of Teso South, Busia County.

Moses owns a one-acre piece of land in Amukura, which he inherited from his father. For years, he had struggled to improve his yields, often hindered by limited access to agricultural extension services due to poor road networks in his area.

But everything changed the day he listened to the first episode of *Kilimo Hai*, a Biovision Africa Trust-supported program that airs every Monday and Friday at 10:00 a.m.

"I make sure I listen to it every Monday and Friday. I never miss it," he says with conviction. "The program provides answers to the very challenges that we smallholder farmers face daily."



Beyond his own farm, Moses has become a champion of change in his community. A natural communicator, he often shares what he learns with friends and neighbors. When he first introduced them to the idea of soil testing, many were surprised

One of the most impactful lessons Moses recalls came from a discussion on soil testing. For years, he had been planting blindly without understanding the health of his soil. The program opened his eyes to the importance of testing before planting.

"I didn't know that by testing soil you can choose the right seeds and also know which nutrients are present," he explains. That one insight helped him improve productivity and cut unnecessary losses on his farm.

Another major shift came when he learned about the dangers of burning crop residues. Like many farm-

CONTINUED ON PAGE 12



Through weekly Kiswahili and local languages radio programmes, TOF Radio helps to improve awareness and knowledge of sound agroecological practices, strengthen the link between researchers and farmers to enhance food security, reduce poverty and increase household incomes among farmers in Kenya.

TOF Radio Stations

Emuria FM	Monday and Friday -10-11AM
Getembe FM	Monday 8PM
Milele FM	Tuesday 11-12AM
Mutongoi FM	Wednesday 10-11AM
Coro FM	Thursday 8.20-9PM
Ingo FM	Friday 8-9PM



CONTINUED FROM PAGE 11

ers, Moses used to burn maize stalks after harvest to clear his land.

But the radio program taught him that burning destroys vital soil nutrients. "I realized burning crop remains leaves the soil weak and less productive," he admits.

Now, instead of burning, Moses uses crop residues to enrich his soil through mulching and composting, a practice that has restored soil fertility and boosted his harvests.

Through the same program, Moses also learned proper livestock management including maintaining a clean cowshed and using composted cow dung as organic manure.

He has since adopted mixed farming, planting maize, beans, and vegetables on the same plot to maximize yields and improve his family's nutrition.

Looking around his farm today, you'll see thriving vegetables, maize, cassava, and beans crops he proudly says he learned to grow through lessons from Kilimo Hai radio programmes.

Beyond his own farm, Moses has become a champion of change in his community. A natural communicator, he often shares what he learns with friends and neighbors. When he first introduced them to the idea of soil testing, many were surprised.

Today, several have adopted the practice, spreading the benefits far beyond his homestead.

For Moses, Kilimo Hai stands out among all radio broadcasts. He credits the program's production team for making learning interactive and relatable.

"They teach in a way that ensures you understand and even give us listeners a chance to ask questions.

For farmers like Moses Igwalang, radio is not just entertainment. It is a classroom, a companion, and a lifeline helping small-holders across Busia farm smarter, earn better, and build a more sustainable future.



The radio program taught him that burning destroys vital soil nutrients. "I realized burning crop remains leaves the soil weak and less productive," he admits. Now, instead of burning, Moses uses crop residues to enrich his soil through mulching and composting, a practice that has restored soil fertility and boosted his harvests

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