



B.Sc. Third Year, Semester - V
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Plant Pathology Unit-2

5) Cash crops

d) Angular leaf spot of cotton



Dr S. S. Patale

Associate Professor
Department of Botany

Smt. S. K. Gandhi Arts, Amolak Science
and P.H. Gandhi Commerce, Kada Dist. Beed
Email- sspatale@rediffmail.com Ph. 9823937501

d) Angular leaf spot of cotton

Causal organism: *Xanthomonas campestris*
pv malvacearum

Host: *Gossypium* spp (cotton)

Distribution

The disease was first reported in Alabama, U.S.A. in 1891 and now known to occur in all major cotton growing regions of the world. From India, the disease was first reported from Madras in 1918 and now occurs in Maharashtra, Madhya Pradesh, Andhra Pradesh, Tamil Nadu and Uttar Pradesh. Annual losses due to the disease in India range from 5% to 25%.



Symptoms:



Symptoms:

The pathogen attacks aerial parts of plant at different stages of growth. On seedling certain symptoms develops as dull green flaccid areas from the periphery of leaves, elongate water soaked dark brown area on leaf and yellowing of leaves as well as tip rotting. Cotyledons become dry and wither and leave collapse and die. The bacterium invades in all tissues of every part.

In adult plants, the leaves attacked first, and the earliest symptoms are the appearance of water soaked spots on the lower surface. These spots enlarge, turn brown and form angular dead areas bounded by veinlets, ands become visible on the upper surface. On the stem, there appear elongate grayish to black lesions (black arm). In severe infection, there is deep cracking. Similar lesions may also develop on petiole and fruiting branches. On the bolls, there may develop small, round water soaked spots that turn brown later.

Causal organism and disease cycle:

The disease is caused by *Xanthomonas campestris* pv *malvacearum* the bacterium is Gram-negative, rod shaped, 1.2×0.9 μm , with single polar flagellum, singly or in pairs, rarely in chains, non spore forming, facultative aerobe. Optimum temperature for growth is 31° to 32°C and thermal death point is 50°C .

Seeds, trash and self sown infected seeds have been shown to carry over the infection from one season to another. The pathogen remained active in dried leaves for 17 years and could survive for eight days in water suspension as well as in both moist and air dried soil at 21° to 33°C . The main source of primary infection is seed which may carry the pathogen both externally and internally. Plant debris may also form as important source of infection, especially in areas where cotton is grown as continuous crop. Other source is self sown infected seeds. High humidity and moderate temperature (28°C) favour the disease.

Causal organism and disease cycle:

Two pests of cotton, *Earias* spp and *Dysdercus koenigii* are also known to transmit the disease mechanically. Besides this, a large number of plants are also known as collateral hosts of the pathogen, though their role in disease cycle is yet to be defined.

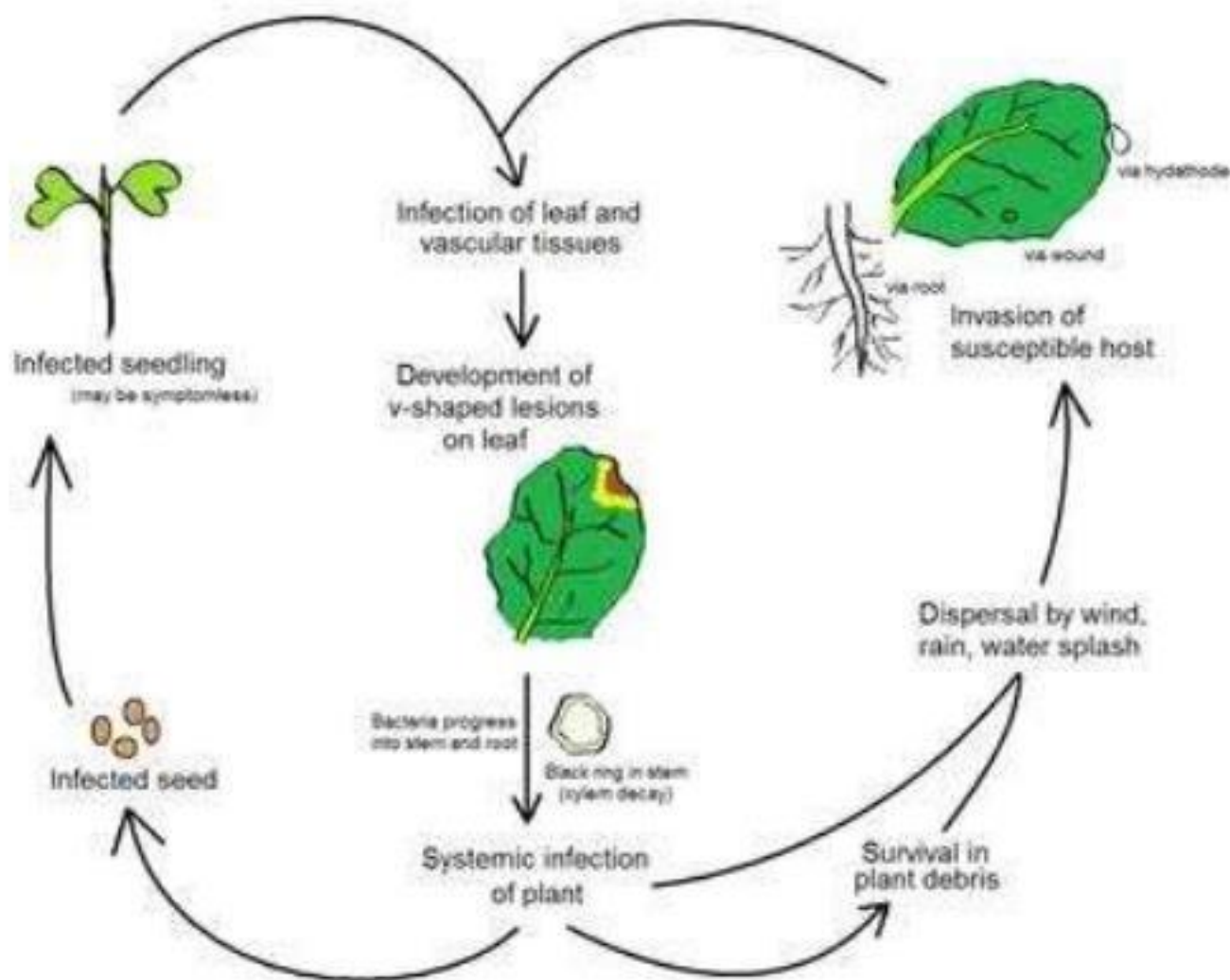


Fig:- Disease Cycle of Angular Leaf Spot

Control measures:

- **Removal and destruction of diseased plant debris.**
- **Deep ploughing after harvest reduces the survival of pathogen.**
- **Destruction of collateral hosts, crop rotation, late sowing, early thinning, good tillage, early irrigation also reduce disease incidence.**
- **Seed treatment: Immersing seeds in sulphuric acid for 10-15 min, rinsed by water and finally drying and treating them with Agrosan GN, Cerasan etc. Seed dressing with oxycarboxin and carboxin have been recommended (2kg/kg seed). These can be used as foliage sprays (1.5-2.0kg/ha). Three sprays first at 4-6 week old crop and subsequent sprays at 10 to 15 days intervals.**
- **Disease resistant varieties: 101-102B, BJA-592, P-14-T-128, Reba-B.50, HG-9, Tamcot-CAMD-E and BJR.**

Thank you