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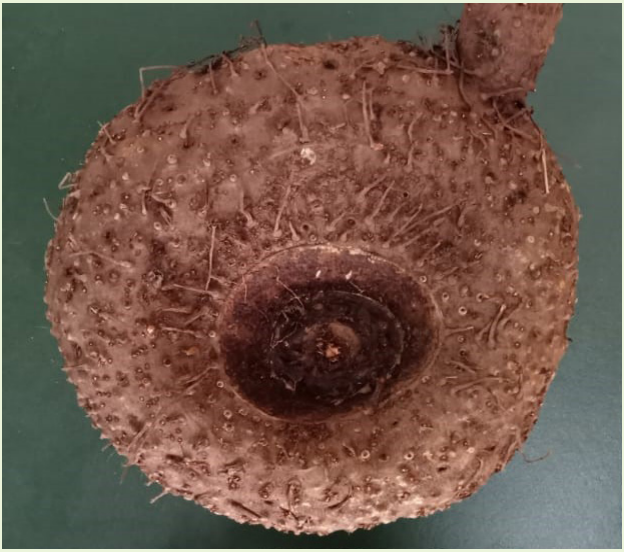
Cultivation of Elephant Foot Yam (*Amorphophallus paeoniifolius*) under Island condition



I. Jaisankar
B. Augustine Jerard
Eaknath B. Chakurkar
V. Damodaran
T. Subramani
D. Karunakaran

Division of Natural Resource Management
ICAR- Central Island Agricultural Research Institute,
Sri Vijayapuram- 744105
Andaman and Nicobar Islands

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Introduction

Elephant foot yam (or) suran is as underground stem tuber which is gaining popularity because of its yield potential and culinary properties. Due to introduction of high yielding, non-acrid varieties, this is being adopted for commercial cultivation in allover India. The corms are rich sources of carbohydrate and minerals like calcium and phosphorus. The tubers are used in various ayurvedic preparations to control piles, dysentery, asthma, swelling of lungs, vomiting, abdominal pain and act as blood purifier.

Climate and soil

Amorphophallus grows very well in tropical and subtropical humid climate with a mean annual temperature of 30-35°C and a well distributed rain fall of 1000-1500 mm spread over a period of 6-8 months. It can come up on variety soils but a well-drained sandy loam soil (or) sandy clay loam soil with a pH of 5.5-7.0 is ideal for the growth of this crop.

Propagation

Amorphophallus is usually propagated by offsets (or) corms. The off sets are miniature tubers arising from the mother corm. In some varieties/ types the daughter corms are not produced in which the mother corm is cut vertically in to pieces of 500-1000 g weight in such a way that each piece has portion of central bud from where the future bud initiates after planting. Dipping of planting material in the cow dung slurry followed by drying in a shaded place is effective in enhancing the sprouting.

Field preparation and planting

The land is prepared by ploughing two to three times. Pits of 60 x 60 x 45 cm are dug at a spacing of 90 x 90 cm (or) 75 x 75 cm and the pits are filled with 4-5 kg of FYM and top soil. The planting material is placed vertically in the pits and is then covered with soil and compacted lightly. The ideal planting time is March-April.

Manure and Fertilizer application

Apply FYM @ 2 –2.5 kg per pit, by mixing with the top soil taken out of the pit and fill it back prior to planting. Chemical fertilizers in the form of NPK @ 80:60:100 kg/ha was found to be ideal for the crop. Nitrogen and Potash are applied in two splits, 50 % of the total requirement as basal and the rest as top dressing, one month later. Phosphate fertilizer could be applied in single dose as basal. Weeding and earthing up could be done along with fertilizer application. Drenching of soil at the base of the crop with fungicide Bavistin @ 4 g/l is advisable against collar rot. In A & N islands, elephant foot yam intercropped in 20 year old coconut garden with four levels of fertilizers revealed that application of 120:90:150 kg NPK ha^{-1} recorded maximum tuber weight per plant (3.17 kg) and highest yield (18.31 t ha^{-1}). However, it was on par with the application of recommended dose of fertilizers (80:60:100) kg ha^{-1} which produced an yield of 15.27 t ha^{-1}.

Organic cultivation of elephant foot yam

- Raising green manure cowpea (seed rate @ kg ha^{-1}) prior to elephant foot yam and incorporation of green matter at incorporation of green matter at 45-60 days.
- Use of organically produces planting materials.
- Treatment of corm pieces of 500-750g with slurry containing cow dung, neem cake and *Trichoderma viride* (5g/ kg seed) and drying under shade before planting.
- Application of *Trichoderma viride* incorporated FYM @ 36 t ha^{-1} (3 kg/ pit) in pits at the time of planting (FYM: Neem cake mixture (10:1) inoculated with *Trichoderma viride* @ 2.5 kg/ tonne of PYM: Neem cake mixture. Trichoderma can be multiplied in FYM alone but it will take 15 days to form sufficient inoculam as against 7-8 days if neem cake is also used along with FYM. This is effective against collar rot caused by *Sclerotium rolfsii*.
- Application of neem cake @ 1.0 t ha^{-1} (80-85 g/pit) in pits at the time of planting.
- Inter-sowing of green manure cowpea (seed rate @ 20 kg ha^{-1}) between elephant foot yam pits and incorporation of green matter in pits at 45-60 days. The green matter addition from the 2 green manure corps should be 20-25 t ha^{-1}.
- Application of ash @ 3 t ha^{-1} (250 g/pit) at the time of incorporation of green manure in pits.

High density planting

High density of planting in elephant foot yam revealed that, lower corm yield per plant was recorded in 60 x 60 cm at 7, 8 and 9 months (1.34 kg) of planting followed by 75 x 60 cm respectively, while individual plant yield was higher in plant density of 90 x 90 cm (2.27 kg) and 90

x 60 cm (2.20 kg) respectively. However, the highest corm yield (40.7 t) was resulted with plant density of 90 x 60 cm. The different management practices expressed variations in the net returns and B: C ratio. Higher net income (14, 72,522) was recorded in 90 x 60 cm which was mainly due to higher yield/ha. However, the highest B: C ratio of 2.92 was recorded in planting at 90 x 60 cm followed by 90 x 90 cm and 75 x 75 cm. Hence, it is recommended that the cultivation of elephant foot yam can done under Island condition with the spacing of 90 x 60 cm.

Intercultural Operations

Mulching

Immediately after planting, the pits are mulched with dried leaves which will induce better sprouting by conservation of moisture and helps controlling weed growth. Paddy straw or green or dried leaves are used as mulch.

Weeding

One or two manual weeding is necessary first at 45 days after planting and the second, one month after the first. The top dressing operation can be combined with this intercultural operation.

Harvesting

The crop becomes ready for harvest at 8-9 months after planting. The harvesting is done in November-December. The maturity is indicated by yellowing and drooping of the leaves. A light irrigation is necessary before harvest. The corms are dug out, cleaned and stored in well ventilated rooms ever for several months without damage. The come yield ranges from 40- 60 t/ha.

Plant protection

Collar rot

This disease occurs mainly due to poor drainage, water logging and mechanical injury at collar regions. Brownish lesions first occur on collar regions which spread to the entire pseudo stem and cause complete yellowing of the plant.

Control Measures

- Using disease free planting materials.
- Field sanitation.
- Providing proper drainage facility.
- Incorporation of neem cake.
- Use of biocontrol agents *viz*., *Trichoderma viride.*
- Drenching the soil with 0.2% captan.

The scientific practices that were adopted by the farmers include basal application of organic manure, seed treatment with cowdung slurry and *Trichoderma viride* before sowing, Gliricidia green leaf mulching after sowing and once again after 50 days, weeding after 45 days followed by earthing up. The farmers have realized average yield of 800 to 1000 kg of elephant foot yam from 0.02 ha area plot after about nine months. Use of improved varieties such as Gajendra and Sree Padma and adoption of scientific cultivation along with other suitable intercrops will make the elephant foot yam cropping system profitable and productive in Andaman and Nicobar Islands.

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

For detailed information please contact
Director
ICAR-Central Island Agricultural Research Institute
Sri Vijaya Puram- 744 105
Andaman and Nicobar Islands, India
Web: https://ciari.icar.gov.in/