

Pest Update (February 3, 2021)

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John Ball, Forest Health Specialist SD Department of Agriculture, Extension
Forester SD Cooperative Extension

Email: john.ball@sdstate.edu

Phone: office 605-688-4737, cell 605-695-2503

Samples sent to: John Ball
Agronomy, Horticulture and Plant Science Department
rm 314, Berg Agricultural Hall, Box 2207A
South Dakota State University
Brookings, SD 57007-0996

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.

Available on the net at:

<http://sdda.sd.gov/conservation-forestry/forest-health/tree-pest-alerts/>

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.

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Plant development for the growing season

We are going to enter a brief period over the next week or so where it will finally be cold. The cold the Dakotas are known for and make people wonder why we live here. So now is a good time to touch upon the subject of temperatures (and moisture which we are

lacking) and how this affects trees and their two biggest threats, emerald ash borer and pine wilt disease.

Timely Topics

An Update to the Winter Watering Question

Considering it is still relatively warm and dry in the Black Hills, it is not too surprising that questions are still coming in about watering. The Black Hills were still seeing temperatures near 60°F during this past week. So, do homeowners in the Black Hills need to water their trees and shrubs?



The purpose of Winter watering is to replace the soil moisture being absorbed by roots and lost back into the atmosphere through the needles of conifers and, to a lesser degree, the buds of deciduous trees and shrubs. If the water leaving the plant through transpiration cannot be replaced by water from the soil, evergreen foliage and the buds on deciduous trees and shrubs can desiccate. Come Spring as the temperatures warm and plants slip out of dormancy, the affected evergreen foliage turns reddish-brown. Deciduous plant buds become brittle and fail to open.

The soils in the Black Hills are still warm and easy to work. There is little to no frost in many areas and these same soils are dry. I was able to dig around trees in the Rapid City area and pull bone-dry soils out of the holes. The only moist soils were the ones receiving melt water from the pockets of snow and ice in a few sheltered locations. Whether you are looking in town or in the surrounding forest – it is very dry.



Watering can be helpful for many woody plants in these parched soils. However, it probably will not be necessary to water for the next couple of weeks as the high temperatures are predicted to be in the teens for most days. Water loss is minimal during days with air temperatures less than 40°F and essentially stops when the temperatures dip much below 32°F, even for evergreens. It looks like it may be after Presidents Day before day temperatures are back into the 40°F again.

The other problem with watering in the Winter is frozen plant tissue. The water in the sapwood freezes at about 30°F. It takes a while for temperatures to drop in a large tree trunk – it is usually at least 5° warmer beneath the bark – but a stretch of temperatures in the 20's will mean that no water is moving in the tree. Extracellular water in the needles will freeze at about 28°F so water is not going to move through the tissue at sub-freezing temperatures. Any added water is not going to move up and through the plant.

Finally, soil temperatures also influence root permeability and water uptake at 33°F may be only one-fifth of that at soil temperatures near 60° to 70°F. Watering may not be beneficial until the temperatures are back at least into the mid-40°F and the soils have also warmed. If the added water pools, rather than is absorbed by the ground, don't add any more.

The point is, water requirements for woody plants in Winter are generally minimal and while watering will not harm them it may be detrimental to the lawn beneath the tree or shrub if the water does not infiltrate into the soil. You do not want to form a layer of ice over the turf.

Water only when the soils are not frozen and the air temperatures are above 40°F. Restrict watering to mid-day so that the water will have an opportunity to soak into the soil before night. Watering about every two or three weeks is probably going to be enough for woody plants through the remainder of the Winter and let us hope we get some moisture before Spring!

The Continuing, and Expanding, Problem of Pine Wilt Disease



The calls continue to come in about dying pines. People noticed Austrian (*Pinus nigra*) or Scotch pine (*P. sylvestris*) trees turning brown and dying within a month or two last Fall. The agent was the pine wood nematode (*Bursaphelenchus xylophilus*) which causes the disease pine wilt (the nematode carries bacteria and even a mite and these may aid in killing the tree). The nematode moves from tree to tree on sawyer (longhorned) beetles.

The sawyer beetles also carry blue-stain fungus – which as the name implies causes the sapwood to develop blue streaks. The nematode feeds on the blue-stain fungus, it helps in their development and reproduction, and in “blued” Austrian and Scot pines we can usually extract a lot of nematodes.



The disease was first noted in the late 1970s and it was soon determined that the nematode is native to the United States, most likely the South, and has been moving north. The nematode had also been moved in wood chips to Europe and Asia where it has killed millions of pines. Since the nematode is native to the US, many of our native trees are not bothered by it. The disease is mostly confined to Asian and European pines in this county with the two most affected, Austrian and Scotch pine, due to their popularity.

The ideal conditions for the development of the disease are those that favor the development of the nematode and its vector, the sawyer beetle, and reduces the defense of the pine. Wet Springs increase the mortality of the emerging sawyer beetles which carry the nematode from its dead host to a live pine. Extremely dry Summers can stress the pines reducing their chief defense, resin flow. Warm Summers have been correlated with increased pine mortality to the pine wilt disease

The optimum temperature range for the nematode development is about 68° to 77°F. The disease does not appear to develop in areas when the mean July temperatures are lower than about 68°F. The disease progresses very rapidly at temperatures above 77°F. Warm summers result in rapid increase and dispersion of the nematode which increases pine mortality to the disease. Trees die in four to six weeks after infection when the average temperatures are the 75 to 77°F range.

The disease has been progressively moving north in South Dakota as our average summer temperature increase. Pine wilt was limited to the southern tier of counties in 1990 and is now found as far north as Watertown and Spearfish. The average July temperature in Sioux Falls in 1990 was 67°F, 2000 72°F, 2010 74°F and 2020 77°F, The proliferation of the disease in the Sioux Falls-Mitchell area this past Summer is no surprise.

The concern is farther north. Aberdeen seems to run a couple of degrees cooler than Sioux Falls. The average temperature was 64°F in 1990, 70°F in 2000, 72°F in 2010 and 75°F in 2020. If this trend continues, I expect we will start seeing pine wilt disease in Aberdeen sometime within the next few years. Asian or European pines do not have a future in state, and we will lose many of our Austrian and Scotch pines during this decade.

Emerald Ash Borer (EAB) Update



Many communities have started a program of removing ash trees in anticipation of emerald ash borer being confirmed in their town. It is tempting to wait until the trees start dying from the insect. This has been the standard for Dutch elm disease and it has worked well for this disease. Dutch elm disease was not found in Brookings County until the early 1970s and we still had many American elms on campus in the 1990s. Now we are down to less than 30 with the trees now on a treatment program, so we do not lose them. Still it took about forty years for American elm to go from more than 200 trees on campus to less than thirty.

This will not be the case with emerald ash borer. The EAB “death curve” is measured in years, not decades, once the insect is confirmed in a community. City resources can become overwhelmed with the need to remove large numbers of standing dead trees. It is better to stretch those costs

over a longer period by beginning the process of removing ash that will not be treated once the insect is found in town now rather than waiting.

While we are expected to have an interval of cold temperatures during the next week or so, -15°F, this is nothing to the emerald ash borers that are curled up beneath the bark. Unless we see a string of days in the -30°F I do not expect to see a significant reduction in the emerging population of adults next Summer. Warmer Summers and Winters seem to be a trend and this is only going to benefit this beetle.

E-samples

Borers coming out of boards



A homeowner in the Black Hills was concerned about insects coming out of some pine board he had cut and was air-drying (with the bark was still attached to the edges). He noticed some piles of dust and then a few beetles emerged. The concern was whether these beetles will attack anything in the house.

This bluish black beetle is the blackhorned pine borer (*Callidium antennatum*). This insect inhabits dead and dying

pinus so they can appear in board cut from this material. The borer overwinters as a larva, pupating in early Spring before emerging as an adult. Infested wood stored in a warm house during the Winter will accelerate the life cycle and adults can appear beginning now.



The appearance of buzzing beetles and pyramids of fine sawdust beneath the board can alarm homeowners but these are just temporary nuisances. The adults will not attack finished wood in a home, it is happier in a dead tree that has intact bark. Removing the bark from the trim is also a means of eliminating some of the insects in this material as well as making the wood less suitable for others to complete their development.

Samples received/Site visits

Custer County

Engraver beetles attacking pines

The dry season has resulted in an expansion of the engraver beetle (*Ips*) population in the Black Hills. These beetles are usually content to attack fresh downed trees and slash piles rather than living trees, but trees stressed by drought are also suitable hosts. And there are a lot of drought-stressed pines in the Black Hills right now.

There are three different engraver beetles found in the Black Hills. The five-spined engraver beetle (*I. grandicollis*) and the six-spined engraver beetles (*I. calligraphus*) are the larger ones, and these were covered in the December 9, 2020 *Update*. The smaller one of the three is the pine engraver beetle (*I. pinii*). It is usually found in the upper branches and trunks of dying pines (pines colonized by mountain pine beetle were attractive hosts during the epidemic). However, it, like its bigger cousins, can attack stressed trees.



Some of the engraver beetle problems we are seeing in the Black Hills now are the result of piling slash this past spring and not continuing to add material as the summer progressed. The first generation of beetles in the spring are usually attracted to fresh, green, slash rather than trees and this material absorbed a lot of beetles. The dry summer causes the slash to dry out faster and since no new material was added, the second generation of beetles moved to nearby stressed pines. The populations have been building in these trees for the Summer.

The adult beetles are now either beneath the bark of these trees or are in the duff and litter beneath them. The adults will be flying this Spring, once the air temperatures return to the 60° and 70°F, so we might see them begin flying in late March. Since they normally are not attracted to trees, they may disperse. Fresh slash should not be piled now unless green material can be continually added to keep the beetles in the piles (and the piles burned next Fall or Winter). If slash must be put down this Winter and a green chain cannot be continued through the summer, the other option is to lop and scatter the brush, so it dries out so quickly the beetles are not drawn to it in April. However, this option is dependent on the rest of the Winter staying dry.



If the weather turns wet, or at least normal, we may see the end of this bark beetle outbreak. Engraver beetles are not attracted to healthy pines. The resin flow from these trees is too much to allow the beetles to bore in, they are sapped out instead. Another reason to hope for wetter weather this Spring.



Sawyer beetles, which are also attracted to dying trees and slash, are also in much of this material and they can eat it faster than the engraver beetles. Since the sawyer beetles will not attack stressed trees, unless they are near death, having these insects attracted to the same food

source will dampen the population growth of the engraver beetles.

While favorable weather and sawyer beetle can help, the best thing we can do is avoid leaving fresh slash piles this Spring.

Davison County

Masses on side of chokecherry trunk



This was a large mass of webbing on the trunk of a chokecherry tree (*Prunus virginiana*). These are the brownish, hairy cocoons of the pale tussock moth (*Halysidota tessellaris*). The pupae are the overwintering stage with the adult pale-yellow moths appearing in June. Eggs are laid during June and July and the larvae are present from August to October. The larvae feed singly and are covered with tufts of light-yellow fine hairs. Tufts of hairs arise on the middle and back end of the insect. Note: these hairs can irritate the skin so while the hairs look soft, don't pet this insect.

The young larvae strip the soft leaf tissue but leave the tougher veins (like kids that cut the crust off their toast). The older larvae will strip the entire leaf except for the very tough central vein and petiole. They feed on many different tree species, but I see them mostly on chokecherry and elms. The populations can become so high that the larvae defoliate the tree, but this is a rare occurrence.

Davison County

Squirrels gone wild!



The squirrels have chewed the outer bark away from this hackberry tree in a band about two to three feet wide but completely around the trunk! Fortunately, but puzzling, only the outer most layer of bark has been chewed off, so a thin layer of bark remains. The tree may recover from this injury but dieback due to the loss of conductive tissue might also occur.

This appears to be a favorite hackberry for squirrels. There were other hackberries without any injury yet this one tree showed previous year's damage along the trunk and limbs. Apparently squirrels like this one tree.



I received an email from Brian Schwingle, a Tree Insect & Disease Specialist with the Minnesota Department of Natural Resource. He read the January 6, 2021 *Update* article on squirrels and they, too, are seeing similar damage on maples, including boxelder. The weather there has been cooler and wetter than what we are seeing across the Plains. They also had a good acorn crop. The dry weather and lack of acorns were reason we suspected squirrels were

chewing on bark on the Plains. We are also seeing most of our damage – and others are seeing similar damage down to Texas – on elms and hackberries with only a few boxelders chewed. We may be looking at different reasons for the attractiveness of maples in Minnesota but regardless this is the Winter for squirrels gone wild!

Reviewed by Master Gardeners Dawnee Lebeau, Carrie Moore, and Bess Pallares

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