

Scientific cultivation of Cole crops

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Cole Crops Includes:

- Cauliflower
- Cabbage
- Knolkhol
- Broccoli

Varieties and Hybrids of Cauliflower

Early Season:

Pusa katki

Pusa Deepali

Himkaran (hybrid)

Pusa Early Synthetic

Mid Season

Pusa sharad

Pusa Hybrid 2

Late Season

Himani

Pusa Snowball 1

Pusa Shubhra

Sowing Time:

Early season: June-July

Mid season: August –Sept

Late season: October- November

Seed Rate:

Early season: 600 g /ha

Mid and late season: 350-400 g/ha

Spacing:

Early season: 45x30 cm

Mid season: 60x45cm

Late season: 60x60 cm

Physiological Disorder of cauliflower

Brown Rot:



Boron deficiency: First water soaked areas appear on bud clusters which turn pinkish or rusty-brown in advanced stages, resulting in rotting. This can be prevented by soil application of 1-1.5 kg/ha of borax or sodium borate.

Varieties and Hybrids of Cabbage

Early Season

- Golden Acre
- Pusa Ageti

Mid Season

- Bahar
- BC-76(Hybrid)
- BC-79(Hybrid)
- Pride of India

Late

- Pusa Drum Head
- Green Challenger

Sowing Time:

Early season: July-August

Mid season: Sept.-Oct

Late season: Nov.-Dec.

Seed Rate:

Early season: 500 g /ha

Mid and late season: 400g/ha

Spacing:



Early season: 45x30cm

Mid and Late season: 60x45cm

Varieties of KNOL KHOL

- King of North
- White Vienna
- Purple Vienna
- Large green



Sowing Time: Sept to first week of November

Seed rate: 1.5 kg/ha

Spacing

Early: 30x25 cm

Late: 40x 25 cm



Sowing Time: September–October

Seed rate: 500g

Spacing: 60x45 cm

Nursery raising:

The seedlings are grown in raised bed of 5-7 cm apart . The seed bed should be prepared by addition of well rotten FYM @ 4Kg/M². The width of the nursery bed should not be kept more than 1m and

length 5 m. Before sowing the seed, the nursery beds should be drenched with Dithane M-45 @ 2g/l of water to reduce the incidence of damping off. Sowing should be done in row with depth of 1.5 - 2cm. After sowing, the seed should be covered with thin layer of (1-1.5 cm) of sand , soil and FYM mixture and light irrigation is given immediately after sowing by watering can. The nursery should be protected from heavy rains. Weeding and intercultural operations should be done at regular intervals.

Transplanting:

4-5 week is old seedlings with 4-6 leaves are ready for transplanting. Transplanting may be done in evening. Irrigation is done just after transplanting.

Weeding and Earthing up:

Two to three weedings are sufficient to control the weeds during the whole crop duration. Earthing up should be done after weeding.

Manuring and Fertilization:

About 15-20tonnes FYM should be added in the soil one month before transplanting in the soil. Besides 100 Kg urea, 60 kg SSP and 60 kg MOP per hectare should be applied. Half dose of Urea and full dose of SSP and MOP should be given at the time of transplanting and remaining amount of urea should be given in two split doses i.e. 30 and 45 days after transplanting.

Scientific cultivation of Broccoli

Broccoli resembles cauliflower, but the plant forms head rather than curd, consisting of green buds and thick fleshy floral stalk. The head is



generally green in colour, it may be purple or sometimes white also. The main head, long slender smaller heads which are called spears are developed in the axils of the leaves.

It has about 130 times more Vit.A contents than cauliflower and 22 times more than cabbage. It is also rich source of sulforaphane, a compound associated with reducing the risk of cancer.

Varieties:

Pusa Broccoli Kt Sel 1: Compact light green heads and average head weight about 250-400g. It takes about 85-95 days from transplanting to harvest.

Palam Samridhi (DPGB 1): Compact, green head and average head weight about 300-400g. It takes about 85-90 days from transplanting to harvest. Average yield varies from 15-20 t/ha.

Punjab Broccoli 1: Head and spears are dark green with bluish-tinge. It takes about 65-70 days from transplanting to harvest. Average yield varies from 7 t/ha.

Seed rate and Sowing:

About 300-400g seed is required for planting one hectare of land. Sowing is generally done in nursery beds followed by transplanting in the field. Nursery raising operation including seed treatment, nursery treatment, sowing method and after care should be followed strictly.

Manures and Fertilizers:

FYM @ 15-20 t/ha is required. 100 kg N, 60kg P₂O₅ and 50kg K₂O per hectare may be applied depending upon the soil fertility status and cultivars. Application of 500gm molybdenum and 15gm of borax helps in controlling the deficiency.

Transplanting:

Seedlings are ready for transplanting after 30-40 days of sowing. Old seedlings transplanted result into poor growth of plant and development of small sized heads. Transplanting is done from mid-September to mid-October and in the hills from August to September.

Spacing:

Spacing of 45cm X 45cm and 45cm X 50cm are followed depending upon the season and cultivars. Close spacing generally reduces the head size and delays the maturity.

Irrigation:

Irrigation at an interval of 7-8 days are required depending upon weather conditions to get good harvest. Dry spells during early growth and head development stage reduce the yield.

Harvesting:

When the head has attained proper size, it should be harvested immediately. Delayed harvesting cause opening of buds (heads) and loosening of head making it unfit for market. The central head is removed along with 15cm long fleshy stem.

Physiological Disorder:

Molybdenum deficiency: It causes whiptail in which the lamina of the newly formed leaves become leathery, irregular and consisting of only mid-rib. This can be prevented by soil application of 1-1.5 kg/ha of molybdenum before planting.



Boron deficiency: First water soaked areas appear on bud clusters which turn pinkish or rusty-brown in advanced stages, resulting in rotting. This can be prevented by soil application of 1-1.5 kg/ha of borax or sodium borate.

Insect pests

1. Cabbage butterfly (*Pieris brassicae*)

Symptoms:

- Catterpillars scrape the leaf surface, whereas the subsequent instar eat up the leaves from the margins inwards, leaving intact the main vein.



Control measures:

- Hand pick the caterpillars and destroy them in Kerosined water.
- Spray Malathion or Endosulfan @ 1.5ml/litre water or alternatively spary Quinalphos @ 1ml/litre water or Chlorpyriphos @ 6ml/10litre water.

2. Cabbage flea beetle

Symptoms:

- Flea beetle feed on leaves forming hole.
- Stem, flowers also attack.

Control measures:

Spray Malathion/Rogor 1ml/litres of water for cabbage aphid.



3. Diamond back moth (*Plutella xylostella*)

Symptoms:

- Catterpillars damage the leaves.
- Central leaves riddled.
- Vegetables unfit for human consumption



Control measures:

- Spray Malathion or Rogor @ 1.5ml/litre water or alternatively spray Quinalphos @ 1ml/litre water or Chlorpyrifos @ 6ml/10litre water for Cabbage butterfly.
- Treat soil around the plant after 10 days of transplanting with Furadan 3 G @1/2 g/plant followed by light irrigation.

Diseases

1. Club rot

Symptoms:

Roots club together forming an elongated.

Control measures:

- Select seed beds in the disease free areas.
- Seeds bed fumigated with methyl bromide @ 0.5-1 kg/sq.m before 7 days prior to actual date of sowing.

2. Damping off (*Rhizoctonia solani*)

Symptoms

- Young seedlings are killed before they reach the surface of the soil.
- Affected seedlings dry up at the ground level and topple over.



Control measures:

- Young seedlings are killed before they reach the surface of the soil.
- Affected seedlings dry up at the ground level and topple over.
- Select seed beds in the disease free areas.
- Treat seeds with Agrosan GN or Emisan @ 2.5 g/kg or Bavistin @ 2g/kg of seed before sowing for Damping off.

3. Black leg of cabbage (*Sclerotinia sclerotiorum*)

Symptoms:

Stalk portion of crop become rotting.

Control measures:

- Treat seeds with Agrosan GN or Emisan @ 2.5 g/kg or Bavistin @ 2g/kg of seed before sowing.
- Grow tolerant varieties Pusa Drum head .

4. Browning or brown rot or red rot of cauliflower**Symptoms:**

Margins of leaves become yellow to brown and dry.

Control measures:

Apply Borax or Sodium borate @ 20 kg/ha or application of 38 kg urea, 8 kg SSP and 2 kg of Borax/bigha.

* Source of photo www.farmer.gov.in