

About Passion Fruits

The Passion Fruit (*Passiflora edulis*) is a vigorous, perennial woody creeper which is native to the tropical regions of America - Brazil, Paraguay and Argentina. The passion fruit is an edible juicy, aromatic, sweet – acidic, round to ovoid fruit with numerous small seeds. The fruit is eaten alone or in fruit salads, juices, sherbets, ice cream, jams and in flavored drinks. Passion fruit growing has enormous economic potential in alleviating poverty by creating employment along the value chain through the production, processing, transport and input supply systems. The passion fruit is a subtropical, shallow rooted, woody, perennial vine that climbs by tendrils to any support. The leaves are evergreen, 3-lobed and finely toothed. They are 3-8 inches long and a deep glossy green. Some varieties have leaves tinged with red or purple. The flowers are single and fragrant, 2-3 inches wide and borne at a node on the new growth. The bloom has white petals and sepals with a corona of white tipped rays that are rich purple at the base. It also has five stamens with large anthers. The crop matures within nine months, and can be harvested four times a year, depending on the availability of rain or irrigation water. The traditional purple variety has a lifespan of between two and half to three and half years, whereas the yellow variety which is hardier can last up to five years under good agronomic management.

Varieties

The two main commercial varieties grown in Kenya are purple passion fruit (*Passiflora edulis* f. *edulis*) for the high altitude areas and yellow passion fruit (*Passiflora edulis* f. *flavicarpa*) for the low altitude area. Both purple and yellow passion fruits give excellent returns on farmers' investments. A farmer investing in a few plants of passion fruits would require about Kshs. 200 per vine and expect a net return of Kshs.1,000 plus depending on his level of management (see cost of production and income) in 30 months. In Kenya alone, the domestic market for both fruits for small-scale processing in hotels, restaurants and homes is hugely unmet. The international market for purple passion fruit has continued to grow but the supply continues to dwindle because of increased pest and disease pressure in the neighboring countries and most regions of north rift and traditional passion fruit growing regions.

Cultivation

1. Seed Selection

Nursery operators should therefore ensure they select mature fruits free from healthy plants. The fruits are then washed and cut to extract the seeds which are then left to ferment in glass or plastic containers for two to three days. This practice helps to decompose the mucilage around the seed and enhances seed germination. The seeds are then washed three times. Any floating seeds and materials have to be discarded and sinking seed allowed to dry under shade for at least one or two days. Dry seeds are scrapped with sand until they attain a shiny colour. They are then soaked in a small amount of water overnight and then sown into polythene sleeves.

2. Seedling Method

Seeds are either planted directly into the field or into 10cm wide by 15cm high polythene bags filled with sterilized soil to eliminate root knot nematodes, soil borne diseases and other harmful organisms. Soils should be sterilized to kill pathogens by either solarisation or direct heat. Seedlings are raised in polythene bags, 10 cm wide and 15 cm deep. Three seeds per bag are sown at a depth of 1 cm and thinned to leave one seedling per pot as soon as they attain two true leaves.

3. Grafting

Grafting is an important means of perpetuating the purple passion fruits and reducing nematode damage and fusarium wilt diseases by utilizing the resistant yellow passion fruit root-stock. Scions from healthy young vines are preferred to those from mature plants. The diameter of the selected scion should match that of the rootstock. Either a cleft graft, whip graft, or side-wedge graft may be made. The wedge graft is the most commonly used type of grafting method for passion fruits.

4. Field preparation and planting

Prepare the land by deep digging and removal of all the perennial weeds. This should be done at least 4 weeks before planting. Make sure there is no hard pan. Growers will need some 350 poles in an acre: 9-10 feet high and 150 mm thick and they must be from mature trees to prevent rots and termite damage, 120 kg plain galvanized wire (12 gauge), 10 kg sisal twine, 5 kg of each U-nails about 670 – 700 plants. Treat the poles 3ft long from the base against termites and rots and then use them to build the support system. The support poles should be placed 6-12 m apart and be at least 2 feet deep in the ground.

5. Nutrient management

Passion fruits require frequent application of balanced fertilizer during growing season. This has to be guided by the soil analysis results. Four weeks after planting, apply a fistful (about 50 g) of CAN to at least 5 plants. Repeat every 4 weeks until the tips of the stems meet on the wire. Do not allow the fertilizer to touch the stem but broadcast the CAN around the plant. When the two shoots meet apply a complete handful of CAN per plant. Soil analysis done at intervals will significantly guide any applications. At the next rains, apply 50 g of 'NPK' (17:17:17 or 10:20:20) per plant and incorporate it into the soil. Repeat this at the start of every rainy season (approximately twice a year).

6. Irrigation

Regular watering will keep a vine flowering and fruiting almost continuously. Water requirement is high when fruits are approaching maturity. If the soil is dry, fruits shrivel and fall prematurely. It is possible to obtain a reasonable yield without irrigation but with irrigation, passion fruit yields double. Inadequate soil moisture, however, can

cause flower abortion, lower fruit weight, loss of fruit, and low yields.

7. Training

When training the vines the aim is to get them on to the wires of the trellis as quickly and simply as possible. Push light stakes into the ground beside each plant and attach them to the wires to provide support for the young leaders. One vertical stake should be used for supporting the young leaders. When the young vine starts to grow, choose two strongest shoots and direct them up the stakes. Remove all other shoots before they attain a length of 8cm to encourage maximum growth in the leaders.

8. Trellising

Passion fruit grow best on trellises where they are well supported. At first the plants are trained up on stakes 2.1m to produce what are called leaders. Two strong shoots are allowed to grow and all other shoots are removed regularly.

9. Pruning

Light is the essential factor for flowering and in passion fruit this is particularly true for floral development and fruit set. That is why training and pruning are important to ensure adequate exposure of the shoots. The passion fruit vine bears its fruit on the current season's growth, so careful pruning is essential. If the vine is left unpruned, the bearing surface becomes further and further removed from the leaders. As there is no room for unlimited expansion along the trellis the annual extensions become intertwined among themselves, and with the growth of previous seasons 17 and of neighbouring vines will be short-lived because of pest and disease become rampant as the density of growth prevents adequate spray coverage.