

Diseases of Annual Vinca in the Greenhouse and Landscape

ANR-1023

Leaf Spot Diseases

Two leaf spot diseases which are caused by the fungi *Alternaria alternata* and *Ulocladium* sp. occur sporadically on annual vinca in both production greenhouses and the landscape. Disease outbreaks may be favored by frequent showers and low soil fertility.

Symptoms of both diseases first appear on the lower leaves as small brown to black spots (Figure 1). Spots on the leaves,



Figure 1. Alternaria leaf spot on vinca.

shoots, and petioles will range from the size of a pinhead up to 1/8 inch in diameter. Alternating light and dark rings of dead tissue give the larger spots a target spot or bull's-eye appearance. As more spots develop, the diseased leaves turn yellow and eventually fall from the plant. Typically, leaf drop starts at the base of the shoot and continues upward until all but the youngest leaves are lost.

Cultivars of annual vinca differ in their sensitivity to Alternaria leaf spot. The susceptibility of some popular annual vinca cultivars to Alternaria leaf spot is listed in Table 1.

Control practices for both diseases include (1) removing vinca plants after the first hard frost, (2) either scheduling overhead watering during predawn hours or midday to minimize wetting of the leaves or installing a drip irrigation system, and (3) adjusting soil fertility and pH according to a soil test report. If

necessary, fungicides may be applied for the control of Alternaria and Ulocladium leaf spot. In landscape plantings, apply a recommended fungicide (see Table 2) every 7 to 14 days after symptoms first appear on the lower leaves.

Phytophthora Blight

Phytophthora blight, which is caused by *Phytophthora parasitica*, is a common and exceptionally destructive disease of annual vinca in both production greenhouses and landscapes across Alabama. Disease development is favored by extended periods of hot, wet weather. Frequent overhead irrigation and heavy fertilization may also contribute to disease development.

Typical symptoms of Phytophthora blight on vinca can include the sudden flagging of one shoot (Figure 2) or the



Figure 2. Flagging of a single shoot is an early symptom of Phytophthora blight on vinca.

Table 1. Susceptibility Of Cultivars Of Annual Vinca To Alternaria Leaf Spot.

Low	Medium	High
Tropicana Rose	Tropicana Blush	Tropicana Pink
Tropicana Bright Eye	Parasol	Cooler Grape
	Little Blanche	Cooler Peppermint
		Cooler Blush

Table 2. Fungicides Recommended For The Control Of Alternaria And Ulocladium Leaf Spot.

Fungicide	Rate Per 100 Gal.	Comments
Chipco 26019 50W	1-2 lb.	Apply as needed at
Chipco 26GT	1-2.5 qt.	7- to 14-day intervals.
Heritage 50W	1-4 oz.	Apply as needed at
		14- to 28-day intervals.



Figure 3. Cankers along the main stem of *Phytophthora*-damaged vinca are often centered on the base of blighted lateral shoots.



Figure 4. Severe *Phytophthora* shoot blight on vinca cv. 'Grape Cooler.'

wilting of an entire plant. Gray-green, water-soaked lesions are usually found at the base of the wilted shoots. Later, sunken, reddish brown girdling cankers may be found along the entire main stem at the base of blighted lateral shoots (Figure 3 and Figure 4). A root rot may be seen in landscape beds infested with the causal fungus *P. parasitica*. Plant death may occur within 1 to 2 weeks of the first appearance of symptoms.

In production greenhouses, strict sanitation is the key to controlling *Phytophthora* blight. Clear benches or floors of debris from the previous crop. Clean propagation and production areas, transplanting equipment, and recycled pots and flats with a commercial disinfectant. Use fresh potting media and minimize water splash onto the fo-

liage when irrigating plant material. Inspect each vinca crop weekly and discard any flats or pots containing diseased plants. To prevent disease outbreaks in production greenhouses, apply the fungicide Aliette WDG as a heavy spray/drench at the rate and interval specified in Table 3. Normally, two to three treatments will be required before the finished crop is ready to ship.

To avoid accidentally introducing *Phytophthora* blight into landscape beds, do not buy irregular, discolored, or otherwise poor quality plant material. Uniform plant height and foliage color across all flats or pots on display are usually good indicators of quality bedding plants.

Avoid installing vinca in the same landscape beds year after year. Alternate growing vinca with other summer annual or perennial flowers. Delay the planting of vinca until the soil warms in the spring to 70°F. Vinca prefer a well-drained sandy or sandy loam soil. In poorly drained clay soils, plant on a raised bed in soil amended with aged pine or hardwood bark. Avoid overfertilizing vinca, particularly with a fertilizer that contains high concentrations of the ammonium form of nitrogen or urea. For best results, apply a slow-release fertilizer or calcium nitrate. To avoid wetting the leaves, water vinca with a drip irrigation system or soaker hose. When using overhead sprinklers, water beds between 2 a.m. and sunrise or at midday. Immedi-

ately remove and discard diseased plants.

Generally, avoid installation of vinca in *Phytophthora*-infested landscape beds. Although all popular vinca cultivars are susceptible to *Phytophthora* blight, the cultivars 'Little Bright Eye' and 'Little Pinkie' may suffer less damage. Not all annuals and perennials are susceptible to attack by the causal fungus of *Phytophthora* blight. Possible replacements for vinca in *Phytophthora*-infested beds include ageratum, begonia, celosia, coneflower, geranium, marigold, scabosia, thyme, verbena, and zinnia.

Fumigation with Vapam or Basamid or soil solarization will protect vinca for one season from *Phytophthora* blight. See Extension publications ANR-30, "Nematode Control in the Home Garden," and ANR-713, "Soil Solarization for the Control of Nematodes and Soil-Borne Diseases," for additional information concerning soil fumigation and solarization, respectively. Vapam and Basamid are RESTRICTED USE PESTICIDES that require Pesticide Applicator Certification for their purchase and use.

Fungicides will give some protection from *Phytophthora* blight. For effective control, apply a fungicide (see Table 3) at monthly intervals starting immediately after plants are set out in the spring through early fall.

Table 3. Fungicides Recommended For The Control Of *Phytophthora* Blight.

Fungicide	Rate Per 100 Gal.	Comments
Aliette WDG	1.25-4 lb.	Spray to wet foliage. Apply monthly. Repeated applications of the high rate of Aliette may damage vinca.

Rhizoctonia Crown Rot and Web Blight

Two diseases caused by the fungus *Rhizoctonia solani* have been found on annual vinca in Alabama. Rhizoctonia crown rot occurs primarily in late winter and early spring in production greenhouses. Web blight has been seen very sporadically in landscape plantings of vinca during hot, wet weather in July and August.

Vinca grown in flats or pots that are damaged by Rhizoctonia crown rot often topple over or snap-off at or just above the soil line (this is post-emergence damping-off). Girdling cankers that form at the soil line will cause a sudden wilting and death of vinca. At times, the thread-like hyphae *R. solani* may be seen suspended between the stems and lowest leaves.

Web blight first appears as semicircular, water-soaked lesions at the leaf-petiole junction on leaves at or just above the soil line. Infected leaves are quickly blighted and killed. Mats of dried tan-colored dead leaves cling to the green shoots (Figure 5). Left unchecked, all but the youngest leaves will be blighted and eventually the diseased plants die. Following a heavy dew, the thread-like hyphae of *R. solani* can be seen on and suspended between symptomatic leaves. Symptoms of the more common and damaging Phytophthora



Figure 5. Lower leaves of vinca blighted by *R. solani*.

blight are easily confused with those of web blight.

Cultural practices recommended for control of Rhizoctonia crown rot on vinca in production greenhouses are the same as those previously described for Phytophthora blight. Fungicides, when applied as a heavy spray/drench at specified intervals through the production cycle, will control Rhizoctonia crown rot. Since web blight is rarely a problem in landscape plantings, preventive fungicide sprays are usually unnecessary. Should damage appear, apply a recommended fungicide (see Table 4). Should weather conditions favor the disease, make several additional applications at 7- to 10-day intervals.

Table 4. Fungicides Recommended For The Control Of Rhizoctonia Crown Rot And Web Blight.

Fungicide	Rate Per 100 Gal.	Comments
Chipco 26019 50W	1-2 lb.	Apply every 7 to 10 days when conditions favor disease.
Chipco 26GT	1-2.5 qt.	
Cleary's 3336 50W	12-16 oz.	
Cleary's 3336 4.5F	20 fl. oz.	
OPH 6672 4.5F	10-20 fl. oz.	
OPH 6672 50W	12-16 oz.	
Contrast 70 WSP	3-6 oz.	Repeat every 21 to 28 days as needed.

To reduce the risk of accidentally introducing *R. solani* into landscape beds, install quality, healthy vinca. Also, space out individual plants to speed the evaporation of free water on leaves and slow plant-to-plant spread of this disease. Finally, fertilize according to soil test recommendations.

Botrytis Blight

Botrytis blight occurs primarily on finished flats or pots of annual vinca just before or after shipment to retail outlets. This disease is occasionally seen in heavily fertilized landscape plantings of vinca. Mild to warm temperatures coupled with extended periods of cloudy, humid, wet weather favor disease development.

The causal fungus of Botrytis blight, *Botrytis cinerea*, usually invades only wounded or senescent plant tissue, particularly flower petals, as well as the leaf debris of dead plants. Small, water-soaked spots on the flower petals, which are usually the first symptoms seen, quickly expand from tan to gray-brown blotches (Figure 6). Fast-spreading, circular spots, often with alternating light and dark rings or bull's-eye pattern, will appear on leaves where blighted petals or other plant debris have fallen. Girdling gray-green, water-



Figure 6. Target spot leaf spot often associated with Botrytis blight on vinca.

soaked cankers, which are similar to those associated with Phytophthora blight, may also be seen. Blighted tissues are often covered with the fuzzy, gray-brown hyphae and spore clusters of the causal fungus.

In a production greenhouse, good sanitation is the key to the control of Botrytis blight on bedding and floral crops. In a dirty greenhouse, even the best fungicides available will often fail to give the desired level of control. Sanitation and cultural practices recommended for control of Botrytis blight in production greenhouses are detailed in Extension publication ANR-753, "Identification and Control of Botrytis Blight on Floral Crops and Woody Ornamentals."

Fungicides may be applied to vinca as a foliar spray or smoke fumigant (greenhouse only). The smoke fumigant formulation of chlorothalonil must be used before the blooms open. Shortening the interval between fungicide applications in late winter and early spring during lengthy periods of cloudy, cool, and wet weather is often necessary for effective disease control. Apply a recommended fungicide (see Table 5) just before shipping finished plants. Fungicides are rarely needed to control Botrytis blight on vinca in landscape beds. See Extension publication ANR-500-B, *Alabama Pest Management Handbook—Volume 2*, for additional information.

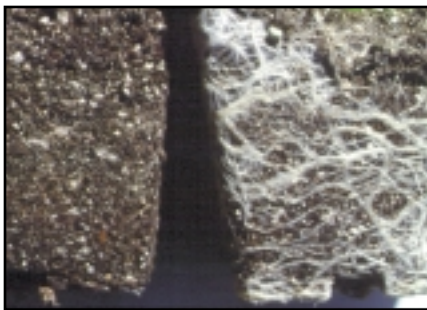


Figure 7. Black root rot-damaged root system (left) versus healthy white root system (right).

Table 5. Fungicides Recommended For The Control Of Botrytis Blight.

Fungicide	Rate Per 100 Gal.	Comments
Chipco 26019 50W	1-2 lb.	Apply every 7 to 10 days when conditions favor disease. Use higher rate at shorter interval when disease is active.
Chipco 26GT	1-2.5 qt.	
Cleary's 3336 50W	12-16 oz.	
Cleary's 3336 4.5F	16-20 fl. oz.	
Cygnus	1.6-3.2 oz.	
OPH 6672 50W	12-16 oz.	
OPH 6672 4.5F	16-20 fl. oz.	

Black Root Rot

Black root rot, which is caused by the soil-borne fungus *Thielaviopsis basicola*, is found primarily on vinca in production greenhouses but may also occur in landscape beds following the establishment of diseased bedding plants. Early-season crops are most likely to be damaged by black rot. Overfertilization with nitrogen, the use of high ammonium-content fertilizers, and a high potting medium pH has been linked to increases in black root rot severity.

Poor growth, yellow foliage, and low plant vigor are symptoms common to all root rot diseases. These symptoms can easily be confused with those of a nutritional deficiency or toxicity as well as other root rot diseases. At early stages of this disease, black or brown bands develop along the normally white roots. With a good hand lens, the bullet-shaped spores of the causal fungus can be seen within the banded areas. As the disease progresses, the colonized roots turn black and mushy (Figure 7).

In greenhouses, good sanitation is a critical component of a

disease management program. Routinely clean and disinfect all work surfaces and benches with a 5% solution of chlorine bleach or a commercial disinfectant. Additional sanitation practices are described under Phytophthora blight. The causal fungus is an inhabitant of peat bogs and is often introduced in peat-based soilless potting media. To minimize disease severity, follow recommended fertilization practices for vinca production. Also, avoid overwatering or under watering vinca.

Fungicides, when applied as a heavy spray/drench at recommended rates and treatment intervals (see Table 6), will control black root rot. Preventive fungicide drenches are recommended for the control of black root rot on greenhouse crops but not in landscape beds.

Black root rot is rarely a problem in landscape beds but may be accidentally introduced when diseased plants are established. This disease can often be avoided by choosing quality bedding plants. Good foliage color and uniform plant height are good indicators that a root rot is not present. Also, following recommended watering and

Table 6. Fungicides Recommended For The Control Of Black Root Rot.

Fungicide	Rate Per 100 Gal.	Comments
Cleary's 3336 50W	12-16 oz.	Apply as a preventive soil drench every 14 days until finished plants are sold. See labels for additional application instructions.
OPH 6672 50W	12-16 fl. oz.	
Cleary's 3336 4.5F	16-20 fl. oz.	
OPH 6672 4.5F	16-20 fl. oz.	
Banset 40W	4-8 oz.	
Terraguard 50W	2-4 oz.	Apply drench every 21 to 28 days as needed.

fertilization practices will reduce the risk of a disease outbreak in landscape beds.

Tomato Spotted Wilt

The virus disease tomato spotted wilt occurs sporadically in landscape plantings of vinca. A number of other annual flowers such as chrysanthemum, impatiens, petunia, zinnia, and begonia are also targets of this disease. The tomato spotted wilt virus (TSWV) and the closely related impatiens necrotic ringspot virus (INRV) are spread or vectored by several species of the insect pest called thrips.

TSWV has a wide host range, and symptoms can be quite variable. On vinca, typical symptoms include yellowing, stunting, and distortion ('possum ear') of young leaves along with small, black concentric rings, spots, or line patterns on those leaves (Figure 8). Flowers on infected vinca are discolored and malformed. Diseased plants are usually severely stunted.

Before you purchase any plants, inspect vinca and other



Figure 8. Yellowing and distortion of the new leaves along with black line patterns are typical symptoms of TSWV.

bedding plants for symptoms of TSWV. Avoid planting vinca and other TSWV-susceptible summer annuals in beds adjacent to vegetable gardens because many broadleaf vegetables are also susceptible to TSWV. Remove diseased plants as symptoms appear. Insecticides applied to control the thrips vector are ineffective in slowing the spread of TSWV.



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