AgriCos e-Newsletter
ISSN: 2582-7049
AgriCos e-Newsletter
Open Access Multidisciplinary Monthly Online Magazine
Volume: 04 Issue: 11 November 2023 Article No: 24

Sweet Potato (*Ipomoea batatas* L.)

Nayana, K. R.[1] and Shrilatha K. A.[2]
[1]Ph.D. Scholar, Department of Vegetable Science, CCSHAU, Hisar Haryana
[2]Ph.D. Scholar, Department of Vegetable Science, Navsari Agricultural University, Navsari

SUMMARY

Sweet potato is a nutritious root crop that contains significant amounts of fiber, beta carotene and vitamin C, particularly in varieties with highly colored roots. Sweet potato thrives during summer's warm days and nights, which are required for optimal growth and root development. Profitable production practices include using good seed stock or purchasing certified slips, selecting suitable soil, following good production practices, fertility, irrigation, pest management and careful harvesting, handling, curing and storing of sweet potato roots. When sweet potato is managed properly, it has the potential to be one of the more profitable vegetable crops. Hence this article provides the brief information regarding the cultivation practices to enhance the crop production and productivity.

INTRODUCTION

Sweet potatoes, *Ipomoea batatas* L., are cultivated extensively in tropical regions for their edible tubers, which serve as a vital food source. These plants are classified in Convolvulaceae family and exhibit a chromosome count of 2n=6x=90. Originating in South America, sweet potatoes have become a staple crop, with over 80% of their cultivation occurring in Asia. India holds the distinction of being the largest producer in South Asia and ranks as the sixth-largest producer worldwide. It is believed that *I. trifida* is the most likely ancestor of this important crop.

Uses:

In tropical regions, sweet potato crop is consumed directly as a vegetable, often prepared by boiling, baking, or frying. In addition to their fresh consumption, peeled sweet potato tubers are sometimes sliced and sun-dried to create chips. These versatile tubers also serve as a valuable source of starch, finding applications in textiles, paper production, cosmetics, adhesives, glucose production, and food manufacturing industries. Their carbohydrate-rich nature makes sweet potatoes a valuable component in animal feed, used for cattle, pigs, and poultry.

Botany:

Sweet potatoes, despite their perennial nature, are typically managed as annual vines. These plants produce numerous trailing stems that extend more than 45 cm above the ground, and these stems are adorned with adventitious roots that culminate in swollen root formations. The leaves are arranged in a spiral pattern along the vines and exhibit a range of pigmentation, from green to deep-purple. The flowers, typically solitary and cymose, display a white-to-purple coloration. The fruit takes the form of a glabrous, dehiscent capsule measuring 5-8mm in diameter, housing 2-4 angular, brownish-black seeds enclosed by a hard testa. The root tubers come in a variety of sizes, shapes, and colors, and their quality as a food source can differ significantly.




Climate:

Sweet potatoes exhibit a wide climatic adaptability, altitudes ranging from sea level to 2400 meters. They are moderate tolerance to drought conditions and flourish in regions with an average annual rainfall of 750 mm or more. Root development is encouraged by shorter days with reduced light intensity, requiring a day length of 11.5 hours or less to induce flowering. Ideal growth conditions are characterized by temperatures exceeding

24°C, while cold weather can limit growth, with temperatures below 10°C causing damage. A frost-free growing period of 4-6 months is essential for warm temperate areas.

Soil:

Sweet potatoes are suitable for wide soil types, sandy loam being preffered. They are known to be acid-tolerant, with an optimal pH range between 5.6 and 6.6, and are sensitive to alkaline and saline conditions. Additionally, sweet potatoes cannot withstand waterlogged soil, necessitating good drainage.

Planting season:

Planting seasons vary across regions, with sweet potatoes typically grown as a rainfed crop during the Kharif season (June-August) and with supplemental irrigation during Rabi (October-December). In states like Orissa, Andhra Pradesh, and Tamil Nadu, sweet potatoes are cultivated in both Kharif and Rabi seasons.

Varieties:

Andhra Pradesh- Samrat, Kiran; Madhya Pradesh- Kalmegh, Sree Bhadra; Maharashtra- Varsha, Sree Vardhini, Sree Bhadra; Tamil Nadu- CO 1, CO 2, CO 3; Orissa- Gouri, Sankar.

Planting material: Sweet potato is usually vegetatively propagated through vine cuttings.

Primary nursery:

In the initial nursery phase, a space of approximately 100 square meters is allocated for the cultivation of sweet potato seedlings. To begin this stage, around 100 kilograms of medium-sized, weevil-free seed tubers, each weighing between 125 to 150 grams, are needed. These tubers are planted at a spacing of 60 x 20 cm. After about 45 days of growth, the vine's length can be pruned to around 20-30 cm, preparing them for further propagation in the secondary nursery.

Secondary nursery:

The secondary nursery phase requires a larger area, approximately 500 square meters, to accommodate the vines transplanted from the primary nursery. These vines are planted at a spacing of 60 x 20 cm. Cuttings, preferably 20-45 cm in length and taken from the apical part of the vine, with at least 3-5 nodes, are ideal for tuber production. Prior to planting, these vines are allowed to wilt for a few days, which encourages root initiation. The recommended general spacing in the secondary nursery allows for the placement of 83,000 cuttings per hectare.

Planting methods: Mound method, Ridge and furrow, Bed method, Flat method.

Interculture:

Intercultural practices play a pivotal role in sweet potato cultivation. Earthing up not only aids in weed control but also enhances the physical condition of soil. Vines should be carefully lifted at the nodes to prevent excessive rooting and to encourage more effective rooting and tuber development at the base.

Irrigation and Manuring:

Four to eight irrigations supplying 112-150 cm of water being generally recommended. Yields are affected if a water storage occurs 50-60 days after planting. Nitrogen 60 kg/ha, P_2O_5 60 kg/ha and K_2O 60 kg/ha is recommended for Andhra Pradesh.

Harvesting and Yield:

The harvesting process is typically undertaken after a maturity period of around 4 months in the southern regions. Maturity is indicated by a dark-greenish color in the tubers, which turns white in fully mature tubers, and their cut ends dry out clearly. To facilitate harvesting, the field is irrigated 2-3 days prior. Yields can vary between 5.0 to 15 tonnes per hectare of fresh tubers, with an additional 2.5 to 10 tonnes per hectare of tops that can be utilized as cattle feed.

Plant protection:

Pest	Symptoms	Management
Sweet potato weevil	(*Cylas formicarius* L.): Weevil feeds on all parts of the plant while the attack of grub is restricted to vines and tubers. Emergence and feeding holes observed on the collar region, leaf and tuber.	Install pheromone traps @ 1trap/ha. Clean cultivation. Disinfecting planting materia by Monocrotophos @ 0.05% dip.
Vine borer	(*Omphisa anastomosalis*): The vines are made hollow and shoots turn yellow and wilt	Spray 0.05% Fenthion at monthly interval, Crop hygiene and rotation
Disease	Symptom	Management
Cercospora leaf spot	(*Cercospora* spp.): Appearance of yellowish brown spots which gradually turn deep-brown, with circular or irregular margin which later on coalesce.	Fungicides- Dithane M 45, Zineb and Miltox (0.25% each).
Alternaria leaf spot	(*Alternaria* spp.): Leaf spots are brown with concentric rings and ell defined margings	Growing resistant varieties.
Black rot	Small, slightly sunken black spots appears on tuber which enlarges later.	Thiabendazole, benomyl, Ferban
Soft rot	(*Rhizopus stolonifera*): Storage disease. Tubers turn moist or soft at one or both ends.	Dipping seed tubers in DCNA

Weevil Vine borer Cercospora Alternaria Black rot Soft rot

CONCLUSION:

In conclusion, the cultivation of sweet potato demands a holistic approach to ensure a productive harvest. Careful selection of planting materials, suitable soil preparation, and adequate spacing are key factors for success. Regular irrigation, weed control, and protection from pests and diseases are to expect a high and nutritious sweet potato.

REFERENCES:

Thamburaj S. and Narendra Singh. Textbook of Vegetables, Tubercrops and Spices. New Delhi: Directorate of Knowledge Management in Agriculture- Indian Council of Agricultural Research; 2001.

Vishnu Swarup. Vegetable Science and Technology in India. Second edition. New Delhi: Kalyani Publishers; 2016.