Sunflower XIV

Verticillium Wilt

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Identification and Life Cycle

Verticillium wilt is caused by the soilborne fungus *Verticillium dahliae* and possibly *V. albo-atrum*. Infection occurs when soilborne microsclerotia germinate and penetrate sunflower roots. The fungus grows into the plant's vascular system, producing numerous microsclerotia that spread throughout the entire vascular system and all parts of the plant. Growth of the fungus throughout the vascular system occludes the water-conducting tissues, causing wilting even in the presence of abundant soil moisture. Microsclerotia formed in dead and dying tissues are returned to the soil during tillage operations. The pathogen can be disseminated in and among fields in surface irrigation water and by the movement of infested soil. The Verticillium wilt pathogens survive between sunflower crops in the soil as dormant microsclerotia, and pathogenically on weeds and other crops such as potato, cucurbits, strawberry, and others.

Plant Response and Damage

Verticillium wilt symptoms can be present on individual plants or groups of plants in a field. Disease symptoms first appear on older plants, generally after the six-leaf stage. A mottling of the lower leaves becomes apparent, but disease symptoms progress up the plant as plants near maturity. Tissue between leaf veins become yellow, then brown, giving diseased leaves a mottled appearance. Diseased leaves eventually wilt, become completely dry, and die. A blackening of the stems is often apparent, especially near the soil line. Infected plants are stunted and mature early or die before flowering. The vascular system of infected stems is brown to black when cut in cross section.

Management Approaches

Biological Control

Incorporation of green residues of sudan grass and broccoli can reduce Verticillium wilt losses if large populations of microsclerotia are not present.

Cultural Control

Plant seed free from the Verticillium wilt pathogen. Avoid fields with a known history of Verticillium wilt. Practice long rotations (greater than 5 years) between sunflower and other susceptible hosts. Resistant hybrids are available and should be planted if the disease is known to be present at damaging levels.

Chemical Control

No fungicides are registered for Verticillium wilt control.

Categories: Sunflower, Disease, Verticillium Wilt

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