Biovision Africa Trust

THE ORGANIC FARMER

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Dear Reader,

Happy New Year! As you harvest last year's yields and prepare land to plant for the new season, remember to make the most of crop residue from your harvest, by returning it to enrich your soil. Last year's short rains were below average, as had been forecasted by Kenya Meteorological Department. You can make the most of the short rains by employing the moisture retention and water conservation technologies you have learnt from TOF in the past months.

In this edition we challenge you to consider planting macadamia nuts as an investment for income diversity. The article gives an in-depth analysis of the costs of growing them, and the benefits they give in the long term.

How much attention do you give to your calves? An expert on matters livestock rearing and management tells you why and how you should invest on the calf, just as much as you do in the lactating cow.

Do not be limited to the number of meals you can prepare with the amaranth blossoming in your farm. A nutritionist sheds more light on the high nutritional value of amaranth, and the many local meals you can make by following various recipe's using amaranth flour and whole grain. Read on for these and much more.

How You Can Invest in Macadamia Production

They are known as the king of the nuts, and for a good reason. Being nutritional powerhouses, they are associated with weight loss, healthy skin, and decreased risk of cardiovascular diseases and diabetes

By Josephat Mulindo

There are 10 species of Macadamia plants, four of which produce nuts. Only two of these are edible. The rough-shelled macadamia, *Macadamia tetraphylla*, is suited to cooler climates, while the smooth-shelled macadamia, *Macadamia integrifolia*, adapts to diverse agro-climatic conditions.

Most Kenyan farmers produce hybrids and improved clones of the two varieties.

Macadamias thrive in altitudes of 0 to 2,000 metres above sea level with a mean annual rainfall of 700mm to 2600mm, which comes in two distinct seasons. As a rule of thumb, areas growing coffee, sugarcane, avocado, papaya, mangoes, and maize are suitable for macadamia production.

Ideal temperatures are between 15 and 29 degrees centigrade and adequate sunlight is important.

Soils should be well-drained, fertile red loams with high organic matter and a pH of 5.5 to 6.5 with low salinity.

Propagation

- Use grafted seedlings that begin fruiting in three to four years;
- Get your rootstock from the rough-shelled macadamia, which is disease-resistant, and the scion (top part) from the soft-shelled macadamia;
- Top-wedge grafting gives the highest rate of union establishment and is commonly used when the scion stem diameter is smaller than that of the rootstock. Cut the scion on both sides of the stem to form a wedge then place into the wedge-shaped cut at the top of the rootstock;
- Transplant three to four months after grafting;
- A spacing of 7.5 x 10 metres is ideal depending on the growth pattern of the trees (upright or lateral growth). Under intensive farming, the spacing can be reduced to 8m x 5m but more pruning would be required;
- Excavate holes of 60cm wide x 60cm breadth x 60cm deep and separate the top soil from the subsoil, two months before transplanting. Discard the subsoil;
- Mix the top soil with two debes of well-decomposed farmyard manure and sand. According to KALRO, a farmer can use the following ratio: 70%:20%:10% (topsoil: sand: manure) when mixing their soil. Plant the seedling in the centre of the hole and cover it but avoid covering the graft union;
- Transplant during the long rains and maintain the same planting depth that the seedling experienced in the pot for better transition;

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Cost of macadamia farming per acre (Ksh): Pg. 2

- Create a basin around the tree to capture rainwater but avoid waterlogging.

Managing the transplants

The following practices are important:

- Weed to keep off pests.
- Apply compost manure twice a year.
- Prune before flowering and after harvesting.
- Irrigate when necessary.
- Mulch the farm or plant cover crops like mucuna beans to conserve moisture and prevent weeds.
- Create windbreakers to protect young plants from winds that can also blow away pollen from the male flower parts.

NB: If you had planted a poor variety, plant a better one in between the mature rows and remove the old ones when the new trees start producing.

Harvesting

The nuts mature 6-8 months after flowering. Remove dirt and other debris from the ground. This will enable the fruits to be gathered without picking up dirt.
De-husk within 24 hours and dry the fruits to avoid fungal attacks. Pack the shelled nuts in airtight containers and store in very low temperatures. A mature macadamia tree yields 50-80kg of nuts annually at its peak.

Pests and disease management

Control pests by lighting a fire using pepper and similar robust smoke-producing weeds, two metres away from the stem, ensuring that the fire does not get onto the leaves. The smoke covers the macadamia tree, effectively managing the pests.

Economics of macadamia production

Hybrid macadamia nut trees start bearing fruits for the first time after four years. Therefore, no income is expected during this period. Intercropping with crops such as vegetables or beans can provide an alternative income before nut production begins.

Cost for macadamia farming per acre (Ksh):

Year	Activity/materials/equipment	Cost (KES)
Year 1	Ploughing	3,000
	Harrowing	3,000
	Excavating 70 holes @ 50	3,500
	1.5 tonnes of compost manure	2,500
	70 seedlings @ 400	28,000
	Planting	2,000
	Weeding	2,000
	Total Year 1	**44,000**
Year 2	Compost manure and application	3,500
	Weeding	2,000
	Total Year 2	**5, 500**
Year 3	Compost manure and application	3,500
	Weeding	2,000
	Total Year 3	**5,500**

Production of nuts begins in the fourth year, with an average of 0.4kg of nuts per tree, which gives 28 kilogrammes. At Ksh150 per kilogramme, that gives an annual income of Ksh4,200.
Below is a cost and income stream from an acre of macadamia nuts. Discounting has not been done so as to match the income stream over cost at similar points in time.

Table 1: Costs and income streams from investment in an acre of macadamia nuts

Year	1	2	3	4	5	6	7	8	9	10
Production (kg)	0	0	0	28	112	462	637	952	1,428	1,904
Value	0	0	0	4,200	16,800	69,300	95,500	142,800	214,200	285,600
Cost	44,000	5,500	5,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
Gross margin	-44,000	-5,500	-5,500	-6,300	6,300	58,800	85,000	132,300	203,700	275,100

A comparison of the cumulative totals of the incomes and costs over time indicates that the farmer will break-even after the sixth year, assuming that the price of macadamia nuts remains at KES150 per kilo throughout.

Give proper care to the calf in your farm

By Nelson Barasa

It is common among farmers to focus all attention on the lactating cows and the bare minimum to the calf. This should however not be the case for any farmer who wants to improve production in the long run. Ensure that your calves start off healthy as this is going to determine the productivity of your cows in future. Healthy calves grow to be strong, resilient, and high yielding cows.
Calves are the most profitable investment in the farm. When calves are given sufficient pre-weaning diet, it translates to early age of service and calving and increases production.

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Science has shown that every one gram gained above the average daily weight gain before weaning translates to four more liters of milk in a cow's first lactation during its later stages of development. Well raised calves have better organ growth that improve longevity of the herd.

It all starts by ensuring that the calf is born in hygienic environment. Once the calf is born, take the calf's body weight, and feed it with colostrum within six hours of birth. A calf is born without immunity and depends fully on the immunity supplied through its mother's colostrum during its first days and week of life. Colostrum is the first milk from cows that has just calved. It provides nutritional, immune and growth factors. A calf should be given about 6 litres per day. Farmers should use teat bucket or bottle when feeding the calf.

After seven days of colostrum feeding, a farmer can continue giving cow's milk or give a good quality milk replacer available in agrovets at a rate of at least 6 litres per day. The 6 litres should be given in three portions of 2 litres each.

A farmer should aim at weaning the calf early (atmost 3 months of age) when they have doubled their birth weight. Assuming a calf was born with 45kg body weight, you should wean that calf when it has achieved at least 90kg of body weight and it is able to consume solid feed.

A calf is born with only one functional stomach which is called abomasum for digesting milk. Their rumen is not fully developed so the calf is not able to digest solid feed. A farmer should focus in ensuring quick development of the rumen.

How do you achieve quick development of the rumen to enable calf to utilize solid feed such as hay?

- Introduce good quality chopped hay at 7 days of age.

Farmer feeding calf with pellets

This will help expand the rumen.

- Provide good quality early weaner pellets, start with a handful a day, and increase amount depending on consumption. Pellets will speed growth of rumen and supplement nutrient to the calf for faster daily weight gain. By the time you are about to wean, the calf should be able to consume at least 1kg.
- Clean drinking water should be availed throughout from the age of three days and the calf allowed to drink as often as desired. Ensure the container you use to give the calf water is different from the one used to give milk.
- You can also provide the calf with mineral lick.

For more information: https://infonet-biovision.org/AnimalHealth/calf-life-worth-living

How to tap amaranth's nutritious value

By Mary Mutisya

Amaranth sprouts freely as a weed, and continues to gain popularity, especially in Europe, where it has been categorised as a superfood.

This annual, fast-growing plant, popular in many rural homes in Kenya, has over 70 species, which are used as vegetables, grains, and to create attractive ornaments.

Amaranth is rich in magnesium, phosphorus, calcium, zinc, manganese, copper, and potassium. It improves immunity and also aids in the formation of red blood cells, strong bones and teeth.

The vegetable species produces small distinct shiny black seeds and is inexpensive and an excellent addition to the dinner table, especially now, when the health of many is under threat from coronavirus pandemic.

Commonly referred to as terere, muchicha, chepkarta, or lidodo in various communities in Kenya, amaranth belongs to the amaranthaceae family. It thrives in deep, well-drained soils and warm temperatures.

Within the vegetable amaranth, the most common species are *Amaranthus dubius* and *Amaranthus tricolor*, while for the grains, it is *Amaranth hypochondrius* and *Amaranth creuntus.*

Also referred to as the "amazing amaranth", its seeds contain at least 16% protein, and 5% oil, and are a good source of Vitamins A, C, D, E, K, B6, folate, riboflavin and dietary fibre.

Amaranth has the following health benefits:

1. When cooked without oil, 100g of amaranth leaves contribute up to 45% of the body's daily requirement of Vitamin A;
2. The leaves contain high levels of iron and can be used to treat anaemia;
3. Amaranth grains contain double the amount of calcium found in milk, which makes them

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excellent in the formation of strong bones and teeth;
4. Unlike cereals such as maize and wheat, amaranth grains are rich in lysine, an essential amino acid that helps in the manufacture of red blood cells in the bone marrow, conversion of carbohydrates into energy, as well as the production of DNA and RNA;
5. The digestibility of cooked amaranth grain is up to 90% and it is recommended for the elderly, those that have been through a long fast and for weaning babies;
6. It is a good immune booster and is excellent for individuals with compromised immunity, are severely malnourished, or elderly;
7. Amaranth seeds are gluten-free and thus favourable to people with celiac disease (gluten intolerant);
8. It easily blends with other cereals and is used to enrich their nutritive values.

Amaranth recipes

As you may already know, amaranth flour is used in all recipes that use maize flour or wheat flour, by simply mixing with amaranth flour. If you intend to cook porridge or ugali, mix amaranth with maize flour at a ratio of 1:2 and follow the process of cooking porridge or ugali. In the same way, if you intend to bake a cake, biscuits or cook pancakes or chapati, mix the wheat flour with amaranth flour at the ratio of 2:1 and use the usual procedure of your meal preparation. Mixing the wheat or maize flour with amaranth flour enriches your meal with nutritional value and gives it a nutty delicious taste.

Recipes that use whole amaranth grain; Nzenga (crushed maize) dish with amaranth.

Nzenga is a traditional diet made from crushed maize that is popular in lower eastern Kenya.

Procedure

- Boil water and pour four cups in a flask; retain some in the boiling pot and add salt.
- Clean the amaranth grains and add to the boiling water.
- Boil until soft, then add the water from the flask.
- Wash Nzenga, sieve and add to the boiling amaranth.
- Stir well with wooden spoon until evenly distributed and add oil.
- Let it boil under low heat until it is cooked.
- Serve with sour milk or side dishes like stews or vegetables.

Amaranth rice dish

Rice is a food popularly eaten in most households in Kenya. However, it is starchy and low in other nutrients. The nutritive value can be improved by substituting part of the rice with grain amaranth as below:

Ingredients

2 level standard cups (250g) rice
½ standard cup (125 g) amaranth grain
6.5 cups of water
1 level teaspoon (5 g) salt

Procedure

- Boil water.
- Save four cups of boiling water in a flask.
- Add the amaranth to the remaining water.
- Leave to boil until tender and tasty, and nearly all the water has been absorbed.

- Add the remaining water and salt.
- Wash rice and add, to the amaranth and stir well with wooden spoon until evenly distributed.
- Boil until rice is cooked.
- Drain excess water if need be and cover.
- Remove from fire, and serve with beef stew, green grams stew or bean stew with vegetables.

For more information: https://infonet-biovision.org/search/site/amaranth

How to control pests in mangoes

By Dr Fathiya Khamis

The mango, *(Mangifera indica Linnaeus)* is a popular fruit that is rich in vitamins and essential minerals. It is commonly consumed as a fresh fruit, but can also be processed into powder or pulp.

One of the major challenges facing mango farmers is pest infestation which cuts down the yields leading to huge losses.

There are over 400 species of insect pests that infest mangoes worldwide. The most devastating are fruit flies *(Bactroceraspp, Ceratitis spp.)* and seed weevils.

Other common pests include mealybugs, thrips, mirids, scales, mites, whiteflies, beetles and aphids. These are mostly controlled using conventional pesticides, which have a negative impact on human health and beneficial insects. To increase the effectiveness of these chemicals, farmers resort to routine applications, which cause safety and health concerns, and high pesticide residues in the fruits, leading to rejection in export markets.

As buyers prefer to buy mangoes that are not laced with chemicals, farmers need to acquire knowledge on how they can produce their mangoes without applying chemicals.

Use of synthetic chemical pesticides interferes with the natural biological processes, which balance and keep pests below damaging levels. Farmers should aim to prevent the occurrence of pests by proper management of mango trees and the farms on which they grow.

Below are ways in which you can minimize pest occurrence in your mango farm.

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1. Use of plant extracts

As has been explained in previous articles on use of plant extracts to control pests, plants such as neem, basil, ginger, garlic and chili can be used to make microbial toxins that kill pests.

How to make extracts using garlic and neem.

Using garlic materials:
2 garlic bulbs
Few drops of soap
4 cups of water
Grinder or knife
Strainer
Bottle container

Preparation of Garlic extract:

- Chop garlic cloves into fine pieces or crush by grinding.
- Allow the crushed garlic to stand for 24 hours.
- Add water and stir in soap.
- Store in a bottle container.
- Strain the water mixture to extract the liquid.
- Dilute with water to a reasonable concentration.
- Shake well before spraying.
- Spray thoroughly on the infested plant, preferably early in the morning.
- ***Note:*** Garlic oil spray affects many organisms. It is non-selective so it can kill beneficial insects as well. It is not recommended for aphid control since it kills the natural enemies of aphids. It should be limited to home and garden applications where natural controls are rarely present.

Preparation of Neem extract

- Pound 500 grams (g) of neem seed kernels in a mortar.
- Mix crushed neem seed with 10 litres of water. It is necessary to use a lot of water because the active ingredients do not dissolve easily. Stir the mixture well.
- Leave to stand for at least 5 hours in a shady area.
- Spray the neem water directly onto vegetables using a sprayer or straw brush. Neem water can be stored and will remain effective for 3 to 6 days if it is kept in the dark.

2. Commercial biopesticides

Some companies such as Osho industries and Real IPM have collaborated with scientists to produce and sell biopesticides made from organic material. These biopesticides are free of synthetic chemicals as they are made from plant extracts or from microbes (bacteria, viruses, or fungi) found in air, soil or water. These biopesticides can either kill one or several targets, but they have no effect on human beings and beneficial organisms in the farm.

One of the biopesticide that you can use in your farm to control mango pests (fruit fly, thrips, and mealybugs) is the Metarhizium anisopliae. Real IPM (Kenya) has been working in collaboration with the International Centre of Insect Physiology and Ecology (Icipe) and has come up with products made from metarhizium such as: Metarhizium 69, Metarhizium 78 and Metarhizium 62.

Metarhizium is a naturally occurring entomo-pathogenic fungi (a fungi that works like a parasite that kills the pest). When applying it, follow instructions on usage of water as

Biopesticide

too much water affects its effectiveness. Metarhizium spores germinate and colonise the pest, killing it in 2 to 4 days. Metarhizium is compatible with various fungicides and insecticides. Additionally, it is not harmful to natural enemies. These biopesticides can be obtained from Real IPM. Contacts are provided at the end of the article.

3. Cultural practices (orchard sanitation)

If left unattended, pests can multiply in your mango farm and affect all the mangoes leaving you with nothing to harvest. Once you cite any affected mangoes (mangoes with dimples and oozing a clear sap) handpick them while they are still hanging. Waiting for them to fall on the ground has an increased risk as the maggots may have left the fruits to pupate. After picking the fruits, you can feed them to pigs or poultry, or dispose them off in black plastic bags, under the sun to allow the maggots to die. Alternatively, you can burn or bury the collected fruits. Ensure to bury them about two feet deep to prevent the adult flies from emerging onto the surface.

4. Physical control

Physical controls include bagging of fruits to prevent pest damage and use of light, pheromone, or bait-loaded traps, that lure pests and kill them.

Bagging fruits

Bagging prevents fruit flies from laying eggs on the fruits. Take papers such as newspapers and fold them in a way that they look like a balloon. You can use glue or any sticky material to make the shape. Blow into the bag to inflate it. Insert each mango fruit per bag and tie at the top firmly. Adjust the paper to ensure that the fruit is not in contact. When using plastic bags, open the bottom or cut a few small holes to allow moisture

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Bagged mangoes

to dry up. Moisture trapped in the plastic bags damages and/or promotes fungal and bacterial growth that can cause diseases. Plastic also overheats the fruit. Bags made of dried plant leaves are good alternatives to plastic. For tall trees use a climbing ladder and bag all the fruits. Your bagged mangoes will be protected from pests and physical damage, and therefore have a quality appearance, for the market.

Use of bait-loaded traps

One way of monitoring pests in your mango farm is by placing traps that attract fruit flies on strategic places on the mango trees. Icipe has developed one such trap, the fruit fly trap, also known as a bucket trap.

This trap is cheap and easy to make. It is made of a cylindrical plastic container with 4 holes evenly spaced on its sides, a lid, a wire hanger and a bait basket (if it is to be used with a dry attractant). Similar traps can be made locally using 'Kimbo' or 'Blue Band' containers or similar plastic containers or plastic bottles.

Handmade fruit-fly trap

They can be used with food baits such as yeast, a piece of fruit (banana, mango) or vinegar. Food baits attract both males and female fruit flies. They are not species specific, and also attract other insects, including natural enemies.

A simple fruit fly trap is made as follows:

- *Take a plastic bottle.*
- *As bait, use 1/2 cup vinegar, mix with water.*
- *Add 4-6 drops liquid dish soap (it heavies down the wings and the fruit flies drown), do not stir.*
- *Then take a pen or pencil and poke 4 to 5 holes in the plastic, just big enough for a fruit fly to fit into, about 7mm. Once a fruit fly crawls in, it cannot get out. You would think they would just fly back out through the holes, but they will not! If you see fruit flies crawling around on the surface of your plastic container but not going inside, make the holes larger.*
- *Hang the bottle in an area where you have seen most fruit flies. Depending on the amount of fruit flies you have, you can expect to start seeing the bottle fill up within just a few hours.*

The trap is filled with bait and hanged on the tree about 2 to 4 m above the ground within the canopy layer, in a semi-shaded spot, preferably in the upwind part of the canopy. The trap should be hanged in such a manner that branches and leaves are nearby, but not touching the trap. Traps should be hanged 10 to 50m apart, depending on the bait used. Collect catches weekly and sieve them.

You can also purchase the fruit fly trap from Real IPM (0746354037), Farmtrack Consulting Ltd (0711495522) and Kenya Biologics (0704652032).

In November edition, we featured a detailed article on how to ensure a conducive environment for natural enemies such as parasitic wasps to thrive and multiply in your farm.

For more information: https://infonet-biovision.org/PlantHealth/Pests/Fruit-flies

Managing cassava mosaic disease

By Beritah Mutune

The African Cassava Mosaic Disease (CMD) is widespread in Africa and causes up to 90 per cent yield losses. It is caused by cassava mosaic geminiviruses and spreads through infected cuttings, whiteflies (Bemisiatabaci), and occasionally, through farm tools. The disease affects leaves at the vegetative growth stage.

Symptoms

Leaves become distorted and growth is stunted. It occurs as a leaf mosaic pattern, which affects discrete areas at an early stage of leaf development. Symptoms vary from leaf to leaf, shoot to shoot and even plants of the same variety may show varying symptoms. Severely affected plants produce virtually no yield of roots or stems for further propagation.

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Cassava leaves affected by mosaic disease

Yield loss

Yield loss due to CMD ranges from 12 to 82 per cent, depending on the variety and type of infection.

Ways to control the disease

- **Use disease-free cuttings:** Use cuttings from healthy plants. If it is not possible to find disease-free cassava plants, select cuttings from stem branches and not the main stem, as they are more likely to sprout into disease-free plants.
- **Use of resistant cultivars:** Resistance to CMD has been successfully incorporated into high-yielding cultivars through breeding programmes. Hybrids can be bought from Kenya Agricultural & Livestock Research Organisation (KALRO) Kenya, Mikocheni Agricultural Research Institute (MARI), Tanzania, and National Crop Resources Research Institute (NaCRRI), Uganda.
- **Field hygiene (sanitation):** Identify and remove all infected cassava and other host plants from sites to be used for new plantings (roguing). This strategy does not protect them from being inoculated by whiteflies, but research shows that the virus is more aggressive in plants infected from contaminated cuttings than by insect vectors.
- **Proper spacing:** The wider the space between cassava stands, the higher the risk of disease. Disease incidence has proven to be high at the widest spacing between cassava stands and along footpaths or gaps in the stands. Use uniform dense cassava stands rather than irregular widely spaced ones.
- **Planting date:** Do not plant in seasons when there are many white flies as this exposes vulnerable young plants to risk of infection. Plant during rainy seasons.
- **Soil fertility and nutrient status:** Though cassava grows in poor soils, this may enhance damage caused by the virus.
- **Intercropping:** Cassava can be grown with other crops, including banana, sweet potato, cereals and legumes. This improves overall land productivity and may decrease whitefly vector populations, whitefly activity, and virus spread.
- **Plant many varieties:** Studies have shown that in areas where many varieties of cassava were grown, losses were much less than in areas with one variety.
- **Field size and shape:** Virus incidence and whitefly numbers tend to be greatest in the outermost rows of plantings, especially those that face the prevailing wind. Plant a resistant variety of cassava around the field margins.
- **Burn all the plants attacked by the disease.**

For more information: https://infonet-biovision.org/PlantHealth/Pests/African-cassava-mosaic-virus-ACMV

Factors to consider during the planting season

By Charles Kimani

It is a new year and as many people embark on setting new year goals, farmers across the country are getting ready for the new planting season. Here are ideas you should consider for improved productivity.

1. Stay on the lookout for weather information

Staying up to date on the current weather forecasts will help you make sound decisions. In Kenya, the National Meteorological department provides timely information on what the weather will be like in the foreseeable days. You should listen to radio programmes on weather forecasts and advisories.

2. Prepare a budget

The adage goes, failing to plan, is planning to fail. To get the best out of your farming business, prepare a budget that indicates the costs you will incur. Such costs include wages for land preparation, buying seeds, etc. By planning early, you secure money for these activities way before the season.

3. Soil testing

Carrying out a soil test will help you discover the nutrients your soil needs, plant-available macro-nutrients in the soil and where soil nutrients are in the soil profile. It will also help you identify nutrients that could be yield limiting in your soil. A complete nutritional cost analysis costs between KES4000 to KES5000 and can be obtained from local companies such as SGS Kenya Ltd, Crop Nutrition Laboratory Services (Cropnuts Kenya) and KALRO. Basic soil analysis costs KES2500.

4. Good land tillage practices

It is very important that one practices minimum soil disturbance that maintains the soil structure. Practice shallow weeding by weeding using your hand or a shallow weeder. Mulching and planting cover crops also helps minimize the need to weed. Avoid using pesticides to control weeds as this kills beneficial insects and introduces harmful chemicals into the soil.

5.Use certified and healthy seeds

The Kenya Plant Health Inspectorate Service, (KEPHIS) the Government unit mandated with ensuring that farmers are using certified seeds has put in place measures to ensure that farmers are not buying substandard seeds. If you opt to buy seeds for planting, ensure to scratch the strip that is clearly marked on the packet to reveal the code. Send the code to 1393 and await a confirmation SMS that will share information on the type of crop, company promoting the seed, date when the seed was tested and other relevant information.

You can also plant seeds from your previous harvest, as long the seeds are of good quality. However, remember seeds harvested from a crop originating from hybrid seeds are not ideal for replanting. Hybrid seeds are marked F1 on the package. It means two varieties have been bred (crosspollinated) to produce a third variety with characteristics from the two. If you were to save seed from hybrid offspring and plant it, each seed will

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grow into a plant with a random combination of the traits found in the original parents, which are rarely preferrable. Pure variety seeds are the best for saving. Ensure to save or plant the seeds that produced a harvest with the quality you would like to harvest the next season.

6. Practice crop rotation

Crop rotation is a practice of growing different crops on the same land in a regular recurring sequence. It also means that the succeeding crop belongs to a different family compared to the previous one. The planned rotation may vary from 2 or 3 years to a longer period. Different crops have different nutritional values and demands.

For maximum yields, farmers should alternate crops in different seasons to improve the quality of the soil and also take advantage of the different nutrients that are provided by different crops. For instance, farmers are encouraged to alternate crops in the cabbage family, that is the light green vegetables such as cabbage, kale, broccoli and cauliflower with legumes such as beans, peas and nuts.

This is because, these crops will make use of the nitrogen fixed by the legumes, as they require much of it. Crops such as onions take small amounts of mineral nutrients from the soil. After such crops as onions, it is advisable to grow heavy feeders such as maize, cabbage, collards, kale, etc. Crop rotation also reduces weeds and controls occurrence of pests and diseases, as some pests are crop specific and are repelled by other crops.

7. Prepare your compost in good time

Use of compost improves yields by 60-80%. Farmyard composting is a continuous process, and one should regularly collect and pile up crop and other farm wastes in layers to make them decompose quickly. With readily available manure, you will not need to purchase synthetic fertilizers to enrich your soil.

For more information: https://infonet-biovision.org/PlantHealth/Composting.

January Farmers' Forum

Mbaya from Meru is looking for tree tomato seedlings. If you are selling contact him on 0725 156 006

Richard Barasa from Mt. Elgon, Kapswony is looking for a heifer crossbreed of Fleckvieh and Gir
Call him on 0755 924 389

How can I get fast growing avocado seeds.
Phone no: 0768 810 227

In need of incubator call 0721 697 174- Uasin Gishu

Solomon Nderitu from Ndenderu is selling strawberry seedlings. To buy call
0722 100 541

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