



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

5) Cash crops

c) Citrus Canker



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

c) Citrus Canker

Causal organism: *Xanthomonas citri*

Host: *Citrus* spp (lemon)

Distribution

Citrus canker is bacterial disease is widespread threat in all the citrus growing areas of the world. The disease said to have originated from China. It was spread to Europe and U.S.A. The disease still quite serious in India, China, Japan and Java. The disease attacks most of the varieties of citrus.

Symptoms:



Symptoms:

Leaves, twigs as well as fruits are attacked, developing necrotic brown spots with a coarse surface. On young leaves, in the beginning lesions appear as small white specks. Soon the lesions become discernible after few weeks they develop in to brown necrotic spots of 1 to 2 mm in diameter. The lesions become raised forming a spongy white eruption. As the lesion enlarges further the spongy eruption begins to collapse and brown depressions appear in their central portion forming a crater like structure. The margin of the lesions remains to be raised above the surface of the host tissue. As the disease progresses, the central portion of the lesion becomes grayish white, hard and appear as corky.

Symptoms:

Yellow haloes are formed around such mature and advanced lesions. More or less similar lesions develop on twigs and fruits. The lesions are 1 to 9 mm in diameter on leaves and up to 1 cm in diameter or length on twigs and fruits. When lesions develop on midrib or petiole, the leaf is more likely to defoliate. The lesions may enlarge rapidly and coalesce encircling the entire twig. The canker lesions develop due to hypertrophy and limited hyperplasia in parenchymatous tissues. The lesions consist primarily of hypertrophied cells, with a small number of hyperplastic cells along its margin.

Causal organism and disease cycle:

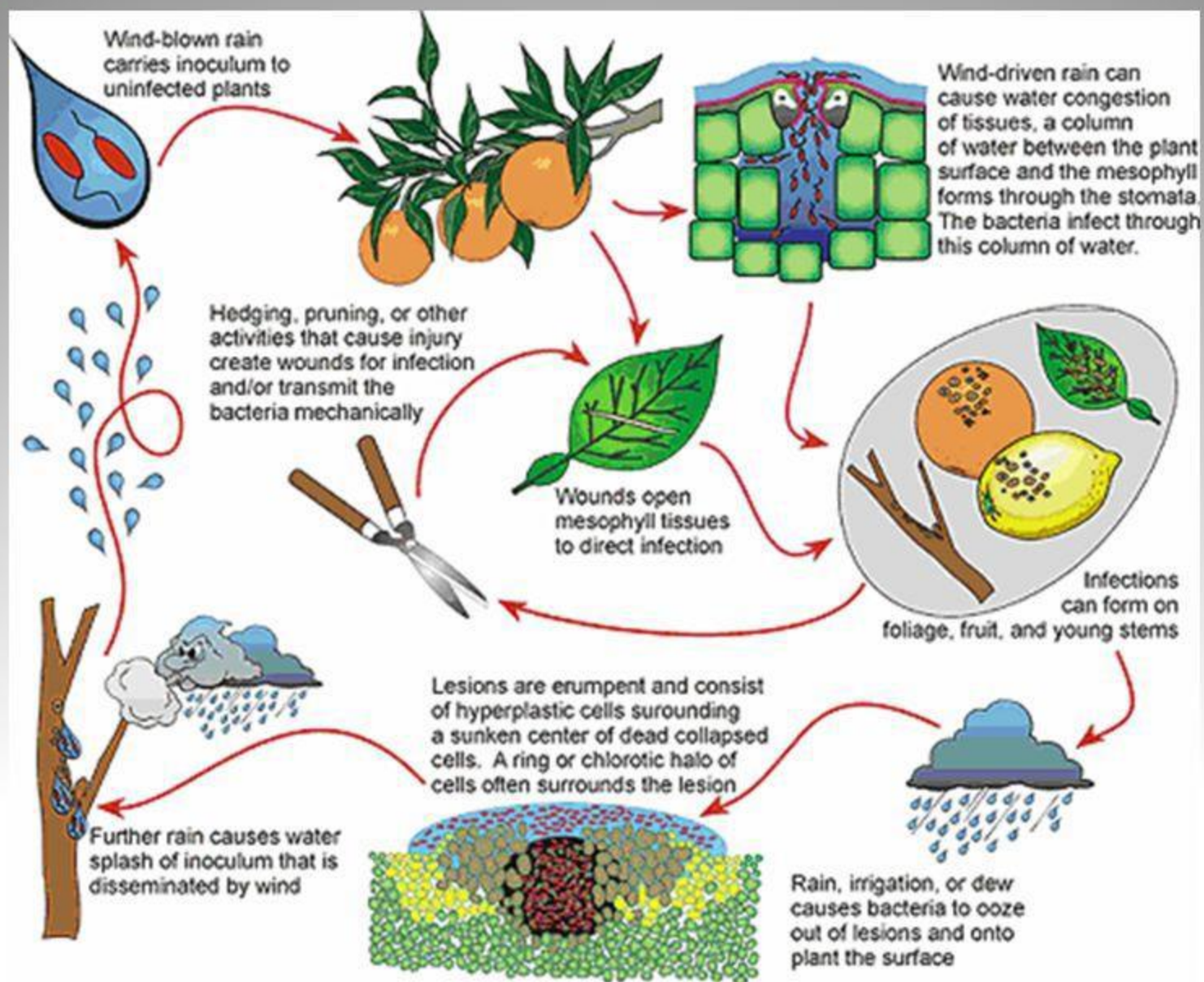
The disease is caused by *Xanthomonas citri*. The bacterium overseasons chiefly in leaf, twig and fruit canker lesions, and if splashed onto young tissue this enters them through stomata or wounds. Old tissues are penetrated only through wounds. Several cycles of infection can occur on fruits, and thus fruits have lesions of different sizes. Free moisture and strong winds often favour the spread of the disease.

The cells are Gram-negative, straight rods, measuring 1.5-2.0 μm $\times$ 0.5-0.75 μm , with a single polar flagellum; in chains, with capsules; non-spore forming, and aerobic. The bacterium is not able to survive saprophytically. This has been shown to be due to antagonism of other soil microbes to this bacterium under natural conditions. It can survive hardly for 2-3 months in lesions of diseased defoliated leaves only under dry conditions. The bacterium could be detected on the surfaces of some weeds growing in citrus groves.

Causal organism and disease cycle:

The bacterium survives chiefly in parasitic form in holdover cankers on leaf and twig, as well as in bark tissues for long periods. The bacterium enters through stomata and wounds. Disease is favoured by mild temperatures and wet weather. The bacteria from the cankers are mostly disseminated by driving rains and by insects such as citrus leaf miners (*Phyllocnistis citrella* and *Thosconyrsa citr/*). However, the chief agent of dissemination and introduction in to new localities is man himself who transfers the disease through infected nursery stock.

THE LIFE CYCLE:



Control measures:

To combat the disease following measures can be suggested.

- 1. Eradication: This is accomplished by removing the trees with advanced infection and burning them.**
- 2. Pruning: The infected trees may be cured by removing the diseased foliage and branches with pruning scissors and then spraying the trees with 1% Bordeaux mixture at regular intervals.**
- 3. The use of disease free nursery stock for planting.**
- 4. The fallen infected leaves and twigs should be collected and burnt.**
- 5. Spraying: spraying with Bordeaux mixture and lime sulphur is useful measure. It should be done during the first three months after the beginning of fruit formation. Spraying should commence before the onset of rains and repeated during rainy season.**
- 6. Citrus nurseries should be raised in places away from the regions of heavy and protracted rainfall.**
- 7. The disease can be checked by periodic sprays with Streptomycin sulphate at 500 ppm.**

Thank you