Biovision Africa Trust

THE ORGANIC FARMER

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Dear Reader,

As the short rains approach, seize every opportunity to make the most of it. Due to climate change, there has been a forecast that some areas will not receive adequate rainfall as expected. It is therefore critically important to harvest, store and apply water conservation techniques in the farm such as mulching and planting cover crops to ensure your farm stays productive, even after the rains.

The wet season provides a conducive environment for common pests especially white flies and late blight. In this edition, we share tips to monitor and manage whiteflies affecting mainly vegetables and late blight on potatoes.

Have you thought of a venture you can start up to generate income this season? Capsicum farming is viable especially with the rain season approaching. Read on for information on how to grow them to generate income. Also, gooseberries are little known among most farmers, yet their nutritional and medicinal value is gradually making them popular especially in making tropical juices. We feature a guide on how to grow them and how to make juices from it to enjoy its nutritional benefits.

Many dairy farmers have been complaining of dwindling milk from their livestock caused by what they suspect to be worm infestation. We share information on worms affecting animals especially cows and how to manage them. Read on to learn these and much more.

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Reaping profits from capsicum farming

By Vincent Kipyegon

Capsicum, popularly known as *pilipili hoho*, is a short term vegetable crop mainly used to add spicy flavours and essential nutrients to meals. Capsicum provides essential health benefits and diet to the body. It keeps the heart healthy, it is rich in vitamin B6 which is important for formation of red blood cells thus reducing the risk of heart diseases. It is low in fat thus improves metabolism and aids in weight loss. Additionally, capsicum lowers the risk of cancer through its rich antioxidant content.

Capsicums are categorized into various categories based on their vibrant colours. Green capsicum is a widely grown and consumed variety in Kenya. Other varieties include: yellow, red, purple and white capsicum. The green variety is mostly grown outdoors while the others are grown in green houses as they require optimum temperature to develop and change colour.

Conditions for growing capsicum

Soils: Capsicum requires well drained deep loam soil rich in organic matter with an ideal soil pH between 5.2 and 7. This provides the conditions necessary for the crop to thrive.

Climate: Capsicums thrive well in temperature between 15°C and 37°C. Temperatures below 12°C can lead to blight attack on capsicum leaves while high temperatures might lead to pre-mature growth of capsicum fruits.

Moderate annual rainfall between 700mm and 1200mm is suitable for capsicum production. Irrigation is required where rainfall is below 700mm. Too much rainfall can smother the capsicum roots as well as cause rotting of capsicum fruits during maturity stage.

It is therefore advisable to grow capsicum preferably during short rain seasons; April-June and August-December. Moderate sunshine is vital for the growth and development of capsicum plant leaves and fruiting.

Nursery formation

Capsicum seeds can be grown in two ways:

1. *The first method is using seed trays filled with coco peat in a green house. Coco peat is made of coco pith that is produced from the husk that grows around the hard coconut and is rich in phosphorus. Seed trays ensure the maximum growth of seedlings and eradicate the risk of soil borne diseases and pest attacks on the seedlings.*
2. *The second method is using a nursery seedbed which should be close to the farm to avoid shock to the seedlings during transplanting.*

The nursery is created by digging up soil lumps into uniform texture. One week before planting, mix the soil well with compost manure or slurry. Raise the bed slightly above the ground level to protect seeds from surface runoff and rain splashes.

Worm control in livestock

Story on Page 7

Continued from Page 1

Make 2 cm furrows 15cm apart. Mix the soil with seed then insert them into furrows. Then water and mulch the surface with dry grass.

Germination occurs after 7-10 days. Once the seeds have germinated, remove the mulch and install a raised overhead shade for the seedbed. Irrigation is carried out regularly up to the fourth week after which it is reduced gradually for the remaining time; this prepares the seedling for adaptations on field conditions. Weeding should also be done regularly by hand. After six weeks, the seedlings will be ready for transplanting.

Transplanting capsicum seedlings

Land preparation should begin one month before transplanting, plough the land deeply. Harrow the field twice to loosen the soil and break large soil lumps. Apply the decomposed compost manure or slurry on the field, 15 tons per acre. Dispatch the manure into the soil by use of hand hoe. Ensure the farm is level and the soil surface is smooth. Irrigate the land if it fails to rain the day before transplanting.

Trans-planting should be carried out early in the morning or late in the evening to ensure proper nursery-field transition of seedlings. Water the nursery 2 hours before transplanting to ease the pulling of seedlings.

Dig holes 4cm deep and 45cm apart in a row by 60cm apart between rows. Holes are dug with a hand hoe or drilled using sharp stick ideally with a depth of 1.5cm. Place the seedling in the hole and cover gently with soil. Irrigate the field immediately after trans-planting.

Fertilization should be done 10 days after planting, apply the first foliar feed fertilizer followed by a series of top dressing using organic foliar feeds every 14 days . Flowering occurs during the 3rd and 4th week. The fruits start maturing between 75 th and 90th days.

NB: It is important to undertake soil test before transplanting in order to determine the nutrients in the soil.

Field management

(i) Weeding

Weeding should be carried out at least twice depending on amount of rainfall and the level of soil fertility of the field. This should be done using hand hoe. When the plants are 2 months, the weeds should be uprooted by hand to avoid exposing the capsicum roots.

(ii) Irrigation

Irrigation must be done the next day after transplanting if it does not rain. It should continue regularly until harvest period except in periods where there is rainfall. The capsicum field should always remain moist as capsicum thrives well in aerated soil.

Fertigation, a process of applying soluble based organic fertilizers to plant via irrigation, should be done after every 14 days. This leads to a better yield of capsicum fruit sizes.

(iii) Unearthing

Unearthing is done during weeding. It involves loosening and surrounding the soil around the capsicum plant. This ensures that surface rain water does not clog around the roots. Unearthing should be done gently to avoid disturbing and exposing the roots.

When the plant develops fruits, the soil should be leveled to prevent it from coming into contact with the capsicum fruit which may lead to rotting.

Pests and disease management

The diseases that may affect capsicum plants include powdery mildew, downy mildew, blight and fruit rot. They can be managed through crop rotation, proper farm hygiene practice, regular irrigation and best agronomic practices. Decayed fruits are removed from the farm during irrigation.

The pests that may attack the capsicum include cutworms, aphids, thrips, spider mites, broad mites and termites. They can be controlled by

1. *Use of copper based organic fungicides from the agrovet.*
2. *Neem and garlic extracts can be used against downy mildew and powdery mildew by spraying on attacked plants.*

Foliar fertilizer is applied to the crop 10 days after transplanting and applied continuously at intervals – preferably 2 weeks - until the harvest is completed. These fertilizers add nutrients to crops at all stages of growth giving optimum fruit yield as well as controlling pests and diseases.

Harvesting

Capsicum is ready for harvest 3 months after transplanting. Ripe capsicum fruit produces a pungent smell. Green capsicum remains green while other varieties turn to their respective colours. The fruit is harvested by plucking gently by hand from the main stem. Capsicum fruits can be harvested for up to 6 months on a weekly interval. Curing is done by removing wounded and decayed fruits from the farm.

Capsicum is a perishable crop thus harvesting relies heavily on orders from the market. Harvesting should be carried out early in the morning on the day of transport to the market so as to keep it as fresh as possible. During this period, the crop should produce between 4 to 6 tonnes of capsicum fruits on a 0.25 acre farm.

Post-harvest handling

The capsicum fruit is then cleaned by rinsing with clean water immediately after harvest. The fruits are then sorted according to size; large, medium and small then they are weighed and packed into 50kg bags ready for transport.

Marketing

Capsicum prices fluctuate depending on supply and market location in Kenya. The price ranges between Ksh35- Ksh60 per Kg and/or 3 capsicum fruits sell at Ksh20.

Conclusion

Growing capsicum can result in huge returns over less input; 50 grams of capsicum seed can produce between 4000 and 6000 seedlings which can produce 4 tonnes on a 0.25 acre farm. With a ready market, capsicum can provide huge yields with small input over a short period of time providing high returns on investment.

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How to make the most of gooseberries

By Mary Mutisya

Gooseberries, commonly referred to as *nathi* in Kikuyu, *tsimbune* in Luhya, *nyamtongolo* in Luo, *chinsobosobo* in Kisii, *ngondu* in Kamba and *Chelolo* in Kipsigis are small orange berry fruits that many people are familiar with from their childhood. These berries are originally from Chile, but in Kenya they are vastly wild, self-propagating and common in farms after harvesting maize. Of late, there is an effort to commercially cultivate goose berries. The Kenya Agricultural and Livestock Research Organization (KALRO) reports that farmers can make up to Ksh750,000 from an acre of these nutritious fruits. In terms of consumption, they are also gaining popularity and are being used as a compliment for salads, and a tasty garnish for cocktails. Also, goose berry value added products are on the rise, top among them being cakes and muffins. The best way to consume them however is in their natural fresh state, as smoothies or fresh juice. In this form, they contain optimum nutrients.

Health benefits of Goose berries

Goose berries have been referred to as the wonder fruit due to their many health benefits which are:

- *Power house of antioxidants and vitamin C- Goose berries are highly rich in vitamin C and A, which help to boost immunity and maintain a healthy skin.*
- *Regulation of blood pressure- Goose berries are rich in phytochemicals such as carotenoids and polyphenols. These components together with soluble pectin helps regulate high blood pressure by keeping the low density lipo-proteins (bad cholesterol) at bay and promoting heart health.*
- *Good for eyesight- Goose berries are rich in vitamin A which is known to improve eyesight. They also contain iron which further boosts vision. Research shows that gooseberries can provide 14 percent of an individual's daily vitamin A requirements and this helps prevent cataract and eye related macular degeneration.*
- *Control and management of diabetes- Goose berries contain soluble fiber which contains fructose and this can help lower blood glucose sugar levels for diabetic patients.*
- *Promotes weight loss- Goose berries are low in calories and high in fiber. When consumed as a snack, they fill the stomach, reducing one's eating frequency thus promoting eventual weight loss.*
- *Anti-inflammatory properties - Goose berries are rich in anthocyanins. This property helps prevent inflammation. Their high levels of polyphenols also help in the treatment of disorders such as asthma which are basic inflammations of the tracheal passage.*
- *Help ease digestion- Fiber helps in the management of the digestive process. The fiber in gooseberries adds onto the bulk of food, making movement along the digestive tract easy. The pectin fiber acts as a laxative, calming a disturbed intestinal tract, and thus preventing constipation.*
- *Fights cold and flu - Antioxidants present in goose berries helps protect one against common cold and flu attacks. Consuming the berries with tea or hot water at least twice a day has shown to help soothe clogged nasal passages and alleviate symptoms of flu and cold problems.*

Simple Guide to making goose berry juice at home

Ingredients

- *Fresh goose berries that are clear and free from patches*

Equipment/what is needed

- *Blender and if one doesn't have they can use a kitchen mortar and pestle*
- *Clean sieve/sieving cloth*
- *Clean container*
- *Water*

Procedure

- *Wash the berries in clean water.*
- *Chop the berries into small pieces and remove the seeds.*
- *Put the chopped berries into a blender or crush them using a kitchen mortar and pestle.*
- *Blend/ crush until the mixture is smooth.*
- *Strain the blended mixture using a sieve to obtain the juice.*

If using a refrigerator to store the fresh juice, do not refrigerate the juice for more than 15 days.

From 1kg of goose berries, one can make approximately 0.7 litres of juice.

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Managing potato late blight in your farm

By Charei Munene

The last two seasons have been very difficult for potato growers due to the high incidence of late blight disease. Late blight which is a fungal disease is the most economically important disease of potato causing widespread loss in Kenya and the world. Most farmers describe the disease to be a cold weather effect. However, the late blight fungus spreads very quickly under cold and wet conditions.

Symptoms of late blight

1. *Late blight will first appear as small, light to dark green water-soaked spots, usually at the tips and edges of lower leaves where water or dew tends to collect. Under moist, cool conditions, water-soaked spots rapidly enlarge and a broad yellow ring surrounds the spot.*
2. *The spots progress to become dark brown. When it is cold and wet, a white growth of the fungus is visible on the under surface of the leaves. If the weather turns dry, the spot dries up and the leaf dies.*
3. *The spots also appear on the surface of the stem near the branches/ nodes and extend upwards and downwards. Such infected stems break and the farmer loses the crop.*
4. *Potato tubers are infected by the disease too. Infected tubers show irregular, shallow or reddish brown spots. Infected tubers often get a secondary infection by soft rot bacteria which rapidly cause healthy potatoes to become smelly and rotten. Rotting is more in wet soils.*

Disease spread

The disease cycle can occur every five to seven days, resulting in rapid spread of late blight. Spores are spread easily among plants and fields by splashing rain, overhead irrigation and wind. Infected seed tubers, volunteer potatoes are likely sources of the disease. The disease stays in infected plant parts. Low temperature and wet conditions favour the disease spread. The whole crop may be killed within 10-14 days.

Prevention

Before the disease even becomes visible, it will have already established. By the time the symptoms manifest, the crop will quickly die because fungi have very fast growth which kills the cells of the plant. It is therefore better to prevent the entry of the disease.

The organic farmer should do regular scouting to identify onset of the disease.

1. *Plant high quality certified seed that are resistant to late blight.*
2. *Plant potatoes with the right spacing (30cm by 75cm), and practice ridging to ensure good drainage, aeration and strong plants.*
3. *Since the disease only survives on living plants, destroy volunteer potato plants and weeds. Remove all the plant materials during harvest.*
4. *Practice crop rotation to prevent buildup of the disease. Don't rotate with tomatoes since they also get infected by late blight.*
5. *Maintain farm hygiene especially tools.*
6. *For irrigated farms, avoid too much watering. Only water in the early morning, avoid overhead irrigation.*
7. *Don't over-apply green manure because excess nitrogen favours the disease progress.*
8. *Ensure your farm soil is well drained.*

Control

1. *Remove infected plants at early signs and burn or dispose away from the farm.*
2. *Store tubers from diseased fields separately from tubers from healthy fields. Potatoes should be stored dry and at the lowest temperature possible to prevent disease spread.*
3. *Let plants die back completely before harvest. Once vines are dead, wait for two weeks before harvesting. Do not harvest tubers when wet.*
4. *Harvest diseased tubers separately from healthy tubers to minimize disease spread.*
5. *Mineral solutions derived from copper e.g. Bordeaux mix (a combination of copper sulphate and hydrated lime), copper hydroxide and copper oxychloride can be used in late blight control. Though these are acceptable in organic farming systems, usage should be done with strict adherence to organic certification to prevent harmful buildup of copper in the soil.*

https://infonet-biovision.org/PlantHealth/Pests/Late-blight

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Sustainable management of whiteflies

By Grace Kinyanjui

Whiteflies are small, winged insects that are mostly found on the underside of plant leaves. They thrive during the warm and humid seasons and feed by sucking sap from their host plants. There are diverse species of whiteflies that attack a broad range of crops. High populations of these insects are a huge threat to crop productivity. Their direct feeding effects include yellowing of leaves and stunted plant growth. They also produce honey dew that favours the growth of sooty mold fungus. Some species e.g. Bemisia tabaci transmit plant viruses that cause yellow mosaic and leaf curl diseases.

Management

Established populations of whiteflies are difficult to control because they rapidly gain resistance to chemical insecticides and reproduce very quickly. Therefore, farmers are encouraged to adopt a mix of methods that are environment friendly to manage whiteflies.

First, the farmer should maintain healthy soil by use of farmyard manure which builds the soil's fertility compared to synthetic fertilizers which make the soil dependent on them. Other techniques that help in maintaining healthy soil include: use of cover crops, perennial forage crops, mulching, minimum tillage and agroforestry.

The second technique is to plant healthy seeds and seedlings, and removing weeds than can serve as hosts of whiteflies. Use companion plants, intercrops and border plants that can repel whiteflies. For example, garlic and onions are good companion plants, while maize and sorghum serve as effective border plants for most vegetables. Practice crop rotation. For example, rotating vegetables with non-target crops like maize.

Check your crops, especially the underside of leaves regularly to detect any infestations. Hanging yellow stick traps slightly above the crops, to capture the insects as they fly, will help in monitoring. This is because adult whiteflies are attracted to yellow colour. Yellow roller traps are ribbons that can also be hung around the crops to capture whiteflies and other flying insects. Besides, the traps can be made at home by smearing petroleum jelly on yellow surfaces such as cardboards and plastics.

Thirdly, providing a conducive environment for insects that serve as natural enemies to whiteflies such as parasitic wasps, mirid bugs, lacewings, hoverflies, predatory thrips, ladybird beetles and predatory mites is very effective in their management. These natural enemies can be conserved by minimizing the use of chemical insecticides and providing refuge and alternate food sources through planting flower strips, and a mix of trees and shrubs. Intercropping is also helpful in increasing the diversity of natural enemies. In greenhouse farming, these natural enemies can be introduced into the farm, as they are available in some organic products based suppliers. For instance, a predatory bug, *Macrolophus pygmaeus* can be purchased from Koppert Biological Systems.

Biopesticides of whiteflies comprise of insect pathogenic fungi and neem. Examples include Beauvitech®WP and Lecatech®WP, both from Dudutech, Mazao Campaign® from icipe and Real IPM and Bio-catch® and Bio-Magic® from Osho Chemical Industries Ltd. Commercial neem-based biopesticides include NeemAzal 1.2EC (Twiga Chemicals Industries Ltd) and Nimbecidine® (Osho Chemical Industries Ltd). Homemade organic sprays are also effective against large numbers of whiteflies. These include extracts from neem and garlic, soap sprays and flour preparations. While spraying, more attention is required on the underside of leaves. Adoption of these ecologically sustainable pest control strategies against whiteflies will reduce dependence on chemical insecticides, increase crop yields and conserve agroecosystems for the future.

Note: Yellow sticky traps and roller traps are available at Koppert Biological Systems, Dudutech and Twiga Chemical Industries Ltd.

https://infonet-biovision.org/PlantHealth/Pests/Whiteflies

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Embrace regenerative farming to build resilience in food production

By Silke Bollmohr

We are going through a difficult time at the moment due to the effects of COVID-19 pandemic which struck the world by surprise. Worse still, we have seen more tragic incidences happening in different parts of the world; fires, floods, droughts, locust invasions, wars, famine, and many more. With all these disasters come interruptions in the food supply chains, especially for urban areas. For example, when COVID-19 started a rapid spread across the world, it led to strict measures including curfews, lockdowns, and very high restrictions of all kinds. As a result, the movement of goods (such as food) was interrupted abruptly, and food items became more expensive or were not available at all.

Like the rest of the world, Sub-Saharan Africa is increasingly becoming urbanized, with many people, especially the young, moving from rural to urban areas in search of jobs and other opportunities to earn an income. According to the UN, it is projected that about 66 percent of the world will be living in urban cities by 2050. While it is an unavoidable subject altogether, migration to urban areas presents its own set of challenges. For example, it results to an increase in urban poverty, pollution, low wages, and unemployment due to competition. As a result, we see the sprawling of informal housing and an increase in food insecurity and consumption of unsafe food.

To reduce loss of farm yields to pests, diseases and infertile soils, farmers have turned to overuse of synthetic farm inputs including fertilizers and pesticides. First, this method of farming becomes unsustainable as it is very expensive to maintain because farmers have to keep purchasing inputs externally. Dependence on expensive external inputs makes many farmers unable to leave the poverty cycle. Besides being expensive, pesticides and chemical fertilizers create a damaging impact on soil, water, and human health. Soils that are laden with these chemicals become acidic and unfavorable for important organisms that support crop yield. When it rains, some of the chemicals are washed away and drain or leach into streams and rivers. As a result, the water is contaminated and becomes toxic to organisms that live in water such as fish and algae. It also becomes unsafe to use for domestic uses often even unsafe for irrigation purpose. Soil erosion is also a key outcome of unsustainable conventional agriculture. Increasing periods of droughts and/ or irregular/ heavy rainfalls make it impossible to farm in rainfed farming activities and dryland areas. Bare soil in conventional agriculture can't slow the waterflow and water cant sink into the soil. Instead, water runs off and immediately evaporates and is wasted.

With these issues in sight, we need to change our approach and adopt effective strategies if we are keen to tackle the present challenges facing our food systems. Polluted soils, pesticide-laden waters and food, and soil

erosion are all issues we should not encourage at all. We need to revert to regenerative agriculture and do away with the current methods that never seem to do us any good. "Insanity is doing the same thing expecting different results." This adage is attributed to Albert Einstein and is loaded with wisdom. We cannot continue applying the same old destructive agricultural techniques and expect to heal the earth. It is time for urban and rural dwellers to turn to regenerative agriculture.

What is regenerative agriculture?

Regeneration is a process of renewal, restoration, and growth that occurs in nature contributing to stable and resilient food and farming systems. It focuses on building healthy soil. To practice regenerative agriculture means that the farmer embraces methods of farming that conserve and restore soil organic matter. This entails among other practices minimum tillage, planting cover crops and diversifying crops and animals in the farm. In the process, the micro-organisms that live in the soil thrive as well and biodiversity is maintained. The benefits of this method of farming include the soil's resilience against erosion and water sources are not contaminated by toxic farm inputs.

Another principle of regenerative agriculture, is optimizing the available pieces of land to grow food sustainably. From you, who live in an apartment with a balcony or a small garden in the city to you who owns a sizeable chunk of land in the village, we can all grow food and provide nourishment to ourselves and our families. For those with small spaces, you can take advantage of vertical farms, sacks and containers to grow a mix of vegetables. This ensures that there is vegetation in the environment, families have access to different types of food no matter where they live, or their economic status and where there is surplus, families can generate income.

Those who have embraced regenerative farming within their spaces have experienced the benefits. Some of them will be sharing their encouraging stories during the upcoming Shambajijini Online Summit 2021 on Regenerative Urban Farming, which will be taking place between 16th to 31st October 2021. Register free of charge at www.shambajijini-summit.net. to learn from the stories shared during the Summit. Regardless of your farm size, you will be happy to know that you can grow safe food. Let's all start growing regenerately and build bridges between the urban and rural spaces in Kenya.

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TOF Radio answers farmers' questions

Effective worm control in livestock

Musdalafa Lyaga

Mr. Philip Nyongesa from Bungoma County has been keenly following Kilimo Hai radio programs on Radio Maisha every Thursday from 7.30 PM. Nyongesa wants to know how to control worms in his livestock.

Worm and fluke infestation have been a burden for many livestock farmers, causing large productivity losses. A serious case of roundworm infestation can prevent weight gain, causing a drop in milk yield and even causing death.

The loss of production from these worms can be huge. Depending on the species of worm and other circumstances, such as the nutrition and age of the animal, anything between one thousand and fifty thousand worms may produce symptoms of disease.

Once established in cattle or sheep, each roundworm can produce between five and ten thousand eggs per day.

So, one heavily infested animal harbouring around three thousand female worms may contaminate a pasture with several million eggs daily for up to 20 consecutive months.

When the larvae hatch on the ground they can survive for many weeks or even months, before entering another animal as it grazes.

Biovision Africa Trust Extension Officer Mr. Francis Maina has been providing extension services to farmers for over 20 years and he is well experienced with issues of animal Health. In his experience, Maina observes that, *"when an animal is burdened by worms, it starts to lose weight and growth rate for a growing animal and stability for a mature animal slows down due to loss of appetite. In some cases, the animal undergoes complete retardation."*

Maina continues to explain that young immature animals are the most likely to be affected by worms to this extent. To protect them from being infested by worms, farmers should always graze young animals on clean pasture and treat them

Continued on Page 8

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

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

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

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

Tuko Mbele Pamoja!

Continued from Page 7

against worms regularly.

Symptoms

Animals affected by worms, especially tapeworms show a number of signs including: a rough coat, pot belly, gastro-intestinal disturbances and even anaemia.

In many cases appetite remains, but there is no weight gain and there may even be a loss of weight.

"Worms are normally hidden in the animals, and farmers are only alarmed when they realise that the calf for example is not growing well", says Maina. Farmers are advised to deworm their calves after every 3 months; when they are clear of worms, they can grow very fast.

Liverfluke

Another major loss for the farmer and the cause of lost productivity in the animal is the liverfluke which affects the liver. The liverfluke has a complex lifecycle involving the limnea snail as an intermediate host. After liverfluke eggs have hatched, the larval stages need to penetrate and develop in a limnea snail, which is commonly found in wet areas.

Infestating forms of the liverfluke are released from the snail, these are then ingested by animals whilst grazing. Once inside the animal, they migrate to the liver and become adult flukes. When there is a big intake of flukes, sheep and cattle can die within a few days.

But normally it is the gradual build-up of flukes in the liver, which causes the animals to become weak over a period of a few months. The lost productivity can be a huge blow to all farmers.

So, for liverfluke, roundworms and tapeworms, farmers need to have an action plan that will work and a good control programme will enable them to boost income.

Whether you have one or two animals, or a large herd, you need to consult with a veterinarian immediately you suspect that your animals are harbouring worms to an extent of losing their productivity.

The best time to give treatment against worms is at the beginning and at the end of each rainy season.

Young animals, sheep and goats are the most likely to be affected and they should be treated not just at the beginning and end of the rains, but also in between.

An interval of 4 to 8 weeks between treatments is recommended during times of challenge.

In order to control liver fluke, especially in wet or marshy highland areas, it is suggested that treatment is given every three months or so depending on the severity of the problem.

Good livestock handlers will always keep an eye out for individual cases of worm infestation. Farmers should treat all animals that are suspected of being burdened by worms with a reputable product.

There are a large number of different types of treatment available, so what should the farmer look for? *"There are drugs that are sub-standard in the market. Use drugs which are known and this can be done through the help of a veterinarian,"* Maina advises.

https://infonet-biovision.org/AnimalHealth/Worms

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FARMERS' FORUM

Samuel Gatongu from **Kirinyaga** is selling **Geese.** To buy **call 0715 422 460**

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