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## Diseases of Cucurbit Crops and Their Management

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Cruciferous vegetables are important *Kharif* vegetables crops, which are grown both for table and seed purpose. This vegetable group constitutes crops like Cauliflower, cabbage, radish, turnip, broccoli, Brussel's sprouts, knoll-khol and rutabaga. These crops are grown throughout the country and are attacked by number of diseases, which not only reduce the quantity but also quality of the produce. The diseases, which are of common occurrence, are described in this article along with their management.

### Introduction

Cucurbits are vegetable crops belonging to family Cucurbitaceae, which primarily comprised species consumed as food worldwide. There is tremendous genetic diversity within the family, and the range of adaptation for cucurbit species includes tropical and subtropical regions, arid deserts, and temperate regions. A number of cucurbit vegetables are exported from India. Cucurbits are highly susceptible to several biotic and abiotic stresses. Cucurbits are affected by a number of diseases like downy mildew, powdery mildew, Root rot, Fusarium wilt, Mosaic virus, anthracnose, Cercospora leaf spot, root knot nematode and bacterial wilt. These diseases are of national importance and cause important economic losses in cucurbits.

### Major Diseases of Cucurbit Crops

1. Downy mildew
2. Powdery mildew
3. Root rot and wilt
4. Mosaic

#### 1. Downy mildew (*Pseudoperonospora cubensis*)

It is the most devastating disease of cucurbits. Small water-soaked lesions appear on the lower side of leaves. On the upper side of leaves, angular pale spots develop. Grayish spore mass of the fungus is visible on underside of these spots. Lesions later become necrotic. In advanced stage, leaves become dry and curl upwards and vines give blighted appearance. Yield and quality is drastically reduced.



**Disease Development**

- The disease generally appears during April-May in Punjab state.
- Wet conditions (due to rains or long dew periods) and low night temperature (20-25 °C) are favourable for onset and further development of the disease under north Indian conditions
- The fungus perpetuates on off-season cucurbit vines.

**Management**

- 1) Destroy over-wintering vines of cucurbits to reduce primary source of inoculum.
- 2) Avoid flood irrigation.
- 3) Give preventive sprays of Indofil M-45/Kavach @ 0.3 % in 2<sup>nd</sup> week of April and repeat at weekly intervals. Repeat sprays after rains.
- 4) Under heavy disease risk situation, give two sprays of Ridomil MZ (0.25 %) or Aliette (0.3 %) at 10 day interval.
- 5) Azoxystrobin (0.1%) and Curzate M-8 (0.25%) also show promising efficacy.

**2. Powdery mildew (*Sphaerotheca fuliginea*)**

It is more destructive on bottle gourds, squashes and melons. White to dirty grey spots appear on the leaves which become powdery as they enlarge. The white powdery coating covers leaves, stem and other succulent parts. Severe infection reduces yield and quality.

**Disease Development**

- The disease develops more at temperature range of 26-28 °C.
- Dry weather conditions (RH 65-70 %) favour infection and disease development.
- The fungus perpetuates on off-season cucurbit vines

**Management**

- 1) Destroy overwintering vines of cucurbits to reduce primary source of inoculum.
- 2) Spray the crop with Karathane @ 50-80 ml/ acre as soon the disease appears and repeat at 10 day interval.
- 3) Triazole fungicides like triadimefon, penconazole, flusilazole, hexaconazole and propiconazole @ 0.1% and plant products like garlic extract (5.0%) also give effective disease control.

**3. Root Rot and Wilt (*Rhizoctonia solani*, *Pythium* spp., *Fusarium* spp.)**

This disease has become more important in the recent years. Due to mortality of vines, the crop stand is greatly affected resulting in poor yields. The incidence is high at fruit formation stage. At young stages also plants may die after emergence and roots show rotting. The disease is characterized by dark brown water-soaked lesions, girdling the base of stem at soil level that ultimately results in death of the plant.



### Management

- 1) Grow crop on raised beds.
- 2) Treat the seeds with Thiram @3 g/ kg of seed before sowing.
- 3) Avoid flood irrigation.
- 4) Drenching the vines at root zone with Ridomil MZ (0.2 %) in case of *Pythium* infection and Bavistin @ 0.1 % in case of *Fusarium/Rhizoctonia* infections provides good control of the disease.

### 4. Mosaic (*Cucumber Mosaic Virus*)

Mosaic is more serious on squashes, bottle gourd, musk melon, pumpkin and cucumber. The losses are high when infection occurs at young stage. A variety of mosaic symptoms occurs on different cucurbits and several strains of the virus exist. The characteristic symptoms appear as alternate green and yellow patches on the leaves. The diseased leaves are mottled and deformed. Dark green raised blisters develop on the infected leaves. Young fruits also develop mottled areas and remain smaller in size.



### Transmission

- The virus is seed borne and is transmitted by aphids.
- The disease can also be transmitted through sap and agricultural implements.
- Several weeds serves as source of inoculum

### Management

- 1) Use healthy seeds from virus free plants.
- 2) Weeds around fields should be destroyed.
- 3) Control aphids by spraying the crop with Rogor or Metasystox @ 0.1 % at 10 days interval.

### Conclusion

In conclusion, to manage the diseases effectively in cucurbit crops, destroy over-wintering vines of cucurbits to reduce primary source of inoculums, select resistant varieties and healthy seed, inspect crops routinely for any symptoms of plant disease and apply protectant fungicides/insecticides when there is a risk of disease development.