College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-AG-T-03**

Collar Rot in the Tobacco Float System

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Importance

Collar rot can be found in tobacco float beds each year in Kentucky, causing a great deal of concern when it makes its appearance. Severe losses to this disease tend to be rare but can occur if care is not taken to minimize risk of disease development and reduce spread after it appears.

Symptoms & Signs

The first symptoms of collar rot are small, dark green, water-soaked lesions that appear at the bases of stems. In most cases, these symptoms are not noticed because initial infections often occur when the canopy closes. Generally, most growers notice collar rot when cankers on lower stems result in yellowing (chlorosis) of older leaves, wilting of plants, or flagging of leaf tips (Figure 1). When clusters of infected transplants collapse, open holes form in the plant canopy (Figure 2). Stems of affected seedlings generally show a wet necrosis that is amber to brown in color, extending upward from the bases of plants (Figure 3).

Signs of the causal fungus may be present on symptomatic plants or on debris in float trays. These include a white, cottony fungal mass (mycelium), which is present if humidity is high. Irregularly shaped, black sclerotia (Figure 4), which resemble seeds or rodent droppings, are the primary survival structure of the pathogen and become apparent in later stages of disease development. Sclerotia are the primary source of disease-causing inoculum in subsequent years.

Figure 1. Early symptoms of collar rot include yellowing of leaf tips and flagging of older leaves.

Cause & Disease Development

Collar rot is caused by the fungus, *Sclerotinia sclerotiorum,* which has the ability to infect over 300 different types of plants, including common weeds. Depending on when the first spores are introduced, disease usually develops in float beds around 5 weeks after seeding. Resting structures (sclerotia) of the collar rot pathogen, normally occurring outside the greenhouse, come out of their dormant state and produce cup-shaped fruiting bodies called apothecia. Apothecia release spores (ascospores) that are dispersed on wind currents. When ascospores land on plants, they germinate if sufficient moisture and

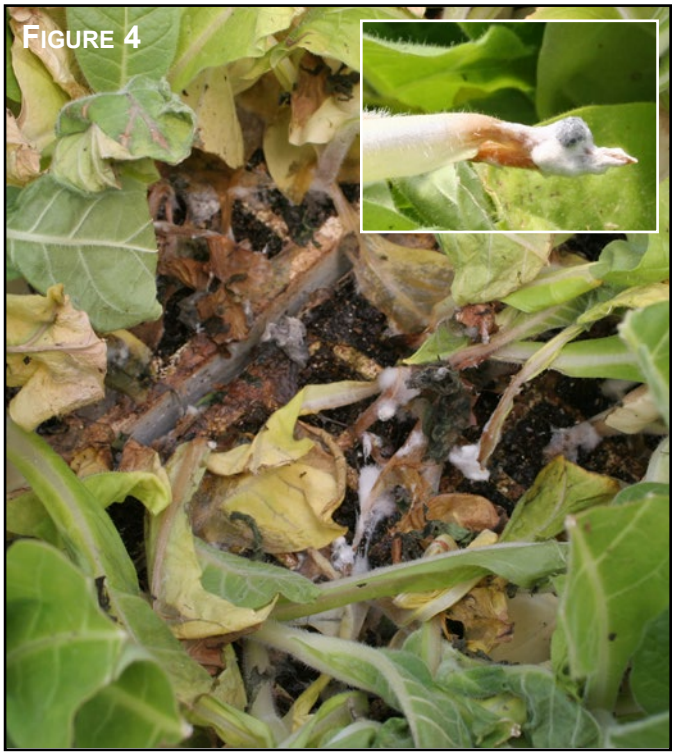

FIGURE 2. COLLAPSE OF CLUSTERS OF PLANTS RESULTS IN SOFTBALL-TO-GRAPEFRUIT-SIZED OPENINGS IN THE PLANT CANOPY.
FIGURE 3. STEMS INFECTED BY *S. SCLEROTIORUM* TYPICALLY ARE WATER-SOAKED AND EXHIBIT A DARK-BROWN NECROSIS.
FIGURE 4. SIGNS OF THE COLLAR ROT PATHOGEN INCLUDE DENSE, WHITE FUNGAL GROWTH AND BLACK, IRREGULAR SCLEROTIA RANGING FROM THE SIZE OF A MUSTARD SEED TO A RAISIN (INSET).

any type of wound is present. Germinated ascospores produce hyphae (fungal "threads") that penetrate tissue and begin the infection process.

The causal fungus first colonizes dead and dying plant material, especially plant clippings that are not removed from the top of the canopy. Under cool, humid conditions, fungal mycelium grows cell-to-cell out of these tissues to nearby healthy plants. This is one of the ways that secondary spread of the collar rot pathogen takes place, since it does not produce airborne spores on plants infected during that season. Secondary spread can also occur through dispersal of infected tissue, which can happen when plants are clipped.

The first collar rot infections usually occur on plants that are 5 to 7 weeks old. This often happens after the first plant clipping following a period of disease-favorable weather. Cool temperatures (60° to 75°F), high humidity, and overcast conditions are ideal for disease development.

Disease Management

Cultural Practices

Sound cultural practices are the most important options that a grower can use to fight collar rot.

- Adequate ventilation and air circulation, which limit the duration of leaf wetness, will reduce initial infections and spread.
- Growers should manage temperatures to promote healthy plants and minimize injury. Injured plants are more susceptible to *S. sclerotiorum*.
- Fertility should be maintained around 100 parts per million (ppm) nitrogen; excessive levels of nitrogen can lead to a lush, dense canopy that will increase humidity and take longer to dry.
- Leaf clippings should not be allowed to build up in transplant trays or remain in contact with seedlings. Mow seedlings at a low engine speed with a very sharp blade to ensure complete removal (and capture) of leaf pieces while minimizing injuries. Frequent mowing results in less leaf material left on surfaces of transplant trays and less severe wounds. The collar rot pathogen can overwinter on clippings and diseased plants, so these should be discarded (at least 100 yards from the transplant facility) or buried to reduce the chance of spores being blown into nearby float beds.
- Maintain a weed-free zone around float beds.
- Home gardens and vegetable crops should not be planted near transplant facilities.

Fungicides

There are no fungicides labeled specifically for control of Sclerotinia collar rot on tobacco transplants, making this a difficult disease to manage chemically. However, using a routine fungicide program for target spot (based on using regular mancozeb fungicide applications and one application of azoxystrobin) should help protect plants from initial collar rot infections.

Additional Resources

The following University of Kentucky publications are available at County Extension offices, as well as on the Internet.

- Fungicide Guide for Burley and Dark Tobacco, PPFS-AG-T-08
http://plantpathology.ca.uky.edu/files/ppfs-ag-t-08.pdf
- Kentucky-Tennessee Tobacco Production Guide, ID-160 (1.6 MB)
http://www2.ca.uky.edu/agcomm/pubs/id/id160/id160.pdf

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