Biovision Africa Trust

THE ORGANIC FARMER

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Dear reader,

As the year unfolds, we hope that you have started actualizing the plans you had made to utilize opportunities the new year presents especially in farming. In the last two years, Covid_19 has disrupted lives in various ways; requiring you to ensure to receive vaccinations availed by the Ministry of Health to protect yourself and your loved ones from the virus.

This edition provides tips on farm hygiene to keep off infectious micro-organisms from your farm; and details of the terrifying East Coast Fever, how to protect your livestock from contracting it, how to identify and manage it. In the previous edition, an article on the increasing demand of strawberries and a guide on how to grow them was featured. This edition focuses on hanging strawberries an approach that anyone can employ, whether in the rural or urban areas, to seize the opportunities available in strawberry farming.

Today many farmers are thriving in value addition enterprises. Read on to discover the simple steps you need to take to start making fruit jam and bee wax candles to make a side income. Only in The Organic Farmer Magazine.

Tips to manage *Tuta absoluta* in tomato production

By Grace Kinyanjui

Tuta absoluta is a serious insect pest of tomato. The caterpillars of Tuta absoluta feed on all parts of tomato plant including leaves, flowers, growing shoots and fruits. Damages on tomato fruits cause fruit rot and reduced crop quality. Currently, tomato growers are investing heavily on synthetic insecticides to control *Tuta absoluta* and other insect pests found on tomato. However, this practice is unsustainable because of increased costs of production and negative impact on human health and the environment.

Can *Tuta absoluta* be successfully controlled without synthetic insecticides?

Yes. Farmers can effectively control *T. absoluta* and other insect pests on tomato by adopting an ecologically-based pest management system.

This is a holistic approach to reducing dependence on synthetic insecticides and serves as a major component of sustainable agricultural production.

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How to make plum jam for home consumption and profit

Story on Page 6

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Practices in ecologically-based pest management systems

i. ***In ecologically-based pest management systems, a healthy agro-ecosystem forms the first line of defense against T. absoluta attack.*** Tomato plants require fertile soils and thus, farmers are encouraged to build organically rich soils for better crop nutrition and sustainability.

Healthy tomato plants are able to tolerate infestation and damage by T. absoluta. Natural soil fertility can be restored with manure, compost, cover crops and crop

ii. ***Adoption of good agricultural practices aimed at preventing or reducing pest infestation.*** These include use of clean tomato seeds, proper management of the nursery and transplanting of pest free seedlings. Also, crop rotation of tomato with distantly related crops such as cereals, legumes, leafy vegetables, fodder grasses and onions.

Do not rotate with susceptible crops such as potatoes, eggplant, black nightshade or tobacco because they serve as alternative hosts of T. absoluta. A good crop rotation system prevents carry-over and buildup of the pest and also increases soil fertility. Adequate irrigation also prevents water stress, favours optimal growth of the plants and makes them less vulnerable to T. absoluta damage.

Farmers should avoid a monoculture of tomato because it creates a favourable environment for T. absoluta and other tomato pests to thrive. Instead, they are encouraged to embrace polyculture production system. An inclusion of insect repellant intercrops such as basil, garlic and onions can deter T. absoluta from tomato. Flowering plants such as sesame serve as good companion plants of tomato because they

iii. ***Regular monitoring of T. absoluta populations from the nursery stage up to the end of harvesting.***
This provides the farmer with information on the onset of the pest attack, the levels of abundance and the effectiveness of any applied control measure.

Monitoring can be done using pheromone traps or direct sampling of plants.

The pheromone traps are usually loaded with male lures specific for T. absoluta to attract and kill the males. Farmers can also make water traps using basins filled with soapy water and then buy the pheromone lures from companies such as Kenya Biologics Ltd, Dudutech and Koppert Biological Systems.

(Dr Fathiya Khamis, of icipe demonstrates how to use pheromone traps on a basin)

Routine scouting involves visual observation of tomato plants for the presence of adult moths, caterpillars, leaf mines, frass or tiny holes on fruits. High trap counts and visible damage symptoms inform the farmer the need to intervene using an ecologically acceptable approach.

Intervention measures

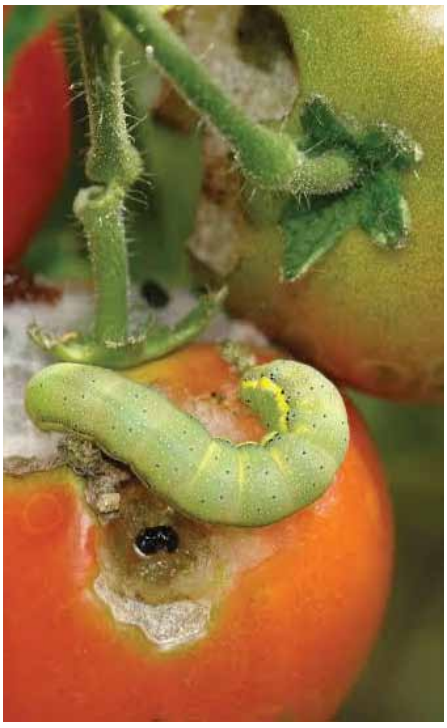
Possible intervention measures include mass trapping, cultural control, use of biological control agents and application of biopesticides.

- ***Mass trapping***
  In mass trapping, the farmer increases the number of traps in the farm to catch a high number of T. absoluta males and reduce the pest pressure. This measure is effective at the early stages of infestation prior to mating and laying of viable eggs by the females.

- ***Cultural practices***
  Cultural practices to curb the spread of infestation include the removal and burying of infested plant parts, removal of weeds and wild host plants that can enhance pest's survival and burying of crop residues after harvest.

- ***Biological control agents***
  Biological control agents can reduce the population density of T. absoluta provided the farmers create favorable conditions. These are the natural enemies such as predators, parasitic wasps and insect pathogens. To have more of these natural enemies in your farm, plant different varieties of crops and avoid application of synthetic pesticides. A foreign parasitic wasp from South America has also been introduced on Kenyan tomato by *icipe* to help in the fight against T. absoluta.

  Commercial and homemade neem-based biopesticides are effective against the pest. Also, biopesticides containing an insect pathogenic bacterium, Bacillus thuringiensis (Bt) such as Baciguard®16WDG (Greenlife Crop protection Africa) can be applied to kill the caterpillars and reduce their damaging impact.



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https://infonet-biovision.org/PlantHealth/Crops/Tomato

East Coast Fever

By Susan Wanjiru

"It is important to keep a keen eye on your animals because by the time they start coughing and their eyes lose transparency, treatment can fail", advises Dr Nyagah.

Sometimes, farmers may not understand the importance of keeping their animals tick-free yet ticks are known to carry and transmit diseases among livestock.

One of the diseases transmitted by ticks is East Coast Fever (ECF). ECF kills many cattle in Africa and causes heavy economic losses in the cattle industry.

When exotic breeds of cattle that have previously not encountered the disease are infected, mortality can be as high as 100 per cent in adults.

With indigenous cow breeds such as the Boran, Sahiwal, and Zebu, mortality is low, even in first-time infections.

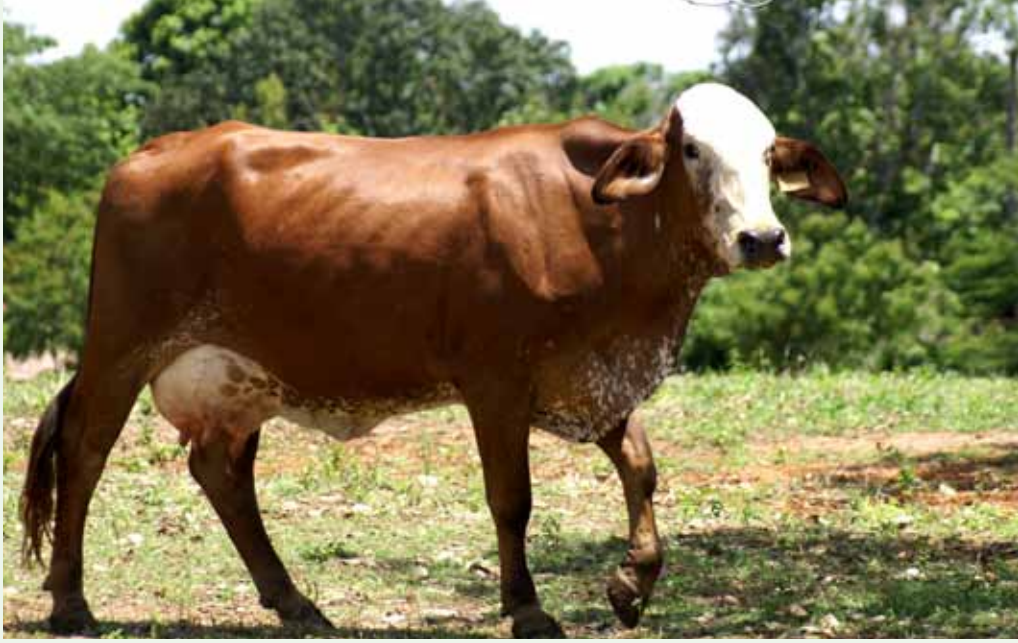
ECF is spread by a tick known as the 'brown-ear tick' (*Rhipicephalus appendiculatus*) that attaches itself to the ears.

Clinical signs

The disease has a 12-day incubation period. Animals will exhibit the following signs: Fever, become listless, stop feeding, cough, have enlarged lymph nodes near tick bites, difficulty in breathing, corneal opacity (the membrane covering the eye losses its transparency), mucous discharges from the eyes and nose, diarrhoea, and anaemia.

Taking note of these clinical signs in good time enhances the success of treatment. It is important to keep a keen eye on your animals because by the time they start coughing and their eyes lose transparency, treatment can fail.

Animals suffocate because the parasites damage the lungs and cause water to accumulate, resulting in breathing difficulties. Death occurs 18-30 days after the initial attachment of the tick.



> ***"It's important to keep a keen eye on your animals because by the time they start coughing and having hazy eyes, treatment can be unsucce-ssful,"***

Control

The losses that come with ECF can be catastrophic and, treatment can also be expensive. It is, therefore, crucial to set up controls before your cows get sick.

One of the most effective ways is by controlling ticks, which are vectors of the disease. The following measures will help you reduce the chances of ECF striking on your farm:

- *Practise rotational grazing, this starves the ticks.*
- *Regularly spray or dip your animals using appropriate acaricides as advised by your veterinary doctor or nearest agricultural officer.*
- *Keep resistant breeds, in areas where the disease is common.*
- *Identify and treat sick animals promptly.*
- *Always have a thermometer to help you confirm fever in animals that show malaise or go off feed.*
- *Promptly call your vet to ensure prompt treatment and increase your animal's chances of recovery.*

Note that when your animal gets infected and survives, it acquires immunity for life. A vaccine is available. However, it should be administered by qualified vets and vaccinators.

You can find a vaccinator near you by contacting Sidai Kenya at info@sidai.com or call **+254 202038201.**

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https://infonet-biovision.org/AnimalHealth/Tick-Borne-Diseases

Developing a hanging strawberry garden

By Vincent Kipyegon

A hanging garden - as the name suggests - is a simple aesthetic hanging structure for planting of crops suspended on wooden boxes or plastic pipes raised above the surface of the earth. It is an innovative garden structure that can be used to grow vegetables and fruits where space is limited. This method is viable as it is labour free, weed free, consumes little space and eradicates soil pests and diseases.

Strawberry is a fleshy sweet heart-shaped red fruit that can be eaten fresh and raw. Strawberries can be grown in the greenhouse as well in open fields. However, both strategies have their own shortcomings; high cost of installing a greenhouse and soil-borne pests and diseases.

Nonetheless, a hanging garden can solve both problems and boost strawberry farming as a business as well as an aesthetic value. It allows for strawberry stem and leaves to extend downwards for up to 2 m.

Requirements

a.) PVC pipes (6), 2 metres or similarly wooden boxes with one side open.

b.) Timber frames (6)

c.) Deep fertile loam soil with humus (solarized for 21 days to kill soil pests and diseases).

d.) Good quality compost.

Procedure

1.) On a level surface, construct 2 triangular structures that are 2 metres above the surface of the earth using hardwood timber.

2.) On each side of the triangle, create three points by nailing 3 wooden frames across them.

3.) Attach gutter hooks on the end of each beams that will hold the PVC pipe containing soil and manure

4.) Join the two pieces adjacent to each other using a 2 wooden frame on each side, 2 metre distance. This creates a house-roof like structure.

5.) Attach 2 metre PVC pipes into the hooks on the beams. Drill square holes 10cm by 10 cm, 15 cm apart through PVC pipe on one side.

Each pipe contains 13 holes. The strawberry seedlings will be planted on these openings once filled with soil and manure.

Planting

Mix soil with compost manure on a ratio of 1:3 (1 wheelbarrow of compost manure to 3 wheelbarrows of fertile soil). Inject the mixture inside the PVC pipes from both sides until it's full.

Plant the strawberry seedling on the holes then water after planting. Ensure the hooks holding the pipes are firm. The strawberry will grow beautifully extending downwards and produce fruits ready for harvest in 3 months.

Irrigation and fertility

Water the structure regularly using a hand-held sprayer. A drip irrigation system can be installed along the strawberry holes to provide a continuous water supply. The seedlings can be mulched to prevent moisture loss. The strawberry plants can be continuously dressed with foliar feeds. Soil and manure can be replenished after 1 year.

NB:

A hanging garden does not have definitive specifications as long it is raised above the surface of the earth. It can also be created by suspending the pipes or structures holding soil on house beams, walls or similar structures. A square shaped structure can also be used to attach PVC pipes or wooden boxes as illustrated below.

Reach out to the number provided on page 8, of this edition to get contacts of strawberry seedlings suppliers.

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Commercial organic fertilizers available in the market

By Mourice Barasa

Organic fertilizer demand has been rising in the recent decade due to soil fertility deficiency caused by the prolonged application of synthetic fertilizers. Different companies worldwide have ventured into processing, packaging, and supply commercial organic manure to farmers.

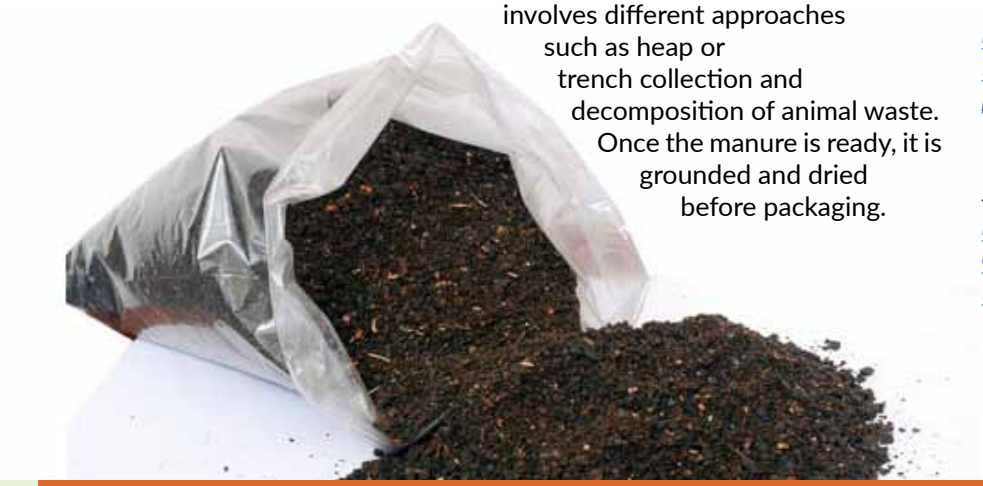
Commercial organic fertilizers are in both liquid and solid forms and serve a specific purpose to the soil.

However, some organic fertilizers such as compost manure, farmyard manure, and animal manure can be transported and sold unchanged for the customers with short distances.

The most commonly used commercial organic fertilizers available in the market are; bone meal fertilizers, fish emulsion, cottonseed meal fertilizer, manure, compost, rock phosphate, chicken litter, and vermicompost.

Commercial compost fertilizer

Compost manure can be prepared and packed for commercial purposes. First, the organic matter is collected and disposed of at a central place for some time (about 5 months). The organic matter includes; animal wastes such as urine and dung, food remains, vegetables, and dead plants. The compost is left to allow the organic matter to decompose completely. Compost manure is then dried and packed in different sacks having different measurements.



Commercial compost fertilizer can be applied either as a top dressing or during planting. It is crucial to apply manure when there is enough moisture to release nutrients to plants. An example of commercial compost fertilizer is Greenfield.

Commercial chicken litter

Chicken litter is often prepared by farmers who are specialized in poultry. The litter comprises the chicken droppings and the bedding materials used. For example, in large-scale poultry farming, where sawdust is used as bedding material, the chicken litter will comprise chicken excretes and sawdust. Chicken litter is preferably used in gardens with nitrogen and potassium deficiency.

Chicken manure has a high preference since it can maintain soil fertility for a longer time than chemical fertilizers. It is either in palate form or powder. An example is the premium organic chicken manure fertilizer.

Rock Phosphate

Some of the rocks are critical in the soil nutrient cycle. Weathering of rocks enhances the supply of soil with nutrients depending on the parent rock. Rock phosphate organic fertilizer is naturally used to improve the level of phosphate mineral nutrients in the soil. Greenfield rock phosphate is an example of the organic fertilizer found in the market.

Commercial Manure

Manure is prepared from animal wastes (dung and urine). Some manure comprises; cow dung, sheep droppings, goat droppings, horse dung, rabbit droppings, and urine.

Manure is essential in the supply of nitrogen, potassium, and fundamental organic carbon. Preparation of manure involves different approaches such as heap or trench collection and decomposition of animal waste. Once the manure is ready, it is grounded and dried before packaging.

Vermicompost fertilzer

Vermicompost comprises food wastes that are decomposed through the application of worms. Worms are used to speed up the degradation rate of organic materials such as food remains and vegetables, creating a heterogeneous mixture. Vermicompost works best in vegetable and root tubers production.

Bone Meal Fertilizer

Bone meal fertilizer comprises finely crushed and grounded wastes from slaughterhouses such as bones and blood. Bone meal fertilizer can be used both as fertilizer and animal feed. The fertilizer is fundamental in soils with more minor phosphorus minerals.

Bone meal fertilizer is characterized by the slow release of nutrients into the soil, maintaining soil fertility for an extended period.

Cottonseed meal fertilizer

It is prepared from the byproduct of cotton after the successful ginning of the cotton. The waste is decomposed and applied as organic fertilizer. Additionally, cottonseed wastes are crushed and packed for commercial use after decomposition.

Liquid organic manure

The filtrates of animal excrete are tapped and stored to be used as folio fertilizers. The commonly used liquid organic fertilizer is rabbit urine. It is collected and sold globally due to its richness in nitrogen, phosphorus, and potassium nutrients. Rabbit urine is also used to control pests on the crop, hence serving two roles when applied on crops. Check page 8 of this edition to get the contacts of farmers selling organic soil fertilizer.

https://infonet-biovision.org/PlantHealth/Introduction-organic-plant-nutrition

Sources
https://www.prakati.in/list-5-types-organic-fertilizers/
Photos

Making plum jam for home consumption and income generation

By Mary Mutisya

To many farmers, the problem of product seasonality and perishability is always an issue of concern and more so when it comes to fruits and vegetables. Post-harvest losses of fruits and vegetables have been reported to occur in billions, and there is need to enlighten farmers on how they can reduce this by embracing product development at home both for their personal consumption and for profit making.

In Kenya, plums are a fruit that is seasonal, harvested once a year between December to January where they flood the local markets, leaving huge losses. One of the best ways to preserve plums is by making jams, preserving them and selling them at a profit. Many fruit jams are made with the addition of pectin for thickening and setting, but fruit jam can be made with just fresh fruit, lemon juice, and sugar. Jam made without pectin is a little softer and looser than jam made with pectin. Enjoy your homemade plum jam.

There are many advantages of making jam at home, some of them being that:

- *There is control of ingredients used such as sugar and preservatives .*
- *One can mix flavors as they wish.*
- *One can use the best available fruit produce and make it all fruit with no dilutions to stretch the product.*
- *Also, learning this technique of making jam at home means that one can make jam at almost any time with the available ingredients.*

What you need

Fruits (plums)- When choosing the fruit, it is important to select fruit that is top quality and slightly underripe or barely ripe (not green). Wash fruits thoroughly under cold running water or fill the sink with cold water. Lift fruit from water allowing dirt to settle. Cut up fruit, removing stems and blossom ends.

Pectin- Pectin is a natural substance found in varying amounts in fruits. The reaction of pectin with acid and sugar causes jelling. Some fruits have more pectin than others. Those with high pectin content include tart apples, concord grapes, sour blackberries, cranberries, gooseberries, quinces and sour plums. Cherries, apricots, blueberries, pineapple, strawberries and peaches have low pectin content.

Because fruits have natural pectin, jam and jellies can be made without it if you are willing to follow the necessary procedures to concentrate the pectin. However, adding commercial pectin hastens the process a good deal and increases the yield.

Acid- Acid adds flavor to the jam and helps with chemical reaction required to form a gel. The acid content varies in different fruits. You can test for acid content by taste. Combine 1 teaspoon lemon juice, 3 tablespoons water and 1/2 teaspoon sugar. Taste this mixture and compare it to the tartness of fruit juice you plan to use. The fruit juice should taste as tart as lemon juice mixture or it will not set properly.

Sugar- Sugar reacts with the pectin and acid and helps form a gel. It also serves as a preservative. Beet and cane sugar work equally well. There are recipes for sugar-free jams and jellies for diabetics. The recipes have made the needed adjustments for the product to set up and preserve properly. Light corn syrup can replace 1/4 of the sugar.

Honey can be used to replace up to half of the sugar in recipes without added pectin. Two cups of honey can replace two cups of sugar in most recipes with added pectin. The rest will be sugar. For example, if the recipe calls for 8 cups of sugar, you can use 2 cups honey and 6 cups of sugar. In smaller recipes (that yields up to 6 half pints) replace 3/4 to 1 cup sugar with honey.

Equipment Needed

A large saucepot, food scale or standard measuring cups, a candy/ kitchen thermometer, a kitchen timer, and a skimmer or slotted spoon.

Procedure

When making jams, it is advisable to make the jams in small batches using a large pan because it boils up as it cooks. When cooking with added pectin, timing should be exact. It is important to add more time for a thicker product and reduce the time for a thinner product.

The following steps should be followed while making plum jam at home.

i. Gather all your ingredients.

ii. Wash the plums and remove any blemishes. Cut the fruit in half, remove the seeds and cut the pieces in half again.

iii. Add the quartered plums, along with water, to the large, wide saucepan.

iv. Bring the fruit to a gentle simmer, stirring occasionally. Cook with the lid on until the fruit is soft.

v. Then, add the sugar and lemon juice and stir until the sugar dissolves.

vi. Bring the fruit to a rolling boil, stirring frequently.

vii. After about 5 minutes, start to check for setting point. You will not have any trouble getting this jam to set as plums are high in pectin.

viii. If your jam has any scum (froth on the surface), remove it with a spoon.

ix. Alternatively, add a small amount of butter and stir to remove the scum.

x. Allow the jam to sit for 5 minutes to allow the fruit to settle.

xi. When ready, ladle the plum Jam into hot, sterilized jars and seal with the lids. After cooling, wipe the jars to remove any spills, label with the date and jam variety and store in a cool, dark place.

You can sell surplus to neighbours or target schools, events, and other gatherings to start marketing your home-made jam. Remember, to sell to commercial markets such as supermarkets and cooperatives, you will need certification from Kenya Bureau of Standards and other relevant permits.

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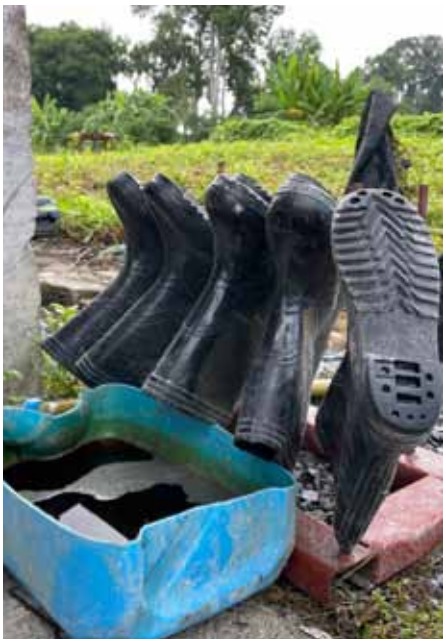
https://infonet-biovision.org/EnvironmentalHealth/Jams-and-Preserves

Improved farm hygiene for less crop and animal disease occurrence

By Charei Munene



Microorganisms are always present in any farm environment. Additional disease-causing microorganisms and pests can be introduced or transferred to different parts in the farm via movement of vehicles, people, stock, the farm's water supply and contact with contaminated equipment, machinery and structures.

Agricultural hygiene aims to minimize the introduction and spread of pests and diseases in farm environments. This helps to protect the safety of food from production to consumption.

Good agricultural hygiene helps protect livestock and crops from pests and disease, including insects, parasites, pathogens and weeds. Workers can carry, introduce, and spread contamination to fresh produce and animals.

Workers can carry human pathogens such as bacteria, viruses, and parasites. Enhancing overall hygiene for your animal and crop farm increases productivity, minimizes animal suffering, crop loss and ultimately protects human health by ensuring that foodstuffs are safe for consumption. A healthy farm environment also protects the health of agricultural workers.

Good farm hygiene practices include;

1. *Making sure all farm workers are sufficiently trained in farm hygiene and how to carry out their tasks. You should train all workers (new and existing) to follow good hygienic practices. Go ahead to write the hygiene rules on your notice board.*
2. *Every farm should have a foot bath or farm gate wheel dip. If possible, limit access of people to your farm.*
3. *Ensure all farming is done with clean protective clothing. Gumboots especially should be washed before moving to different parts of the farm.*
4. *Ensure the farm has clean latrines and hand-washing booths. Workers should clean their hands and maintain good personal hygiene when collecting and dealing with produce.*
5. *Ensure wastes are stored properly to minimize the risk of environmental pollution. Produce and waste bins should have designated areas. Surface contamination should be avoided at all costs.*
6. *Observe all crops and animals regularly and use proven methods to treat all disease, injury to minimize the spread of disease, keep sick animals isolated from other cattle on the premises. Remove all weeds and volunteer crops. Many crop pest and diseases are hidden in weeds and volunteer crops.*
7. *Have an identification system for all your animals, from birth including disease history.*
8. *Have a strong pest control strategy for rodents, birds, slugs and snails.*
9. *Apply the right amount of water during irrigation. Your farm drainage should be well managed without any stagnant water. Most disease-causing micro-organisms require stagnant water and rotting materials to multiply.*
10. *Use clean quality water for your crops and animals.*

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https://infonet-biovision.org/AnimalHealth/Disease-Prevention

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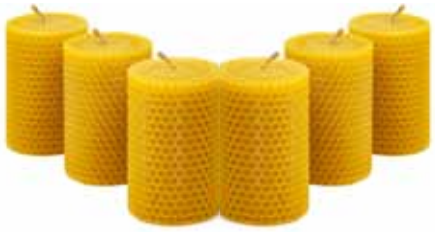
Tuko Mbele Pamoja!

Continued from Page 7

Get extra income and light up your homestead with bee wax

By Esther Mwoloi

Every household requires a source of light. If your home is situated in areas that are not yet connected to the grid, you most likely incur high costs of paraffin to light lamps in the evening. Have you ever thought of saving costs by using candles that you make at home?



Julius Mutuku is a beekeeper from Mutituni Village, Nduu Sub Location, Machakos County who has been keeping bees since the year 2017. Although Julius started bee keeping business with little knowledge about it, he has been able to get more income from its products such as honey, candles and propolis. He is also a carpenter by profession hence he can make his own beehives. He sells one hive at Ksh5,000 and already colonized hives at Ksh15,000. He explains the procedure he follows in making candles out of bee wax.

Once honey is harvested, a farmer is left with honey combs which are useful in making candle wax.

1. Ingredients

- *A sizable amount of honey comb depending on the size and the number of candles you require.*
- *A pot.*
- *Water.*
- *Source of heat.*
- *A clean basin or a jar.*

2. Procedure

- *Light up your source of heat and place the sufuria.*
- *Place your honey combs into the sufuria.*
- *Add some water to the honey combs, let them boil for about ten minutes.*
- *The wax which will be yellow in color will settle at the top.*
- *Some amount of water will settle at the centre.*
- *A black component known as the propolis will settle right at the bottom*
- *Place a cotton wick into the container that you are using before pouring in the wax.*
- *Pour the top component which is the melted wax into a clean jar.*
- *Before the wax cools off and hardens pour it in the containers that have your desired shape. If you are interested in making straight candles a pipe will be suitable for that.*
- *Leave the cotton wick hanging outside to avoid it being immersed into the wax.*
- *Leave the wax to dry off.*
- *You can now remove the candle from your container and light it up.*

https://infonet-biovision.org/AnimalHealth/Bee-products

FARMERS' FORUM

Organic soil fertilizers on sale!

Gideon Mitaa from Kagundo, Machakos County is selling **rabbit breeds** and has over **25, 000 litres of rabbit urine** for sale.

Joseph Mulucia from Kangundo, Machakos County is selling **vermi worms and vermi juice** in large volumes.

To get their contacts, call: 0715 422 460

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