

THE PURDUE LANDSCAPE REPORT

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Phomopsis Dieback of Spruce

(John Bonkowski, jbonkows@purdue.edu)

We receive a large number of spruce samples each year at the PPDL, with the vast majority being from Colorado blue spruce with needlecast. Many others show lower needle yellowing, which could be associated with nutrient deficiency or root stress.



Figure 1: A spruce tree suffering from root damage and water stress.



Figure 2: A young spruce tree under the effects of transplant and root stress.

However we are receiving an increasing number of Norway spruce samples with small branch dieback from the tips. This tip dieback symptom can have many causes: cold injury, root damage manifesting in branch dieback, *Diplodia* tip blight (caused by *Diplodia sapinea*, the same pathogen that causes [tip blight in pine](#)), and *Cytospora* canker. *Phomopsis*, another fungal pathogen which causes tip blight on spruce in nursery situations has been observed in greater frequency since 2012 by plant diagnostic labs in the North Central region causing cankers and tip dieback in more mature spruce trees in the landscape.



Figure 3: Dieback symptoms in a mature tree associated with *Phomopsis* infection.



Figure 4: Phomopsis dieback with excessive needle loss on branch tips.

The disease begins in the lower canopy and moves upward, but in some cases it progresses quickly, causing dieback through a large portion of the tree. Besides needle death and drop, there are virtually no other external symptoms to indicate where the original infection took place. Occasionally you may find resin building on the outside of a canker. Cutting into the thin bark will show the brown discolored tissue where the canker is developing. Cankers are often located in between two areas of healthy tissue. This can lead to older needle loss similar to needlecast diseases, but leaving terminal buds alive. However, once the pathogen spreads and girdles the branch, the rest of the branch will begin to die out to the tip.



Figure 5: Symptoms of Phomopsis dieback begin in the lower canopy initially before spreading upward over time.



Figure 6: A small amount of resin present at the location at the point of infection.



Figure 7: There are few symptoms on the exterior of the branch, aside from some resin, that show the presence of a canker.

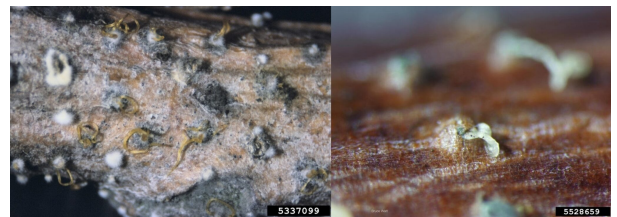


Figure 8: Phomopsis pycnidia on different hosts with spores oozing out in tendrils during humid weather.

Under humid conditions the fungus produces spore bearing structures (pycnidia) in the cankered tissue, erupting from through the thin bark. These structures are black and, in wet weather may produce yellow to tan colored tendrils of spores (cirrhi) which are visible with a hand lens. When dry, they retain their tendril-like shape, but when moist, they loosen up and are easily spread by rain.

The pathogen appears to infect younger tissue readily, which is where we see it most commonly, but will also infected wounded older tissue as well, leading to cankers on larger limbs. Pruning out infected branches will reduce the potential inoculum for future seasons. We are not sure why this disease is becoming a more prevalent issue in the landscape, but trees being exposed to more environmental extremes may be a contributing factor. This emerging problem it is just one more reason to keep your trees happy if they want them to remain aesthetically pleasing in the landscape.

Above or Below Mulch: Should you apply preemergence herbicides before

or after mulching?

(Kyle Daniel, daniel38@purdue.edu)

When spring mulching occurs, most companies will apply a preemergence herbicide for extending weed control. It is well known that the combination of mulch and preemergence herbicides is a very effective method in controlling weeds (<https://www.purduelandscapereport.org/article/cultural-plus-chemical-a-good-weed-control-combo-in-landscape-beds/>). When applying preemergence herbicides with mulch, which should be first for the most effective control?

This common question is answered by knowing the herbicides that you will be applying. Herbicides that are volatile, such as dichlobenil (Casoron), or that photodegrade quickly (DNA-dinitroaniline herbicides such as: trifluralin (Treflan), oryzaline (Surflan), etc.) will be most effective applying prior to mulching to prevent degradation of the chemical. Herbicides that aren't as susceptible to degradation will be most effective on top of the mulch by binding to the organic matter of the mulch.



Figure 1. Herbicide and mulch trials at the Daniel Turf Center at Purdue University.

A study examining the effect of EPTC (Eptam 5G) on yellow nutsedge above and below pine straw, pine bark, and shredded cypress found that the greatest control was found below shredded cypress (Chen et.al., 2013). Similar results of oryzalin were found in Case and Mathers (2006). It is speculated the reason for the increase in control under mulch is due to the volatility of EPTC and oryzalin (Marble, 2015).

Size of bark materials were found to be a significant factor in herbicide placement in Case and Mathers (2006). Large pine bark nuggets were most effective at weed control when the herbicides were placed on top of mulch, with the exception of oryzalin.

When applying mulch and herbicides this spring, know the properties of your herbicides to determine the most effective location for maximum weed control. If possible, split applications will extend the control through early summer. Always ensure a water event (rainfall or irrigation) after applying preemergence herbicides to ensure efficacy.

Literature Cited:

Case, LT, Mathers, HM (2006) Field evaluation of herbicide treated mulches. Proc South Nur Assoc Res Conf 51:402.

Chen Y, Strahan RE, Bracy RP (2013) Effects of mulching and preemergence herbicide placement on yellow nutsedge control and ornamental plant quality in landscape beds. Hort Technol 23:651-658.

Marble, C. (2015) Herbicide and mulch interactions: A review of the literature and implications for the landscape maintenance industry. Weed Technology. 29: 341-349.

Effect of Cold Temperatures During Bud Break

(Kyle Daniel, daniel38@purdue.edu)



Figure 1. Maple bud break in West Lafayette, IN.

This week's forecast is indicating unseasonably cold temperatures for most of the state with lows in the lower 20's. While the temperatures shouldn't reach record setting status, it could cause some plant stress. Plants are most susceptible to cold injury going into dormancy and coming out of dormancy, with maximum cold hardiness during the winter. Warm temperatures pushing plants early, after receiving enough chilling hours to release from dormancy, can cause injury on sensitive plants.

With bud break occurring on some species around the state, some plants may receive minor damage. With only two nights of cold temperatures, there should be very little damage to plants in the landscape. Extended days of cold temperatures this time of the year are what causes extensive damage, so plants should come out of the week with minimal damage.

For more reading on dormancy and similar past weather events, see below.....

What do trees do in the winter?

<https://www.purduelandscapereport.org/article/what-do-trees-do-in-the-winter/>

2020 has jumped the shark!

<https://www.purduelandscapereport.org/article/2020-has-jumped-the-shark/>

Winter injury could cause a reduction of flowering on perennial

trees and shrubs

<https://www.purduelandscapereport.org/article/winter-injury-could-cause-a-reduction-of-flowering-on-perennial-trees-and-shrubs/>

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