

Broccoli

Brassica oleracea var *italica*
Brassicaceae/ Cruciferae





- ▶ The word broccoli came from ‘brocco’ (a Italian word means shoot)
- This is not so much popular vegetable in our country. It is mostly cultivated in hilly regions of Himachal Pradesh, Jammu Kashmir and Uttar Pradesh and Nilgiri hills.

Uses

- Both heads and fleshy stems are eaten as salad or cooked as single or mixed vegetables with potato.
- It has 130 times more vitamin A than cauliflower and 22 more than cabbage.
- It has anticarcinogenic property. It is a rich source of sulphoraphane a compound associated with reducing the risk of cancer.
- It is also beneficial in heart disease
- It is used to prepare salad, soup, curry, pie, cassarole etc.
- Boiling more than 10 minutes reduces its nutritional content.

- Terminal growing point and axils of leaves bear cluster of flower buds
- harvested before opening of flower bud
- USA is the largest producer
- ideal crop for protected cultivation

Varieties:

- Purple, white, pale green ,dark green
- Early (60-70d) ,mid (90-110d) ,late types (110-120d)
- Pusa Brocccoli KTSel 1
- Palam Samrudhi
- Punjab Broccoli

Cultivation practices similar to cabbage

- It is sensitive to temp. and warm weather causes small thin leaves and loose heads
- The opt. temp. for growth is 20° to 30 °C for early and 5 to 10° C for late types.
- Optimum temp. for heading is 15-20° C

- The sowing time is September to mid November in north India.
- Both direct sowing and transplanting methods are used.
- In direct sowing 2 to 2.5 kg. seed per ha is needed and for transplanting, seed rate is 500 to 600 g/ha.



Flowers



Pods



Seeds

- After harvesting heads are kept in dark place for sometime otherwise they become yellowish
- Yellowing can be checked by storing in O₂ free chamber or application of BA @ 10 ppm or 2,4,5-T @ 2-4 ppm 3-4 days before harvesting.

Diseases

DISEASE	SYMPTOMS	CONTROL
1. Damping off (<i>Pythium, Phytophthora, Rhizoctonia spp.</i>)	Germinated seed killed or seedlings topple down due to collar rotting	<ol style="list-style-type: none">Seed treatment with Thiram or Captan @ seedSpray 0.2% Dithan 45Soil sterilization
2. Downy Mildew (<i>Pernospora parasitica</i>)	Fluffy downy growth on lower surface and purplish or yellow brown spots on upper surface of leaves	<ol style="list-style-type: none">Seed treatment in hot water at 50°C for 30 minSpray 0.3% Dithan 45 or Ridomil-72
3. Yellowing (<i>Fusarium oxysporum fsp. coglutinans</i>)	Yellowing of leaves starting from lower leaves leading upward fast	<ol style="list-style-type: none">Seed treatment with Benlate0.2% Carbendazim

DISEASE	SYMPTOMS	CONTROL
4. Club root <i>(Plasmodiophora brassicae)</i>	Swelling of roots causes club shaped rootlets	i. Drenching of seed beds with 1% formaldehyde ii. Liming to correct soil pH as it is more in acidic soils
5. Black leg <i>(Phoma lingam)</i>	Seedlings topple over due to distortion of vascular bundle and root system	i. Seed treatment ii. Hot water treatment iii. Spray 0.2% Dithane M-45
6. Black rot <i>(Xanthomonas campestris)</i>	V shaped lesions with brown veins on leaf	i. Hot water seed treatment ii. Seedling treatment with 0.01% Streptocycline iii. Spray 0.01% Streptocycline
7. Soft rot <i>(Erwinia carotovora)</i>	Water soaked patches on head which later turn dark brown	As black rot

INSECT	SYMPTOMS	CONTROL
1. Cabbage butterfly <i>(Pieris brassicae)</i>	Bluish green caterpillars feed on leaves starting from margin to centre	i. Grow paired mustard rows after every 25 row of crop ii. Spray 0.03% Fenvelerate or Cypermethrin
2. Cut worm <i>(Agrotis ipsilon)</i>	Caterpillars cut down the young seedlings just above the ground level	i. Clean cultivation ii. Destruction of big soil clods iii. Soil application of Aldrin @ 20 kg/ha
3. Cabbage aphids <i>(Brevicoryne brassicae)</i>	Nymphs and adults suck the sap from leaves and causes sooty mould	Spray 0.03% Dimethoate or 0.05% Methyl demeton

INSECT	SYMPTOMS	CONTROL
4. Diamond back moth <i>(Plutella xylostella)</i>	1cm long greenish caterpillars feed on the lower side of leaves producing whitish patches and make holes	As cabbage butterfly
5. Cabbage flea beetle <i>(Phylloterata cruciferae)</i>	Grub feed on tender roots and adult is bluish green, 1.5-2cm long and make small round holes in leaves & stem	Spray 0.2% Carbaryl



Brussels sprout

Brassica oleracea var gemmifera

Brassicaceae/Cruciferae

- Name from Brussels in Belgium where it was cultivated since 15th century
- Miniature cabbage like growth in the axils of leaves all along stem
- Used as cooked vegetable, salad
- Two groups Dwarf and tall
- **Dwarf**: stem 50cm long
- Sprouts crowded on the stem

Suited to areas where season is short.

Improved Long Island

Dwarf Improved

Early Morn, Jade cross

- **Tall**: suited at areas where season is long

Hilds Ideal

Red Vein

Amager Market

- Climate : temperature 16-20oC
- Cultural practices are same as cabbage
- seed rate=300-400g/ha
- Spacing=90x90cm
- Harvest: first formed leaves mature (sprouts solid, uniform, outer leaves folded closely)
- **De topping** found beneficial in dwarfs and hybrids