

## Boxwood blight disease identified in North America *Claonectria pseudonaviculata* or *Cylindrocladium buxicola*

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### Origin and distribution of boxwood blight

Boxwood blight symptoms were described in the United Kingdom back in the mid-1990s, but the pathogen was not formally identified at that time. In 2002, researchers in New Zealand named the new species, *Cylindrocladium pseudonaviculatum*, and later researchers in the United Kingdom named it *Cylindrocladium buxicola*.

In October 2011, boxwood blight was first detected in the United States by plant pathologists in Connecticut and North Carolina. Currently, Connecticut, Maryland, Maine, North Carolina, New York, Ohio, Oregon, Pennsylvania, Rhode Island and Virginia have all reported boxwood blight. It has also been found in British Columbia, Canada. The prediction is that boxwood blight will continue to be detected in many other states.

### Host range

Boxwood blight occurs on all *Buxus* species and cultivars. English boxwood, *Buxus sempervirens* 'suffruticosa' and American or common boxwood *B. sempervirens* appear to be highly susceptible. *Pachysandra terminalis* (common names: pachysandra, Japanese spurge) is also susceptible to boxwood blight with similar symptoms of leaf lesions, visual sporulation on the leaves and quick leaf drop.



Sharon M. Douglas, Univ. of Connecticut

Photo 1. Leaf spot symptoms

### Fungus description and plant symptoms

Proper analysis by a diagnostician from a land grant university, such as Michigan State University, or state department of agriculture is recommended because boxwood blight symptoms are similar to other boxwood diseases, insect feeding damage and abiotic disorders. The symptoms appear on all aboveground portions of boxwood with dark or light brown spots or lesions on the leaves (Photo 1). The lesions have dark borders expanding into larger concentric patterns. Infected leaves will turn brown or straw-like and drop to the ground. Plants can be rapidly defoliated by this disease.



Peter W. Trenchard, Univ. of Connecticut

Photo 2. Distinctive black stem cankers



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Photo 3. Blighted leaves, defoliation and stem lesions

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Additionally, the fungal pathogen can infect stem tissue, causing dark lesions that extend along the stems (Photo 2). Many lesions can appear on the stem from the soil line to the shoot tips (Photo 3). It is important to note that this disease can infect boxwood in all stages of production from propagation to finished material as well as landscape plantings (Photos 4 and 5). Boxwood blight does not kill infected plants, but the defoliation predisposes them to infection by other pathogens and environmental factors that lead to plant death.

## Life cycle

This disease can complete a life cycle in one week under warm and humid conditions. Fungal growth can occur in a broad temperature range from 41 to 86°F with the optimum temperature for reproduction at 77°F. Like many fungal diseases, moisture is necessary for infection. Free water from dew, irrigation and rain play a part in the severity of the disease and is an element to be carefully monitored. This fungus does not need a wound to infect the plants. Boxwood blight can penetrate the cuticle and epidermis directly as well as enter through natural openings like the stomata. The fungus produces spores on sporodochia (Photo 6) that can be seen on the undersides of infected leaves and on the black lesions on stems. The fungus survives in leaves and cankers as well as in leaf debris that have been infected.

The boxwood blight pathogen has the ability to persist for long periods of time because of its specialized spore type called microsclerotium. The microsclerotia (hardened spore) are present on fallen leaves and can be moved via machinery, humans, wind and water. The overwintering fungus will sporulate, producing conidia that infect host plants under appropriate environmental conditions.

In a nursery or landscape situation, the pathogen is readily spread by wind, rains that are accompanied by winds, splashing irrigation water, contaminated equipment, tools, contaminated clothing, shipping containers, and vehicles. A primary concern of the nursery industry is the unintended movement of infected plant material throughout the country. This would promote the rapid spread of the disease.

## IPM strategies

Scouting the crop for the disease is the first step in managing boxwood blight. Since *Pachysandra terminalis* is in the same family as *Buxus*, scout any pachysandra in the same vicinity. In greenhouses, temperature and moisture management can reduce the infection potential and disease spread. In nurseries, proper water management can reduce disease spread. Using drip irrigation systems eliminates the splashing of water over from an overhead irrigation system. Chemical management guidelines are still being developed. Lab trials have been performed – there are products that have shown efficacy in those studies. However, more trials, both lab and field, need to be performed.



Photo 4. Field-grown nursery plants with symptoms and leaf debris

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Photo 5. Boxwood blight in a residential property

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Photo 6. Sporodochia on stem lesion

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