

TOPIC:WILT OF COTTON

SUBJECT: BOTANY

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Wilt of Cotton

Cotton is the most important fibre crop in India. Asiatic varieties of cotton are *Gossypium arboreum* L. and *G. herbaceum* where as exotic or American variety is *G. hirsutum*.

Over 20 diseases of microbial native have been reported on cotton in India and wilt of cotton is one of them.

Wilt is one of major disease of cotton, found wherever this crop is grown. It is believed to have originated in Mexico or Central America.

In India the disease was reported from Maharashtra, Tamil Nadu, Karnataka and other states. The fungus also infects the other hosts like pigeon pea, brinjal, chilli, tobacco and ladies finger. Several hundred plant species are susceptible, including economically important food crops such as sweet potatoes, tomatoes, legumes, melons, and bananas.

Symptoms:

- Earliest -seedling is the yellowing and browning of the cotyledons.
- The disease appears at all the stages of plant growth.
- In seedling stage, there is yellowing of cotyledons, browning of petioles, followed by death and falling of affected leaves.
- In young and adult plants, there is loss of turgidity, drooping of leaves and tender shoots, yellowing, browning and finally death of the plants.
- The tap root become stunted and laterals are less abundant.
- Browning and blackening of vascular tissues.
- Discoloration of leaves starts from the margins and spread towards midribs.
- Wilting may be complete or partial.
- Wilt is restricted to black cotton soils with pH 7.6-8.00. It is rare in light to loam soils.



Figure: Yellowing and drying of leaves



Figure: Vascular discolouration

Etiology: Causal organism : *Fusarium oxysporum* f.sp. *Vasinfevtum*

Systemic position:

Kingdom: Fungi

Phylum: Ascomycota

Subphylum: Pezizomycotina

Class: Sordariomycetes

Subclass: Hypocreomycetidae

Order: Hypocreales

Family: Nectriaceae

Genus: *Fusarium*

Species: *Fusarium oxysporum* f.sp. *Vasinfertum*

The fungus is present both inter and intra cellularly in the host tissue. The mycelium plugs the xylem vessels partially or completely. The macro conidia are 1-5 septate, hyaline, thin walled, linear to falcate with tapering ends. The micro conidia are hyaline, thin elliptical to spherical, single or two celled.

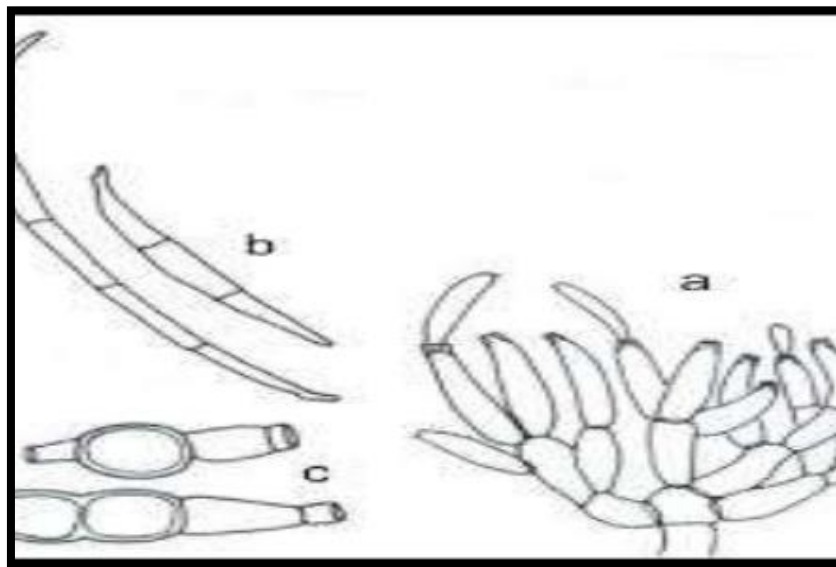


Figure: a)Microconidia; b)Macroconidia; c)Chlamydospores

Disease cycle:

Fungus can survive in soil as saprophyte for many years. Secondary spread may be through wind, water and other physical and biological agents. *Fusarium oxysporum* grows and develops at temperature from 10-35°C. The disease cycle is graphically represented here.

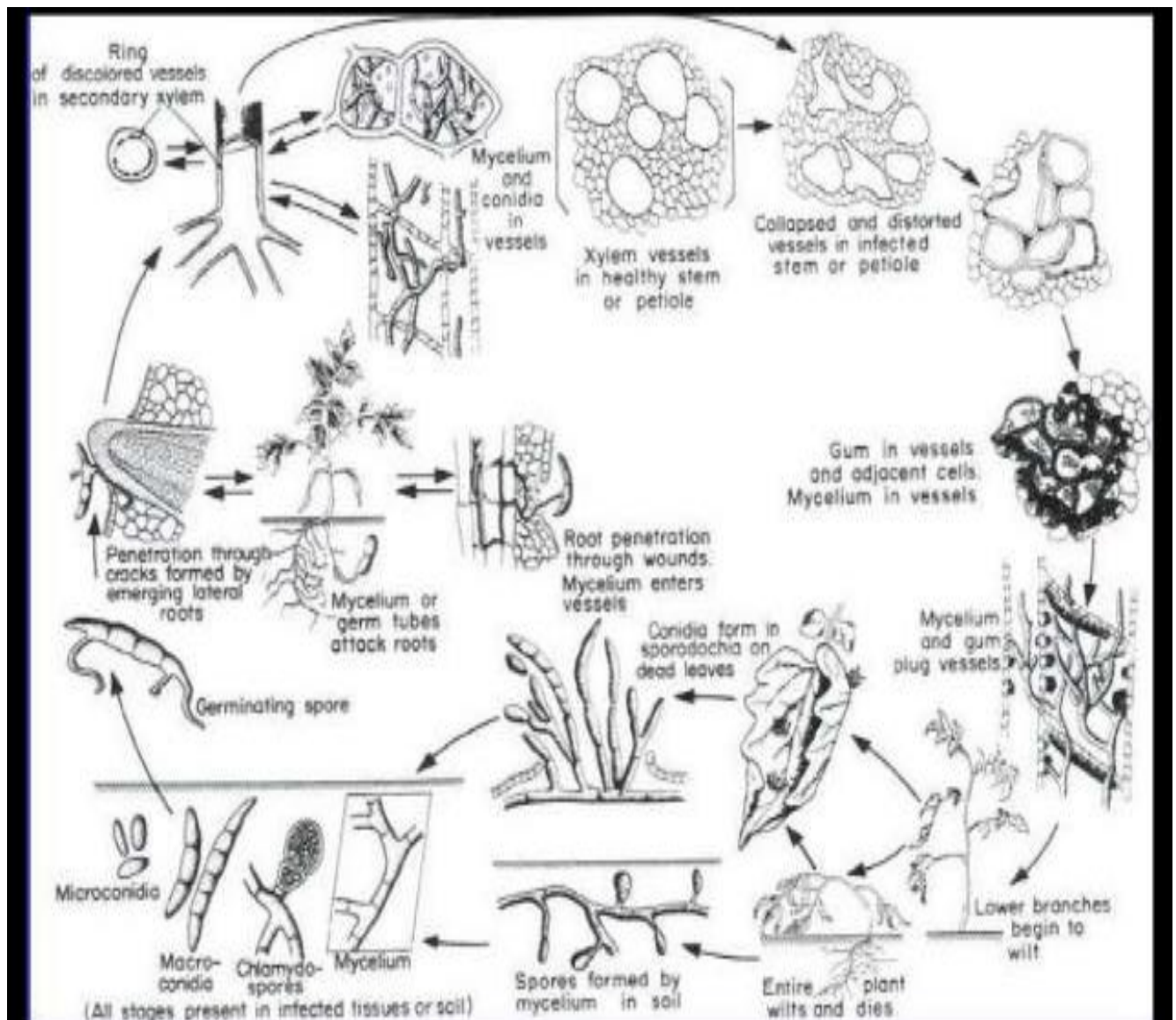


Figure: *Fusarium oxysporum* life cycle

Control measures:

- Field sanitation, crop rotation and mix cropping are useful for reducing the disease.

- Use of resistant varieties like *G. arboreum* and *G. herbaceum* are susceptible whereas *G. hirsutum* and *G. barbadense* are immune.
- American varieties are resistant to wilt in India.
- Complete destruction of diseased plant debris.

References:

- http://agropedia.iitk.ac.in/sites/default/files/uas%20raichur/Fusarium%20wilt_Cotton2.jpg
- http://agropedia.iitk.ac.in/sites/default/files/Fusarium%20wilt_Cotton1.jpg

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