

ROOT CROP: RADISH



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INDEX

1. Radish: An Introduction	1
2. Plant Description	1
3. Uses of Radish Plant	2
4. Popular Varieties	2
5. Temperate Varieties of Radish	3
6. Tropical Varieties of Radish	3
7. Growing Radish	4
8. Food Uses	5

Radish: An Introduction

Radishes are a popular root vegetable of Brassicaceae family and are grown for their fleshy edible tubers, which are actually modified tap roots. Radishes can be grown as annuals or biennials depending upon the growing purposes. For vegetable purposes, it is grown as an annual and for seed production, it is grown as a biennial. Tubers may be eaten raw as a salad vegetable or cooked as a vegetable dish. Just like other Brassica vegetables, radishes are also a powerhouse of nutrients. Radishes are among the top 50 plant-based nutrient-dense foods. Radish is believed to be originated in the Mediterranean region.

Taxonomy

Kingdom	Plantae
Order	Brassicales
Family	Brassicaceae
Genus	Raphanus
Species	R. raphanistrum
Subspecies	Sativus
Scientific name	Raphanus raphanistrum

Plant Description

Winter radishes grow to a height of 50-60cm and a spread of 45cm. dwarf, small varieties grow to a height of 30cm. Leaves are arranged in a rosette and are highly divided with a big terminal lobe and smaller lateral lobes. Root system consists of a prominent tap root and small lateral roots. Flowers are small and white-coloured and are borne on a racemose inflorescence. Fruits are small pods containing numerous seeds.

Uses of Radish Plant

They are mainly grown for their root tubers which are used as a starch vegetable. They can be grown for their tender leaves also which can be used as a leafy vegetable. In addition to this, they can be grown as companion plants. They can also be grown as cover crops or catch crops in winter. They can be grown as forage crops. Some specific varieties can be grown for oil production and for sprouting seeds also.

Radishes as Companion and Trap Plants: Radish plants have a strong pungent odour that deters insect pests as aphids, thrips, beetles, cucumber beetles, squash bugs, and ants. Therefore they can be grown as a trap crop, to lure/trap insect pests away from the main crop. Cucumbers and radishes grow well as companion plants. Radishes are good companion plants for chervil, squash, tomatoes, lettuce, peas, and nasturtiums.

Popular Varieties of Radish

There are numerous varieties of radish, each of them varying in size, flavor, color, and growing duration. Skin colour of the tubers ranges from white through pink, red, purple, yellow, and green to black, but the flesh is always white; tuber color is due to the presence of anthocyanins in them. Tuber shape can be globular, tapering, or cylindrical. There are small, large, round, long, mild, and sharp varieties. Broadly, radish varieties can be divided in two groups: European or temperate type and Asiatic or tropical and subtropical types.



Temperate/Winter Varieties of Radish

White Icicle: These plants produce pure white-coloured, carrot-shaped, thin and tender tubers. Tubers are around 10–12 cm long. It is an early maturing variety and the crop becomes ready in about 30 days after sowing. It makes a good salad as it is easy to slice them to thin slices. It has good resistance to pithiness.

French Breakfast: These plants produce elongated, red-skinned radish tubers. The plants are susceptible to pithiness; it is also an early maturing variety and can be harvested after 30 days of sowing.

Red King: Tubers of these plants have a mild flavor, and plants have good resistance to club root disease.

Rapid Red White Tipped or Scarlet Globe: These are early maturing varieties and the crop becomes ready in 30 days. They produce globular red coloured tubers.

Other winter varieties of radish: April Cross, Bunny Tail, Cherry Belle, Champion, Sicily Giant, Snow Belle, Plum Purple, Gala, and Roodbol

Tropical Varieties of Radish

- **Japanese White:** Tubers grow better when the temperature is low; they are pure white coloured and 30 to 45cm long.
- **Pusa Desi:** Tubers are of the same size as those of Japanese White and have a green stem tip.
- **Pusa Chetki:** Tubers are pure white, mildly pungent and become ready for harvest in 40 to 45 days.
- **Pusa Reshmi:** Tubers are 30 to 35 cm long, tapering towards the top, and white-coloured with green stem tip.

Daikon or Japanese Radish: Daikons are winter varieties of radishes from Tropical Asia and these are mainly grown for oilseeds. Daikons can be used as a cover crop to increase soil fertility, to suppress weed growth, and to prevent soil erosion. Common names of Daikons are Japanese radish, Chinese radish, and Oriental radish. They are mildly flavoured with elongated white roots. 'April Cross', is a well-known Daikon radish variety.

Growing Radish

Climate: Radish plants are fast-growing, winter season vegetables. It is a biennial plant just like other Brassica plants but grown as an annual for vegetable purposes. It is very easy to grow radish plants as they are very hardy and suffer from very few pests and diseases. A cool season with temperatures 10 to 18 °C produces top quality tubers. The plant prefers full sun light for its growth.

Soil: Radish can be grown in all types of soils. However, the most ideal soils are well-drained, rich, fertile light sandy loams with a soil pH 6.5 to 7.0. Late varieties can be grown in clayey soils also. Since radish plants are fast-growing, soils should be fertile with high content of organic matter. Soil should be having good water holding capacity and should be moist throughout the plant growth.

Propagation: Propagation is by seeds. Seeds are sown directly in the fields on ridges. Distance between the ridges and the spacing within rows depend on the variety. Seed rate is 10-12kg/ha. Seeds germinate in 3-4 days. Favourable soil temperature for germination is between 18 and 29 °C.

Planting: In temperate climate, radish can be grown throughout the year. In warmer climates, radishes are planted during autumn season. Depth of seed sowing affects tuber size; hence a sowing depth of 1cm to 1.5 cm is recommended for small radishes and 2cm to 4 cm is recommended for large radishes.

Fertilizer and Irrigation Requirements: A crop that yields 20 tons/hectare of radish tubers removes about 120 kg of nitrogen, 65 kg of phosphate and 100 kg of potash from the soils. A fertilizer schedule may be planned based on nutrient removal from the soils, soil fertility analysis, and different plant growth stages. Radish requires plenty of water from sowing time until the tubers become ready for harvest.

Insect Pest Management: Aphids eat tender shoots and can be controlled by spraying nicotine sulphate. Flea beetles affect seedlings and young plants and leave holes in the leaves. Swede midge attacks the foliage and growing tips. Cabbage root flies attack the roots and as a result the foliage droops and wilts. White maggots make tunnel through the tubers making it inedible. Integrated Pest Management practices may be adopted for the effective control of pests. There are no important diseases. Sometimes, radish plants are affected by mosaic and rust diseases.

Harvesting and Yield: Radish crop matures very fast, generally 30 days after sowing. In colder climates, the crop maturity may be delayed by a few more weeks; it may take 45-50 days for crop maturity. Radish should be harvested when the tubers are still tender; harvesting delay may result in ‘pithiness’ of tubers as well as may develop bitterness in tubers. A light irrigation is done before harvesting because it is easy to pull out the plants when soil is moist and loose. Tubers are pulled out along with the tops, with the help of a spade or similar tools. Washed and cleaned tubers are packed for marketing. The European varieties yield about 8-12 tons/ha whereas the Asiatic types yield 20-30 tons/ha.

Storage Conditions: At room temperature, radishes may be stored up to 3 days. At 0 °C (32 °F) with a relative humidity of 90–95%, radishes may be stored up to 2 months.

Seed Production: For seed production, tubers are left un-harvested in situ so that plants can complete reproductive cycle. Seed yield is 600 to 800 kg/ha according to the variety. Radish seeds contain up to 48% oil which is not fit for human consumption but is a potential source of biofuel.

Food Uses

Radish tubers have a crisp texture and a strong, pungent, peppery flavor. Pungent flavor is due to the presence of glucosinolate, myrosinase, and isothiocyanate. Radishes are used in fresh salads. Chopped leaves are used in potato soups. Tubers and leaves may be sautéed to prepare a side dish. Tender seed pods are used in many Indian dishes.



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