South Dakota State University Extension

Tree Pest Alert

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In This Issue

Samples

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Note: samples containing living tissue may only be accepted from South Dakota. Please do not send samples of plants or insects from other states. If you live outside of South Dakota and have a question, please send a digital picture of the pest or problem.

Any treatment recommendations, including those identifying specific pesticides, are for the convenience of the reader. Pesticides mentioned in this publication are generally those that are most commonly available to the public in South Dakota and the inclusion of a product shall not be taken as an endorsement or the exclusion a criticism regarding effectiveness. Please read and follow all label instructions as the label is the final authority for a product's use on a pest or plant. Products requiring a commercial pesticide license are occasionally mentioned if there are limited options available. These products will be identified as such, but it is the reader's responsibility to determine if they can legally apply any products identified in this publication.

Reviewed by Master Gardeners: Carrie Moore and Dawnee Lebeau

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Plant development for the growing season

We may be starting our traditional January thaw. The temperature dropped to -10 to -15ºF last week but may be up in the 40s this week. This is the typical roller-coaster temperature swings we see during mid-winter. Sturgis saw a high of 48ºF then a few days later a low of -15ºF.

We are not experiencing days above 50ºF yet, let alone an average of 50ºF. Usually, we start accumulating GDD during late January. Often only the Black Hills communities from Spearfish to Rapid City see temperatures in the 60s with nights remaining above freezing.

They are the first communities to start accumulating GDD. Aberdeen – in the frozen tundra of the north – is the last.

Aberdeen	0
Beresford	0
Chamberlain	0
Rapid City	0
Sioux Falls	0

Drought monitoring

The entire state is classified as "Moderate Drought" or a greater drought intensity by the US Drought Monitor. The dry soil is developing large cracks, appearing like long crevasses on a glacier. These cracks are common in dry, clay soils that are experiencing fluctuating temperatures.

Cold temperatures and dry soil are a bad combination

The dry winter means there is little snow cover. While snow is a pain to shovel, it provides an insulating blanket that protects roots from low-temperature injury. Most people are surprised to know that roots do not tolerate as cold of temperatures as the above-ground parts of the plant.

Most roots tolerate soil temperatures to a low of 15ºF. This threshold applies to trees as well as perennial bed plants. Temperatures that dip below this threshold in the upper four inches of the soil – where root density is highest – means a loss of roots, perhaps a fatal number of roots lost for a plant.

The soil temperatures across the state are in the low 20ºFs at a four-inch depth in open soils. These are survivable root temperatures, but we still have a lot of winter to go. There are also a few counties, such as Codington and Campbell, where the soil temperatures are -16ºF.

If cold temperatures and open soil conditions continue through February, I expect to see some losses in young windbreak plantings come spring. These trees will turn brown, rather than bright green, since the roots are dead and cannot bring water to the foliage.

Treatments to Begin Now

Will anti-transpirants help my evergreens?

Most needle browning is due to winter desiccation, often called winter burn. The evergreen is giving up moisture on warm, windy winter days that it cannot replace through a frozen stem and roots. While spraying a film on the plants to prevent water loss sounds like a good idea, it may not work. The film can also turn a blue spruce into a green spruce.

How does an anti-transpirant work? Plants lose water to the atmosphere through transpiration. This is an essential process and is the driving force for water movement through the plant. As the water evaporates from tiny pores on the leaves (called stomata), it is pulled up as a continual chain through the stem and roots. The plant can move this water without doing any work – the transpiration process drives the movement.

Anti-transpirants are designed to retard or stop this water loss from the leaf. The most common anti-transpirants work by creating a physical barrier to the release of water vapor by the plant. The barrier is created with acrylic, latex or wax that forms a film over the leaf surface plugging many of the tiny pores.

The thought behind the use of anti-transpirants is by plugging the pores the water will not transpire out of the foliage so the plant will not dry out and turn brown. Unfortunately, this is often not true and, in some instances, can even make the problem worse. The real problem is these products can work too well and last too long, often into the growing season and that is where the real problems begin.

First, water loss through the needles by transpiration is a normal process that we usually do not want to interrupt. As mentioned earlier, this is the driving force for the circulation of water through the plant. Retarding the transpiration process can reduce water movement into and through the plant and, along with this, all the nutrients and growth regulators that are carried by this stream.

Water escaping from the needles during the summer also provides a cooling benefit to the foliage, much as sweat cools our skin. The evaporative cooling as the water vaporizes is reduced by plugging the stomata, heating the leaf up, sometimes 15ºF or more.

Second, not only do anti-transpirants retard the movement out of the leaves, but they also retard the movement of carbon dioxide. Carbon dioxide is the essential building block for the sugar-making process of photosynthesis. Anti-transpirants not only reduce water loss, but they can also reduce photosynthesis.

So, there are a lot of negatives to the use of anti-transpirants. One of my favorite quotes is from a study on the use of anti-transpirants on evergreen seedlings in windbreaks; “Tree survival was inversely proportional to their effectiveness.” In other words, the better the anti-transpirants plugging up the stomata pores, the lower the survival rate of the trees.

Another study on the effectiveness of anti-transpirants in protecting evergreens from winter burn found that most products slightly increased the browning rather than reduced it. The problem was the material was still working six months later, now summer, when you do not want to reduce loss at all.

Can anti-transpirants be helpful? Possibility. But to reduce the winter desiccation the film cannot be placed on the foliage until the plant is completely dormant, sometime in early November. They need to be applied when the air temperatures are in the 40ºFs, and they must wear off by early spring.

This is a tough recipe to follow. It is too late to spray them now. They may not wear off in time (but an application by a commercial applicator would be fine now – they know the correct amount and circumstances).

The short answer is that the best means of avoiding or reducing winter burn on your evergreens is to water in late summer and fall so the plant enters winter healthy, not stressed. While anti-transpirants are sold to combat this dehydration, they are not the quick and simple solution they appear.

Timely Topics

Emerald ash borer update

Emerald ash borers (EAB) survived the -18ºF temperatures last week just fine. We need to have temperatures another 15 to 20 degrees colder to see significant mortality. But many of these sleeping larvae are in for a big surprise, their home is being cut down and chipped!

Ash tree removals are at high speed in communities across eastern South Dakota

Residents of communities from Elk Point to Brookings are noticing ash trees disappearing at a rapid rate. These are ash trees in communities from Union to Brookings counties – counties where we have confirmed infestations. The cities are taking advantage of the lack of snow to remove the ash trees along the streets. People leave for work in the morning and when they come home there is a stump where there was a tree!

While folks find this alarming, the cities are doing the right thing, a fact I must explain to worried homeowners that call. These trees must come down, either now or soon, whether they are presently infested or not. All city street or park trees in these communities – unless being treated – will become infested and die; delaying the work will not help.

Canton, where the emerald ash borer was confirmed in 2020, just removed all ash, both public and private, except those being treated. During the first three years of the infestation, few trees were removed. By 2024, there were streets lined with dead ash, a very hazardous condition. Now these trees are all a huge mulch pile.

E-samples

Pine needle scale on spruce

This is a picture of a white spruce with needles covered by pine needle scale (*Chionaspis pinifoliae*), a sucking insect. These are the small (1/8-inch long) white tear drop shaped bumps that cover the newest needles. The scales are dead now but are filled with eggs.

The eggs will hatch this spring at about 300 GDD, about the time common lilac begins to bloom. The young, called crawlers, are mobile. The crawlers will move out to the new needles, insert beak-like mouthparts into the tissue, and suck out cell contents.

They remain at this spot, lose their legs, and form a shell over the body as adults. The females form shells as adults, the adult males look like gnats and fly away. They are not even necessary for reproduction!

Horticulture oils, either as dormant or summer oils, depending on the temperatures at application, are effective at killing scale crawlers but not their natural enemies. However, applied when the new needle growth is tender or temperatures are too warm, can cause injury to the needles.

Scurfy scale on aspen

Another picture of small white bumps, but on an aspen tree, also appears to be a scale. These are scurfy scales (*Chionaspis furfura*), a close relative to the pine needle scale.

Scurfy scales are 1/8-inch bumps that are grayish white with a round shape. They are close in appearance to the oystershell scale (*Lepidosaphes ulmi*) which also can be found on aspen. Oystershell scale is brown to gray and have a more elongated oyster shell-shaped form. The two scales are so close in appearance that the picture could be showing either one.

Lifecycles are similar with these two insects. The bumps on the aspen bark are all dead females with eggs nestled beneath them. The eggs hatch in mid late spring, about 400 to 500 GDD with the crawlers moving out to the shoots to feed. Once they begin feeding, they become sessile. They feed by sucking cell contents till summer when the females form their shell.

They can be treated with a horticultural oil in April to suffocate the eggs before they hatch. Infested trees can also be sprayed with an insecticide while the crawlers are present, but this treatment may also kill the natural enemies which provide most of the control of these insects.

Samples received/Site visits

Codington County, Black knot on chokecherry

Black swellings are very noticeable in chokecherry trees now that the leaves are gone. This is a fungus called black knot (*Apiosporina morbosa*). The infection results in woody swellings, knots on branches and trunks of cherries. The disease can also occur on plums though it is far less common on this host.

The disease begins as a slight swelling of a newly infected twig. The twig may also have a faint color change, more of an olive green. At the end of the first year, or sometimes not until the second year of infection, the swelling becomes an enlarged black knot. This knot sometimes has a white covering. This is a fungus living on a fungus, the mycoparastic fungus (*Trichothecium roseum*).

Many trees have some resistance to this disease, so it is common to see it on three chokecherry trees in a belt and no knots on any of the other trees. The simplest solution here is to just remove the highly susceptible ones and replant them if possible. However, if the disease is showing up in much of the windbreak your options become more time-consuming.

First, prune out and destroy all the knots on the trees and those found on any trees within several hundred yards of the windbreak. The pruning must be accomplished before the beginning of March and the clipping destroyed, not merely left on the ground beneath the trees. The pruning will take two years to complete as the first-year infections, the slight swelling of the twig, are not clearly visible and you often do not see them until the knot forms the second year.

After all the winter sanitation pruning is completed, and only if the sanitation pruning is done, can the owner consider spraying with a fungicide to protect the trees from becoming infected again. The most common fungicide used contains chlorothalonil as the active ingredient (and labeled for use on cherries).

The first application is made at bud break, and treatments are continued every two weeks until the new shoots have hardened off or the weather turns dry (usually about mid-June). This is a long period for treating and the treatment must be applied every year to continue protection.

Some producers chose just to prune and spray every five or so years and look at suppressing the disease rather than attempting to eliminate it. Others just live with the disease.

Minnehaha County, Witches'-broom on hackberry

It is much easier to see abnormalities on deciduous trees during the winter. Black knot is more noticeable and so is witches-broom. These brooms are dense clusters of stunted shoots that appear along – but never at the end – branches.

The brooms may continue to expand over the years or decline. Regardless, the brooming does not kill the tree or even branches. They just look ugly.

The cause of the broom is not well understood. It was once thought that an eriophyid mite (*Aceria celtis*) and a powdery mildew fungus (*Podosphaera phytoptophila*) were responsible for the brooms. While they are found on trees with brooms, the connection between their presence and the formation of brooms has not been proven.