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Plant Pathology Fact Sheet

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; it causes a great deal of concern when it makes its appearance. Severe losses to this disease are rare, but they can occur if care is not taken to minimize the risk of disease development and prevent further spread after it does appear.

Symptoms and Signs

The first symptoms of collar rot are small, dark green, water-soaked lesions that appear at the bases of stems; however, these symptoms are not commonly seen. In most cases, this disease becomes apparent when cankers on lower stems result in chlorosis of older leaves and subsequent wilting of plants or flagging of leaf tips (Figure 1). When clusters of infected transplants collapse, there are open holes formed in the plant canopy (Figure 2). These clusters, or "foci," are usually grapefruit-sized (4 to 6 inches in diameter). Stems of affected seedlings generally show a wet necrosis that is amber-to-brown in color, beginning at the base of the plant and extending upward (Figure 3). Signs of the causal agent may be present on symptomatic plants or on debris in float trays. These signs include a white, cottony mycelium (fungal mass) which is present if humidity is high, and irregularly shaped, black sclerotia (Figure 4). Sclerotia resemble seeds or rodent droppings and are the primary survival structure of the pathogen. They are also the primary source of inoculum for outbreaks in subsequent years.

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

Plants that are 5 to 7 weeks old are most susceptible to collar rot. We often see the first cases shortly after plants are first clipped following a period of disease-favorable weather. Cool temperatures (60º to 75º F), high humidity, and overcast conditions are ideal for development of this disease.

FIGURE 2. COLLAPSE OF CLUSTERS OF PLANTS LEAVES SOFTBALL- TO GRAPEFRUIT-SIZED OPENINGS IN THE PLANT CANOPY.

FIGURE 3. STEMS INFECTED BY *SCEROTINIA 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.

It is also important to note that the causal fungus is an efficient colonizer of dead plant matter, as well as weakened or injured tissue; these are usually the first to be attacked. The fungus will then move from these areas to nearby healthy plants as long as cool temperatures and high humidity prevail. This is one of the ways that secondary spread of the collar rot pathogen takes place, since it does not produce airborne spores on infected tissue. The other way in which secondary spread can occur is through dispersal of infected tissue, which happens when infected plants are clipped.

CAUSE AND DISEASE DEVELOPMENT

Collar rot is caused by the fungus *Sclerotinia sclerotiorum*. This disease begins to appear in float beds around 5 weeks after seeding. Resting structures (sclerotia) of the collar rot pathogen, normally located outside the float system, come out of their dormant state and produce cup-shaped fruiting bodies called apothecia. Apothecia then produce spores (ascospores) that are dispersed on air currents. When ascospores land on susceptible tissues, they germinate if sufficient moisture is present. Long periods of leaf wetness (greater than 16 hours) are required for this process. Germinated ascospores produce hyphae (fungal “threads”) that penetrate tissue and begin the infection process.

DISEASE MANAGEMENT

Fungicides

There are no fungicides labeled specifically for control of Sclerotinia collar rot on tobacco transplants, making this a difficult disease to manage. We do know, however, that using a routine fungicide program for target

spot, based on mancozeb fungicides and one application of Quadris, will help reduce overall stress that can contribute to collar rot later in the season.

Cultural practices

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

- Adequate ventilation and air circulation are the primary concerns since these limit the duration of leaf and stem wetness.
- Growers should manage temperatures to promote healthy plants and minimize injury. The latter is important because injured tissues are more susceptible to *S. sclerotiorum*.
- Fertility should be kept at around 100 parts per million (ppm) nitrogen; excessive levels of nitrogen can lead to a lush, dense canopy that will take longer to dry and will be more susceptible to attack by the collar rot pathogen.
- 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 well-sharpened blade to ensure complete removal (and capture) of leaf pieces in the least injurious way possible. Frequent clippings will reduce the amount of tissue that must be removed by the mower and will cause less plant injury. This also results in less leaf material left on the surface of the transplant trays. The collar rot pathogen can overwinter on clippings and diseased plants, so these should be discarded (a minimum of 100 yards from the transplant facility) or buried to reduce the chance of spores making their way back into nearby float beds.
- Home gardens should not be planted near transplant facilities. Additionally, keep a weed-free zone around float beds. Over 300 species of plants, including many weeds and vegetables, are hosts to *S. sclerotiorum.*

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://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/ppfsagt8.pdf

- Kentucky-Tennessee Tobacco Production Guide, ID-160 (*1 MB file*)
http://www.ca.uky.edu/agc/pubs/id/id160/id160.pdf

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