Improved varieties and technologies of yams for intercropping in coconut gardens for higher yield and income

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Greater yam *(Dioscorea alata)*, White yam *(Dioscorea rotundata)* and Lesser yam *(Dioscorea esculenta)* are cultivated as commercial crops in India in an area of about 40,000 hectares with a total production of about 11.20 lakhs tons and an average yield of 28 tons per hectare. It is cultivated widely in 44 districts of 13 states in India and the important yam growing states are Andhra Pradesh, Odisha, Kerala, Assam, Gujarat, Madhya Pradesh, Maharashtra, Tamil Nadu, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. Yam is a crop with several nutritional and health benefits. Yam is rich in starch and has only moderate nutrient density with appreciable contents of potassium, vitamin B6, manganese, thiamine, dietary fibre, and vitamin C. Yam tubers contain mucilage which are bioactive natural products possess anti-tumour, anti-inflammatory, immune-modulatory and antioxidant activities. Yam has the highest potassium levels amongst the 10 major staple foods of the world.

General nutritional profile of yam	
Property	Quantity
Dry matter (% FW)	20-35
Starch (% FW)	18-25
Total sugar (% FW)	0.5-1.0
Protein (% FW)	2.5
Fibre (% FW)	0.6
Lipids (% FW)	0.2
Vitamin A (mg/100g)	0-0.18
Vitamin C (mg/100g)	5-27.6

Improved Varieties

Though many species of yams are cultivated by farmers in our country, greater yam, white yam and lesser yam are most popular among farmers in Kerala, Andhra Pradesh, Telangana, Odisha and North Eastern states. ICAR-CTCRI, Thiruvananthapuram, Kerala, has released 17 different varieties of yams and the recently released greater yam varieties are, Bhu Swar, Sree Nidhi and Sree Hima. Sree Haritha and Sree Swetha have also been released recently in White yam.

Scientific Cultivation Practices

The recommended agrotechniques to be followed for cultivation of greater yam and white yam in coconut gardens are given below. These two yams are ideal intercrops in coconut gardens with sufficient sunlight. It also fits well in many cropping systems as it is grown as an intercrop along with turmeric, maize, red gram etc.

Site specific nutrient management

The ICAR-CTCRI has developed special fertilizer mixtures exclusively for yams for major growing areas of the country and demonstrated in farmers' gardens of Kerala and Andhra Pradesh. The microfood (Micronol) for greater yam and other major tuber crops have also been commercialized to M/s Linga Chemicals, Madurai, Tamil Nadu (Phone no. 9994093178) and the products are now available in the market for large scale use by the tuber crop farmers for addressing the problem of micronutrient deficiencies and also to enhance the soil/crop health while increasing the crop yield to the tune of 10-15%. Farmers are convinced about the performance of the new fertilizer mixture and microfood as it could increase the yield and quality of tubers which could substantially increase the income of the yam farmers.

Harvesting

The crop becomes ready for harvest in about 9-10 months after planting and the average yield is 25-30 tons per hectare.

The crop attains maturity when total senescence takes place. During harvest, care should be taken to avoid injury to the tubers. Tubers devoid of any physical damage are ideal for marketing.

Storage method

Fully mature, graded and cured tubers should only be used for storage as planting material. The storage place should be well ventilated and cool. The tubers should be stored in a single layer. But if the storage place is insufficient, then they can be stored in two layers.

Varieties of Greater yam *(Dioscorea alata)*

Bhu Swar
Year of release: 2017, Maturity: 6-7 months, Yield: 20-25 t/ha, Starch (%): 18-20, Good culinary quality, Early maturing variety

Sree Nidhi
Year of release: 2017, Maturity: 8-9 months, Yield: 35 t/ha, Starch (%): 23.2, Good culinary quality, Tolerant to anthracnose disease

Sree Hima
Year of release: 2020, Maturity: 8-9 months, Yield: 58 t/ha, Starch(%): 26.3, Excellent cooking quality

Sree Haritha
Year of release: 2017, Maturity: 9-10 months, Yield: 46 t/ha, Starch (%): 24.02, Excellent cooking quality with good flavor, Drought tolerant

Sree Swetha
Year of release: 2017, Maturity: 9 months, Yield: 30 t/ha, Starch (%): 22.02, Dwarf, bushy and non climber, Good culinary quality

Marketing

The tubers are marketed at local places and also to various places of the country viz., Ernakulam, Chennai, Mumbai, Hyderabad, Bengaluru, Delhi. Some quantities are exported to Gulf and European countries.

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Particulars	Greater yam	White yam
Varieties	Sree Shilpa, Sree Karthika, Sree Keerthi, Sree Roopa, Orissa Elite, Sree Swathy, Sree Neelima, Bhu Swar, Sree Nidhi, Sree Hima	Sree Priya, Sree Subhra, Sree Dhanya, Sree Haritha, Sree Swetha
Time of planting	March- April	March- April
Planting material	Setts : 250-300 g	Setts : 250-300 g
Method of land preparation and planting	Pit reformed into mound	Pit reformed into mound
Spacing (cm)	90 x 90 (9000 plants)	90 x 90 (9000 plants)
60 x 60 (Dwarf) (20000 plants)		
FYM (tons per hectare)	10	10
N:P_2O_5:K_2O (kg per hectare)	80:60:80	100:50:100
Intercultural operations	Trailing the plants 15 days after sprouting; weeding & earthing up within a week after sprouting and 1 month later	Trailing the plants 15 days after sprouting; weeding & earthing up within a week after sprouting and 1 month later
Duration (months)	8-10 months	9-10 months
Average yield (tons per hectare)	25-30	35-40