



Tree Pest Alert



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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: Bess Pallares, Carrie Moore, and Dawnee Lebeau

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Plant development for the growing season

Trees are not growing, they are wilting. The combination of high temperatures and low soil moisture is causing leaf wilt and scorch. Some trees, hackberry is a good example, are already shedding leaves. Others, such as this recently planted shagbark hickory, are wilting.



South Dakota does not have a Goldilocks climate, as defined by planetary science, one that is neither too cold or too hot (nor too wet or too dry). We live by the extremes, so it is *either* too hot or too cold, and too wet or too dry. Maybe the South Dakota “Better than Mars” ad campaign was wrong. True, we have a breathable atmosphere, but as with Mars we are a land of extremes.

At least we can duck into the house to escape our weather extremes but not so with our trees. They must endure whatever nature throws at them. This means they can be subjected to an overabundance of moisture one year and the lack of water the next.

There has been some research on the effect of extreme wet-dry pattern on trees as this may become a more common trend. The worst situation for a tree is wet (2018-2019, early 2020) followed by dry (late 2020, 2021). The wet, saturated soil result in a reduction in the root-shoot ratio, fewer roots proportional to the tree canopy.

When the weather reverses and it goes to dry, the reduced root system cannot provide sufficient water for the canopy. The tree suffers drought-stress, become more susceptible to pathogens and insects, and may even die back or just die.

Treatments to Begin Now

The treatment that is needed now by all trees and shrubs is water. Simply water.

Timely Topics

Emerald ash borer update

We are still at peak emergence so about half the emerald ash borer adults that are emerging from the trees this year are either already out or coming out now. You might be lucky (or unlucky?) to find some emerging adults along the lower trunks of heavily infested trees that are presenting severe dieback.

This is what I saw last week on some very heavily infested trees in southern Minnesota last week (at an I-90 rest area). The trees were almost completely dead, so they had been infested for several years. At that point in the decline, the beetles are emerging along the lower trunks and that was certainly the situation here!



We were able to count five adults emerging between three and six feet on an ash tree. They do not emerge very quickly, a common characteristic with other *Agrilus* insects. I have watched bronze birch borers take 30 minutes or more to emerge from birch trees and seen equally long times for emerald ash borer.

Pine wilt disease update

Pine wilt disease has appeared in the *Pest Alert* several times this year. The June 2 *Pest Alert* announced the confirmation of the disease in Aberdeen, the farthest north at that time. This week I met with Tiffany, the Natural Resource Specialist for the Conservation Districts, along with Peggy and Shauna (pictured from left to right) in Harding County. We looked at some Scotch pine trees that had their needles rapidly turn yellow and wilt. The twigs were so dry that they could be easily snapped. These are classic symptoms of pine wilt disease.



Later that day as I drove from Bison to Aberdeen on Highway 12, I could see small windbreaks and groves with dead or dying Scotch pine. There is a grove near Mina where some Scotch pines are presenting their normal blue-green needles, other trees are starting to yellow (current infestation), and a few trees have straw-colored needles (last year's infestation) and even some devoid of needles (the previous year's infestation).

The appearance of pine wilt disease is associated with high summer temperatures and low moisture – a climatic combination that is occurring throughout South Dakota this year. The nematode, *Bursaphelenchus xylophilus*, responsible for the disease can be found in pines, but the disease will not appear if the weather is cool (average July temperatures less than 68-70°F) and moist.

Unfortunately, the trend is for drier and warmer summers and the prediction is that this disease will continue to move north. Since pine wilt can now be assumed throughout the state, Scotch pine and Austrian pine should not be planted with the expectation that they will live their normal life span of a century or more. Since the disease is most common on mature trees, saplings are rarely killed, most likely the life span may become only several decades before the disease kills them.

The disease does not kill all the trees in a row or community over a short period. While the disease has been present in Yankton County for more than 25 years, there are still some nice-looking Scotch pines. There is just fewer every year.

Diplodia tip blight in Northwestern SD

That same day near McLaughlin I met with Annie from the Corson County Conservation District about pine problems. We looked at a ponderosa pine windbreak that had small groups of declining trees along two belts. The declining trees were presenting with yellow to straw-colored needles and either dead or stunted shoot tips. The symptoms were most apparent on the lower branches. These are common symptoms of *Diplodia* tip blight.



Diplodia is fungal pathogen (*Diplodia pinea*) that is found throughout the state. You can find infected trees from Brookings to Bison. It is usually more a disease that disfigures a tree – loss of shoot tips in the lower canopy – but can become a tree killer under certain circumstances.

Drought is one of those circumstances and water deficits increase susceptibility to the disease. Corson County average annual precipitation is about 16.5 inches. The county had about 30 inches of precipitation in 2019, and slightly less than half that in 2020, about 14 inches. This year only about 6 inches so far (and half of that in a few May storms).

Some of the trees affected the most in the windbreaks are in the lower areas of the two belts. These were wet spots for the last few years but are bone dry this year. As discussed earlier in this *Pest Alert*, wet followed by dry, is a stressful combination for trees.

An interesting observation was that one of the rows had a few Scotch pines had been planted among the ponderosa pines and they all looked fine. While Scotch pine can become infected with *Diplodia*, it is not a common problem, and one reason Scotch pine was a good choice for tree belts. Now that pine wilt is also in the area, Scotch pine is no longer a good option.

E-samples

Basswood leaves falling

I have received a dozen calls and several images sent by text or email of leaves falling from basswoods and lindens. The ground is littered with narrow, pale yellow green leaves. Except these are not leaves. They are leafy bracts that support the flowers.



The bracts are thought to be an attractant for the moths that pollinate the flowers at night (bees pollinate the flowers during the day). The flowers are fading now and with that the bracts are beginning to drop. No need for concern.



Carpenter ants and silver maple

This was a concern about big ants in a tree. The ants are the carpenter ant (*Camponotus*), and the tree is a silver maple. The two are a common combination in communities.



The ants are responsible for all the coarse sawdust beneath the tree, but they are not responsible for the decay. Instead, they are taking advantage of the soft, moist, decayed wood in the tree to make a home. They do not even eat the wood, just carve into it for a nest.



So, the ants are not the problem, nor is killing them a solution. They are like the canary in the coal mine. But instead of warning about elevated carbon monoxide, the ants are warning you that the tree is decayed and may not be stable.

The tree should be evaluated by an arborist, and the arborist should have the Tree Risk Assessment Qualification from the International Society of Arboriculture. The reason you need a qualified arborist to do the assessment is you do not want to remove the tree if it is structural sound, but you do want to remove it if the decay is too extensive.

Just from the pictures, I am leaning towards the decay being extensive enough that the stability of the tree has been compromised. I suggest an evaluation sooner rather than later.

Girdling tree support

Tony, one of the South Dakota Department of Agriculture and Natural Resources foresters, stopped by to look at this boxelder. The call was a concern that the tree leafed out late this year. Upon close examination, Tony noticed that the strap and support posts for staking were still in place five years after planting!



While trees often need a little supplemental support for the first year after planting, there is little need to continue staking longer than a year. If the material stays in place longer, people tend to forget about it, at least until the top of the tree begins to decline.

Samples received/Site visits

Beadle County, Dutch elm disease

The symptoms of Dutch elm disease (*Ophiostoma*) are beginning to appear across the state. The most common symptom associated with this non-native fungal disease is flagging – the leaves along a branch turning yellow and wilting. Eventually, usually within the same season, the symptoms spread to other branches and then the entire canopy.



Trees that show severe symptoms, many flags, this early in the season were usually infected the previous year and often the infection was via root grafts with a nearby (within 40 feet) infected tree. The disease can also be transmitted by bark beetles, but these symptoms usually appear in mid-summer, mid-July to early August, and begin on a single branch or two before spreading to the rest of the canopy.

Healthy American elms, and we still have many in communities around the state, can be protected from the disease through fungicide injections performed every three years. The injections do not protect from root-graft infections so the best candidates for injection are mature, isolated trees.

Other management tactics include prompt removal – within two weeks – of trees that begin to flag this summer. The objective is to remove and destroy the tree before the beetles carry the fungus to another tree or the disease spreads by root graft to nearby elms.

The disease has been present in the United States for about 90 years and in South Dakota for a little more than 50 years. It took about 20 years for the disease to spread throughout the entire state. Pine wilt took about 30 years to cover the state. I expect we will find emerald ash borer state-wide between 2035 and 2045.

Custer County, Pine engraver beetles

The pine engraver beetle (*Ips pini*) and its larger relative, the turpentine beetle (*Dendroctonus valens*), are infesting stressed pines throughout the Black Hills. We are beginning to see the second generation of pine engraver beetles starting to fly. These will often move to stressed trees if there is not sufficient slash – fresh, down treetops and branches. The trees are more vulnerable in mid-summer due to drier conditions.

The pine engraver beetle makes its presence known through fine dust that falls in the bark crevices and on the ground around the base of the tree. If the bark is pulled away, a network of tunnels forming X or Y patterns are etched on the wood.



Turpentine beetles create large globs of white to reddish pitch near the base of the tree. Coarse, reddish dust is found near or below the pitch masses. If the pitch is pulled away there is a wide tunnel that is either I or J shaped.



Pine engraver beetles can kill stressed trees if many beetles attack and infest a tree – a situation we saw last year and may see again this year. Usually turpentine beetles are not tree-killers, but they are good indicators that the tree is stressed.

Since both beetles are attracted to dying or broken trees, the aroma of fresh sap is a calling card for them. We see both insects appearing on home construction sites where pines are being removed to build a home, but the owner wants to retain some of the pines.

It does not help when the landowner stacks the felled trees as firewood or logs next to the trees that are being retained as seen here. This material attracts the beetles, and the trees are often attacked as was the case in this situation.

Lawrence County, Spruce decline

These were two samples from two different properties. One was of Black Hills spruces, approximately 10 to 15 trees, ranging from saplings to mature trees. The trees new growth is brown, stunted and curled.



The trees were heavily infested with galls created by the eastern spruce gall adelgid (*Adelges abietis*). We were also able to pull adult winged adelgids out of the curled tips thought this does not necessarily mean adelgids are the cause for the curling. They can also curl shoot tips in

addition to forming pineapple-shaped galls at the shoot base.

The pattern of decline among the trees is more consistent with an abiotic origin. This is one of those situations where a site visit is required to determine the agent or agents in the tree decline.

The other sample was from some Colorado blue spruce growing near the Sugar Shack on US Hwy 385 – this will be worth a site visit just for an excuse to go to for a meal at the Shack! The sample did not show any of the common needlecast disease or SNEED. The tip dieback and needle loss may be due to the spruce needleminer but will have to visit to be sure.



Pennington County, Hackberry, not ash

The tree most misidentified as an ash is hackberry. This site visit was to inspect an 'ash' with the dead branches as a possible emerald ash borer infested tree.

The tree turned out to be a hackberry, not an ash. I find trees misidentified as ash every year. Most of these share a compound leaf arrangement with ash such as boxelder. Other are misidentified as ash during the winter due to their opposite branching arrange. Norway maple is frequently confused, in winter, with ash.



Hackberry produce alternate branching and simple leaves, so I am not sure why the confusion with ash. It might be that the leaf of hackberry – serrated and ovate shaped – is like that of an ash leaflet. But the base of a hackberry leaf is slanted, and it is attached to the twig rather than a rachis, the continuation of the petiole as with ash leaflets.

Union County, Maple chlorosis

Yellow leaves are appearing on oaks, birch, and maples across the state. A closer examination of these leaves usually reveals that the main veins are still green, though this may be very faint. This is not a disease, but a disorder brought about by the tree's lack of a micro-element, either iron or manganese.



Our soils have adequate levels of these two micro-elements, but the trees are not able to absorb them. The reason is that our high soil pH (7.3 to 7.8) limits the solubility of iron and manganese, so these micro-elements do not move into the roots. The simplest solution, lowering the soil pH, is not often practical as it seems.

Elemental sulfur is recommended and sold for lowering soil pH. The sulfur is converted to sulfuric acid by soil bacteria, and this lowers the pH. The difficulty is that the sulfur must be incorporated into the soil to be effective and soil disturbance around established trees may injure roots. Also, it may require a lot of sulfur over the years to reach the desired pH, 6.8-7.2.

The most common means of correcting the problem is to inject the micro-element directly into the tree. Trunk injections of iron or manganese are performed in the summer or early fall and, depending on the product and the rate, the effects of the application – greener leaves – may persist for one to three years.

The best means to determine which micro-element, iron or manganese, needs to be applied is to perform tissue analysis on the chlorotic foliage. However, in general, oaks (swamp white oak, northern red oak, and pin oak) and birch (river and gray birch) respond to applications of iron.

Maples (red, silver and their hybrid, the freeman maples) often lack manganese more than iron. Merely injecting maples with iron may not see a complete reversal of the symptoms. Sometimes iron and manganese are needed or just manganese.

Regardless of whether the deficiency is iron or manganese (or both), injections alone should not be viewed as the solution, they are only one tactic in management of chlorosis in a tree. The soil environment should also be improved by mulching and the best

choice may be the shredded debris – leaves, twigs, bark, and wood – from the chipper of a local tree company.

The purpose of mulching is not to lower the soil pH. Studies have shown inconsistent results on the influence of organic mulch on lower soil pH. Sometimes there has been a slight reduction, others a slight increase and often no change.

The purpose of the mulch is to improve the soil for the roots – higher root density, better absorption of the limited micro-elements available. A layer of mulch can cool the soil and help retain moisture, two critical needs for trees this year!