

Beet Root



Beet Root

Botanical Name: *Beta vulgaris sp vulgaris.*

Family: Brassicaceae

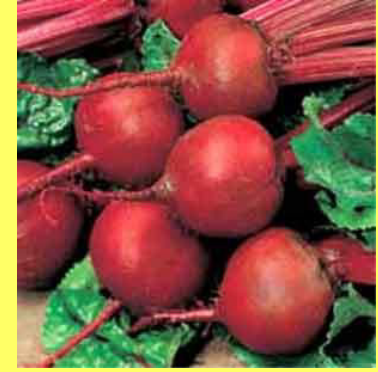
Chromosome number 2n=18

Origin :

Europe, North Africa & West Asia



Uses



- ☺ **Roots are served as boiled, pickled or salad.**
- ☺ **Tops may be used much like spinach as leafy greens for salads or boiled.**
- ☺ **The tender leaves & young plants are used as greens (pot-herbs).**
- ☺ **Large sized beets are used for canning.**
- ☺ **Rich in protein, CHO, Ca, P, Fe & vitamin C.**

- ☺ **Red colour of table beets is due to *betacyclin*, a nitrogen containing compound, with chemical properties similar to anthocynins.**
- ☺ **Also contains a yellow pigment *betaranthin*.**
- ☺ **The ratio of these two pigments varies with cultivation & changes during growth and with environmental conditions.**
- ☺ **Betanin appears to be a potent anticancer compound**

Betalains and Cancer Chemoprevention

- **Betainin appears to be a potent anticancer compound**
- **Betacyanin-rich beets – most efficient to scavenge free-radical** (Wettasinghe *et al.*, 2002)
- **Beetroot extract have the chemopreventive properties against lung and skin cancers** (Kapadia *et al.*, 1996)
- **Betalains have slightly higher protection against skin and lung tumors than anthocyanins and carotenoids** (Lila, 2004)



Soils

- ♠ Good beets are produced on a wide variety of soils.
- ♠ Deep, well drained loams or sandy loams are considered best.
- ♠ Sensitive to soil acidity.
- ♠ A soil pH 6-7 is considered best for beet..
- ♠ Beet is one of the few vegetables that can be grown successfully on saline soils.

CLIMATE

- ♥ Cool season crop that can tolerate mild frosts and light freezes.
- ♥ It grows best in the winters in the plains of India.
- ♥ Seed germination over a wide range of soil temperature (40-85°F) but optimum germination occurs between 65 & 75 °F.
- ♥ Beets are very sensitive to low temperature & if exposed to 4.5°C – 10 °C for 15 days leads to bolting before the roots attain marketable size.
- ♥ It grows well in warm weather but attains best colour, texture and quality in a cool weather condition.
- ♥ Excessive hot weather causes ‘zoning’ – the appearance of alternating light & dark red concentric circles in the rot.
- ♥ Under cool weather, the roots have a high sugar content, quality roots with intense colour (18.3-21.1 °C).
- ♥ Beets require abundant sunshine for development of storage roots.

Varieties

Deteroid Dark Red



Land Preparation

- ♥ The soils should be thoroughly prepared by ploughing 15-20 cm deep followed by sufficient disking & hoeing to pulverize the clods.
- ♥ The soil surface should be smooth & loose & free from all clods and trashes.
- ♥ Well rotten FYM or compost is also added at the time of land preparation.

Sowing Period

North India	Sept-Nov
South India	July-Nov
In hills	March-July end

- ♥ Seeds sown early when the temperature is high, may produce beets with coarse and woody fresh and dull colour

Seed Rate & Spacing

- ☺ Beet seeds are sown directly in the field by sowing seed balls that contain one or more seeds.
- ☺ The seed balls are planted at a rate of 7-9 kg/ha in rows 45-60 cm apart and thinned later to an in-row spacing of 8-10 cm
- ☺ Multigerminant seeds or beet seed is a fruit containing usually 2-6 seeds.



Thinning

- ▶ Thinning is an essential operation in beet cultivation because the seed ball is actually a fruit containing 2-6 seeds each of which may germinate & produce a plant
- ▶ Generally, the plants emerge in groups unless segmented seed or monogerm seed is used.



Manures and Fertilizers

Open pollinated varieties

Farmyard manure q/ha)	N	P ₂ O ₅	K ₂ O
	(Kg/ha)		
150-200	60-70	100-120	60-70

☺ Application method same as other root crops.

Interculture and weed control

- ▶ More or less the same as that of radish & turnip.
- ▶ Care should be taken to provide proper spacing between the plants by thinning the excess seedlings after germination.
- ▶ One or two earthing ups are also given to prevent the exposure of roots to sunlight which causes greening & lowers the quality of produce.
- ▶ Pre & post emergence sprays of propachlor (2.5 kg/ha) gives weed control for 40-50 days & increased yield.

Irrigation

- || The soil should be kept sufficiently moist until emergence of seedlings.
- || Water requirement has been reported to be 300 mm supplied in 5-6 irrigations.
- || 3 irrigations are sufficient when there are winter rains.

Harvesting

- ☺ The marketable maturity is just depending on the size ranging from 3-5 cm dia.
- ☺ Usually the top is removed for marketing the roots.

Yield



250-300 q/ha.

Storage

- ☑ At temperature of 32 °F and 98-100% RH topped beets can be stored for 4-6 months while bunched beets for 10-14 days
- ☑ Only for 2-3 days at room temperature.



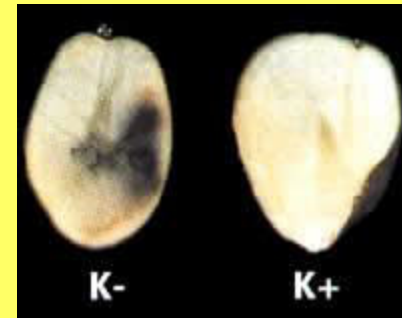
PHYSIOLOGICAL DISORDERS

1. Internal Black Spot

☺ Also known as brown heart or heart rot.

Possible Reasons

- Boron deficiency.
- Plant usually remains dwarf or stunted
- The leaves are smaller than normal.
- In general, boron deficiency appears more often in a dry season particularly when a long dry spell is followed by wet period favouring rapid growth because the root system in the upper soil layer ceases to function during dry period and thus intake of B is reduced.



Management

- Application of 10-15 kg of Borax/ha.