



Fusarium wilt in cotton

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ABOUT THE STUDY

Fusarium wilt of cotton, caused by the fungus, *Fusarium oxysporum f. sp. vasinfectum Race 4* (FOV4). Macroconidia are 1 to 5 septate, hyaline, thin walled, falcate with tapering ends. The microconidia are hyaline, thin walled, spherical or elliptical, single or two celled. Chlamyospores are dark coloured and thick walled. The fungus also produces a vivotoxin, Fusaric acid which is partially responsible for wilting of the plants.

SYMPTOMS

The disease affects the crop at all stages. The earliest symptoms appear on the seedlings in the cotyledons which turn yellow and then brown. The base of petiole shows brown ring, followed by wilting and drying of the seedlings. In young and grown up plants, the first symptom is yellowing of edges of leaves and area around the veins i.e. discoloration starts from the margin and spreads towards the midrib. The leaves lose their turgidity, gradually turn brown, droop and finally drop off. Symptoms start from the older leaves at the base, followed by younger ones towards the top, finally involving the branches and the whole plant. The defoliation or wilting may be complete leaving the stem alone standing in the field. Sometimes partial wilting occurs; where in only one portion of the plant is affected, the other remaining free. The taproot is usually stunted with less abundant laterals.

FAVOURABLE CONDITIONS

Soil temperature of 20-30°C. Hot and dry periods followed by rains. Heavy black soils with an alkaline reaction. Increased doses of nitrogen and phosphatic fertilizers. Wounds caused by nematode (*Meloidogyne incognita*) and grubs of Ash weevil (*Myllocerus pustulatus*).

DISEASE CYCLE

The fungus can survive in soil as saprophyte for many years and chlamyospores act as resting spores. The pathogen is both externally and internally seed-borne. The primary infection is mainly from dormant hyphae and chlamyospores in the soil. The secondary spread is through conidia and chlamyospores which are disseminated by wind and irrigation water.

MANAGEMENT

Treat the acid delinted seeds with Carboxin or Carbendazim at 2 g/kg. Remove and burn the infected plant debris in the soil after deep summer ploughing during June-July. Apply increased doses of potash with a balanced dose of nitrogenous and phosphatic fertilizers. Apply heavy doses of farm yard manure or other organic manures. Follow mixed cropping with non-host plants. Grow disease resistant varieties of *G. hirsutum* and *G. barbadense* like Varalakshmi, Vijay Pratap, Jayadhar and Verum. Spot drench with Carbendazim 1g/litre.

Rotation to any crop other than cotton prevents an increase in the soil population of *Fusarium* but may not significantly reduce the number of spores in the soil. The fungus will sustain itself on the roots of most plants, including weeds (without causing any symptoms), and cannot be eliminated by crop rotation alone. Always use *Fusarium*-free seed produced in disease-free fields at all times. Avoid moving gin trash that originated in infested cotton fields to noninfested fields. Any field operation that moves soil from one location to another can spread spores of the fungus and introduce it to other fields.