



# Blackleg of Tobacco

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## IMPORTANCE

Blackleg of tobacco, also referred to as bacterial soft rot, is one of the most serious problems likely to be encountered in the transplant production system. This disease can become a transplant problem during extended periods of warm, wet, overcast weather in spring. Blackleg has the potential to destroy large numbers of plants in a relatively short period of time. As with other diseases in the float system, proper management goes a long way in preventing problems with blackleg.

## SYMPTOMS

The bacteria that cause blackleg infect plant debris and above-ground plant parts through wounds. A foul odor can often be detected even before symptoms are observed. Infected tissues appear necrotic and “slimy” (FIGURE 1). Systemic infections, which arise when the bacteria move from debris or wounded tissues into healthy plant parts, result in darkening of stems. This stem discoloration tends to primarily move up one side of seedlings, hence the name “blackleg” (FIGURE 2). Affected areas of stems may split, and in advanced stages, seedlings will collapse. Under favorable conditions, blackleg will spread rapidly, causing significant loss of useable transplants in as little as 1 to 2 days (FIGURE 3).

## CAUSE & DISEASE DEVELOPMENT

Warm, humid conditions in the float bed are the ideal environment for *Pectobacterium carotovorum* (previously known as *Erwinia carotovora*) and other soft-rot bacteria that cause blackleg. These bacteria are common in soil, in association with plant debris, and on leaf surfaces. Initially, blackleg bacteria colonize wounded tissues and organic matter in trays. Because the pathogens are always present, disease development depends on a favorable environment and a food source, or substrate. Factors that may lead to outbreaks of blackleg include: high nitrogen levels (greater than 150 ppm), warm temperatures (higher than 75° F), high humidity, long periods of leaf wetness, and plant injury (stress and wounding).

**FIGURE 1. EARLY SYMPTOMS OF BLACKLEG INCLUDE SOFT-ROTTING OF LOWER LEAVES AND LEAF MATERIAL.**





**FIGURE 2. BLACKENED, WATER-SOAKED LESIONS ON LOWER STEMS OF AFFECTED PLANTS ARE TYPICAL OF LATER-STAGE BLACKLEG.**



**FIGURE 3. IN SEVERE CASES OF BLACKLEG, LARGE NUMBERS OF PLANTS CAN BE LOST IN A MATTER OF A FEW DAYS.**

The latter occurs routinely during clipping and can lead to rapid spread of bacterial soft rot, especially if carried out when plants are wet.

## DISEASE MANAGEMENT

Cultural practices are the most important ways to prevent bacterial diseases.

**Sanitize all equipment and greenhouse surfaces** prior to starting new plants if blackleg has been a problem in the past. A solution of one-part bleach and nine-parts water will eliminate most pathogens on non-porous surfaces; sanitized metal should be rinsed with fresh water to avoid corrosion. Tray steaming and/or fumigation for *Pythium* management would also be expected to eliminate blackleg bacteria.

**Provide adequate ventilation** to maintain moderate temperatures and to shorten periods of wet foliage.

**Avoid over-fertilizing** or “pushing” seedlings, as this leads to dense, lush growth that is more susceptible to disease.

**Trays with affected plants should be removed and discarded** to protect other plants in the greenhouse.

### Follow these guidelines when clipping plants:

- Use a well-sharpened blade operating at a low mower speed to avoid excessive plant injury.
- Mow regularly, removing no more than ½ to 1 inch of leaf each time. When more than 1 inch of leaf is clipped, plants may be severely injured and plant debris becomes deposited on seedlings – factors that can lead to devastating outbreaks of blackleg.
- Only clip and handle plants when they are completely dry.
- Mower blades may be sanitized following each pass to avoid spreading bacteria to wounded plants.
- Remove any leaf debris left behind after clipping.

## 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>
- Burley and Dark Tobacco Production Guide (ID-160)  
<http://www.ca.uky.edu/agc/pubs/id/id160/id160.pdf>

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