

Diseases of English Ivy

English ivy is a woody evergreen vine that is popular in Alabama landscapes and interiorscapes. It is typically used as ground cover or as potted foliage. It grows best in full to partial shade and will tolerate the acidic soils common in many parts of the state. There are many cultivars, which are grouped into classes based on leaf shape and color. The American Ivy Society has developed a classification system that includes nine English ivy classes.

Common infectious diseases of English ivy include anthracnose, bacterial leaf spot, *Phytophthora* spp. root rot and leaf spot, and Rhizoctonia aerial blight and root rot. Edema, a noninfectious condition resulting from excessive moisture, may also damage English ivy.

Anthracnose

On English ivy, anthracnose may develop as a leaf spot, stem canker, or blight disease and may occur in landscapes, nurseries, or interiors. Although anthracnose can badly damage nursery stock, landscape plantings of English ivy can be devastated by the disease. Symptoms of anthracnose may be easily confused with those of bacterial leaf spot; therefore, a laboratory examination of leaf specimens may be needed in order to differentiate between the two diseases.

The fungus *Colletotrichum trichellum* is the most commonly reported causal agent of ivy anthracnose, but *C. gloeosporioides* is known to cause this disease as well. Symptoms of anthracnose begin as circular, necrotic areas that usually develop into irregular, dry, brown to reddish brown or black spots about $\frac{3}{4}$ inch (2 cm) in diameter (Figure 1). Spots usually begin at or near the margins of the leaves.

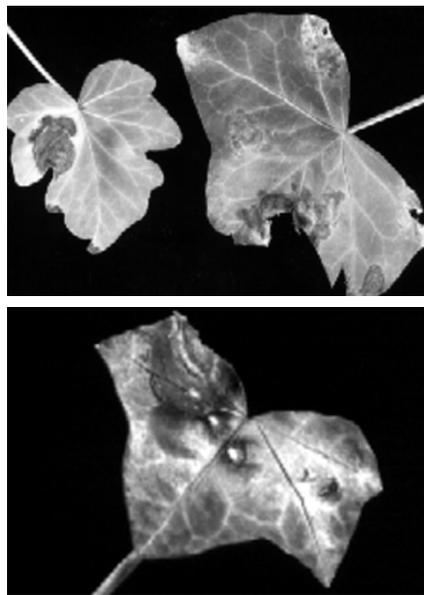


Figure 1. Anthracnose leaf spots

Fruiting bodies of the fungus appear as black specks scattered on the surface of the leaf spot. At a low level of magnification, numerous black needle- or hairlike structures (setae) may be seen on upper leaf surfaces. Girdling lesions that develop on petioles and stems may cause a shoot dieback or defoliation.

In the nursery, anthracnose spreads easily when cuttings or liners are placed close to each other and watered by overhead sprinklers. Fungal spores are spread by the splashing water. In the landscape, the spores may be spread by splashing water, by windblown rain, or by insects. The optimum temperature for disease development and spread is 68 to 77 degrees F.

Controlling anthracnose in nurseries and landscapes requires the use of good sanitation practices, good cultural practices, and protective fungicide treatments:

- Remove dead leaves, stems, and other plant debris frequently.
- Use tip cuttings for propagation.
- Water early in the day so that foliage is dry before evening. Drip irrigation is recommended.
- Do not handle plants when they are wet.
- Control insects and mites.
- Apply fungicide treatments in accordance with label directions.

It is reported that chlorothalonil products may cause some foliage distortions and brown leaf spots when applied to English ivy. Fungicides labeled for control of anthracnose on English ivy are listed in Extension publication ANR-500B, *Alabama Pest Management Handbook, Volume 2*.

Studies conducted to check the relative susceptibilities of English ivy cultivars to anthracnose have not identified any resistant plants. Gold Dust and Green Feather developed a low level of disease after inoculation with *C. gloeosporioides*. Perfection and Han Variegated developed moderate levels of disease; Manda Crested was heavily damaged. In another greenhouse trial, all five cultivars tested were susceptible to anthracnose to varying degrees. Crested was most severely damaged. Glacier and Needlepoint suffered moderate leaf spotting and dieback. Gold Dust and Shamrock developed the least amount of disease. In addition to English ivy, approximately 500 other species of ornamental plants are susceptible to *C. gloeosporioides*. The disease may spread among such plants as aucuba, camellia, *Codiaeum*, *Ficus*, ligustrum, liri-ope, magnolia, and palms.

Bacterial Leaf Spot

Bacterial leaf spot, caused by *Xanthomonas campestris* pv. *bedera*, is perhaps the most common disease of English ivy. Nursery, landscape, and interior ivy plantings may be affected by this disease, but it is most severe in nurseries and landscapes where humidity is high. This disease is distributed worldwide. Other members of the Araliaceae family, such as scheffleras and aralias, are also susceptible. Bacterial leaf spot can easily be confused with anthracnose, and both diseases can occur at the same time on the same plant.

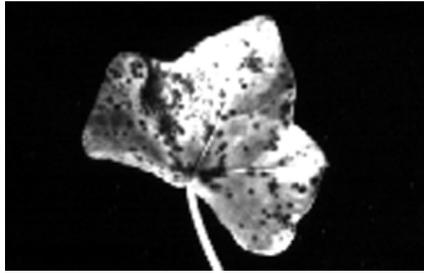


Figure 2. Small water-soaked bacterial leaf spots

Initial bacterial leaf spot lesions appear on the upper and lower surfaces of the leaves as green-brown, brown, or black water-soaked (oily) spots that may expand to 2 to 10 millimeters in diameter (Figure 2). Lesion water-soaking is most noticeable on the undersides of the leaves early in the day or following rain or irrigation. Centers of the leaf spot are red-brown or brown-black, and when conditions are moist, an orange-red ooze is sometimes seen along the edges of the leaf spots. Lesions are vein-bound, angular, and may have a yellow halo 1 to 2 millimeters wide. Leaf lesions may extend into the petioles and stems, causing leaf and shoot death. The surfaces of older lesions usually dry and crack. Symptoms often appear on the older leaves first. Infections of immature leaves may cause leaf speckling and deformity. On some cultivars, red margins may appear around spots on mature leaves. Small, dark brown girdling cankers may also be seen on mature stems.

The leaf spot bacteria are spread by splashing water and during propagation when conditions are wet. Dense foliage and plants being packed closely together facilitate spread of the disease. The bacteria survive in infected plant debris and in the soil, and infections occur most often where leaves are shaded and wet. Wet, poorly drained

areas are most conducive to disease development. *X. campestris* pv. *bedera* has been reported on many cultivars of English ivy. It is also reported to occur on Algerian ivy, *Dizygotheca*, *Fatsia* × *Fatsbedera*, and *Polyscias*.

Controlling bacterial leaf spot requires good sanitation, good cultural practices, proper fertility, and sometimes protective chemical sprays:

- Maintain pathogen-free stock plants.
- Avoid overhead watering when possible.
- Keep workers out of production ranges when the foliage is wet.
- Control insects and mites.
- Remove all diseased plant materials, including infected stock plants and crop debris, from production benches.
- Clean benches and tools, using a surface disinfectant.
- Use proper levels of fertility.
- Apply protective chemical sprays.

Although higher-than-recommended rates of fertilizer may reduce ivy's susceptibility to bacterial leaf spot, overfertilization may increase its susceptibility to other diseases.

Chemical control of bacterial leaf spot has often proven difficult. In trials, up to 90 percent control of bacterial leaf spot has been obtained using cupric hydroxide (Kocide 101), fosetyl aluminum (Aliette 80WDG), or a 1 percent solution of white vinegar. Streptomycin sulfate has been reported to be phytotoxic to English ivy. Best control has generally been achieved by using a combination of chemical treatments, minimizing overhead irrigation, using resistant cultivars, and adhering to a balanced fertilizer application schedule.

Cultivars of ivy with high levels of resistance to bacterial leaf spot have not been found. In a recent study, leaf spotting developed on all cultivars tested, but Gold Dust, Perfection, Sweet Heart, Eva, California, and Manda Crested developed the fewest leaf spots. Hahn Variegated and Brokamp proved to be most susceptible to bacterial leaf spot. Telecurl, Green Feather, Ivalance, and Gold Heart were intermediate in their susceptibility to this disease.

Edema

Edema (oedema) is a condition caused by excessive water levels in foliage. It is found predominantly on greenhouse crops, but it may occur in landscape plantings of English ivy. Symptoms of edema develop primarily on lower leaf surfaces but also develop on the petioles and on immature stem tissue. Initial symptoms are tiny water-soaked blisters on the undersides of the leaves. During extended periods of wet, cloudy weather, extensive rupturing of the blisters may be seen. These blisters callus over into noticeable light tan to rusty brown warts or pustules and do not disappear. Extensive edema can cause chlorotic spots to appear on the upper leaf surfaces.

Edema occurs primarily in midwinter and in spring. Major early spring storm systems may provide the cool, wet weather conditions that cause plant tissues to accumulate abnormally high levels of water and, therefore, to develop edema. Favorable conditions for edema include high soil moisture; a cool, moist air mass; poor air circulation or greenhouse ventilation; and reduced light intensity. Many herbaceous foliage and floral crop species develop edema in the greenhouse. Among the other woody ornamentals affected by edema are camellia,

Eucalyptus, *Fatsia* × *Fatsbedera*, jasmine, ligustrum, schefflera, *Taxus*, and other ivy species.

To control edema in landscape plantings of English ivy, monitor automated irrigation systems to prevent overwatering, and space plants properly to help minimize problems. In the greenhouse, use bottom heat coupled with forced ventilation. There are no chemical treatments to control edema.

Phytophthora Root Rot and Leaf Spot

Phytophthora species (*palmivora*, *cinnamomi*, *nicotiana* var. *parasitica* and others) can cause root rot, stem blight, and leaf spot in landscape plantings and greenhouse crops of English ivy. Typical symptoms of Phytophthora-incited diseases of English ivy are poor top growth and poor color. Often, the lower leaves turn brown and curl downward (Figure 3). Although a root rot sometimes is seen, leaf spot and stem rot symptoms are usually more common. With *P. palmivora*, spots on the leaves are large, gray-black in color, and water-soaked. A vascular necrosis of stems and roots was reported to occur on *H. helix* California.

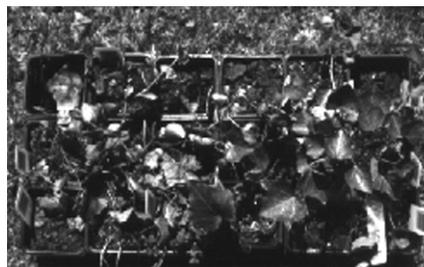


Figure 3. Foliar damage caused by *Phytophthora* root rot

As with most *Phytophthora* infections, the pathogen is spread by water, soil, and movement of infected plants or plant parts. Development of *Phytophthora* diseases is often triggered by excessive moisture in the soil or potting media. English ivy grown in poorly drained soils or on sites prone to flooding is a likely target of *Phytophthora* disease. Warm temperatures and frequent rains or overwatering will contribute to the development of the leaf spot and shoot blight phases of this disease. *P. palmivora* has a host range that includes *Dieffenbachia picta* and a number of other tropical plants including rubber, cacao, citrus, breadfruit, papaya, and many ornamentals. Both *P. nicotiana* and *P. cinnamomi* will infect many common herbaceous and woody greenhouse and landscape crops.

Controlling *Phytophthora* root rot and leaf spot requires the use of good cultural practices, good sanitation practices, and good irrigation management:

- Use pathogen-free potting media and pathogen-free stock plants.
- Never reuse potting media.
- Discard diseased plants.
- Use protective fungicide treatments to control this disease in the greenhouse and nursery.
- Clean greenhouse benches, using a surface disinfectant.
- Clean pots, using a surface disinfectant.
- Do not allow water to stand in plant areas or in potting media.
- Mix soil or potting media with amendments to increase water drainage.

Composted pine bark or hardwood bark is recommended in some situations as a potting mix component because of its good drainage properties and its demonstrated protective nature against *Phytophthora* infections. Fungicide treatments are available for protective control of this disease and are most effective when combined with recommended cultural and sanitation practices. A complete list of recommended fungicides can be found in ANR-571, "Phytophthora Root Rot on Woody Ornamentals," and ANR-500B, *Alabama Pest Management Handbook, Volume 2*. See Extension publication ANR-571, "Phytophthora Root Rot on Woody Ornamentals," for additional information about managing *Phytophthora* diseases on greenhouse and landscape crops.

Rhizoctonia Root Rot and Aerial Blight

Rhizoctonia solani is a widespread aerial and root-rot pathogen of many greenhouse and nursery crops including English ivy. With the aerial blight phase of this disease, brown, irregularly shaped, water-soaked lesions may occur on all aboveground plant parts. Symptoms usually appear first on lower leaves near the soil line.



Figure 4. Wilt caused by *Rhizoctonia* root rot

The red-brown mycelial mat of the causal fungus may be seen on blighted leaves. This disease also may involve the roots, which may develop brown, dried lesions sometimes involving the whole root system. Root rot will usually result in foliage wilt, dieback, and poor growth (Figure 4).

The causal fungus survives in plant debris and soil. Contaminated soils or potting media as well as infected cuttings are the most common means of disease spread. Development of aerial blight is favored by warm, humid conditions. Root rot may develop over a wide range of soil moisture levels.

Controlling *Rhizoctonia* root rot requires the use of good cultural practices, good sanitation practices, and chemical treatments:

- Propagate English ivy in a soil-less potting media.
- Never reuse potting media.

- Do not reuse pots, flats, or other containers unless they have been carefully rinsed, sanitized with a surface disinfectant, and dried.
- Clean water breakers, hoses, and tools, and keep them off the greenhouse floor.
- Discard unsalable, dying, or dead plants.
- Wash down production benches after each crop, using a surface disinfectant.
- Schedule overhead irrigation at midday—do not water late in the afternoon or at night.
- Apply preventative fungicide drenches throughout the production cycle if necessary.
- Remove damaged foliage from the planting area to control the aerial blight phase of this disease.
- Maintain dry foliage as much as possible.
- Space plants so that air circulation allows for low relative humidity levels.
- Use protective fungicide treatments if necessary to control *Rhizoctonia*.

Fungicides recommended for the control of *Rhizoctonia* root rot and aerial blight are listed in ANR-500B, *Alabama Pest Management Handbook, Volume 2*.

Jackie Mullen, *Extension Plant Pathologist and Diagnostician*, and **Austin Hagan**, *Extension Plant Pathologist*, Professor, Plant Pathology, both at Auburn University

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