

## **BROCCOLI**

*(Brassica oleracea L. var. italica)*

Broccoli is an important vegetable among the Cole crops. It is a rich source of vitamins and minerals. In fact, it contains more vitamin A than cabbage and cauliflower and the highest amount of proteins among the cole crops. It also contains anti-cancerous compounds and antioxidants.

Broccoli is of two types: heading type and sprouting (green and purple) broccoli. Heading broccoli forms curd like cauliflower; while sprouting broccoli contains a group of green immature buds and thick fleshy flower stalk forming a head. Sprouting broccoli is more popular in India.



### **Variety**

Green sprouting broccoli having green, firm and compact crown heads are more in demand in India. The important varieties are: KTS-I, Solan Green, Lucky, Fiesta, Pushpa, Aishwarya, PalamVichitra.

### **Soil and Climate**

Broccoli can be grown in a wide variety of soils, but sandy and silt loam soils are most suited. It prefers well-drained upland soil for proper growth. The optimum pH range is 5.8-7.2.

It is a cool season crop and is sensitive to very low and high temperatures. The optimum temperature range of 10-25 °C is ideal for proper growth of the crop.

### **Field preparation**

Same as in cauliflower

### **Seed rate**

400-500g/ha

### **Sowing Time**

**In plain-** Mid September to early November

**In hills-** September-October

### **Nursing Raising**

Same as in cauliflower

### **Transplanting**

The seedlings are ready for transplanting after 4-6 weeks of sowing. FYM @ 10-15 t/ ha should be applied one month before transplanting. Nitrogen 120 kg, 80 kg phosphorus and 60 kg potash should be applied at the time of transplanting. Remaining half of nitrogen should be

applied in two split doses at 30 and 45 days after transplanting. Transplanting should be done in the afternoon at a spacing of 45x30cm.

### **Irrigation**

Light and frequent irrigation should be given at 10-15 days interval depending on weather conditions.

### **Intercultural Operation**

The crop should be kept weed free. Shallow hoeing should be done at 20-25 days after transplanting to remove weeds and loosen the soil for better aeration.

### **Plant protection measures**

**Cutworms:** The caterpillars are 3 to 4 cm long, gray or brown to almost black with various markings. They hide in daytime and feed at night. They cause damage by biting the foliage and by cutting down the young seedlings just above the ground level.

#### **Control:**

1. Picking and destruction of the larvae at the early stage of the crop.
2. Growing of paired rows of mustard after every 25 rows of the crop.
3. Spraying of the heavily infested crop with Rogor or Endosulfan @ 2 -3 ml/l of water.

**Leaf Webber:** The leaves are skeletonised by the larvae, which remain on the under surface of leaves in webs and feed on them. They also attack flower buds and pods. The insect commonly sucks early grown crop.

#### **Control:**

1. Picking and destruction of the larvae at the early stage of the crop.
2. The crop should be sprayed with Cyfluthrin @ 0.5ml/l of water.

**Aphids:** They feed on the plants affecting the quality. Mustard can act as a trap crop for aphids. Neemseed kernel extract can be sprayed at 4% or Oxydemeton methyl @ 0.02% can be sprayed for controlling this insect.

**Mustard saw fly:** The larvae of mustard saw fly feed on leaves and it can be controlled by spraying Chlorpyrifos or Quinalphos @ 0.05%.

**Damping off:** It is a serious disease in the nursery. In severe conditions, the affected seedlings droop and fall off due to infection at the collar region. Seed treatment with Thiram or Captan @ 2.5-3 g/kg of seed is recommended. The seedlings should be treated with Bavistin @ 1g/l or Dithane- M - 45 @ 2g/l of water.

**Downy Mildew:** This disease appears from nursery to curd formation stage. Fine Hair like downy growth of fungus is observed on the leaves. Corresponding to the downy fungal growth, minute pinhead brown necrotic spots appear on the upper surface of leaves. For controlling the disease, dense sowing of seeds in the nursery should be avoided; foliar spray of Mancozeb @ 0.25% should be done at disease infestation stage and repeated at 7 - 8 days interval.

**White rust:** It is a soil borne disease caused by fungus *Sclerotinia sclerotiorum*. The fungus attacks the bases of the outer leaves and plants suddenly wilt. For controlling this disease, the soil should be drenched with Bavistin @ 1g/litre of water. Seedlings should be dipped in 0.25 % Benlate suspension for 5-8 minutes before transplanting. Deep ploughings should be done, as the fungus cannot survive below 15cm.

**Black rot:** First signs of the disease often appear along the margins of leaves as

chlorotic regions and the chlorosis progresses in the direction of the mid rib forming a V-shaped area. Symptoms may appear from any side and centre of the leaves. The bacteria are transmitted through seeds.

**Black leg:** It occurs mostly in moist regions, especially in areas with high rainfall during the growth period.

Seed treatment should be done with hot water at 50°C for 30 minutes or mercuric chloride @ 1g/l for 30 seconds.

### **Harvesting and yield**

The crop is ready for harvesting after 80-90 days of transplanting. Heads having 10-15 cm stems and green, compact bud clusters are harvested with a sharp knife.

On an average, yield varies from 175-240 q/ha depending upon the variety.