

Southern Blight on Flowers, Shrubs, and Trees

ANR-1157

Southern blight is a destructive disease of a wide variety of annual, perennial, and woody plants in both the nursery and landscape. This disease occurs primarily during steamy, hot, wet weather any time from late spring to early fall. In residential and commercial landscapes, southern blight is most commonly seen on old garden sites, particularly those that have well-drained sand or sandy loam soils.

Although aucuba is the most common woody host of southern blight in Alabama landscapes, the causal fungus *Sclerotium rolfsii* may also attack azalea, crabapple, hydrangea, lirioppe, loquat, peach, Pittosporum, quince, Russian olive, winter daphne, and black walnut. Among annuals and perennials, ajuga and phlox are the most common targets of *S. rolfsii*. Other annuals and perennials susceptible to southern blight are listed in Table 1.

Table 1. Some Annuals and Perennials Susceptible to Southern Blight

African daisy	Coneflower	Lantana	Snapdragon
Ageratum	Coreopsis	Lily	Statice
Amaryllis	Dahlia	Lirioppe	Stokes daisy
Anemone	Daylily	Marigold	Sunflower
Bachelor's button	Delphinium	Narcissus	Sweet pea
Basil	Dianthus	Oxalis	Tulip
Bee balm	English ivy	Pansy	Veronica
Begonia	Gerbera daisy	Passion vine	Vinca
Caladium	Ginger	Pentas	Violet
Calendula	Gladiolus	Peony	Zinnia
Candy tuft	Hollyhock	Petunia	
Canna lily	Hosta	Poinsettia	
Carnation	Hydrangea	Red hot poker	
Chrysanthemum	Impatiens	Salvia	
Columbine	Jasmine	Scabosia	

Although southern blight does not have nearly as much impact on the production of container- and field-grown shrubs and trees as *Phytophthora* root rot does, significant losses of selected woody shrubs and trees can occur virtually overnight. In Alabama, severe outbreaks of this disease have recently been seen in container-grown butterfly bush (*Buddleia davidii*), forsythia, hosta, and Prague viburnum (*Viburnum x pragense*) (Figure 1).

Symptoms

On nearly all plants, the sudden flagging or wilting of the leaves and succulent shoots is the first noticeable



Figure 1. Southern blight in a field planting of viburnum

symptom of southern blight (Figures 2 and 3). At early stages, some recovery of the leaves may occur overnight, but the wilt soon becomes permanent. Typically, wilting of the foliage is quickly followed by the rapid collapse of the whole plant and then plant death (Figures 2 and 3). On container-grown hosta, the older leaves yellow, wilt, and die, but the plant usually does



Figure 2. Southern blight on Prague viburnum. The wilted, diseased plant is on the right.



Figure 3. Southern blight on forsythia. The wilted, diseased plant is on the left; a healthy plant is on the right.

not die. Some trees may survive for a month or more after being infected by *S. rolfssii*, but most annuals and perennials succumb almost overnight to this disease.

Typically, the brown, water-soaked, and sometimes sunken cankers that often encircle or girdle the stem or root collar are found 1 to 2 inches above or below the soil line. The superficial white, fanlike mat of fungal mycelia is usually seen on or just below the soil surface, on fallen leaves and other plant debris, and on the lower stem or root collar of the target plant (Figures 4 and 5). At times, this white mat may be seen before the root collar or stems have been damaged. Given favorable soil conditions, the mycelial mat of *S. rolfssii* may also be found intertwined among the roots or bulbs 1 to 2 inches below the soil surface. Clusters of round sclerotia, about the size of a mustard seed, appear on the mat of fungal mycelia on the soil surface and on infested plant debris. The seedlike sclerotia, which are at first white, quickly turn dark brown. When conditions no longer favor pathogen growth, the mycelia mat disintegrates, but the clusters of sclerotia remain on the soil surface or host tissues.

Disease Cycle

In Alabama, the causal fungus *Sclerotium rolfssii* is distributed statewide. The fungus can survive up to several years as sclerotia in the soil, in potting media, and on plant debris; however, mycelial mats of *S. rolfssii* found in soil or plant debris rapidly disintegrate. This fungus is readily spread in the landscape and nursery on transplants or rootstock, in bark media or soil, and possibly by flowing water. In landscapes, sclerotia can quickly be moved from bed to bed in soil clinging to



Figure 4. Mycelia mat of *S. rolfssii* on the surface of potting media surrounding the root collar of forsythia

Figure 5. Mycelia mat of *S. rolfssii* growing up the stem of Prague viburnum



hand tools such as shovels, on tillers or similar tillage equipment, and on shoes. Poor nursery sanitation and the recycling of unwashed containers or flats are major factors contributing to most outbreaks of southern blight in many container nurseries. Decaying plant debris releases volatile organic chemicals that trigger the germination of sclerotia. The fungus often colonizes partially decayed leaves and other debris before attacking the target host plant.

Although southern blight can develop over a wide range of temperatures, unseasonably high day temperatures favor rapid disease development. Typically, disease outbreaks occur during the summer months when day and night temperatures exceed 90 and 70 degrees F, respectively. Because the media of container stock is very warm, southern blight may be seen on the pot-grown plants before the disease appears in landscape or field plantings. The disease may develop at lower temperatures, but its progress will be slow and the level of plant mortality may be lower.

Soil moisture levels also have a significant impact on the rate of sclerotial germination and fungal growth. Often, the heaviest southern-blight-related loss follows several days of heavy rain or overwatering. In field- and container-grown plants, devastating outbreaks of southern blight have often been seen when a heavy rain occurs after an extended period of hot, dry weather.

Control Practices

Prevention is critical to avoiding damaging outbreaks of southern blight. Once container and field stock have been damaged, the plants are usually not salable and must be destroyed. When necessary, applying timely fungicide drenches can protect susceptible crops from this disease; however, adopting sanitation and production practices designed to prevent the accidental introduction of *S. rolfssii* is the best means of avoiding disease outbreaks. For example, store bulk media components and containers on raised and preferably covered asphalt or concrete pads in areas that are not prone to flooding. Never add nonsterile soil or recycled potting media to fresh bark media or replant into old potting media. Rinse and disinfect recycled containers to remove all old potting media, and then dry them and store them off the ground on pallets or on shelves in a building.

Other sanitation practices include clearing leaves and discarded media from production ranges after each crop and dumping diseased plants and used potting media in compost piles located away from production ranges. In the landscape, do not plant *S. rolfssii*-susceptible plants in old vegetable gardens or other areas where this fungus is present. Also, do not use soil from old vegetable or flower gardens as fill for new beds.

The drainage system in a container nursery must be designed to rapidly funnel water away from production beds. To prevent water from flooding or pooling around containers, crown production beds, cover them with black plastic or a weed barrier, and then top them with gravel or a similar coarse material. Separate container stock by container size and water requirements to minimize the risk of over- or underwatering. In both the landscape and nursery, fertilize annuals, perenni-

als, and woody plants and adjust their pH according to the results of a soil or media assay. For more information about strategies for controlling soilborne diseases of the nursery and landscape, refer to Extension publication ANR-571, "Phytophthora Root Rot on Woody Ornamentals."

Other options for controlling southern blight in landscape plantings are soil fumigation and solarization, which will greatly reduce the numbers of viable sclerotia of *S. roffsii*. Both treatments can be used to control other soilborne diseases, plant parasitic nematodes, and some weeds. Unless either of these treatments is repeated annually in an infested bed, control of this disease, as well as of other soil pests, usually does not carry over into the next year. Although bulk soil or recycled media may be fumigated or stem-pasteurized, some sclerotia will survive, and serious crop losses of pot-grown annuals, perennials, and woody plants could occur. For more information, refer to the following Extension publications: ANR-731, "Soil Solarization for the Control of Nematodes and Soilborne Diseases," ANR-500, *Alabama Pest Management Handbook*, and ANR-30, "Nematode Control in the Home Garden." Table 2 lists preplant fumigants and bulk soil treatments for controlling southern blight. **NOTE:** All soil fumigants

are restricted-use pesticides that can be purchased and applied by licensed, certified pesticide applicators only.

When combined with good nursery management, preventative drench or broadcast treatments of selected fungicides can protect southern-blight-susceptible plants in the nursery and landscape. However, fungicides should only be routinely used on susceptible plants in those nurseries and landscape plantings where southern blight has consistently caused plant loss in previous years.

Fungicides will protect the roots, root collar, and stems from *S. roffsii* but will not kill the fungus in host tissues. Wilted plants will not recover after being treated with a fungicide and therefore should be immediately discarded. Since development of southern blight is usually limited to the summer months, the first treatment should be applied in late May to mid-June. Depending on the fungicide selected, make one to two additional applications at 4- to 6- week intervals or until weather patterns no longer favor disease development. Treatment schedules and application rates will depend on the fungicide chosen and the level of disease pressure. Table 3 lists fungicides that can control southern blight on ornamentals.

Table 2. Preplant Soil Fumigants and Bulk Soil Treatments

Product	Rate	Comments
Basamid granular Restricted-use pesticide	9.4 to 13 oz per 100 sq ft of bed area	BED FUMIGATION: Spread uniformly across the bed, and till to a depth of 8 inches when there is enough soil moisture for plant growth. Wet the soil after treatment so a crust forms. Till beds at least 5 to 7 days after treatment. Wait at least 2 or 3 days after tilling before planting. DO NOT use in a greenhouse that contains plants. See the label for additional application and replant directions.
	4 to 5 oz per cu yd of media or soil	BULK SOIL MIX: Add to the soil mix. Media must be moist when treated. See the label for further instructions.
Vapam Restricted-use pesticide	1 to 2 pt per 5 gal of water	BED FUMIGATION: Apply with a hose-end proportioner or sprinkler evenly to 100 sq ft of bed area, and thoroughly water into the soil. A plastic tarp cover is optional. DO NOT PLANT for 2 to 3 weeks. If the weather is cold or the soil has a high organic matter content, wait 3 to 4 weeks to plant.
	1 fl oz per 2 cu yd of media or soil	BULK SOIL MIX: Add Vapam to the soil mix, sprinkle mix with water, then cover for 48 hours. Aerate for 2 to 3 weeks before planting. See label for additional application directions.
Dowfume Restricted-use pesticide; contains methyl bromide, which will be banned by 2005. For commercial use only.	4 lb per 100 sq ft of bed area	BED FUMIGATION: Treat soil prepared for planting. Cover the treated area tightly with plastic. Aerate the soil for 3 to 7 days after treatment. Wait longer if the soil is cool, wet, or high in organic matter content. Also controls other pests and some weeds.
	4 lb per cu yd of soil or media	BULK SOIL TREATMENT: Cover the pile or soil cart tightly with plastic. Aerate the soil for 3 to 7 days after treatment. If the media or soil is cool and wet, aerate for several more days. Also controls other pests and some weeds.
Aerated steam		BED OR BULK SOIL TREATMENT: Add soil amendments. Bring the temperature in the coldest spot to 160 to 180 degrees F for 30 minutes. Store treated soil or media away from contaminated materials.

For optimum distribution of fungicide through the soil or potting media, apply a drench or granular fungicide when the plants need to be watered. If the beds are dry, water-in broadcast treatments of granular fungi-

cides. Drenches usually give better postplant protection from southern blight than do broadcast applications of a granular formulation of the same fungicide.

Table 3. Fungicides for Controlling Southern Blight on Ornamentals

Fungicide	Rate	Comments
PCNB		
Terraclor 400	6 to 12 fl oz per 100 gal of water	PRE- AND POSTPLANT DRENCH: Treats 400 to 800 sq ft of bed or bench area. Make one additional application 4 to 6 weeks later if needed.
	5.25 pt per 1,000 sq ft of bed area	PRE- AND POSTPLANT BROADCAST APPLICATION IN FIELD: Apply in enough water to ensure uniform coverage of soil surface. Incorporate to a depth of 4 inches.
Terraclor 75W Defend 75W Revere WSP Engage 75W	3.5 lb per 1,000 sq ft of bed area	PREPLANT DRENCH: Apply in enough water to ensure uniform coverage of soil surface. Incorporate to a depth of 4 inches. Refer to the label for a list of PCNB-tolerant plants.
Turfcide 10G Engage 10G Defend	20 to 40 lb per 1,000 sq ft of bed area	PREPLANT BROADCAST: Spread evenly on soil surface, and thoroughly mix into top 7 inches of soil. For use on bulb crops. Refer to the label for additional information and a list of PCNB-tolerant plants.
Azoxystrobin Heritage 50WDG	1 to 4 oz per 100 gal of water	PRE- AND POSTPLANT BROADCAST DRENCH: Apply every 7 to 21 days as needed. Safe for use on a wide range of annuals, perennials, and woody plants

	Rate per gallon	Rate per 100 gallons	
flutolanil Contrast 70WSP	--	3 to 6 oz	PRE- AND POSTPLANT DRENCH: Apply at a rate of 1 to 2 pints per square foot of bed or bench area at 21- to 28-day intervals as needed to control disease. Make no more than 4 applications of Contrast 70WSP per growing season.
flutolanil+ thiophanate-methyl Sys Star 80W	--	2 to 4 oz	PRE- AND POST PLANT DRENCH: Apply at a rate of 1 to 2 pints per square foot of bed or bench area at 14-day intervals as needed to control disease.
tebuconazole Disease Control for Roses, Flowers, and Shrubs	1 ½ t	--	PRE- AND POSTPLANT DRENCH: Apply at a rate of 1 to 2 pints around the base of the target shrub or over 1 square foot of bed area at 14-day intervals as needed to control disease. Irrigate immediately after drench application.

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Use pesticides **only** according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label.

The pesticide rates in this publication are recommended **only** if they are registered with the Environmental Protection Agency and the Alabama Department of Agriculture and Industries. If a registration is changed or cancelled, the rate listed here is no longer recommended. Before you apply any pesticide, check with your county Extension agent for the latest information.

Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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