

Dear Reader,

The Organic Farmer Magazine continues to feature information that guides you in season. As you harvest and prepare for the next planting season, ensure that your produce is safely stored to avoid post-harvest losses. This edition features potato storage techniques and maize seed selection tips for this planting season.

Remember to make use of storage techniques such as metallic silo bags, use of plant extracts e.g. pyrethrum or neem powder or diatomaceous earth to store and preserve your grains. Proper storage starts by ensuring that the grains are dry. Grains especially maize should have a moisture content of 13.5% before storage. To check the moisture level, you can try to crack a grain with your teeth, if it easily cracks, then it is not ready for storage. Alternatively, shaking a few grains in a soda bottle with salt for 2-3 minutes will help identify the moisture levels. If the salt sticks on to the sides of the bottle, the maize is not dry enough for storage. Also ensure to place the bags with stored grain on a raised ground and allow about 50% free space in the store to allow for air circulation. To get rid of pests that might have infested the previous yields clean the store first, especially cracks on the walls or floor and soak the bags in hot water before re-using them. Metallic silo bags can store up to 1,000 kg to 1,500 kg of grains. They can be obtained from Kenya Livestock Research Organisation (KALRO) or private companies such as Kentainers.



Better potato storage for higher returns

By Charei Munene

With proper storage, well-matured potatoes will stay in good condition for four to seven months. Potatoes naturally form sprouts 30 to 140 days after harvest. Potato storage serves three purposes: It makes possible a longer marketing period for the tubers, it ensures the minimum amount of loss from moisture and decay and also maintains the vitamin C content of potatoes.

For proper storage,

- Cut the above ground part of potato i.e. dehauling to allow for skin set on the tubers in the field for at least 10-14 days before harvesting. This stops tuber growth at the desired maturity, stabilizes the tuber solids, and promotes skin set. Do not harvest when the soil is too wet. Harvesting when it is relatively dry makes the potatoes to have less bruising and wounding.
- Grade out diseased tubers as quickly as possible. The longer they are mixed with healthy tubers, the higher the chance of disease spread. Separate the ones with bad spots or disease after harvest, as injured potatoes don't last. They also may spread spoilage or disease microorganisms to other potatoes. Potatoes store longest if they are unwashed. After harvesting from the garden, lay them out in a single layer

in a dark and airy place to let the soil dry on to the tuber. Lightly brush off excess dirt before you pack them. You need only brush off the soil on potatoes grown in coarse, sandy soil. Washing potatoes encourages rot formation. Inspect all the potatoes for soft spots, sprouts, mold, shovel damage, and pest damage. Only perfect potatoes are suitable for long-term storage.

- Curing period immediately after harvest is critical to successful storage. Airflow over and through the pile is important to supply oxygen and prevent condensation. However, do not over dry the potatoes during curing. Cure your potatoes for about 10-14 days.
- Before storing potatoes, facilities should be cleaned thoroughly and inspected. Pile dry, unwashed potatoes in a clean wooden or cardboard box, mesh bag, or basket to ensure good ventilation. Plastic bags won't allow them to breathe and will shorten their shelf life considerably. Potatoes release carbon dioxide and water in the form of a vapor, so a tightly sealed bag will get damp without proper ventilation.
- Store your potatoes in a location with a temperature between 5°C to 8°C and 85 percent humidity. Do not store your potatoes next to a source of heat or in a refrigerator. Heat encourages rotting while



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the too-cold temperature in a refrigerator turns the potato starch into sugar. You can achieve this in your farm by constructing a cold room with local materials such as wooden sticks or using charcoal walls.

- Keep your potatoes away from light which triggers sprouting. Potatoes will often go green when they're not stored properly and they're exposed to light. This is due to formation of chlorophyll (which is found in all green plants), however the green colour is a useful indicator that levels of certain toxins that are harmful to humans have risen.
- Keep your potatoes away from other produce especially onions to prevent flavor transfer and premature ripening. Onions release gases that quicken potato decay.
- It's best to inspect your potatoes every few weeks to sort out any that have sprouted or are going soft. If left unchecked, a few rotten tubers can spoil an entire box. Rotting in storage is caused by bacteria which live in the soil and which can also survive in stored potatoes.

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<https://infonet-biovision.org/PlantHealth/Crops/Potato>



Source: CIP

Figure 1: A potato storage ambient store constructed with local materials

Why you should practice intercropping

By Maureen Kamore

Farmers are encouraged to practice intercropping as it does not only help in effective utilization of land but also facilitates better utilization of soil moisture and nutrients. Other reasons for intercropping include: repelling pests, reducing weeds and providing nutrients for the neighbouring crops.

Intercropping offers smallholder farmers the opportunity to effectively use the land available and yield more as well as diversify their produce. Additionally, inter-cropping allows families to enjoy a variety of nutrients from the farm, compared to monocropping, where the farmer only grows staple crops depriving the family of other types of food that would ensure supply of nutrients and a balanced diet in meals. As the planting season approaches, you can plan to practice any of the following types of intercropping to enjoy the benefits mentioned above.

Different types of intercropping

In deciding which crops to intercrop, farmers should consider their density, required period of maturing, irrigation needs of each crop, as well as sunlight and nutrients needs.

1. Mixed cropping

Mixed cropping involves planting two or more plants simultaneously in the same field, with no distinct arrangement so that they grow together and can be harvested together. Mixed cropping is best suited for small-scale farming where harvesting is done by hand. It helps in additional protection to the primary crop against adverse weather. The following crops can be intercropped in this way:

- cashews, coconuts and mangoes
- cassava and bananas
- maize, sorghum, millets and sesame
- vegetables and legumes such as cowpeas, pigeon peas and green grams
- cotton with legumes

2. Row cropping

Row cropping is the growing of two or more crops at the same time alternat-



Trap cropping cabbages with marigold

ed in rows. It allows for substantial interspecific interactions, such as shading, root mingling, and competition for water and nutrients. Crops that would do well in row cropping include cereals with legumes, for example maize and beans. The benefit here is additional nitrogen fixing by legumes benefiting the cereal.

Other common combinations include:

- tomatoes with onions
- tomatoes with brassicas
- cabbage or kale with lettuce
- cabbage or kale with onions

3. Relay intercropping

Is planting a second crop type into an existing standing crop once it has reached the reproductive stage. This method of planting reduces temporal overlap in harvesting different species. When choosing crops to intercrop in this way, ensure that the second crop is tolerant of the shade of the first one. Crops that are suitable for this method of intercropping include maize and cotton, or chick peas and rice, in upland areas. Other examples are:

- maize and soybean
- maize and sweet potato

4. Alley intercropping

Is the cultivation of food, forage or any other crops between rows of trees. Higher plants protect the lower ones from winds and shelter from extra sunlight as well as prevent soil erosion with their vigorous root systems.

5. Trap intercropping

Is the planting of a trap crop to protect the main crop from a certain pest or several pests. A trap crop is a plant that attracts agricultural pests, usually insects, away from nearby crops. Examples of plants used for trapping pests include marigold and mustard. The trap crops attract the pests and fungi, drawing them away from the value crops in the farm.

6. Strip intercropping

Strip intercropping is similar to row intercropping but in strip intercropping, a close-growing crop is alternated with one that leaves a considerable amount of exposed ground. This can be practiced by large scale farmers as it allows for machine operation. Examples of crops that are intercropped in this way include wheat, maize and soya beans.

7. Push-pull technology

Push-pull technology is an intercropping strategy for controlling agricultural pests by using repellent “push” plants and trap “pull” plants. For example, cereal crops like maize or sorghum are often infested by stem borers. Grasses planted around the perimeter of the crop attract and trap the pests, whereas other plants, like *Desmodium*, planted between the rows of maize, repel the pests and control the parasitic plant striga.

The idea of intercropping is for crops to complement each other in growth. When intercropping consider the following:

- The height of the crops; tall crops should shelter ground, bushy crops from excessive sunlight.
- Shallow rooted crops should be intercropped with deep rooted crops to avoid competition for nutrients.
- Crops that require heavy irrigation such as cabbages should not be intercropped with crops that are affected by too much water.
- Crops selected should be of different families to avoid overpopulation of various pests and diseases.

Suitable Intercropping Combinations

Crop	Intercrop with
Tomato	Onion family, Carrots, Asparagus
Maize	Desmodium, Napier grass
Spinach	Beans, Strawberry
Pumpkins	Corn, Beans
Potato	Cabbage, Beans, Corn
Asparagus	Basil, Tomato, Parsely
Celery	Onion, Cabbage, Tomato
Carrots	Radishes, Lettuce, Tomato, Nasturtium
Onion family	Beets, Carrots, Lettuce, Cabbage family
Parsely	Tomato, Asparagus



Advantages of Intercropping

- Plant diversity creates overall plant health.
- Greater income due to increased yields.
- Reduction in chemical/fertilizer application.
- The fertility of the soil is maintained.
- Optimum utilization of resources.
- Trap cropping for pest control.
- Maximum utilization of nutrients present in the soil.
- A complementary sharing of plant resources, such as Nitrogen from N fixing plants.
- Weed suppression and a reduction in susceptibility to insects and disease.

Disadvantages of intercropping

- When maturity time differs, sometimes harvesting becomes difficult.
- Some intercrops might be alternate hosts for certain pests, contributing to higher infestation.
- Controlling pests and diseases takes more efforts in intercropped farms.
- It is labour intensive and using farm machines may be difficult.
- Allelopathic effect where one organism produces one or more biochemicals that influence the germination, growth, survival, and reproduction of other organisms, may have adverse effects on intercropped plants.

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<https://infonet-biovision.org/PlantHealth/Intercropping-and-Push-Pull>

Details of tamarillo (tree tomato) production

Josephat Chengole Mulindo

Introduction

You can never go wrong with tamarillo (tree tomato) production. It is an easy plant to propagate, the cost of its seed is affordable and the fruits are highly marketable locally and in the export market. This is because tree tomatoes are known for their nutritional and health benefits.



The tamarillo was originally a yellow and purple coloured fruit. However, in the 1920's, a red-skin variety was developed and is now the most commonly known variety of the fruit. Others still exist and are common among Kenyan farmers - yellow, orange, deep purple and dark striped. This rainbow fruit has its colours associated with taste. The red fruits are more acidic while the yellow and orange fruits are more sugary-sweet.

Tamarillo plant is a small sized tree reaching about 100 to 400 centimetres in height with hairy stems and branches. It has a shallow fibrous rooting system. The leaves are large, simple and perennial with a strong pungent smell. A mature tree bears pink-white flowers that come in clusters of 10 to 50 floral pieces. They produce one to six fruits per cluster. The fruits are generally egg-shaped measuring 4 - 10 centimetres long. The plant has a lifespan of up to 12 years.

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Ecological requirements for tamarillo (tree tomato)

Tamarillo is a subtropical plant. It does well in areas with warm conditions that are not affected by strong winds. Specifically, the plant requires the following ecological conditions;

Soils: Tamarillo trees require well-drained fertile soils, rich in organic matter. They grow naturally on soils with a pH of 5-8.5. Perfect drainage is a must and the trees do not tolerate waterlogging.

Climate: Tamarillo requires rainfall ranging between 600-4000 millimetres and annual temperatures between 15°C and 25°C. The plant is intolerant to frost (below -20°C) and drought (below 300 mm of rainfall per year) stresses.

Altitude: In Kenya, tamarillo grows well in altitudes between 1,500m to 3,000m above sea level.

Propagation

Tamarillo can be propagated by seeds, cuttings or grafted seedlings. Seeds produce a high-branched, erect tree, ideal for sheltered locations.

To ensure the outcome from seed propagation breeds, one should be careful to take seed from red fruits with black seed pulp or yellow fruits with yellow seed pulp. Cuttings develop into shorter, bushy plants with low-lying branches that are suited for open spaces where winds may be a challenge.

Cuttings are obtained from healthy pruned wood from a mother plant that is about 12 months old then trimmed to about 12 inches long.

Grafted seedlings are obtained from a bug weed rootstock and a tamarillo scion of a desired variety. The bug weed has a taproot system while the tamarillo has the fibrous shallow rooting system.

Nursery establishment

Though seeds can be sown directly in the farm, it is better to start them in a nursery to ensure you have robust seedlings to begin the tamarillo orchard with.

Variety selection: Varieties to propagate should be selected depending on market requirements. Red fruit variety has an appealing colour and is more preferred in the Kenyan market.

Seed extraction: Seeds should be extracted from mature fruits harvested



from vigorous and heavy fruit bearing and healthy trees to prevent seed borne diseases. The fruits are washed then cut in two pieces. Seeds are scooped out and washed to remove the sticky material. The seeds are then dried in direct sunlight for about 7 days. The dried seed is viable for 3 months.

Nursery preparation: Ideal site for the nursery should be under the sun and should not have had other crops like managu, Irish potatoes, pepper, tobacco and eggplant in the past 4 seasons. The nursery soil should be well aerated, drained and with good pH. Ploughing should be done to a depth of 20-30 centimetres and stones, weeds and debris removed. Well decomposed organic manure (5 kg/m²) should be mixed with the nursery top soil, one week before planting. The nursery bed should be above ground level with a length of 100 centimetres and a width of 20 centimetres.

Sowing seed: For an acre, 2.5 grams of viable seed is required (an equivalent of about 1200 seedlings). The bed surface should be levelled and sowing lines of 0.5 centimetres depth are made using a stick. Seeds are sown in lines at the spacing of 20cm x 5cm and are covered with little soil. Apply mulch on the bed, followed by regular watering. Between 7 and 10 days later, the seeds should have germinated. Remove the mulch and create a raised overhead shade to protect the seedlings from direct sunlight and heavy rain intensity. One month later, when seedlings are 5 centimetres in height, transfer them to polytubes or pots that are 13 centimetres in diameter. The seedlings will be ready for transplanting in about 3 months. One to two weeks before transplanting, harden up the seedlings by reducing the irrigation frequency and exposing the seedlings to greater sunlight intensity.

Transplanting tamarillo (tree tomato)

Land for tamarillo production should be located in a place with an adequate supply of water. Tamarillo requires adequate watering at least once a week. Make provision for a water tank on the farm if rain water is inadequate.

Land preparation should start at the time the nursery is established. The field has to be ploughed at a depth of about 20-30 centimetres, the debris removed and then levelled.

Dig holes of 60cm x 60cm x 60cm. Separate topsoil from subsoil. Discard subsoil. Mix topsoil with a bucket of fully decomposed farmyard manure and fill the hole. If it is dry, water the mixture in the hole before transplanting your seedling. Plant the seedling to the depth it was in the polytube. Put mulch around the hole and ensure moist and not waterlogged soil conditions.

Field management

Mulching: Select good organic material as mulch. If material is adequate, cover the whole field. If inadequate, cover the area around the planting hole. Mulching prevents loss of soil moisture, controls weeds by shading them and diseases by preventing soil contact with the plant foliage. It controls soil temperature by keeping it cool or keeping it warm and adds to soil fertility when organic mulch decomposes.

Weeding: The tamarillo field should be kept weed-free. Weeds compete for nutrients and space with the fruit trees. Besides, they act as hosts for pests, fungi and viruses that may affect the tamarillo plants. While doing manual or mechanical weeding, the shallow rooting system of tamarillo trees should be considered.

Pruning: At a height of about 100 cen-

timetres the top of the plant should be chopped off to encourage branching and keep the height of the crop to a manageable level for ease of harvesting. Plants grown from cuttings generally grow with many low branches. These should be removed so the plant branches are far enough above ground level to prevent infections.

Irrigation: Tamarillo plants are sensitive to drought. Lack of water limits plant growth, fruit size and yields. Tamarillo plants need irrigation during dry periods and peak growth times. Drip irrigation is most preferred for delivering water directly to the roots whilst leaving foliage and fruits dry, to minimize infections. However, the choice of method of irrigation will depend on your local economic and land physical realities.

Use of grafted tamarillo plants reduces the plant's vulnerability to water stress. The bug weed that is used as the rootstock has a taproot system that goes deeper in the soil to scavenge for water in the lower soil strata.

Pest and disease management: Tamarillo is fairly resistant to most diseases and pests. However, organic sprays can be used to manage blight and powdery mildew in cases of an outbreak. Whiteflies and aphids are managed by directing smoke from burning neem tree leaves into the orchard. As a general rule, avoid plant overcrowding by sticking to the recommended plant spacing. Maintain field hygiene and practise crop rotation. Use of grafted seedlings gives a boost to the tamarillo plants in pest and disease tolerance. The bug weed which acts as the rootstock is tolerant to viral infections and nematodes.

Item/activity	Seedlings (number)	Manure (buckets)	Holes (labour)	Weeding/pruning labour (months)
Quantity	1200	1200	1200	12
Price	100	20	50	7000
Cost	120000	24000	60000	84000

Production cost in the first year will be ksh288,000. In subsequent years, the production costs are estimated at ksh84,000 annually. The net income stream is indicated in the table below up to year 5 when the orchard should ideally be replaced with a new one.

Period	Year 1	Years 2	Year 3	Year 4	Year 5
Gross income	2,880,000	2,400,000	2,400,000	2,400,000	2,400,000
Cost	288,000	84,000	84,000	84,000	84,000
Net income	2,592,000	2,316,000	2,316,000	2,316,000	2,316,000

In conclusion, it can be inferred that tamarillo production is viable and very profitable.

Harvesting

Tamarillos start producing fruits at 10 - 12 months of age. Tamarillo is best harvested when quite ripe, as close to complete maturity as possible. If not yet mature, it doesn't taste good. If too young it even becomes difficult to digest. Flavour improves if the fruit is left to ripen on the tree. When the fruits develop the red or yellow colour, then they are ready to harvest. Harvesting is done by pulling the fruits from the shrubs with a snapping sound to ensure the stalk remains attached on the fruit. A single tree yields about 30 kilograms of fruit annually.

Post-harvest handling

After harvesting, the fruits should be washed to remove dust and other debris. They are then dried and sorted into batches according to size, colour and skin condition. The fruits should be packaged based on the requirements of the client.

Economics of tamarillo production

Returns: An acre of land can carry about 1,200 tamarillo trees. With each tree producing 30 kilograms, the yield per year would be 36,000 kilograms of fruit. At a price of ksh80 per kg, this results in a gross revenue of ksh2,880,000 per year.

In subsequent years, production per acre comes down to an average of 25 kilograms per tree annually yielding 30,000 kilograms with an annual income of ksh2,400,000.

The production costs in the first year are indicated in the table below.

Causes of chicken diarrhea and its treatment

By Violet Agweya

A normal chicken dropping has a white cap and is brown in color. This white cap is urate. Chickens do not urinate so the urates are expelled with the fecal matter.

Diarrhea in chickens will be very loose or not formed at all. It may look like colored water. When the dropping has a loose consistency and becomes watery and/or foul smelling, it is diarrhea. In addition, if your hen looks ragged and tatty and sits off by herself then it is likely to be sick.



Major causes of diarrhea in chicken include:

- Worms
- Viruses (such as rotavirus and adenovirus)
- Bacterial diarrhoea, caused by an infection
- Kidney damage
- A feed too high in protein
- Poor feeding

Other illness that have a symptom of diarrhea in chicken include:

Coccidiosis- a protozoan disease caused by poor hygiene and sanitation. Symptoms include sick looking birds with heads down, ruffled feathers and bloody diarrhea and death of young chicks.

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Prevention and control:

- Avoid keeping different age groups of birds in the same house as disease may spread from adults to young chicks.
- Use of Effective Microorganisms (EM) in drinking water. EM provide beneficial microorganisms that improve the gut flora of the birds, making digestion more efficient.
- Clean up chicken house and disinfect the area with lime (dusting with whitewash or agricultural lime)

Fowl cholera - (Pasteurellosis) This may occur at all ages of chicken, causing infection of the stomach.

Symptoms: severe diarrhea, breathing problems, loss of appetite, blue combs and wattles. It may occur as a chronic disease or as sudden death. Infection is mainly through contaminated feed and drinking water. There is no treatment. Best prevention is strict hygiene and vaccination. Destroy through killing and burning affected birds.

Marek's - Seen only in birds older than 16 weeks. Initially the birds may show paralysis of one or both wings, or one or both legs might be paralysed. The disease is a virus, so there is no treatment, but commercial vaccines are available.

Coryza - This disease can be acute, mild or chronic. Contamination occurs by faecal matter, aerosols or through feed and water. It can be prevented by vaccination with bacterin in water at 10 to 12 weeks and 16 to 18 weeks.

Symptoms: Swollen watery eyes, closed eyes, nasal discharge (runny nose), laboured breathing and decrease in egg production. All clinically ill chicken should be destroyed.

Newcastle disease - Newcastle is the most economically important and the only notifiable disease in chicken. Often 30-80% of the flock dies. It is spread by dogs, birds, wild birds and man. There is no cure, affected chicken must be killed in a humane way. Prevention occurs only by early vaccination.

Symptoms: Respiratory stress, lack of appetite, green diarrhoea, nervous symptoms and high mortality. Death can also be sudden without any perceived symptom.

Gumboro disease - This disease is common in hatcheries. It affects young chicken 2 to 6 weeks old and it is rare in indigenous birds. Transmission occurs through feed, water and faeces.

Symptoms: Diarrhoea, sleepiness and depression, ruffled feathers and trembling of the head. Mortality is between 50% and 80%. The disease weakens the immune system, making the birds more susceptible to other infections. It can be controlled by vaccinating the chicken when they are 2 to 6 weeks old through drinking water.

Salmonella - It affects chicks and adults. It is spread by contamination of eggs at laying or through contaminated feed and water and faeces.

Treatment of chicken diarrhea

Short periods of diarrhea that are caused by overindulgences do not require any treatment except removing the food. In weather related circumstances you can help them by providing clean fresh water enhanced with vitamins and electrolytes. Just remember not to give them electrolytes on a continual daily basis as it can easily cause diarrhea.

To make your own electrolyte solution mix the following:

8 teaspoons granulated sugar, ½ teaspoon sea salt, ½ teaspoon baking soda and 1 gallon of water.



You can also use poultry microbes frequently to improve the gut health of your birds



Prevention of chicken diarrhea

Having good biosecurity: Good biosecurity involves ensuring that the chicken coop is free from germs, by restricting any possible agent including visitors, or putting in place protective measures whenever visitors come to the coop. Secondly, to avoid infestation of lice and mites clean the chicken house by regularly applying lime wash/disinfect the floor and walls. Ensure to provide dry litter regularly where applicable and do not put too many birds together. Different species of poultry for example hens, turkeys, pigeons, ducks and guinea fowls should be kept separate. Also, separate chicks from adult birds except from the mother hen. Do not try to eat sick birds that have died - diseases can sometimes transfer to human beings no matter how well they are cooked. Burn or bury dead birds.

Finally, ensure to vaccinate birds against common diseases. Vaccination is very important in protecting your chickens from common diseases.

Below is the vaccination regime recommended for commercial chicks, but also applicable to improved management of indigenous chicken.

Another good bio-security rule is: if you bring in new chickens to your flock, they need quarantining first. The new hens may look perfectly healthy, but some diseases do not show themselves immediately. The recommended period of isolation is 30 days.

Keeping your hens healthy is the best way to be proactive against diarrhea, you can also use poultry microbes frequently to improve the gut health of your birds. Remember to always look for the cause before you act.

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<https://infonet-biovision.org/AnimalHealth/Chicken#simple-table-of-contents-6>

Age	Vaccinate against	Application
1st week	Marek and Newcastle disease	Subcut (neck)
2nd week	Gumboro	In drinking water
3rd week	Lasota + IB (Newcastle)	In drinking water or eye/nostril drop
4th week	Deworming, IBD forte	In drinking water
5th week	Lasota + IB	In drinking water
6 to 8th week	Typhoid	Injection
9th week	Deworming (every 2-4 weeks)	In drinking water
8 to 10th week	Fowl pox	Wing stab
12 to 14th week	Typhoid	Injection
16 to 18th week	Renewed Newcastle (where disease is prevalent)	Optional



Improving your harvests starts with good seed selection and storage practices

Musdalafa Lyaga

I heard on radio that one can grow certified seeds. Is the use of certified seeds allowed in organic farming?

Certified seed implies the seed has been grown following strict standards, and the resulting seed has been tried and tested before being given the status of being certified. This ensures that there are no disease pathogens on the seed and the viability is good. It also ensures that the seed is pest free. 'Certified seeds' are not necessarily organic.

Organically certified seed remains the best option for farmers, however, accessibility of organically certified seeds is a major challenge. Many farmers rely on their neighbours, community seed banks, Agricultural Research Institutions, local and international NGOs, national and community seed banks, large seed supply companies among others to obtain seeds.

Good harvest is largely the result of careful seed selection and good storage of seed in preparation for planting.

Factors to consider when doing seed selection

One of the most important factors to consider is the specific climatic and environmental conditions of your area. Just because a seed variety is doing well in one region, does not mean it will obviously do well in another. If you are not well informed of the varieties suitable for your area, consult with an agricultural extension officer. You can also attend farmer field days organized within your area to see how the various seeds are performing

in local conditions before trying them out in your fields. The more you know about a seed product, the more likely you'll be successful in managing it. After selecting the right seed for your field, ensure good farm management practice to yield optimally.

Maize varieties and their suitable climatic conditions (Source: Kenya Seed Company)

Highland Maize Varieties

These varieties are bred and recommended for medium to high altitudes (1500-2100m) where day temperatures seldom exceed 28°C during growing season and where the night temperatures drop to as low as 8°C. Rainfall requirements ranges from 800-1500mm. Examples include H6213, H6212, H6 210, H9401, H629, H628, H627, H626, H625, H614, H624, H623, H516, H515, H513, H511, PH4, PH1, DH01, DH02, DH03, DH04, Katumani composite and DLC 1.

These are Highland hybrids grown particularly in Trans-Nzoia, Uasin-Gishu, Nakuru, Laikipia, Kisii, Narok, Bungoma, Kakamega, Nandi, and Kericho. Tea zones of central Kenya: Nyahururu, Bungoma, Bomet, Nyeri, Kiambu and Meru tea zones, Timau, Nkubu, Nanyuki, Kirinyaga, Igembe, Bukwa and Mbale.

Medium Altitude Agro-Ecozone (1000-1700m)

These varieties are commonly grown in coffee growing belts. The favorable rainfall is 750-1000mm. Some of the varieties in this category include H515, ideal for early to medium transitional zones and lowland areas of Kirinyaga, West Pokot, Bungoma, Homa Bay, Kerio Valley, Kagio, Mwea, Makueni, Kitui, Marakwet, Baringo and Koibatek, Voi, Mwatate, Mariakani, Garissa; and H516 which is ideal for areas such as Western Kenya, Elgeyo Marakwet, coffee zones of central Kenya,



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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	91.5
Bungoma	
Busia	
Malindi	106.3
Location	Frequency
Webuye	95.9
Garissa	88.7

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

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

Tuko Mbele Pamoja!

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Tharaka Nithi Nyanza (Migori, Kisii, Nyamira), Baringo, Embu, Chuka.

Transitional Zone

The altitude in this zone falls between 1000-1700m where the temperatures ranges from 12°C to 30°C and has rainfall similar to that of high altitudes. Hybrid 624 is a typical example in this category and can do well in areas such as Bungoma, Kakamega, Bumula, Lanet, Nandi, Laikipia and Narok.

Lowland Agro-Ecozone: PH1 and PH4

Pwani hybrids are fairly short varieties resistant to lodging and more tolerant to moisture stress and recommended for altitude range of 0-1250 metres above sea level with 400mm of rainfall. It has an added advantage of good husk cover hence reduced crop loss even when attacked by birds and weevils. It is also suitable under intercropping systems. PH1 and PH4 are recommended for the Lake region and the Coastal strip of Kilifi, Mpeketoni, Hola, Gariseni, Voi, Mwatate, Kwale and Kinangop.

Dryland Agro-Ecozone: Katumani Composite B

This is a fast growing open pollinated variety, which is fairly short and produces short cobs. It is a drought escaping variety flowering within 60-65 days and maturing within 90-120 days.

The variety performs well within altitudinal range of 1000-500m above sea level and is a variety for marginal rainfall areas. The variety requires 250-500mm of rain, and has performed extremely well in arid marginal areas in many parts of Africa particularly in Somalia, Ethiopia, Sudan, Tanzania and Namibia.

Dryland Agro-Ecozone (DLC1)

This is another open pollinated variety which is recommended for arid and semi-arid regions. This variety flowers earlier than Katumani Composite B by about 4-7 days and is shorter but more prolific. Under unfavorable conditions, the variety performs better than Katumani Composite B. The variety is best suited where rainfall duration is short and amounts to less than 350mm. The variety is a good substitute for Katumani where rainfall is erratic.

Production of own maize seed by smallholder farmers

As a way of coping with drought conditions and climate change, many smallholder farmers are now continuously developing on-farm breeding strategies.

Own maize seed can only be produced from varieties which are not hybrids. Hybrid varieties are made by planting two varieties in the same field, allowing only the male parent to produce pollen, and harvesting the seed only from the female parent. This is controlled crossing of two different parents. The offspring (the hybrid) will perform better than the average of the parents or even better than each of the parents.

However, if you try to plant the seeds from the cobs of these hybrids, your plants will not yield as much as the mother plants.

If selecting seeds from your harvest to plant the next season, ensure to select from non-hybrid seeds. Select seeds from vibrant, high yielding variety that has shown robust growth. Properly selected and stored seed will yield satisfactorily.

For more information on seed selection please visit www.infonet-biovision.org

<https://infonet-biovision.org/PlantHealth/Crops/Maize-Seed-Production>

FARMERS' FORUM

Daniel Ndung'u from **Kinangop** is selling **chia seeds @350 per 250g**. To reach him call **0715 422 460**

Leonard Oginga from **Rarieda** in **Siaya** is selling **goose eggs**. To reach him call us at **0715 422 460**



Partner organizations



To contact us on the "tusemezane" platform or ask a question, kindly call or sms +254 715422460. Mail to: feedback@biovisionafrica.org

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