

Okra

Diseases

Damping Off (*Pythium sp.*, *Rhizoctonia sp.*):

Cool, cloudy weather, high humidity, wet soils, compacted soil, and overcrowding especially favor development of damping-off. Damping-off kills seedlings before or soon after they emerge. Infection before seedling emergence results in poor germination. If the decay is after seedlings emergence, they fall over or die which is referred to as "damp-off." The destructiveness of the disease depends on the amount of pathogen in the soil and on environmental conditions. Seedlings that emerge develop a lesion near where the tender stem contacts the soil surface. The tissues beneath the lesion become soft due to which the seedlings collapse.

Control: Excessive irrigation should be avoided to reduce humidity around the plants. Seed treatment with antagonist fungal culture of *Trichoderma viride* (3-4 g/kg of seed) or Thiram (2-3 g /kg of seed) and soil drenching with Dithane M 45 (0.2%) or Bavistin (0.1%) affords protection against the disease. The field should be regularly inspected for the disease-affected seedlings. Such seedlings should be removed and destroyed.

Fusarium Wilt (*Fusarium oxysporum* f. sp. *vasinfectum*):

This disease is caused by fungi, which persist in the soil for a very long time. Initially the plants show temporary wilting symptoms, which becomes permanent and progressive, affecting more vines. The leaves of the affected plants show yellowing, loose turgidity and show drooping symptoms. Eventually, the plant dies. In older plants, leaves wilt suddenly and vascular bundles in the collar region become yellow or brown.

The fungus invades the root system and colonizes the vascular system. In doing so, water movement is blocked and toxins from the fungus alter normal cell function. Cutting the base of the stem reveals a dark woody portion. No control is available other than a long rotation. All varieties are susceptible.

Control: Continuous cultivation of bhendi on the same piece of land should be avoided. In case of fields severely infected by the wilt pathogen practicing long crop rotations is useful in reducing the pathogen population. Three sprays of Karathane (6g in 10 litres of water) or Bavistin (1g/litre of water) immediately on appearance of initial symptoms at 5-6 days interval checks the spread of the disease. Leaves of fully grown plants should be thoroughly drenched during spraying.

Powdery Mildew (*Erysiphe cichoracearum*):

The disease is found mainly on the older leaves and stems of plants. Yields of many of the infected vegetables are reduced due to premature foliage loss. Increased humidity can increase the severity of the disease, and infection is enhanced during periods of heavy dew.

The disease symptoms appear as subtle, small, round, whitish spots on leaves and sometimes stems. The spots enlarge and coalesce rapidly and a white mass resembling talcum powder becomes evident on the upper surface of older leaves or other plant parts. Young leaves are almost immune.

A large part of the talc-like powder on the leaf surface is composed of spores. These spores are easily blown by winds to nearby susceptible plants. Heavily infected leaves become yellow, then become dry and brown. Extensive premature defoliation of the older leaves can ensue if the disease is not controlled.

Control : Healthy, vigorous leaves and stems are less prone to infection. Plants under nutritional stress in most cases will develop powdery mildew much sooner than plants the same age grown under a good nutritional program. Hence the plant should be well manured and application of fertilizers should be done on the basis of standard recommendations. Application of Wettable Sulphur (0.2%) or Bavistin (0.1%) or at an interval of 1 week interval effectively controls the disease.

Cercospora Leaf Spot (*Cercospora abelmoschi* and *C. malayensis*):

C. malayensis causes brown, irregular spots and *C. abelmoschi* causes sooty black angular spots. The affected leaves roll wilt and fall. The disease causes severe defoliation during humid seasons.

Control: Since the fungus survives on the diseased plant material, removal and destruction and of diseased plant material helps to check the spread of the disease. The disease is effectively controlled by spraying with Copper Oxychloride (0.3%) or Zineb (0.2%) starting from about a month after sowing and repeating at fortnightly intervals, depending upon the severity of the disease incidence.

Yellow Vein Mosaic Virus (YVMV):

This is the most important and destructive viral disease in bhendi. The disease infects at all the stages of crop growth and severely reduces growth and yield. The disease is transmitted by white fly.

The characteristic symptoms of the disease are a homogenous interwoven network of yellow veins enclosing islands of green tissues. Initially infected leaves exhibit only yellow coloured veins but in the later stages, the entire leaf turns completely yellow. In extreme cases, the infected leaf become totally light yellow or cream coloured and there is no trace of green colour. At times, enations (raised structures) are observed on the under surface of infected leaf. Plants infected in the early stages remain stunted. The fruits of the infected plants exhibit pale yellow colour, deformed, small and tough in texture.

Control: Removal and destruction of virus affected plants and planting of disease resistance varieties reduces the disease incidence. Controlling the whitefly population minimizes the incidence of YVMV. Soil application of Carbofuran (1kg a.i./ha) at the time of sowing and 4-5 foliar sprays of Dimethoate (0.05%) or Metasystox (0.02%) or Nuvacron (0.05%) at an interval of 10 days effectively controls the whitefly population.

Enation Leaf Curl of Bhendi:

The natural transmission if the disease occurs through whitefly. The disease symptoms appear prominently on the lower surface of the leaf as small, pin head enations. These later on become warty and rough textured. Size of the leaf is reduced. The most characteristic symptoms of the disease are twisting of the main stem and lateral branches along with enations. The bending of the plants is so severe that the entire plant appears to be creeping on the soil surface. Twisting of leaf petiole is conspicuous. The leaves become thick and leathery in structure. In case of heavy infection the newly emerged leaves also exhibit bold enations, thickening and curling. Fruits produced on the infected plants are few and deformed.

Control: Removal and destruction of virus affected plants reduces the disease incidence. Controlling the whitefly population minimizes the incidence of YVMV. 4-5 foliar sprays of Dimethoate (0.05%) or Monocrotophos (0.02%) at an interval of 10 days effectively controls the whitefly population.