# Lecture 02 - Diseases of Mango (2 Lectures)

**Anthracnose:** *Colletotrichum gloeosporioides*

**Symptoms:**

The disease appears on young leaves, stem, inflorescence and fruits. Leaves show oval or irregular, greyish-brown spots which may coalesce to cover larger area of the leaf. The affected leaf tissues dry and shred. Leaves on infected petioles droop and fall. On young stem, grey-brown spots develop. These enlarge and cause girdling and drying of the affected area. The disease appears on young leaves, stem, inflorescence and fruits.

Often, black necrotic areas develop on the twigs from the tip downwards causing a dieback. In humid weather, minute, black dots develop on the floral organs. The infected flower-parts ultimately shed resulting in partial or complete deblossoming. Latent infections of fruit are established before harvest. The ripening fruits show typical anthracnose. Black spots appearing on skin of the affected fruits gradually become sunken and coalesce.

**Pathogen**

Mycelium septate and coloured. Conidia Single celled, hyaline, small and elongated.

**Mode of survival and spread**

On dried leaves, defoliated branches mummified flowers and flower brackets. Contact with diseased fruit during transport and storage. The secondary spread is through airborne conidia.

**Favourable conditions**

Temperature of 25°C and Relative Humidity 95-97%

**Disease cycle**

The survival of pathogen in detached diseased twigs and leaves lying on surface of soil and in diseased twigs attached to the tree. They successfully reproduced the disease by inoculating leaves, petioles, stems and fruits. The optimum temperature for infection was found

to be 25˚C. The disease spreads rapidly in the rainy season. Cloudy and misty weather during flowering favors damage to the infected floral parts.

The pathogen causes severe leaf spotting. The appearance of spots in more concentration at the stem-end and sometimes in stripes down the sides of the fruits suggested distribution of spores by rain water over surface of the fruit. The fungus can enter the pores of green fruits. The latent infection of mature fruits may take place through lenticels. The fungus apparently infects the fruit while it is green and develops in flesh during ripening.

**Management**

Spray *P. fluorescens* (FP 7) at 3 weeks interval commencing from October at 5g/like on flower branches. 5-7 sprays one to be given on flowers and bunches. Before storage, treat with hot water, (50-55°C) for 15 minutes or dip in Benomyl solution (500ppm) or Thiobendazole (1000ppm) for 5 minutes

**Powdery mildew:** *Oidium mangiferae (Acrosporum mangiferae)*

**Symptoms**

Powdery mildew is one of the most serious diseases of mango affecting almost all the varieties. The characteristic symptom of the disease is the white superficial powdery fungal growth on leaves, stalk of panicles, flowers and young fruits. The affected flowers and fruits drop pre-maturely reducing the crop load considerably or might even prevent the fruit set. Rains or mists accompanied by cooler nights during flowering are congenial for the disease spread.

**Pathogen**

Mycelium is ectophytic. Conidiophores short, hyaline and conidia single celled -barrel shaped, produced in chain. Fungus is odium type.

**Mode of survival and spread**

Survives as dormant mycelium in affected leaves. Secondary spread by air borne conidia.

**Disease Cycle**

Spores blown wind from infected areas readily adhere to hairy, unopened flowers near tip of the inflorescence and germinate in five to seven hours. Fungus grows rapidly during cloudy weather accompanied with heavy morning mist. Warm, humid weather and low night temperatures favour dissemination of the pathogen. Overall disease development is favoured by high humidity.

**Management**

Dusting the plants with fine sulphur (250-300 mesh) at the rate of 0.5 kg/tree. The first application may be soon after flowering, second 15 days later (or) spray with Wettable sulphur (0.2%), (or) Carbendazim (0.1%),(or) Tridemorph ( 0.1%),(or) Karathane (0.1%).

**Mango malformation : *Fusarium moliliforme var. subglutinans***

**Symptoms**

Three types of symptoms: bunchy top phase, floral malformation and vegetative malformation. In bunchy top phase in nursery bunching of thickened small shoots, bearing small rudimentally leaves. Shoots remain short and stunted giving a bunchy top appearance. In vegetative malformation, excessive vegetative branches of limited growth in seedlings. They are swollen with short internodes forming bunches of various size and the top of the seedlings shows bunchy top appearance. In malformation of inflorescens, shows variation in the panicle. Malformed head dries up in black mass and persist for long time. Secondary branches are transformed into number of small leaves giving a witches broome appearance.

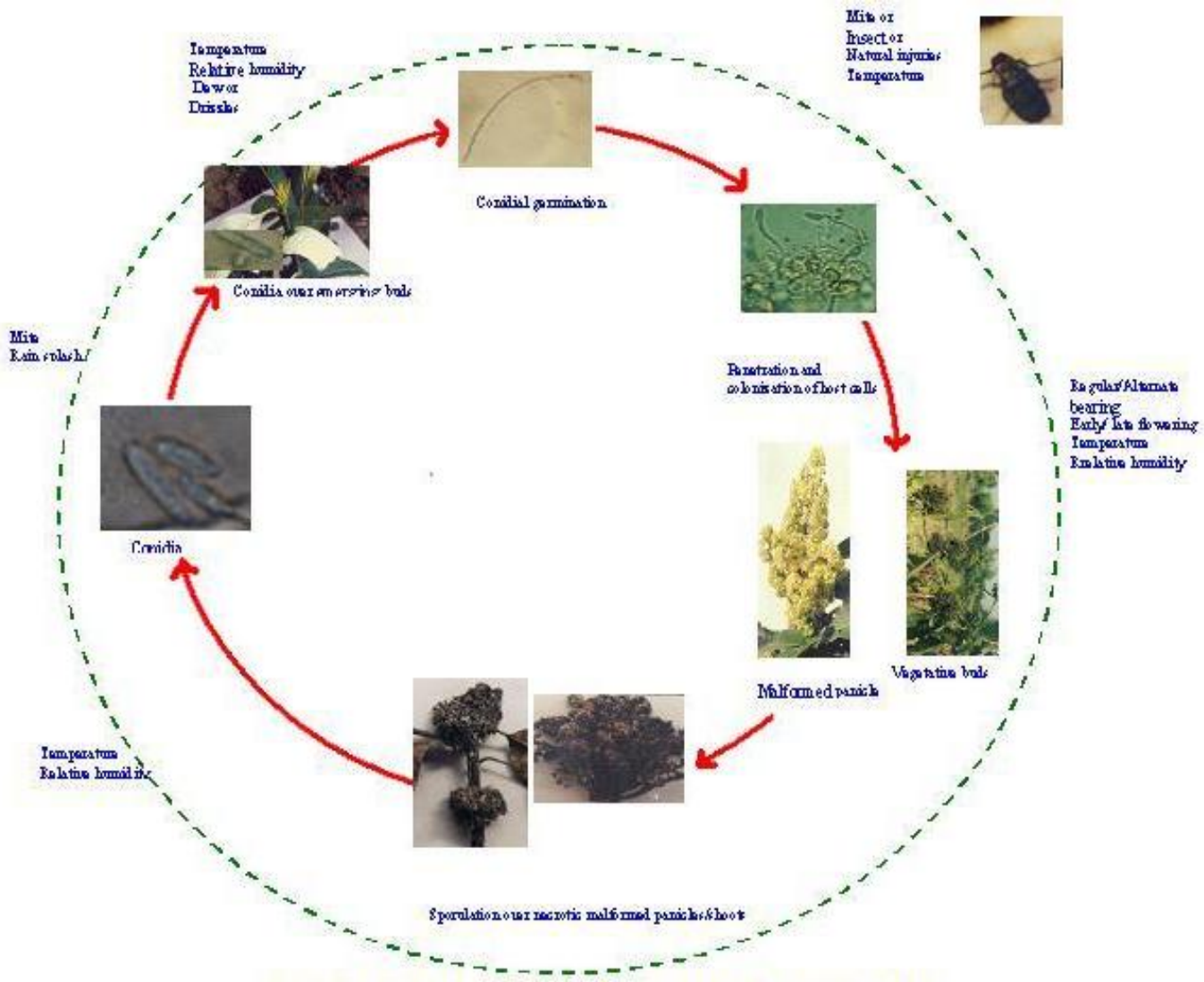
**Pathogen**

Micro conidia are one or 2 celled, oval to fusiform and produced from polyphialides. Macro conidia are rarely produced. They are 2 -3 celled and falcate. Chlamydospores are not produced.

Mode of spread

Diseased propagatives materials.

**Disease Cycle**




**Management**

Diseased plants should be destroyed .Use of disease free planting material. Incidence reduced by spraying 100-200ppm NAA during October. Pruning of diseased parts along the basal 15-20 cm apparently healthy portions. This is followed by the spraying of Carbendazim (0.1%) or Captafol (0.2%).

**Stem end rot:** *Diplodia natalensis*

**Symptoms**

The dark epicarp around the base of the pedicel. In the initial stage the affected area enlarges to form a circular, black patch. Under humid atmosphere extends rapidly and turns the whole fruit completely black within two or three days. The pulp becomes brown and somewhat softer. Dead twigs and bark of the trees, spread by rains

**Pathogen**

The fungus produces brown to black, globose to sub globose, pyriform, erumpent pycnidia that are ostiolate. They are 120-155x370-465 micron meter. Two types of conidia are produced within a pycnidium. One is hyaline, thin walled and unicellular.Tha another one is thick walled and bicelled with four to six longitudinal striations.

**Mode of spread and survival**

The fungus persists in infected plant parts which serve as source of inoculum.

**Management**

Prune and destroy infected twigs and spray Carbendazim or Thiophanate Methyl(0.1%) or Chlorathalonil (0.2%) as fortnightly interval during rainy season.

**Red-rust:** *Cephaleuros virescens*

**Symptoms**

Algae attacks foliage and young twigs. Rusty spots appear on leaves, initially as circular, slightly elevated, coalesce to form irregular spots. The spores mature fall off and leave cream to white valvet texture on the surface of the leaves.

**Pathogen**

*Cephaleuros virescens* after a period of vegetative growth develops its reproductive structures.Sporangia formed directly on the thallus are sessile and thick walled with orange pigments. hey are formed singly on the vegetative filaments. When the sporangia are riped the con tents are converted into Zoospores and liberated through an opening in the wall. The Zoospores are orange in colour, ovoid and swim actively by means of cilia.

**Management**

Bordeaux mixture (0.6%) or Copper oxychloride 0.25%

**Grey Blight :** *Pestalotia mangiferae*

**Symptoms**

Brown spots develop on the margin and at the tip of the leaf lamina. They increase in size and become dark brown. Black dots appear on the spots which are acervuli of the fungus. Survive on mango leaves for over a year. Spreads through wind borne conidia. Heavy infection is noticed during the monsoon when the temperature is 20-25˚C and high humidity.

**Pathogen**

Acervuli seen as minute black dots on affected portion. Mycelium is colored and septate. Conidia five celled middle three cells are colored and the end cells are hyaline Slender 3-5 appendages are produced at the apex of the spore.

**Mode of survival and spread**

Survive on mango leaves for over a year. Spreads through wind borne conidia.

**Favourable conditions**

Heavy infection is noticed during the monsoon when the temperature is 20-25˚C and high humidity.

**Management**

Remove and destroy infected plant parts. Spraying copper oxychloride 0.25 Mancozeb 0.25% or Bordeaux mixture 1.0%.

**Sooty mould :** *Capnodium mangiferae*

**Symptoms**

The fungi produce mycelium which is superficial and dark. They row on sugary secretions of the plant hoppers. Black encrustation is formed which affect the photosynthetic activity. The fungus grows on the leaf surface on the sugary substances secreted by jassids, aphids and scale insects.

**Favourable conditions**

The fungus grows on the leaf surface on the sugary substances secreted by Jassids,Aphids and scale insects.

**Management**

Management should be done for insects and sooty moulds simultaneously. Controlling of insect by spraying systemic insecticides like Monocrotophos or methyl dematon .After that spray starch solution (1kg Starch/Maida in 5 litres of water. Boiled and dilute to 20 liters) .Starch dries and forms flake which are removed along with the fungus.