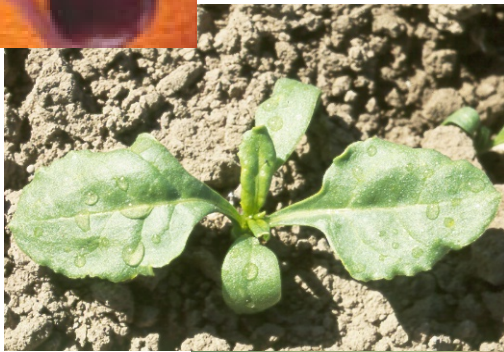


TROPICAL SUGARBEET

Production Technology



TAMILNADU AGRICULTURAL UNIVERSITY
Coimbatore-641 003
Tamil Nadu

TROPICAL SUGARBEET

Production Technology

Introduction

Sugarbeet (*Beta vulgaris* Var. *Saccharifera* L.) is a biennial sugar producing tuber crop, grown in temperate countries. Now tropical sugarbeet varieties are gaining momentum in tropical and sub tropical countries including Tamil Nadu as a promising alternative energy crop for the production of ethanol. The ethanol can be blended with petrol or diesel to the extent of 10%



and used as bio-fuel. The bi-products of sugarbeet viz., beet top can be used as green fodder, while beet pulp and filter cake from industry can be used as cattle feed.

Sugarbeet has now emerged as commercial field crop because of the favourable characters like (i) tropical sugarbeet varieties suitable for Tamil Nadu (ii) shorter duration of 5 to 6 months (iii) moderate water requirement of 80–100cm. (iv) higher sugar content of 12 to 15% (v) improvement of soil conditions because of tuber crop and (vi) suitability for saline and alkali soil.

Further, as the harvesting period of sugarbeet coincides with the period

from March to June, the human resource of sugar factory in the off season could be efficiently utilized in the processing of sugarbeet in the sugar mills, which facilitates in continuous functioning of the sugar mills.

Variety and duration

The tropical sugarbeet varieties are suitable for cultivation in Tamil Nadu. (Pasoda, H1 0064 and Doratea). The duration of these tropical varieties will be 5 to 6 months depending on variety and climatic conditions prevailing during crop growth period.

Climate and soil

Tropical sugarbeet requires good sunshine during its growth period. Sugarbeet can be grown during October to March with a well distributed rainfall of 300 – 350 mm across the growing period. This condition favours vegetative growth and acts as a base for tuber enlargement. However, high soil moisture or continuous heavy rain may affect development of tuber and synthesis of sugar.

The sugarbeet crop requires an optimum temperature range of 20 to 25°C for germination, 30 to 35°C for growth and development and 25 to 35°C for sugar accumulation.

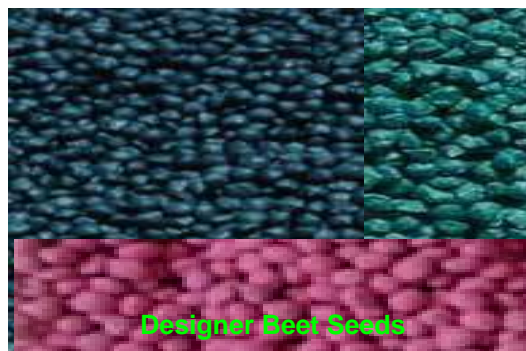
All kinds of well drained deep soil (45 cm) with stable and porous soil structure and sandy loam to clayey loam texture are suitable. Optimum pH range is from 6.5 to 8.0 but it can also grow in saline and alkaline soil. The soils with good organic matter status are more favourable for sugar beet.

Season

Sugarbeet is a cold weather crop season (Rabi). Hence, sugarbeet is sown from October to November and harvested during April - May.

Field preparation

Sugarbeet being a root crop requires deep ploughing (45 cm) followed by 2 to 3 ploughings to obtain a good soil tilth condition for favorable seed germination and tuber development. After proper levelling to ensure adequate drainage, ridges and furrows are formed at 50 cm apart.



Seeds and sowing

To maintain the required plant population of 40,000 / acre, use 2 pockets designer seeds. One pocket contains 20,000 seeds weighing 600g. The recommended spacing is 50 x 20 cm.

The designer seed is dipped at 2 cm depth on the top of the ridges at 20 cm apart at one seed per hole.

Weeding and earthing up

The crops should be maintained weed free upto 75 days. Pendimethalin @ 1.5 lit / acre can be dissolved in 300 litres of water and sprayed with hand operated sprayer on 3rd day after sowing, followed by hand weeding on 25th and 50th day after sowing. The earthing up operation coincides with top dressing of N fertilizer.

Manures and Fertilizers

Manures and Fertilizers	Basal Application	Top dressing
Farm Yard Manure	10 tonnes /acre	-
Biofertilizers		
Azospirillum	2 kg /acre (10 pockets)	-
Phosphobacteria	2 kg /acre (10 pockets)	-
Fertilizers		
Nitrogen	30 kg /acre	15 kg /acre each at 30 & 60 DAS
Phosphorus	24 kg /acre	-
Potassium	24 kg /acre	-

Irrigation

Sugarbeet is very sensitive to water stagnation at all stages of its growth. Irrigation should be based on soil type and climatic conditions. Pre-sowing irrigation is essential at the time of sowing, since sufficient soil moisture is a pre-requisite for proper germination. First irrigation is crucial for the early establishment of the crop. For light textured sandy loam soil, irrigation once in 5 to 7 days and for heavy textured clay loam soil irrigation once in 8 – 10 days is recommended. Light and frequent irrigation is recommended for maintaining optimum soil moisture

The irrigation may to be stopped atleast 2 to 3 weeks before harvest. At the time of harvest if the soil is too dry and hard it is necessary to give pre harvest irrigation for easy harvest.

Pest and diseases

The major insect pests that affect the sugarbeet crop are aphids, tobacco caterpillar, and diamond backmoth. Integrated pest management programme has to be adopted to control these insect pests. To control aphids, spray neemoil 3 % or dimethoate 2ml/lit with teepol 0.5 ml/lit, for tobacco caterpillar, spray endosulfon 2ml/lit or carbaryl 2g/lit of water

The major diseases that affect the sugarbeet crop are rhizoctonia wilt, powdery mildew, cercospora leaf spot, and fusarium yellow. To control rhizoctonia wilt, spot drenching with Bordeaux mixture 1% and for fusarium wilt, drenching the soil with carbendazim @0.1%.

To control powdery mildew, spraying of wetttable powder 0.3%, and for cercospora leaf spot, application of mancozeb 0.25% on 10-14 days schedule.



Harvest and yield

The sugarbeet crop matures in about 5 to 6 months. The yellowing of lower leaf whorls of matured plant and tuber brix reading of 15 to 18% indicate the maturity of beet tuber for harvest. The harvested beet tuber should be handled as gently as possible to remove soil and trash to minimize the beet breakage and bruising to get quality beet tuber.

The average yield of beet tuber is 30 to 35 tonnes / acre.

Economics

Total cost of cultivation per acre is around Rs.8000 to 8500 and the income will be Rs.18,000 /acre with a net income of Rs. 10,000/ acre.

Harvesting should be timed so that the tubers reach the factory within 48 hours for processing.
Till such time the tubers should be retained in the field

For Further Details

**The Director
Soil and Crop Management Studies
Tamil Nadu Agricultural University
Coimbatore-641 003, Tamil Nadu**

**Phone: 0422-2444961
Fax: 0422-2431672/2444961
E.Mail: directorscms@tnau.ac.in**