College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-GEN-16**

Southern Blight

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Importance

Southern blight (Figure 1) affects hundreds of different plants, including vegetables, field crops, ornamentals, and fruit. This disease is also known as southern stem blight, basal stem rot, Sclerotium blight, crown rot, and white mold (not to be confused with Sclerotinia white mold). Refer to Table 1 for a listing of some of the plants commonly affected in Kentucky.

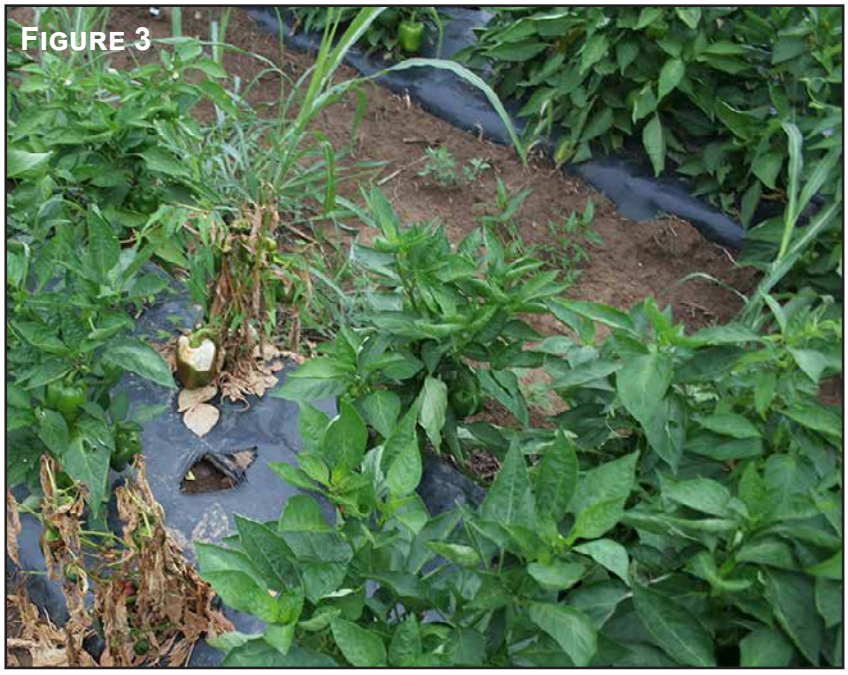
Depending on host plant, production system, and environmental conditions, the severity of this disease can vary from a minor problem on isolated plants to extensive damage causing significant crop losses.

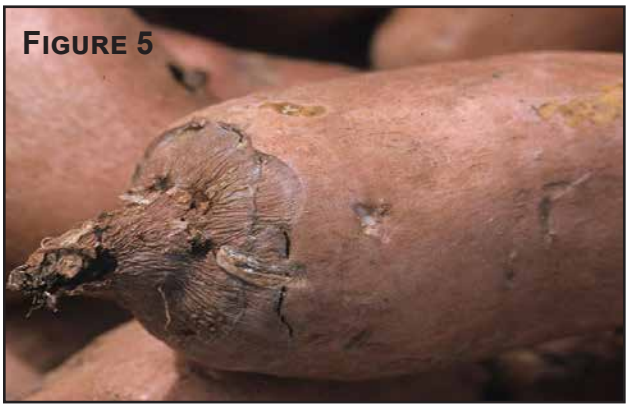
Symptoms & Signs

Symptoms may differ with the type of plant and plant part affected, but can include any of the following:

- Water-soaked or brown lesions on lower stems, especially near the soil line (Figure 2).
- Chlorosis (yellowing) followed by necrosis (death) of foliage; leaves may remain on plants (Figure 3).
- Gradual or sudden wilting.
- Root decay.
- Crown rot (Figure 4) and collapse of plants.
- Dieback, decline, and death of woody plants.
- Dry decay of tubers, tuberous roots (Figure 5) and bulbs.
- Soft water-soaked decay of fleshy fruit (Figure 6).

Figure 1. Southern stem blight affects a wide range of plants, including bell pepper.





The presence of numerous round sclerotia (fungal structures) on and in infected tissues is what makes southern blight unique among stem and root rot diseases. Sclerotia are tiny (1 to 2 mm in diameter, or about the size of a pin head). Initially white, sclerotia darken to tan, brown, orange, or reddish-brown as they mature. Look for one or more of the following signs that are diagnostic for this disease:

- Sclerotia, as described above (Figure 7).
- White, fungal mats fanning out from infection sites (Figures 8, 9 & 10).
- Fungal mats (Figure 11) and sclerotia (Figure 12) on soil surfaces and on plant debris in the vicinity of affected plants.

Figure 2. Soybean plant with a water-soaked, brown lesion developing on the lower stem at the soil line.
Figure 3. Wilting, necrosis, and death of pepper plants due to southern blight; exposed fruit have sunscald.
Figure 4. Ajuga with crown rot due to *Sclerotium rolfsii* in a residential landscape planting. Notice the circular shape to the patch of dead plants.
Figure 5. Dry decay of sweetpotato tuberous root.
Figure 6. Southern blight causes a soft, watery decay of fleshy fruits, such as tomato.

Cause & Disease Development

Southern blight is caused by the soil-borne fungus, *Sclerotium rolfsii*. This pathogen survives adverse conditions as sclerotia in soil and as mycelium (fungal strands) on decomposing plant residues. Sclerotia can persist in upper soil layers for many years. The disease tends to be more prevalent in sandy or sandy loam soil types and also in soils with high organic matter that has not decomposed.

Conditions favoring disease development include high moisture levels, both in soil and under plant canopies, and relatively high temperatures (optimum: 81°F to 95°F). When favorable conditions continue, mycelial mats become visible 2 to 4 days after infection, while sclerotia can begin to develop about 7 days after infection.

Short distance dispersal of the pathogen occurs via running water, movement of infested soil and debris (e.g., on cultivating tools and equipment), and growth of mycelia from infected plants to healthy plants. Long distance spread can occur via infected transplants, infested soil, or contaminated seed mixtures.

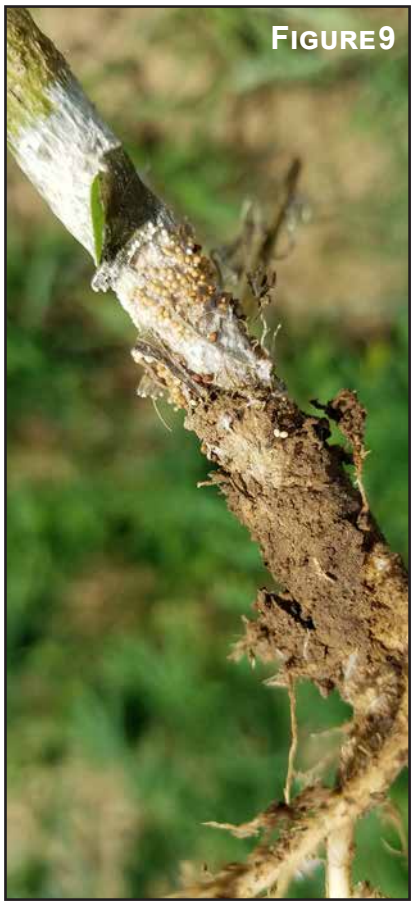


Figure 7. Sclerotia, developing here on pumpkin fruit, are initially white, but darken with maturity.

Figure 8. Rope-like mycelium may be observed fanning out from infection sites.

Figure 9. A fungal mat of mycelia with tan-colored sclerotia developing on an infected hemp stem.

Figure 10. Mycelia and sclerotia present on infected soybean stems. Note the plants to the left that have been killed by this disease.

FIGURE 11. A FUNGAL MAT OF *SCLEROTIUM ROLFSII* EXTENDING INTO THE SOIL NEAR AN INFECTED PEPPER STEM.
FIGURE 12. ABUNDANT SCLEROTIA PRESENT ON THE SOIL SURFACE NEAR A DISEASED APPLE TREE.

DISEASE MANAGEMENT

Management practices depend upon the crop and production system. Implement as many of the following as possible to limit the risk for infection and/or impact of disease:

Before planting

- Avoid planting susceptible crops in sites with a history of southern blight.
- Plant only pathogen-free plants. Examine lower stems and roots of transplants for signs of the southern blight fungus (fungal mats and sclerotia).

Crop rotation

- Rotate to a non-host or one less preferred by the pathogen for 3 to 4 years if the site has a history of southern blight. *Sclerotium rolfsii* has a large and diversified host range, which can make selection of a rotational crop challenging. Suggested non-host crops include corn, small grains, grain sorghum, or pasture grasses. Ornamental grasses are also reportedly resistant to this disease.
- Many weeds can serve as hosts to *Sclerotium rolfsii*, so weed management during rotations or during fallow periods is essential to reduce survival of inoculum.

Sanitation

- Remove and destroy infected plants in landscapes, residential gardens, and high tunnels/greenhouses.
- Remove surrounding soil and plant debris when digging plants. Do not allow sclerotia to drop back onto the planting site or surrounding soil.

Cultural practices

- Use deep tillage to bury sclerotia and infected plant debris after plants are removed. Survival of sclerotia declines at depths greater than 6 inches. Grow a non-host crop in subsequent years to further reduce viable inoculum. Without crop rotation, deep plowing is less effective since previously buried sclerotia may be returned to the upper layer of soil.
- Improve air circulation and plant tissue drying by increasing plant spacing. Moisture trapped within a dense plant canopy favors disease development.

Soil treatments

- Solarization using clear plastic sheeting can be an effective means of reducing pathogen levels in high tunnels or greenhouse ground beds. The treated areas should to be exposed to full sunlight and a soil temperature of 110°F to 125°F for at least 4 to 6 weeks is required.

- Fumigation with chemical soil treatments is broadly effective in reducing a number of soilborne pathogens in commercial fields, but can also reduce populations of beneficial soil microorganisms. In addition, small numbers of sclerotia can survive, requiring repeated fumigant applications. Only applicators with specialized Category 1b licenses may utilize fumigants. As of the date of this publication, grower access to commercial fumigators in Kentucky is limited and costly.

Fungicides

- Limited fungicide options are available to commercial growers, depending upon the crop. Labeled fungicides are generally applied to soils prior to planting or at transplanting.
- Contact a local county Extension office for specific fungicide recommendations. Follow the directions on the product label for use and restrictions.

TABLE 1. SOME OF THE PLANTS THAT CAN BE AFFECTED BY SOUTHERN STEM BLIGHT IN KENTUCKY.

Vegetables	Ornamentals	Other Crops
Bean	Ajuga	Apple
Cabbage	Bentgrass	Hemp
Carrot	Chrysanthemum	Peanut
Cucumber	Columbine	Soybean
Eggplant	Coreopsis	Sweet woodruff
Garlic	Dahlia	Tarragon
Muskmelon	Hosta	Tobacco
Peppers	Lupine	
Potato	Narcissus	
Pumpkin	Peony	
Radish	Phlox	
Rhubarb	Vinca	
Tomato		
Turnip		
Watermelon		

Additional Resources

- Home Vegetable Gardening (ID-128)
http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf
- IPM Scouting Guide for Common Problems of High Tunnel and Greenhouse Vegetable Crops in Kentucky (ID-235)
https://publications.ca.uky.edu/files/ID235.pdf
- Managing Diseases of Herbaceous Ornamentals (PPFS-OR-H-01)
http://plantpathology.ca.uky.edu/files/ppfs-or-h-01.pdf
- Managing the Greenhouse Environment to Control Plant Diseases (PPFS-GH-01)
http://plantpathology.ca.uky.edu/files/ppfs-gh-01.pdf
- Soil Solarization for High Tunnels (HortFact-7003)
http://www.uky.edu/hort/sites/www.uky.edu.hort/files/documents/solarization.pdf
- Woody Plant Disease Management Guide for Nurseries and Landscapes (PPFS-OR-W-29)
https://plantpathology.ca.uky.edu/files/ppfs-or-w-29.pdf
- Vegetable Production Guide for Commercial Growers (ID-36)
https://publications.ca.uky.edu/files/ID36.pdf

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