



**Photo 1:** Pachysandra makes a lovely ground cover for landscapes, particularly shaded areas. This bed, more than 50 years old and with stems and roots 1-2 feet thick, was deemed too competitive for this landmark, focal silver maple, which had begun to decline. Replacement of the old bed with soil and new pachysandra plants reversed the decline in the silver maple.



**Photo 2:** The leaf blight phase of *Volutella* results in blotches on, and eventual dieback of, the leaves.



**Photo 3:** The stem blight phase of *Volutella* is particularly destructive, resulting in dead plants and thinning beds.



## The Plant Doctor's LANDSCAPE TIPS

By David L. Roberts, Ph.D., Senior Academic Specialist, College of Agriculture and Natural Resources, Michigan State University

### PACHYSANDRA: VOLUTELLA LEAF & STEM BLIGHT

#### INTRODUCTION:


Pachysandra is a very popular ground cover for many Michigan landscapes. Pachysandra comprises several species of ("almost") woody evergreen perennials belonging to the boxwood family (Buxaceae). *P. terminalis*, also called Japanese spurge, is one of the more commonly utilized species, possessing characteristics of great shade tolerance and aggressive growth habit that keeps weeds to a minimum. Pachysandra is also not a preferred food for deer compared to some other landscape plants. Although slowly spreading, pachysandra may form a dense mat of stems and roots more than a foot thick. Over time, the plant may become quite competitive with trees and shrubs (Photo 1). Because of the pervasiveness of pachysandra, it may sometimes be considered a weed or even invasive. Where pachysandra is desired, one of the more serious threats to the plant's viability and health is *Volutella* leaf and stem blight.

#### SYMPTOMS AND DISEASE CYCLE:

The fungus, *Volutella pachysandricola*, infects the leaves and stems of pachysandra. Leaf infections are usually manifested as dark blotches on the foliage (Photo 2). Infected foliage droops and becomes brown-black. The most serious infections, however, are stem infections, which girdle and kill the plant. Infected stems appear black and gnarly. Fungal reproductive structures are formed on the dying stems and leaf tissues. Moisture from irrigation and rainfall splashes spores from diseased plants to nearby plants, causing further infections. Theoretically, spores may be splashed several feet from infected stems. Typically, however, adjacent or nearby plants are infected. The continued infection cycle and disease spread frequently results in pachysandra dying out in patches.

The fungal pathogen is capable of repeating a number of infection cycles throughout the warm season. The fungus survives overwinter in the diseased plant debris until the following spring ... when the infection, spread, and infection cycle is repeated.

#### MANAGEMENT OF VOLUTELLA:

*Volutella* infection and spread are most often witnessed in high moisture situations. Hence, poor drainage, frequent irrigation and prolonged wet weather conditions tend to promote *Volutella* leaf and stem blight. *Volutella* leaf and stem blight is most often seen in highly maintained landscapes (example: frequent or daily irrigation) and is far less common in low maintenance situations. The disease can practically be managed by irrigation: in other words, low to no irrigation. Established pachysandra generally does not require abundant irrigation to thrive and be healthy. Removing and destroying infected plants may be a practical cultural control. In severe cases, occasional applications of a broad spectrum fungicide may minimize further infections and help promote plant recovery ... provided moisture is kept to a minimum. 



**Photo 4:** Continued advance of *Volutella* leaf and stem blight results in unthrifty, declining beds of pachysandra; due to the nature of fungal spread, the pachysandra tends to die out in patches.



## CONCOLOR FIR & RHIZOSPHAERA NEEDLECAST

### INTRODUCTION:

Spruce trees, particularly Colorado blue spruce, have traditionally been a widely utilized and favored conifer for many landscapes. However, in recent years, Colorado Blue Spruce has been highly impacted by "Spruce Decline," a phrase coined by the author to denote a series of maladies that eventually result in unsightly declining and dead trees. This species of spruce is susceptible to a wide variety of issues including but not limited to: Cytospora canker, Cooley spruce gall, Rhizosphaera and Stigmina (Mycosphaerella) needlecasts, pitch mass borer, and Phomopsis canker.


Concolor Fir, a.k.a. white fir (*Abies concolor*), is an increasingly valuable conifer for use in Michigan landscapes. This tree possesses several advantageous characteristics. First, the tree exhibits variable color and texture but many specimens have a blue to bluish-green color (Photo 1), similar to Colorado blue spruce. As with many species of firs, Concolor tends to be somewhat slower growing, an enviable feature where rapid growing conifers may outgrow their designed space allotment within a few years after installation. Of considerable value is the fact that Concolor fir tends to be less susceptible to diseases and pests than many other conifers, such as blue spruce, and Scotts and Austrian pines. While Concolor fir is less prone to attack by serious diseases and pests, it is, nonetheless, susceptible to Rhizosphaera needlecast, caused by the fungus *Rhizosphaera kalkhoffii* Bubak.

### DISEASE SYMPTOMS AND CYCLE:

Infection of fir needles by Rhizosphaera may occur from early spring (April) through October. However, most infection occurs in the early spring when abundant moisture from spring rains favor spread of fungal spores and infection of needles. During the spring period of infection, the previous years' needles are exposed to infection, sometimes before buds and current year's needles have expanded. Hence, the disease is more prominent on older, inner foliage (Photo 2).

Infected needles become purplish-brown and are eventually "cast" from the trees. Fruiting (reproductive) bodies of the fungus may be observed protruding (in rows) from natural needle openings called stomata (Photo 3); the presence of the fruiting bodies aids in diagnosis of the disease. If early infections are the predominant event, the current year's growth may appear unaffected while previous years' needles are lost (Photo 2). Needles on lower branches are most commonly affected by Rhizosphaera because these branches remain damp the longest and infection is more likely to occur. Rhizosphaera needlecast is generally not considered a lethal disease. However, several years of aggressive defoliation may result in branch death. In rare situations, the entire tree (especially small trees) may be killed. Bare branches may signify severe needlecast, canker diseases or other problems.

### RHIZOSPHAERA MANAGEMENT:

Rhizosphaera needlecast can be managed in several ways. Landscapes that utilize frequent irrigation may be conducive for Rhizosphaera and other foliar infections. Also, those landscapes with poor air movement that results in prolonged leaf wetness are more susceptible to Rhizosphaera and other foliar diseases. Also, it is important to not crowd trees; densely planted trees prohibit light penetration and air movement, resulting in more needlecast infections (Photo 4). In some situations, applications of broad-spectrum fungicides during the spring may be warranted to help prevent infections by the Rhizosphaera fungus. With fungicide protection, trees may recover. 

For more information, please feel free to email David Roberts at [robertsd@msu.edu](mailto:robertsd@msu.edu) or contact a professional plant health care provider. The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.



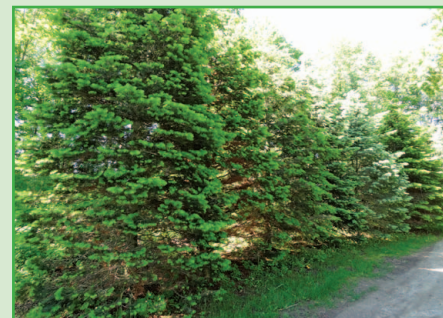
**Photo 1:** Concolor fir is a fine alternative to the attractive but increasingly problem-prone Colorado Blue spruce. This lone specimen growing in the sun and with good air movement is less susceptible to diseases such as Rhizosphaera needlecast.



**Photo 2:** In typical needlecast infection fashion, inner and older needles are usually affected before the current season's growth is affected.



**Photo 3:** Diagnosis of Rhizosphaera needlecast may be aided by examining needles for the presence of tiny dark fungal fruiting bodies emerging from needles.



**Photo 4:** These Concolor firs have a high incidence of Rhizosphaera needlecast due to dense planting, shading and low air circulation.

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