

## Varieties and Propagation Methods of Sweet-Potatoes in South India.

By

S. N. CHANDRASEKHARAN & D. DANIEL SUNDARARAJ

The species *Ipomoea batatas* Poir is known nowhere in a wild state. The cultivated form is derived from an allied species, *I. fastigiata* Choisy which is believed to have originated in West-Indies and Tropical America. The plant, being well suited for tropical countries, is extensively cultivated in the tropics of both the hemispheres. It is not adapted for cool climates and seldom thrives well over altitudes of 3,000 ft. The crop requires a warm moist climate in the planting and growing season and a dry sunny weather at harvesting time. Sweet-potato are grown only in one season in the Southern districts of Madras i.e., from September—October to February—April. In the Circars and Agency tracts it has generally two seasons, June to September—October and September—October to February—March. A similar practice exists in Malabar and parts of South Kanara.

**Botanical description:** *Ipomoea batatas* Poir, belongs to the family *Convolvulaceae* and is a perennial by habit, though it is treated as an annual in crop practice. It is a weak-stemmed, twining or trailing herb; leaves alternate, exstipulate, varying in shape but often ovate to orbicular in outline, cordate or truncate at the base, entire, shouldered, digitately lobed, or deeply cleft. Flowers axillary, cymose or solitary borne on short peduncles; calyx 5-parted, greenish imbricate, about half-an-inch long and persistent; corolla gamopetalous, funnel-shaped,  $1\frac{1}{2}$  to 2 inches long by 1 to  $1\frac{1}{2}$  inches wide at the mouth and light purple in colour; ovary superior, bicarpellate, 2 to 4 celled, 4-ovuled; fruit a capsule; seeds small slightly flattened and black. The adventitious roots are modified into tubers which store reserve food material.

**Varieties:** Though *Ipomoea batatas* flowers quite freely under South Indian conditions, it does not often set fruits and seeds. The non-setting of seeds is ascribed to the self-sterility of the flowers and this has made the breeding of new varieties a difficult task. But recently, by control treatments they have been induced to bloom and set viable seeds (3). It is also recorded that when two or more varieties are grown side by side they occasionally set seeds; in Japan by artificial cross-fertilization the setting has been increased from 16.3 to 58.1 per cent (5). The absence of free crossing and non-setting of seeds are mainly responsible for the limited number of varieties met with in *Ipomoea batatas*. Many present-day sweet potato varieties have originated as a result of bud mutations which take place rather freely in this species (2, 4).



## Sweet-Potatoes

## DARARAJ

There are about ten varieties that are commonly cultivated in Tropical America and among them many types have been recognised. Though the different varieties are classified commercially as the "dry" and "yam" types depending on the texture of the flesh of the tuber, there is no definite satisfactory classification based on morphological characters.

In South India there are two distinct varieties distinguished by the colour of the skin of the tubers—one with white skin and another with reddish skin. In both the varieties the pulp is white. The red variety which is supposed to be the earlier introduction of the two, is a hardier plant with robust vines, forming smaller tubers. The duration of the variety is shorter and the yield is also less than that of the white variety which forms bigger tubers. The tubers of the latter are more uniform in shape and a little more fibrous than the red variety and has a better keeping quality. In the red variety there is a form with light red or pink colour which is cultivated to a small extent in the Circars. The white variety on the East-coast and Central Districts is of one type without any variation, whereas four forms have been met with in this variety on the West-Coast districts. Though a variety with yellow pulp is said to be existing, it has nowhere been found so far. The following varieties and forms are cultivated by the ryots in the centres noted below:

Centre	Variety and forms	Distinguishing leaf characters
I. Coimbatore and Southern districts	Red variety	Leaves entire or with slight shoulders and without any pink colour on veins.
	White variety	Leaves prominently shouldered when young and often lobed in mature plants with pink markings on veins.
II. West Coast districts	Red variety	Similar to the red variety in the other area.
	White variety Form I	Leaves lobed and often cut into five lobes; pink colour markings on veins; similar to the common white variety found in centre I. Known as 'mathras' around Kasaragode.
	Form II	Leaves deeply lobed into seven; rest similar to form I.



Centre	Variety and forms	Distinguishing leaf characters
	Form III	Leaves more or less entire with or without shoulders and without any pink colour on veins. Plant resembles red variety.
	Form IV	Similar to form III but with pink colour markings on veins. Locally known as 'nadan' around Kasaragode.
III. Vizianagaram	Red variety	Leaves more or less entire with or without shoulders and with purple colour markings on veins.
	Light Red or Pink	Leaves shouldered; with light purple colour markings on veins locally known as 'kosta'.
	White variety	Leaves shouldered or lobed but without any colour markings on veins.

**Propagation Methods:** The propagation of *Ipomoea batatas* is mainly by vegetative means with cuttings taken from the vines. There are two ways by which the seed material or vine cuttings are prepared for planting in the regular season. The common method is to raise small plots of nurseries with cuttings got at the time of harvest. The vines from the first small nursery are again multiplied in a second bigger nursery after two or three months. In another two to three months the second nursery gives planting material for 15 to 20 times the area occupied by it.

In the second method, instead of planting the vine cuttings small unsaleable tubers are planted in the nursery. These tubers produce a number of shoots which arise from the axils of the lateral roots of the tubers in about 7 to 10 days after planting. The meristematic cells situated at the base of the fibrous lateral roots develop into shoots under favourable conditions. The small sprouts may be easily pulled out and transplanted in the field as is done in many parts of America (1). In South India wherever the nursery is raised from the tubers, the sprouts are allowed to develop into vines from which cuttings are obtained for the main crop.

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After rejecting the mature bottoms, cuttings of 9 to 12 inches long with 3 to 4 nodes are usually taken from the vines. Longer cuttings than 12 inches produce very small tubers as a number of nodes get confined to a smaller area and thus retard tuber development. The vine cuttings can be safely stored in gunny bags without deterioration of viability for 2 to 4 days. The leaves are usually removed from the cuttings and it is a matter of natural response that such cuttings produce new growth more quickly than the cuttings with leaves. The cutting is capable of rooting at all the nodes that come into contact with the soil; the buds at the axils of each leaf develop into shoots. When the tender apical cuttings are planted the terminal bud unfolds the younger leaves and puts forth vigorous growth without drying up.

**References cited**

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2. " " " 653 (1942).
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4. Rosa, J. T. (1926) Ibid, 17 : 167.
5. Sugawara, T. (1940) Jap. Journ. Bot. 10 : 335 - 342.

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