

# THE PURDUE LANDSCAPE REPORT

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## Early Season Samples: Spruce Needle Loss and Boxwood Leaf Spots

(John Bonkowski, [jbonkows@purdue.edu](mailto:jbonkows@purdue.edu))

There have been a number of samples we have received at the PPDL in recent weeks that bear similar problems worth noting. It is still relatively early for significant in-season disease development due to how cold it has been, although we have certainly had enough rainfall to encourage fungal growth. We have received multiple samples of spruce and boxwood which will be covered.

Since the start of the year, we have been received spruce samples showing needle thinning, browning, and loss in the lower canopy (Fig 1, 2, 3). If I said these are Colorado Blue Spruce, we could call it *Rhizosphaera* and maybe call it a day, however, these samples are primarily from other species of spruce. An important thing to remember when it comes to evergreen conifers is that it takes time for symptoms to develop, whether due to disease or to abiotic factors. The majority of these branches lacked any discoloration within, suggesting that there was no infection and that the limbs were still living.



Figure 1: A spruce tree showing significant needle loss and dieback lower in the canopy.



Figure 2: Needle loss at or near branch tips.





Figure 3: Close up of needle browning and loss near spruce branch tips.

Last year, we had drought conditions during the summer throughout large parts of the state leading into the fall with below average precipitation (Fig 4). Since evergreen plants hold onto their foliage through the winter, desiccation can occur since they are still losing water to the air, especially when it is dry and windy. If these plants are not getting enough water going into winter, there is greater risk of winter injury or burn and needles may turn brown, especially near branch tips (exposed areas).

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2019	3.50	4.45	4.18	5.62	6.02	6.12	3.61	3.51	2.26	4.29	2.70	3.26	49.52
2020	4.65	2.81	4.62	3.05	5.07	3.52	4.58	3.31	1.53	4.44	3.02	1.80	42.40
2021	2.45	2.21	3.82	2.94	3.72	5.93	5.44	3.42	4.06	6.04	1.43	4.00	45.46
2022	1.68	4.53	4.02	3.30	5.06	2.35	5.49	3.83	2.26	1.79	1.60	2.28	38.19
2023	3.35	3.02	****	****	****	****	****	****	****	****	****	****	*6.37
Normals	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1991-2020	2.95	2.48	3.33	4.39	4.78	4.80	4.29	3.60	3.29	3.33	3.38	3.01	43.63

Figure 4: Indiana Precipitation data, in inches of rainfall, from 2019 to present. Courtesy of Midwest Regional Climate Center – cli-Mate: <https://mrcc.purdue.edu/CLIMATE/>

Irrigation during periods of hot and dry weather will mitigate drought stress, but irrigation may still be necessary in the fall to avoid needle desiccation. What about when trees of the same age, on the same property are showing different levels of severity or one tree is perfectly fine while the next is toast?

I think it is important to remember each tree is an individual. We may see similar patterns in the landscape across the same tree species when stress is caused by environmental effects, but if the overall health of that tree when it was first planted, the amount of love and care, and the site conditions (soil, light, general water levels) are different, then the trees may have vastly different reactions to stress. Determining this 5 years after planting can be difficult for someone just walking into the situation, or when dealing with 30ft tall trees, but it is something we have to keep in mind.

We have also been receiving boxwood samples with yellow ringspots on the leaves (Fig 5, 6). While people may not see this damage until the leaves are turning brown or fall off the tree (Fig 7), this is a symptom of active feeding by the boxwood leafminer and can be quite striking. The maggot feeds within the leaves and causes the leaf to bubble-out where these blotch-like leaf mines are located. This year there have been anecdotal reports of seeing early leafminer activity, which could be associated with the milder winter we have had in the Midwest. We typically see leaf miner activity starting later in the year and that the damage

often goes undetected by homeowners until much later in the season.



Figure 5: Yellow ringspots on boxwood foliage. Photo Credit: Jeff Pell, Agriculture and Natural Resources Educator, Hendricks County



Figure 6: Blotch-like leaf mines caused by the larvae of the boxwood leaf miner.



Figure 7: Boxwood leaf miner injury across an entire boxwood plant which will lead to defoliation.

Additional Resources

## Managing Garlic Mustard

(John Woodmansee, [jwoodman@purdue.edu](mailto:jwoodman@purdue.edu))

Garlic mustard (*Alliaria petiolata*) can be found in public parks, backyards, meadows, forests, gardens, and along roadsides throughout Indiana. The leaves have a strong garlic smell to them. Garlic mustard was first introduced from Northeastern Europe in the 1860s in Long Island, New York. Immigrants from Europe used it for food (an herb), medicine, and erosion control. It can be spread by water, insects, wind, animals, or humans.



Here's the kicker with garlic mustard – according to research (Kleinstein, 2001), each year one plant can produce up to 15,000 seeds that are viable for up to 5 years. (Other references mention 3,000 to 8,000 seeds). Regardless of whether it's a few thousand to many thousand, it's a lot of seeds. So, if you let a few garlic mustard plants go this year, you could have a “train wreck” of weeds in a few very short years, and you could be fighting those weeds for years to come. The research also states that garlic mustard has properties that may inhibit growth and the competitive ability of other plants, empowering the invasive nature of the weed. Large patches of garlic mustard also reduce light availability in spring for species growing on the forest floor. Garlic mustard prefers shady, moist conditions, such as woodland settings, but can also grow in sunny conditions. It is a biennial, which means that vegetative growth in a “rosette” form close to the ground occurs in the first year. In the second year, it produces an erect stem with small, white 4-petaled flowers that produce seeds, then it dies. It can grow from several inches up to about 4 feet. Rosette leaves are dark green and heart-shaped, with scalloped edges. Leaves on second-year growth are more triangular, becoming more strongly toothed as the plant matures. Garlic mustard develops slender seed pods that open in the late spring/summer.

According to the U.S. Forest Service, “Garlic mustard poses a severe threat to native plants and animals in forest communities. Once introduced to an area, garlic mustard out-competes native plants by aggressively monopolizing light, moisture, nutrients, soil, and space.” The plant has no natural enemies.

So, what can be done?

Some public parks have enlisted the help of groups like Boy Scouts, Master Naturalists, and others to pull garlic mustard in spring before or near the onset of flowering (before it goes to seed). Although tedious, that is one of the best management strategies and one that homeowners can also do around their property. They are easier to pull after a rain event. Application of herbicides containing glyphosate and triclopyr is most effective on the first year (rosette) form in the fall. Be sure to read and follow all label instructions, and note that glyphosate and triclopyr will affect any plant it touches, so be cautious.

Find out more information about garlic mustard from USDA (with links to other credible sources) at <https://www.invasivespeciesinfo.gov/profile/6655/resources>.

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## Southwest Damage, Scalding, or Frost Cracking

(Ben McCallister, [bmccalli@purdue.edu](mailto:bmccalli@purdue.edu))

We are now on the other side of the equinox, days are getting longer, and there are specks of green poking out on the plants in our life. If you're in Indiana or similar areas of the Midwest, you've probably experienced what I like to call *False Spring* and *Second Winter* and are looking forward to actual Spring setting in with more chances of spending time outside.

As you head outdoors though, you might notice signs of damage on some of your trees that include splits or cracks that could range in size from less than 1” to up the entire length of the main stem and/or sunken areas on the trunk (Figs. 1 & 2). What you're witnessing is winter stem damage known as sunscald or southwest damage (usually located on south to southwest facing sides of the tree).





Figure 1 – Southwest damage from the base of the tree up the trunk.



Figure 2 – Sunken wound from scalding damage.

So, what is southwest damage and why has your tree been affected by it? It's a wound that's opened during winter due to sudden drops in temperature. These drops can come from different instances like the change from day to night or even from sudden cloud cover on a sunny day. The sun warms the trunk on the south to southwest faces of the tree, then the temperature change causes the bark to split. Repeated instances eventually cause dehydration of the damaged area which causes scalding.

Southwest damage comes from a previously sustained injury and will likely be found on younger trees or species with thin bark including *Acer spp.*, *Betula spp.*, *Malus spp.*, *Platanus spp.*, *Prunus spp.*, and *Ulmus spp.* If these trees are also stressed, for example, from the dryer hotter summers we've been experiencing or other factors, they will be more vulnerable to damage moving into winter months.

As your trees grow and become more established, chances of

damage decrease. Install white tree guards in Fall on trees less than 4" to help protect them during the winter. Those of you that are ahead of the game in your tree protection will have already done this last year to help prevent southwest damage (and damage from deer rub if you installed them in the fall before the rut). I commend you on your efforts, but make sure not to leave them on year-round. As things begin to heat up those covers can be a source of moisture retention which can lead to rot on the trunk of your tree. Plan on removing them as Spring sets in and save them for next Fall.



Figure 3 – Use of white tree guards can protect the trunk from temperature changes that cause damage. Joseph OBrien, USDA Forest Service, Bugwood.org



Figure 4 – Callus tissue growth closing over southwest damage.

If cracking has already occurred, don't panic. It's not the end of your tree. Depending on the extent of the damage the tree may be able to seal off the damage with callus tissue called wound wood (Fig. 4). Healthier trees can produce this more quickly. Some things you can do to assist your tree include the following:



- Putting your tree on a watering schedule (especially in the summer) to reduce water and heat stress.
- Mulching your tree (no mulch volcanoes) can help stop mechanical damage from mowing and other lawn maintenance and can also help with water retention in the soil.
- Herbicide use should be limited and done on days with little to no wind to help reduce drift onto the tree.
- Plan on installing white tree guards mid to late Fall. I like the white corrugated drainpipes you can find at local home and garden stores. Make sure to get a diameter larger than your tree to provide airflow to the trunk.

If you are still worried about the health of your tree, you can always find an ISA Certified Arborist nearby using the [Trees Are Good website](#). They will be able to help assess any other issues and provide excellent professional help.

## Works Cited

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## A Cold Mold that Craves the Shade

(Lee Miller, [turfpath@purdue.edu](mailto:turfpath@purdue.edu))

Pink snow mold is a disease caused by the fungal pathogen *Microdochium nivale* (syn. *Monographella nivalis*) that is being observed in middle and northern Indiana this late winter. The pathogen is termed psychrophilic, or cold loving, due to its propensity to grow and infect in colder temperatures. The disease can be particularly severe on unfrozen turf under an insulating snow cover, but the pathogen doesn't necessarily need snow to form and cause damage. For this reason, the disease is also referred to (perhaps more correctly) as Microdochium patch by researchers, since symptoms also occur in the cool, wet conditions that have been the norm this winter. Conversely, the true snow molds, such as gray and speckled, require an extended amount of snow cover to develop, and are more regularly observed in the colder climates of Michigan, Wisconsin, Minnesota and Canada.



### Shade impacts snow melt and disease activity.

**A.** Shade from a building creating a stark contrast between a wintry and spring-like landscape. - Photo by A. McCurdy

**B.** Microdochium patch prevalent in shade from a structure and not affecting turfgrass in full sun. Inset: micrograph of pathogen spores.

Microdochium patch can occur on nearly all turfgrass species, with the most severe symptoms occurring on creeping bentgrass and annual bluegrass. On higher cut lawns such as Kentucky bluegrass or the fescues, Microdochium patch is less common, but when it occurs can be very conspicuous. Symptoms on higher cut turfgrass are circular tan brown to white patches approximately a foot or more in diameter that can coalesce to affect larger areas. When the disease is active, especially on cool wet mornings, a faint pink hue may be observed on patch edges. This pink coloration is the sporodochia which bear numerous spores, or conidia, that facilitate transmission and disease spread. Microdochium patch symptoms can be easily confused with red thread, necrotic ring spot, or Ascochyta blight, which may occur later in the spring season.

As shown above, shade greatly enhances disease incidence and severity. Note photo A and how the sunlit side has daffodil bulbs emerging from their slumber, while the shade from the building on the other half maintains a wintry wonderland. The extension of cool, wet conditions from the shade in photo B provides the conducive conditions for Microdochium patch while the sun-dried canopy remains disease free.

Heavily shaded areas under a tree canopy can be reduced through selective pruning, but renovating a multi-story down to a ranch isn't quite as feasible. In reality, most cultural practices for Microdochium patch suppression need to be remembered and implemented next fall. Don't apply nitrogen fertilizer too late in the fall, particularly during extended periods of cool, wet weather. Continue mowing in the fall at a normal mowing height until the turf stops growing to prevent excessive growth and lodging. Don't reduce mowing height or scalp the turfgrass which may lead to winter injury.

When used on high amenity areas such as golf course or sports fields, one or two fall preventive fungicide applications prior to the first snowfall may be necessary to prevent widespread damage. If cared for properly, higher cut turfgrass will usually recover from Microdochium patch, so fungicide applications are normally not recommended in the home landscape. Restrict mowing and traffic while the disease is active. In affected areas,



rake the matted leaf tissue to allow for sunlight and air into the turfgrass canopy. When high temperatures in spring rise consistently into the 60-70°F range, apply a quick release nitrogen fertilizer to encourage recovery. If the disease is

especially severe, consider overseeding the area in early spring to rebuild lawn density.

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