

COMPLETE GUIDE ON SWEET POTATO FARMING IN KENYA

Sweet Potato is a dicotyledonous plant belonging to the family convolvulaceae. It is a perennial vine adaptable to different agro-ecological zones. It is widely grown on a small scale mainly in subsistence farming. The tubers are a rich source of the flavonoid anti-oxidants, vitamin A, dietary fibers and minerals.



Locally sweet potatoes are boiled or roasted and eaten either alone or with other foods such as milk, porridge, soups or grains. The sweet potato vines are a useful fodder crop, especially in the dry season.

Importance of Sweet potatoes in Kenya

- Climate change is affecting amount and rainfall patterns, sweet potatoes is a more weather resilient crop
- It is a low-input crop making it ideal for many smallholder households; crop rarely requires pesticides or fertilizers.
- Production presents opportunity for farmers to improve their food security situation and income from the sales of surplus.
- The ability of sweet potato to establish ground cover very fast enables suppression of weeds such as *Strega* control of soil erosion and maintenance of soil fertility makes it an important crop for Kenya's farming systems.

Prospects of sweet potato in Kenya

Sweet potato is now consumed by many Kenyans of all classes. More families and hotels are coming up with more creative recipes other than boiling the tubers. Sweet potatoes are regarded as a natural nutritious food due to the fact that they are grown without chemicals hence is perceived as healthier dietary choice. Consumption has increased in both local and 5 star hotels.

In major producing areas marketing in most cases is through, some merchants from major towns e.g. Mombasa, Nairobi and Nakuru. They contract the farmers and purchase their tubers at wholesale prices on the farm

Sweet potato is relatively cheap for households and serves as a good substitute for bread and cakes

The demand for sweet potatoes is increasing country wide with entrepreneurs venturing in sweet potato processing

Other Opportunities in the Sweet Potatoes Enterprise include;

- Seed bulking –to produce and sell high quality vines/cuttings to other farmer
- Livestock feed – growing of sweet potatoes as fodder also manufacturing livestock feeds
- Industrial use – Starch is produced from sweet potatoes for industrial use (garment factories)
- Production of composite flours

Ecological Requirements

Altitude

Sweet potato grows at altitudes up to 2100m above sea level and is occasionally found as high as 2400m. The crop prefers lower and mild elevation zones.

Rainfall

Annual rainfall of 750-1000mm annually is best for production however some varieties are known to be drought tolerant. Although sweet potato can tolerate drought to some extent, yields drastically reduced when drought occurs during the first 6 weeks after planting and at root formation and development.

Temperature

Sweet potato is essentially a warm weather crop. Growth is best at temperature above 24°C. When temperatures fall below 10°C, growth is severely retarded.

Soils

Sweet potato grows best on sandy-loam soils and does poorly on clay soils. Good drainage is essential since the crop cannot withstand water logging. A soil pH of 5.6 – 6.6 is preferred. It is sensitive to alkaline or saline soils, and such soils should be avoided.

Where the water table is high, the crop is planted on mounds or on ridges. Soils with high bulk density or poor aeration tend to retard tuber formation and result in reduced yields.

Varieties

Both local and improved varieties are grown

- Sweet potato varieties differ from one another in the color of the tuber skin (usually white, brown yellow, reddish purple), color of the tuber flesh (usually white or yellow), shape of the tuber, shape of the leaves, depth of rooting, time of maturity, resistance to disease and other vegetative characteristics.
- Varieties whose flesh is yellow-orange colored have high levels of carotenes used in synthesis of vitamin A. This is particularly important in parts of North Eastern, Coastal, Western and Nyanza regions where Vitamin A deficiency is prevalent.

Improved varieties that are grown in Kenya

SPK 013, SPK 004, Kemb 20, Kemb 23, Kemb10, KSP 20, KSP 11, Mugande Muibai, Ex-Diani, Mafuta, Japanese pumpkin and CIP Selection, 420009.

1. Kemb 10 and SPK 004 are suitable for most areas of the country.
2. KSP 20, KSP 11 and CIP, 420009 have shown good performance in dry areas.
3. SPK 013 is recommended for the Western zone including the Lake Basin
4. Kemb 23 and Ex-Diani are suitable for Central and Coastal lowlands.
5. Mafuta is suitable for all sweet potato producing areas and is best for foliage production.

N/B

- The most traded variety of sweet potato in Kenya is the red skinned and yellow fleshed because of its high consumer demand.
- High yielding vines (seed) can be obtained at KARI Regional Research Centers Country wide and from some farmers

Planning production

- Ensure Climatic production requirement are met
- Source for adequate clean planting material and variety that the market requires
- Plan for marketing in advance

Land preparation

The field should be cleared and crop residues or grass (trash) removed. The field is then ploughed and harrowed. In the tropics sweet potato is grown on ridges, on mounds or flat seedbed. The growing of sweet potato on the flat seed bed should be is not recommended because the resulting yields are usually low.

The crop residues and other trash can be placed in between the ridges or mounds to facilitate moisture conservation and reduce soil erosion and can become additional source of nutrients when decomposed. It also suppresses weeds.

Early and thorough land preparation is necessary to create a deep loose seedbed ideal for expansion of tubers.

Ridges are recommended because of the following advantages:-

1. Easy to make
2. Higher yields and quality storage roots
3. Mechanization is possible so commercialization of potato growing
4. Soil moisture conservation
5. Reduce soil erosion
6. Inter-cropping sweet potato with other crops is possible
7. Cultivation in mounds gives good yields and is extensively practised throughout the tropics.

Planting materials

Sweet potatoes can be propagated by use of storage root or vine cuttings.

1. Propagation by storage roots

When propagating by roots, the sets must be robust (healthy) and avoid using the rinds. The tubers should not be planted deep to avoid rotting. These can then be covered with small amounts of soil or no covering at all. This method of propagation results in very low yields and is not suitable for commercial production.

2. Propagation by vine cuttings

The use of vine cuttings is the recommended practice both for subsistence and commercial production. The vines are preferred to roots for planting because:-

- Vine cuttings are free from soil borne diseases.
- Use of vines leaves the entire tuber production for consumption or for selling compared to using roots for propagation that requires that some roots must be left for the next seasons planting.

N/B Yields are higher with vine cuttings than when roots are planted. Also better storage root in terms of shape and size are produced.

Preparation of planting materials

- Select clean, healthy (free from virus and pests) vines 25-30cm. longer vines result in wastage of planting material while shorter ones establish more slowly and give poorer yields.
- Pieces from the stem apex are preferred to those from the middle and basal portions of the stem although, where planting material is in short supply, middle and basal vine cuttings may be used with little reduction in expected yields.
- In drier areas with only one main rainy season the availability of planting material is a problem and farmers are advised to keep vines during dry season near water points on a

nursery plot or under shade. Alternatively, leave some tuber in the soil over the dry season. When the rain comes the tubers sprout and the new vines are used for planting.



Planting methods on mound seedbed

There are three major planting methods used by farmers:

1. Cluster of vines in one spot on the mound. Usually 4-6 vines are planted.
2. 3-4 vines in single stand at equal distance from each other.
3. 2 vines per stand at equal distant from each other.

Planting method (b) is superior to planting method (a) and (c) in terms of storage root yield and quality.

The normal size of the mounds should have a base diameter of 30-45cm. The distance between the mounds should be 1 m apart (from the center of mound to the next).

Planting methods on ridged seedbeds

There are two main planting methods on ridges which may be adopted.

1. Single row of sweet potato plants in the middle of the ridge at 30cm between plants within the rows. The distance between the centers of the ridges should be 1 m apart.
2. Double rows of sweet potato plants on opposite sides of the ridges at 30 cm between plants within rows and 50-60cm between rows.

The sweet potato vine cuttings are planted at an angle with vine ends towards the center of the ridge. One-half or two-thirds of the vine cuttings is placed beneath the soil.

Seed rate

The recommended number of cuttings per hectare is 27,000 cuttings/ ha or (11,000 cuttings per acre). Depth of planting is 4-6 cm deep.

Time of planting

Sweet potato can be planted at any time so long as there is sufficient moisture in the soil. However, it is best to plant sweet potato early in the rainy season so that it has the entire rainy season to grow. Where rainfall is biannual, two crops of sweet potato are possible.

Fertilizer Application

Normally sweet potato does not require fertilizers. Farm manure can also be applied to improve fertility and soil structure

***N/B** in extremely poor soils, it may be necessary to apply a basal dose of compound fertilizer like 17: 17: 17 at 100kg/ha. However, extreme care should be taken not to apply N in excess which will enhance vegetative growth at the expense of storage root growth. 2 split applications are recommended, the first at planting and the second about 1 month after planting.

Weed control

Weeds are a problem in sweet potato only during the first two months of growth.

After this period, vigorous growth of the vines causes rapid and effective coverage of the ground surface and smothers the weeds present. 2 hand weeding after planting are recommended. First weeding is done within 2 weeks after planting and the second weeding two weeks after the first one when earthing-up is being done.

Harvesting

1. Young leaves can be harvested for vegetable use 2 months after planting.
2. Tuber harvesting:
 - The maturity period depends on the variety and the environmental conditions but generally range between 3-6 months after planting.
 - Yellowing and drying of leaves is mostly an indication of maturity. In most cases sweet potato is harvested as needed (piecemeal) and there is no fixed time for harvesting. One major disadvantage of piece meal harvesting is that many of the tubers are past their prime at the time when they are harvested.
 - Sometimes complete harvesting is done. Mature tubers are recognized by the sap exuded which does not darken easily or readily. Cracks in the soil indicate the location of the tubers. The crop yield depends on varieties, cultural practices such as timely planting, weeding and method of planting.
Yield
 - An average yield of 10-20 tons/ha can be obtained from growing any of the above mentioned varieties.
Storage
 - Whichever method of harvesting is employed, it is important that the tubers are free of surface wounds and bruises which may reduce their storage life.
 - Curing can also be done to promote healing of wounds inflicted during harvesting.

- Tubers are cured by subjecting them to temperatures of 27-29.5°C and relative humidity of 85-90% for 4-7 days and then stored at 13-16°C.
- In rural areas they can be stored in underground pits or on platforms, covered with soil.



Pest's

Major pest is Sweet potato weevil

An adult fly feeds on leaves and stems causing thickening and cracking of the vines and feed on leaves. Larva bores into the storage roots producing a bitter substance
Losses are estimated by retailer at 3 to 5%, due to weevils and rotting.

Control

1. Early planting and prompt harvesting to avoid dry period.
2. Practice good field sanitation
3. Practice crop rotation.
4. Use clean planting material.

Disease

Sweet potato virus causes dwarfing of the plants, yellowing of vines in young leaves and excessive branching. The disease is spread by aphids and white flies

Control

Use resistant or tolerant sweet potatoes varieties

1. Use healthy, clean, virus free planting materials.
2. Good field sanitation.
3. Control the white flies.

Challenges

- Poor post harvesting handling, storage, and transportation from farm to market is the main challenges in sweet potato marketing
- Bulkiness, perishability, high costs of marketing per unit sold.
- In the Kenyan marketing system is not organized, hence farmers receive low price from the commodity through middle men
- Processing opportunities are not exploited; Selling of fresh tubers gives low value for the commodity.
- Use of low quality planting material lead to low yields and poor quality produce

Advice to growers

- Need to plan marketing strategies by matching production with market demand to avoid losses
- Value addition of sweet potatoes tuber for more profit by making products such as bread, cookies, crisps, chips, jam, juice, chapati and mandazi.