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Fusarium Stem Rot of Greenhouse Peppers[1]

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Fusarium stem rot of greenhouse peppers was first reported in greenhouse operations in Canada and Great Britain in 1994. The first report of the disease in Florida greenhouses was in 1999. Up to 40% of the plants in the affected greenhouse range were infected in that outbreak. Although no fruit symptoms were observed, wilting and death of the upper portions of the plant resulted in severe yield losses.

The Pathogen

Species within the genus Fusarium cause diseases of many vegetable crops. The causal organism of Fusarium stem rot of peppers is *Fusarium solani*. The fungus belongs to the class Pyrenomycetes within the Phylum Ascomycota.

The vegetative stage of *F. solani* is characterized in culture by whitish mycelial growth and by crescent shaped macroconidia. The sexual stage of the pathogen is *Nectria haematococca* and is typified by dark red, spherical perithecia (ascoscarps) (Figure 1). Neither the mycelium nor the perithecia are obvious on diseased plants.

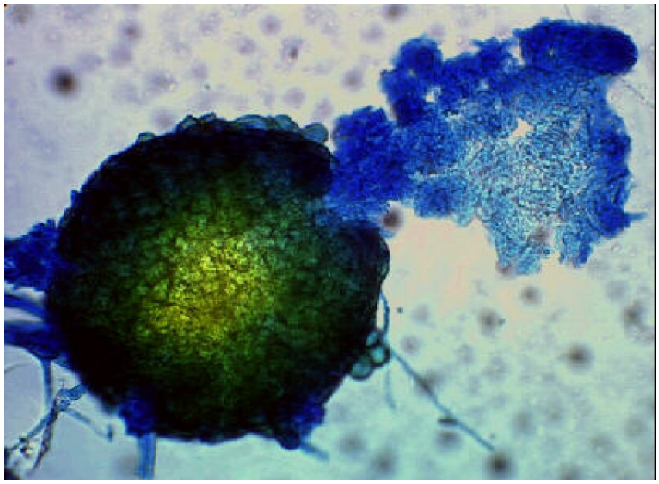

Figure 1. Perithecium of *Nectria haematococca* with extruding ascospores

Symptoms

In greenhouse peppers, the first disease symptom observed is a black lesion on the stem at a node where the plant has been pruned or from which fruit has been harvested (Figure 2 and Figure 3).

Wounds or openings in the stem provide entry sites for the fungus. The lesions increase in length

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Figure 2. Lesion occurring at pruning site near base of the stem

Figure 3. Lesion occurring at harvest site on upper node

and width until they girdle the stem, causing the plant parts above the lesion to wilt and die (Figure 4). Leaves below the lesion do not wilt.

Plants that are infected early in the production season have lesions near the base of the stem while those that are infected later in the season are more likely to have lesions at upper nodes. The number of infected plants and the severity of disease symptoms increase throughout the growing season. Although fruit damage was reported in Canada and Great Britain, no fruit symptoms were reported in Florida.

Figure 4. Wilt caused by Fusarium stem rot in greenhouse pepper

However, wilted plants and branches produced no fruit, reducing yields. Fusarium stem rot has not been reported as a problem in field grown peppers.

Control

Sanitation measures offer the best control at this time. Removal and disposal of infected branches or plants during the cropping season reduce the inoculum in the greenhouse and spread of the disease. Using a sharp knife for pruning or harvesting is reported to reduce disease spread by promoting rapid healing of wounds.

Between crops, the greenhouse should be thoroughly cleaned. All crop debris should be removed and all surfaces should be cleaned with a 1% bleach spray. Torn plastic covering the soil should be replaced. The fungus may be carried into the greenhouse on the rockwool cubes of the transplants so maintaining a clean transplant production area is also important.

No fungicides have been labeled for control of Fusarium stem rot of pepper in the greenhouse. Controlled inoculation of cultivars 'Cubico', 'Kelvin' and 'Triple 4', and observation of cultivars 'Kelvin', 'Cubico' and 'Grizzly' in a commercial greenhouse did not suggest differences in susceptibility of cultivars to the fungus.

Controlled temperature studies show that the rate of disease development is greater at higher temperatures. Keeping the greenhouse cooler could reduce losses due to the disease, although greenhouse cooling in Florida is very difficult. High relative humidity also encourages spread of the disease so

increasing air movement in the greenhouse will slow the spread of the disease.