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THE PURDUE LANDSCAPE REPORT

In This Issue

Plant for the Sun!

(Lindsey Purcell, lapurcel@purdue.edu)

Trees offer many functional and aesthetic benefits, but one of the most common is shade. Because of this, one of the most important aspects of tree selection and planting is placement. Improper placement of trees can diminish the value of the tree on the site. The tree can actually become a liability if it conflicts with infrastructure or just does not providing any useful function at all. It's important to consider and energy efficient design to obtain shade where it's needed most such as south or west facing structures.

In this hemisphere, the sun is in the south and the source of cold weather is in the north. Whenever possible, place openings for sunlight and radiant heat primarily on the southern exposure, then on the west and east. For energy efficiency in winter, use the low arc of the sun to capture the maximum amount of warmth through east-, west-, and south-facing windows. Windows with a northern exposure are a source of cool air from prevailing winds during the hot months. So, give the north minimum exposure and maximum natural protection in the winter.

When selecting trees for energy efficiency, don't plant evergreen trees near the house on southern exposures. Trees may provide some shade and screening but will also block out the warming effects of the sun during winter months. When choosing trees for shade and solar gain, choose larger, deciduous-canopy trees, which provide an advantage year-round. This means shade in the summer, blocking the sun's energy. In the winter, after leaves have dropped, the sun's energy can pass through the tree and into the window.

https://www.purduelandscapereport.org/wp-content/uploads/2018/05/Figure-1.mp4

Select good quality trees from a reputable source that are suitable for your location. The old adage, "you get what you pay for" goes for nursery stock as well. Correct placement is critical for an energy-efficient design and reduced maintenance as the tree grows and matures. Be certain the mature height and spread fit the location before purchase and planting the tree. This allows the tree freedom to spread into the design space naturally without excessive pruning needed to prevent conflicts with the home. However, the tree still must be close enough to the house for the canopy to provide shade. A good rule of thumb to begin placing the tree at least 20 feet from the house. For larger shade trees, you may need to plant as far as 40 feet from the house to insure room for growth (Figure 1).

Trees provide many benefits besides shade which includes cleaner air and increased property values. These ecosystem services are the reason why we plant trees, besides beautifying our landscape.

Figure 2. Protection from the summer sun.

The functional benefits of shading help make homes energy-efficient by creating a cooling effect during the hot summer months and by allowing passive solar gain during cold winter months. However, proper selection and placement is critical to make the tree work for your site. Choose wisely, plant properly.

For more information on tree selection see publication FNR-531-W as well as the video that goes along with the publication, FNR-538-WV. Tips on tree installation can be found in the publication FNR-433-W along with the video FNR-540-WV.

Red Band (Dothistroma) Needle Blight

(Gail E. Ruhl, ruhlg@purdue.edu)

The Purdue Plant and Pest Diagnostic Lab (PPDL) recently received samples of Mugo Pine and Spruce that exhibited reddish-brown bands on needles of lower branches (Figs 1 & 2).

Fig 1 Dothistroma needle blight on Mugo Pine

Fig 2 Dothistroma needle blight on spruce

Microscopic examination of needles confirmed the presence of *Dothistroma*,(Fig 3) a fungus that causes red band needle blight. Needles infected with Dothistroma first exhibit dark green bands on the needles that are quickly replaced with brown or reddish brown lesions. Only the base of the needle will remain green, with the remaining portion tan or brown. (Fig 4)

Fig 3 Magnified spores of Dothistroma

Fig 4 Browning of needles due to Dothistroma needle blight on Mugo Pine

Infection is typically more severe in the lower portion of the canopy nearest the ground. (Figs 5 & 6)

Fig 5 Dothistroma infection on lower branches of Austrian Pine

Fig 6 Lower canopy infection of Dothistroma on Mugo pine

Fig 7 Ponderosa Pine

In late Fall, black fruiting bodies (Fig 7) appear on needles and mature to release spores the following Spring and Summer. The spores are spread by wind and rain and can infect needles throughout the growing season. New needles are susceptible once they emerge from the needle sheaths.

Fig 8 Extensive browning and premature needle drop due to Dothistroma infection on Scotts Pine

Infected needles may develop extensive browning 2-3 weeks after the first appearance of symptoms and drop prematurely rather than remain on the tree for their normal two to three years (Fig 8). For example, infected second-year needles are often cast (dropped) before the infected current-year (first-year) needles. Needles that become infected the year they emerge are often not shed until late summer the following year. Repeated severe infections over several years will result in decreased vigor and growth of the tree, ultimately causing death. In areas where Dothistroma needle blight is severe, you may want to consider planting another species of tree other than susceptible pines. It is reported that a number of coniferous hosts are affected but two-needled pines are particularly susceptible. Spruce is thought to be of low susceptibility, only becoming infected under high inoculum pressure.

Stressful site and environmental growing conditions, such as occur on berms, may predispose susceptible conifers to infection by needle blights. Improving the vigor of trees is important with regard to overall tree health. Watering during especially dry periods and mulching to help maintain a more consistent moisture level within the feeder root zones of trees will assist in reducing overall stress. (Conifer Dieback ID-477-W)

Sanitation is the recommended cultural management: remove any dead branches, and rake up and destroy fallen needles which harbor the fungus. This may slow the spread but will not provide full control.

Fungicide sprays may be practical on smaller trees for management of this disease. Fungicides prevent new infections–they do not cure existing ones. Diseased needles will continue to deteriorate and fungicides must be applied every year for several years before improvement is actually seen. As these fungicides aren't curative, they will do nothing for last year's infected needles so the tree may appear to get worse before it gets better.

Dr. Janna Beckerman, Purdue Ornamental Plant Disease Extension Specialist notes that labeled, protective fungicides sprays are limited to copper-based compounds such as Junction, and Camelot O in the landscape, and should be applied twice in the spring after new growth appears, and again 4-6 weeks later when new needles are expanded. For nursery or Christmas tree growers, Kocide 3000 is also labeled for control of this disease. During wet years, additional later applications may be needed. It is important to make sure that all needles are thoroughly covered with the fungicide spray. Keep in mind that these products are toxic to fish and other aquatic creatures! Do not apply to run-off, or apply directly to water, or to areas where surface water is present.

For confirmation of the specific needle blight fungus present on your conifers, submission of a physical sample of infected needles on symptomatic branches is necessary. (https://ag.purdue.edu/btny/ppdl/Pages/physicalspecimens.aspx)

Kingdom Fungi

(Janna Beckerman, janna@purdue.edu)

Video 1: What are fungicides and how do they work?

Fungi are a unique group of organisms—so unique that they are put into a separate category called a 'Kingdom'. In Kingdom Fungi, some members cause rust, scab, powdery mildew, leaf spots and blights (to name but a few!).

When these fungi are 'out of control' many people turn to

fungicides.

What are fungicides and how do they work? We have a video that explains this: https://www.youtube.com/watch?v=eNiqROUtpgo

Video 2: How do fungi attack plants?

Fungicides are used to stop fungi from attacking plants, not after you see the damage. Anyone who has grown roses knows how Japanese beetles damage plants. But do you know how powdery mildews infect and damage plants. Find out here: https://www.youtube.com/watch?v=eNiqROUtpgo

Fungicides are best used as part of an integrated strategy that looks to improve how the plant looks or yields. Why use fungicides? Fungicides are used to protect plants when integrated management can't do the job to the degree needed to produce a harvest. Fungicides work as protectants or work systemically. This video briefly discusses the differences between the different types of fungicides https://www.youtube.com/watch?v=AVas6juNnfc

Video 3: Why Use fungicides?

Video 4: Why didn't my fungicide work?

Unfortunately, most people using fungicides are less than impressed with their results. Why didn't my fungicide work? A lot of people think fungicides don't work, when in fact, they didn't use the product correctly. Learn how to properly apply fungicides for the best results.

https://www.youtube.com/watch?v=M8-1xfo243Y

To find any of these videos, click on the link or Google: YouTube fungicides Purdue

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