GROWING TAPIOCA

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Introduction

Tapioca (*Manihot esculenta* Crantz.), also known as cassava, probably originated from tropical America and was introduced to other tropical regions during the 17th century by the Portuguese. It belongs to the family Euphorbiaceae. It grows well in areas of latitudes of 30^{o} North to 30^{o} South of the equator.

In Sarawak, tapioca has been intercropped with hill padi by local farmers mainly as subsistence farming. In recent years, there had been attempts by the private sector to go into big scale planting. Tapioca is cooked and eaten, or processed into starch for cooking and baking. It is also used as animal feed and in the production of concentrated fructose-glucose syrup, a type of a sweetener used in the food and drink industries.

Site Selection

The suitable soil for tapioca planting is a light, sandy loam soil of medium fertility. Good drainage is also important. On clay or poorly drained soils, root growth is poor, and so the tuber-to-shoot ratio is considerably decreased. Moreover, the poor soil aeration under such conditions causes the few tubers formed to rot readily. Gravelly or stony soils tend to hinder root penetration and are therefore unsuitable. Saline soils are also unsuitable. Tapioca can grow and yield reasonably well on soils of low fertility where production of most other crops would be uneconomical. Under conditions of very high fertility, tapioca tends to produce excessive vegetation at the expense of tuber formation.

Tapioca is not suitable for planting in areas at altitudes exceeding 1,000 metres above sea level. If the altitude exceeds this level, plant growth will be slow and fresh tuber yield is reduced. Optimal temperature conditions are between 25^{o}C – 29^{o}C. The growth will be stunted if the temperature is less than 10^{o}C and fresh tuber yield is reduced when the temperature exceeds 29^{o}C.

Rainfall of 100–150 cm a year is suitable for the growth of tapioca. In areas where the rainfall exceeds 250 cm a year, drainage should be provided. Although tapioca can withstand drought season, the early stages of growth require sufficient water.

Land Preparation

One round of disc ploughing, followed by one round of harrowing or rotor-tilling is generally adequate. Planting beds of 60 cm wide and 20 cm high are then prepared. This will facilitate weed and water flow control.

Planting material

Cuttings should be taken from mature stem portions, preferably from plants at least 6 - 8 months old, free from pests and diseases and the cuttings should be taken from the middle of the stem. If possible, cuttings should be collected from plants which have received sufficient fertilisers in the previous season.

Preparation of cutting

Preparation of cutting using cutter

Cuttings ready for planting

Planting/Transplanting

Stem cuttings, 30 cm long are manually planted in a slant position at an angle of 40^{o} – 45^{o}, burying half their length and the buds facing upwards. Planting holes are spaced at 1 m X 1 m. The planting rate is 10,000 cuttings per hectare. The planting of tapioca cuttings can also be done by a mechanised transplanter. Horizontal planting is recommended when using a transplanter.

Using a mechanised transplanter

Fertiliser Application

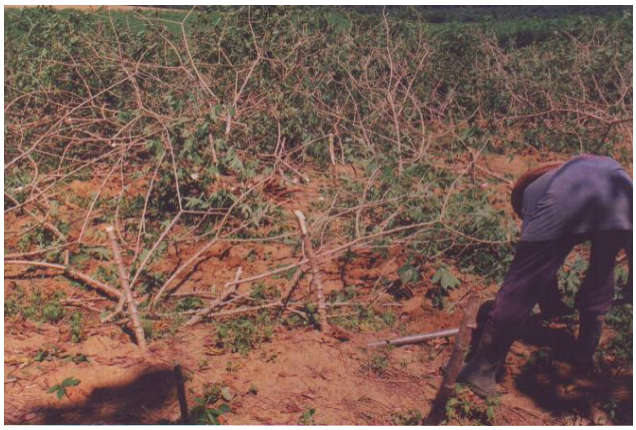
As a general guidance, tapioca requires 450–700 kg/ha of a 12:12:17:2 complete fertiliser. The fertiliser is applied at planting and the second application is at two months after planting. Spot placement of fertiliser within or just beside the planting hole is effective.

Weed Control

Weeds are a problem in tapioca only during the first three months of growth. After this period, vigorous growth of tapioca causes rapid and effective coverage of the ground surface and smothers the weeds. Weeds should be destroyed by using hoe or weedicide. Pre-emergent herbicides do not endanger the newly planted cuttings. However, it is advisable to carry out spraying of herbicide before or during planting.

Harvesting

Harvesting can be carried out manually or by using a mechanised harvester.



Manual harvesting with a hoe

Mechanised harvester

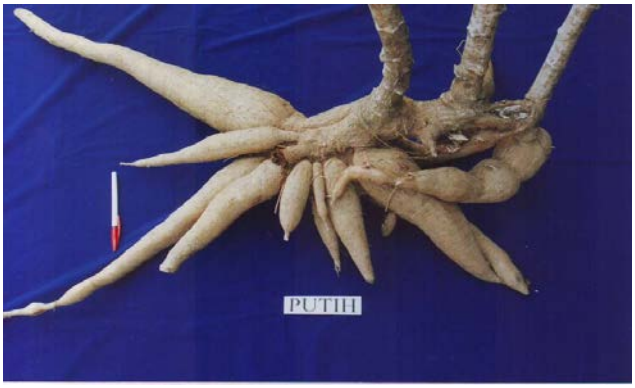
Time of harvesting after planting depends very much on the variety planted. Some varieties, particularly the sweet types, are ready for harvesting in about 9-12 months. The 'Sawah' variety requires 10 months before it is ready for harvesting whereas the 'Putih' variety is best harvested for making tapioca chips or *kerepek* at 9-10 months after planting. Yields vary greatly according to the variety, soil, climate and age at harvesting.

Based on evaluation carried out by Agriculture Research Centre, Semongok, 'Sawah' and 'Putih' varieties can yield up to 20–30 metric tonnes per hectare – provided that the recommended agronomic and management practices are observed.

'Sawah' tapioca plant

'Sawah' tubers

‘Putih‘ tapioca plant



‘Putih’ tubers