

# Managing Bacterial Soft Rot On Tobacco Seedlings



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Our weather has been fairly cool over the past month, and this has kept diseases on tobacco seedlings in check for the most part. Conditions figure to warm up, however, as we head into May. One of the biggest threats to tobacco in float beds during warm weather is bacterial soft rot, or black leg. This disease is fast-moving and can cause quite a bit of damage in a very short time frame. Careful management of tobacco float beds can prevent serious losses or delays in setting.

**BACKGROUND.** Warm, humid conditions in the float bed are the ideal environment for *Erwinia carotovora* subsp. *carotovora* and other bacterial species that cause blackleg. Initially, leaf clippings (debris) or wounded tissue are colonized by the blackleg pathogen. Debris and leaves infected by *Erwinia* appear necrotic and slimy (Figure 5). Systemic infections, which arise when *Erwinia* moves from debris or wounded tissues into healthy plants, result in darkening of the stem that tends to move up one side of the seedling primarily, hence the name “blackleg” (Figure 6). Affected areas of the stem may also show splitting, and in advanced stages, seedlings will collapse. Under favorable conditions, blackleg will spread rapidly, causing significant loss of useable transplants in as few as 1-2 days (Figure 7).

The bacteria that cause blackleg are essentially parasites of wounded or stressed tissue, and are plentiful in soil and on leaf surfaces. Because the pathogens are always present, development of disease is dependent on a favorable environment and plentiful food (in the form of plant debris or wounded/stressed tissue). Factors that may lead to outbreaks of blackleg include: high nitrogen levels (> 150 ppm), warm temperatures (>75 °F), high humidity, long periods of leaf wetness, and plant injury (stress and wounding). The latter occurs routinely during clipping and can lead to rapid spread of bacterial soft rot if carried out when plants are wet.

**MANAGEMENT.** Cultural practices are the most important ways to prevent of bacterial diseases. Provide adequate ventilation to shorten the length of time that foliage stays wet – this may be the most important of all management practices to reduce the incidence of blackleg. Most outbreaks we see in Kentucky are associated with warm temperatures and excessive moisture on float plants. Avoid over-fertilizing, a practice referred to as “pushing” seedlings, as this leads to dense, lush growth that is more susceptible to disease and takes longer to dry. Clip and handle plants only after they have been allowed to dry properly. Leaf debris left behind after clipping can serve as a starting point for the pathogens that cause blackleg and should be removed promptly. Along with maintaining good airflow in the float system, keeping as much leaf debris out of the beds as possible is a key to holding blackleg in check.

Chemical options for control of blackleg are limited. Agricultural streptomycin can be used in outdoor plant beds to suppress bacterial diseases, but is not specifically labeled for use in transplant facilities. Because the use of agricultural streptomycin is not expressly prohibited in transplant production, however, EPA rules allow its use in the float system. Streptomycin

provides only moderate suppression of blackleg, though, and growers who choose to apply the material in the greenhouse must accept all liability. Apply 3-5 gallons of a 100-200 ppm solution of streptomycin to 1000 sq. feet of float bed. This use rate translates to 0.5-1 lb per 100 gallons of water, or 1-2 teaspoons per gallon. Apply streptomycin before symptoms appear for best results, using the lowest rate. Use the 200-ppm rate immediately after the appearance of symptoms of blackleg. Some plant injury may be observed when applying the higher rate. Refer to the product label and the “2013-2014 Kentucky-Tennessee Tobacco Production Guide” (ID-160) for more information. The guide can be found online

at [www.uky.edu/Ag/TobaccoProd/pubs/id160.pdf](http://www.uky.edu/Ag/TobaccoProd/pubs/id160.pdf)

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**Figure 5.** Early symptoms of blackleg include soft-rotting of lower leaves and leaf material; a foul odor can often be detected even before symptoms can be seen.



**Figure 6.** Blackened, water-soaked lesions on the lower stems of affected plants are typical of later-stage blackleg.



**Figure 7.** In severe cases of blackleg, large numbers of plants can be lost in a matter of a few days.