

## Lecture 04 - Diseases of Grapes

**Downy mildew:** *Plasmopara viticola*

### Symptoms



Irregular, yellowish, translucent spots on the upper surface of the leaves. Correspondingly on the lower surface, white, powdery growth on leaves. Affected leaves become, yellow, brown and gets dried. Premature defoliation. Dwarfing of tender shoots. Brown, sunken lesions on the stem. White growth of fungus on berries which subsequently becomes leathery and shrivels. Later infection of berries result in soft rot symptoms. No cracking of the skin of the berries.

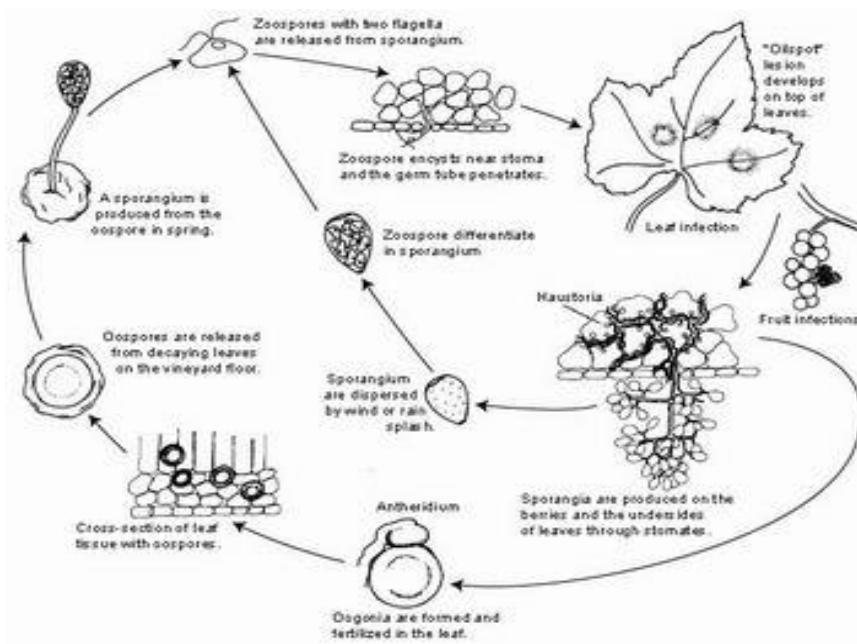
### Pathogen

Mycelium is intercellular with spherical haustoria, coenocytic, thin walled and hyaline. Sporangiophores arise from hyphae in the sub stomatal spaces. It branched at right angle to the main axis and at regular intervals. Secondary branches arise from lower branches. The sporangia are thin walled, oval or lemon shaped. The Zoospores are pear shaped, biflagellate and 7 – 9 micron meter. The oospores are thick walled.

### Mode of Spread and Survival

Through sporangia by wind, rain etc. As oospores present in the infected leaves, shoots and berries. Also as dormant mycelium in infected twigs. Optimum temperature: 20-22°C. Relative humidity: 80-100 per cent.

## Disease Cycle



## Management

Spray Bordeaux mixture 1 % or Metalaxyl + Mancozeb 0.4 %.

### Powdery mildew : *Uncinula necator*

#### Symptoms

Powdery growth mostly on the upper surface of leaves. Malformation and discolouration of affected leaves. Discolouration of stem to dark brown. Floral infection results in shedding of flowers and poor fruit. Early berry infection results in shedding of affected berries. Powdery growth is visible on older berries and the infection results in the Cracking of skin of the berries.



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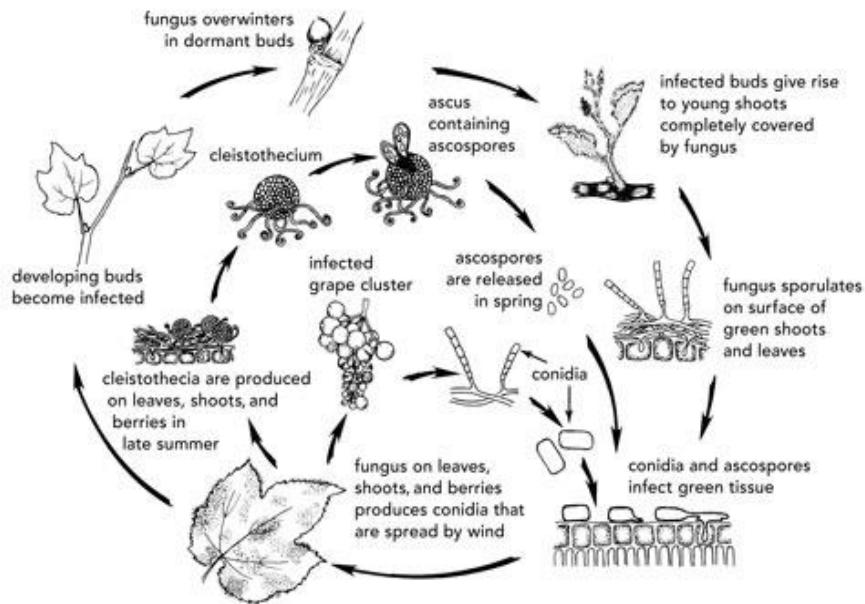
#### Pathogen

White growth consists of mycelium, conidiophores and conidia. Mycelium is external, septate and hyaline. Conidiophores are short and arise from external mycelium. Conidia are produced in chain. They are single celled, hyaline and barrel shaped. The fungus is oidium type.

## Mode of Spread and Survival

It spread through air-borne conidia. Through dormant mycelium and conidia present in the infected shoots and buds. Sultry warm conditions with dull cloudy weather, highly favourable.

## Disease Cycle



## Management

Spray Inorganic sulphur 0.25 % or Chinomethionate 0.1 % or Dinocap 0.05 %.

**Bird's Eye Spot/Anthracnose:** *Gloeosporium ampelophagum (Elsinoe ampelina)*

## Symptoms

The disease appears first as dark red spots on berry. Later, these spots are circular, sunken, ashy and in late stages these spots are surrounded by a dark margin which gives it the “bird’s-eye rot” appearance. The spots vary in size from 1/4 inch in diameter to about half the fruit. The fungus also attacks shoots, tendrils, petioles, leaf veins, and fruit stems. Numerous spots sometimes occur on the young shoots. These spots may unite and girdle the stem, causing death of the tips. Spots on petioles and leaves cause them to curl or become distorted.



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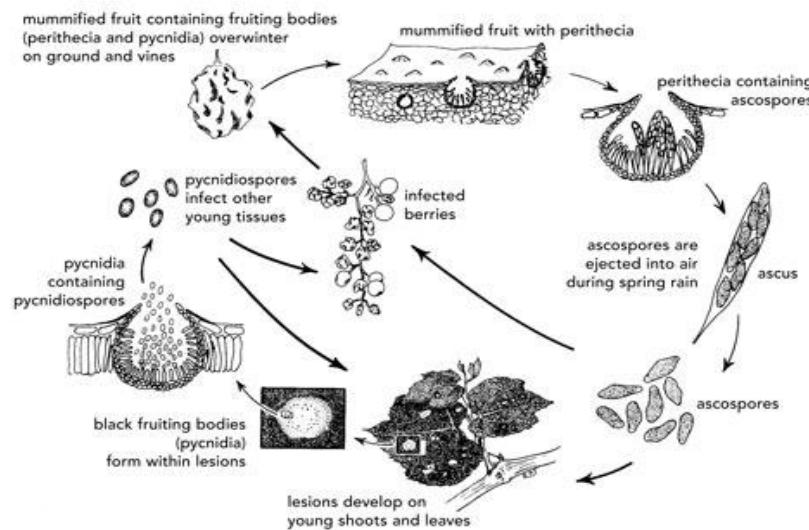
## Pathogen

Mycelium is septate and dark colored. Conidia single celled oval and hyaline.

## Mode of Spread and Survival

Seed-borne-infected vine, cuttings and air-borne conidia. As dormant mycelium in the infected stem-cankers. Warm wet weather. Low lying and badly drained soils.

## Disease Cycle



## Management

Removal of infected twigs. Copper oxychloride 0.2% or Mancozeb 0.25%



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