

Pest Update (August 26, 2020)

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Note: samples containing living tissue may only be accepted from South Dakota. Please do not send samples of dying 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

Dry is still the word across much of the state. Much of the state (other than the south central and east central parts of the state) has not seen precipitation for a while, and drought intensity is either abnormally dry or moderate drought.



Many drought-stress trees have leaves presenting with marginal scorching or even premature fall colors of reds and yellows. The leaves on some trees are even being shed and it looks like fall in a few yards.

These trees need a drink and a *long* drink. A mature tree needs several hundred gallons of water a week – put a soaker hose beneath it and let it run for a few hours at night. Long soaks

are better than a short sprinkle so put the hose out about once a week with a turret or oscillating sprinkler and let it run a couple of hours.

You want the water to soak in to the top 6 to 9 inches of soil. After watering wait two hours and push an old screw driver or rod a foot into the soil and see if it pulls out moist, but not wet. Too much water is as stressful to the tree as too little.

The sprinkler should be set beneath the tree. The highest concentration of roots are near the trunk, so water this area the most. While roots may extend out to a distance equal to the tree's height, usually watering is necessary to the area within about 2/3 the height.

The trees are most sensitive to drought include birch, maples, and willows. These are the ones that present the most symptoms. However, all trees will benefit from watering.

Timely Topics

Emerald ash borer update

Larval development

Emerald ash borer sampling continues in Sioux Falls and Canton. Most of the larvae are still 3rd instar with a few 2nd and 4th instars. As mentioned before, we measure the width of the head capsules to determine instar. The head capsule is about 0.3-0.5 mm wide for 2nd instar, 0.6-0.8 mm for 3rd instar and greater than 1 mm for 4th. The mature larvae are also more than 1 inch long.



The 4th instar larvae are also called the prepupae. They carve an opening into the outer sapwood and curl back on themselves – like a cat taking a nap – and this is not too far off as these nap for the winter and become pupae in May. The 2nd instar larvae (pictured) may not complete their development in time to pupae next spring and continue in their larva stage all next summer. These will emerge the following year and require two years, rather than one year, to

complete their life cycle from egg to adults.

Adult beetles

It has been weeks since the last catch of an adult emerald ash borer. Emergence probably ended in late July. Since the adults live for about three weeks, a few perhaps a month, all the emerald ash borers should now be in the tree as larvae rather than flying around the trees as adults.

The adult-free zone is demarked as beginning Labor Day, just to be on the safe side. After next weekend, ash trees can be removed and the wood moved without the concern of adults exiting from it *this* year. If the infested wood is cut and stacked for firewood, the insect can still complete their development before the wood dries and emerge next year.

This is one reason why ash (and any other hardwood) cannot be moved from the quarantine area (Minnehaha, Lincoln and northeastern Turner Counties) at any time of the year.

Bronze birch borer and Asian birch trees

Emerald ash borer is not the only *Agrilus* found in our state. We also have the bronze birch borer, *Agrilus anxius*, and, as the name implies, this is a serious pest of birch. However, there are several important differences between emerald ash borer and the bronze birch borer. Emerald ash borer is an exotic borer. It is native to East Asia and our ash species have limited tolerance against this insect. The bronze birch borer is a native insect, and our native birch have tolerance to this pest.

The emerald ash borer and bronze birch borer are regarded as a “secondary pest,” only able to successfully colonize their native hosts when they are stressed by age, drought, or other agents. These native hosts have defensive chemicals they can produce to prevent or repel an attack. However, once they are stressed, they lack the energy to respond to attacks and are vulnerable.

The non-native hosts, North American and European ash for emerald ash borer and Asian and European birch for bronze birch borer, either lack these defensive chemicals or they do not respond to attacks so the trees are successfully colonized regardless of whether they are healthy or stressed.

Our native paper birch (*Betula papyrifera*) and the gray birch (*B. populifolia*) have tolerance to bronze birch borer and the borer only becomes a problem when the tree is planted on a droughty site or is not irrigated regularly during a dry summer. However, the European white birch (*B. pendula*) and the Asian white birch (*B. platyphylla*), among other exotic birches, are attacked regardless of their vitality.

This is not an unexpected outcome. As has been documented numerous times, tolerance generally occurs when the pest and tree share an evolutionary history, they grew up together, so to speak and have reached a stand-off where the pest is only able to succeed when the tree is already declining.

When the tree is faced with a pest to which it has no previously relationship, it may have few or no defenses to counteract the threat. It never had the need to create them and has no means to quickly make them. This is the dilemma that our North American ash now face – the emerald ash borer recognizes them as ash by their volatiles (they smell like an ash), but our ashes have limited defenses against this exotic threat.

A similar situation with birch, but the problem is reversed in this country. Our native bronze birch borer recognizes Asian and European birch as birch (they smell like birch), but they have limited defenses against this insect.

Despite this, we continue to see new Asian birches released as “bronze birch borer resistance” yet this is proven false within a few years. These is clearly been shown on our campus where we planted Crimson Frost birch (a cross between an Asian, *B. platyphylla*, and a European, *B. pendula*, birch) and the Dakota Pinnacle birch (an Asian birch, *B. platyphylla* ‘Fargo’). The trees remained borer free for about 10 years or so but now are heavily infested by the borer.



We cut down a dying and infested Crimson Frost birch last week and the trunk was covered with the characteristic D-shaped holes made by *Agrilus* adults as they emerge from the wood. When we peeled the bark away, there were numerous serpentine galleries and larvae that look identical to emerald ash borer, flat, legless creamy white with bell-shaped segments and two small pinchers at the rear, except they were in birch.

It is best to plant our native birch species or its cultivars to avoid the problem with bronze birch borer.

Apple harvest is beginning in many areas of the state.



It is a good time to review how to pick apples. First, apples do not continue to ripen once picked, they are at their peak flavor (and best color) when you take them from the tree. Do not pick apples too early but how can you tell? The first indicator the apple is ripe is the color. The apple should have the normal coloration for the cultivar without pale or yellowish patches. Next, if the color is right, the fruit should come easily off the branch. If you must *pull* the

fruit from the tree – it is too early. If the apple is ripe, you do not need to pull it off the tree, merely place the palm of your hand beneath the fruit and roll up the apple with a slight twist. The apple should snap off with little additional pressure.

Once you picked the apple, place it in the bag, do not throw it, otherwise it may bruise. Place it in a cool spot at home – root cellars are perfect, but rare to find in modern homes, so the refrigerator will do. Just do not wash the fruit until you are ready to eat it, they last longer that way (but if the fruit has dirt on it, rinse and dry before storing).

Trees are beginning to drop leaves (and even twigs).



Premature autumn coloration – yellows and reds – as well as leaf drop is beginning to occur on trees throughout the state. We are even seeing cottonwood beginning to drop their twigs. The reason is most likely the extreme drought stress on these trees as trees in irrigated lawns are not presenting the same symptoms. There is not much that can be done for these defoliating trees except water, water, water. Even if the tree has dropped most

of its leaves, it will still be transpiring water and this water must be replaced. Continue to water your trees during the month of September.

E-samples

Grasshoppers and junipers



I received this picture from Tony, one of the foresters with the South Dakota Department of Agriculture. This is a Rocky Mountain juniper (*Juniperus scopulorum*) in the southwestern part of the state that is presenting with browning and yellowing shoot tips. However, this was not due to one of the twig blight pathogens, but grasshoppers.

The tips had been girdled by grasshoppers feeding on the tender bark of the new shoots. We usually do not think of woody plants when it comes to grasshoppers. However, the *Melanophus punctulatus* group, which includes the juniper grasshopper, *M. splendidus*) are woodland grasshoppers and can be found on the Pine Ridge.

They can damage junipers and even ponderosa pines in drought years and when grasshopper populations are high – a combination that some areas of western South Dakota are seeing this year.

Oak lace bug



I received several pictures of lace bugs (*Corythucha arcuata*) and their injury on bur oak. This is a common insect problem with bur oak, and I do see some injury every year. The lace bug is a sucking insect that feeds on the underside of the leaves. The feeding causes white to yellow stippling on the upper leaf surface. Severely infested leaves turn yellow, then brown, before falling prematurely. While oaks are rarely killed by the defoliation, repeated attacks can result in enough defoliation that branch dieback occurs. These stressed trees are also more vulnerable to attack by the two-lined chestnut borer, which can kill the tree.

Right now, if you flip over a discolored oak leaf and look at the underside, you will notice these black, shiny “varnish spots,” which is the poop from the lace bugs. Some of the lace bugs should be nearby and these small (1/4-inch) adults have flat wings with intricate, almost lacy, vein patterns. The thorax has a similar pattern to their wings.



The adults are the overwintering stage and will soon be moving to bark crevices to wait out the cold. The damage is just about done at this time, so there is no need to treat the trees.

Oak skeletonizer



A skeletonized leaf has the soft tissue between the veins removed. This is like window paning, where only a layer of the soft tissue has been fed upon allowing light to penetrate through the remaining leaf layer. The oak skeletonizer, *Bucculatrix ainsliella*, is an insect responsible for window paning and skeletonizing oak leaf. They are more common on red oak (*Quercus rubra*) than bur oak (*Q. macrocarpa*).

There are two generations per year with the pupae in a cocoon being the overwintering stage.

The larval feeding is almost completed for the year and no treatments are recommended or effective during this time.

Samples received/Site visit

Lincoln County

Bacterial blight on lilacs



Bacterial blight on lilac has been covered in many issues of the *Update* this season. We see the disease pop up every few years or so and this happens to be one of those years. The disease begins with yellow lesions on the leaves that eventually turn brown or black. The infected leaves will appear wilted before they fall. The shoot tips may also turn black and curl.

The symptoms appear to many people as herbicide, so most of my calls on lilacs during the summer are concerns with what was sprayed (by the neighbors, and usually a neighbor they already do not like).

This one was different. They were not concerned about herbicide as only some lilacs in the long row were affected and others were not. Lilacs are beginning to flower due to drought stress and many of the lilacs were in bloom again, even the defoliated ones. Bacterial blight is most common on white-flowering lilacs and these were the only ones showing symptoms in the row.



Minnehaha County

Declining silver maple



Sioux Falls has many mature trees that provide wonderful shade during our hot, summer days. Unfortunately, some trees do not age gracefully and silver maple (*Acer saccharinum*) is one of them. The call concerned sawdust coming down on the car from a very large silver maple. This is usually an indication of borer, and old silver maples are attractive to many different

wood-feeding insects. Most of these prefer to feed in declining trees so are also an indicator that the tree may be rotted and likely to fail.

When I stopped by, I noticed the tree had two major problems. First there were many stubs in the canopy that already showed decay leading into the stems. Second, the multiple stems were decayed near their common attachment and there is a likelihood that one or more could fail. While you hate to lose the shade, losing the house (or car) is probably worse, so I suggested removal.



Minnehaha County

Why aren't the acorns falling?



Some samples are priceless. The question, why aren't the acorns falling from the tree? The answer? Because they are not acorns! These are oak galls. These 1-inch long reddish to whitish galls are formed by the larvae of a tiny cynipid wasp (they do not sting). The wasps are called 'cell pirates' as the larvae inject a growth regulating chemicals into the plant tissue causing it to form this gall around them. The young

live inside the galls, now perfectly protected from the environment and predators. Many of the galls form on the twigs, such as the horned oak gall, but there are others such as the hedgehog gall form on the leaves. Regardless, they are not acorns!

Walworth County

Diplodia tip blight

I made several stops in Campbell and Walworth counties to look at dying pines. Some of these will be addressed in next week's *Update*, but one of the most common problems was diplodia tip blight on ponderosa pines. This disease has appeared in several issues of the *Update* this year. The disease appears to be the

worse in the northcentral part of the state, and it is easy to spot windbreaks trees infected by the disease.



The most common symptoms of diplodia tip blight are stunted new needles on the tips of the shoots. These are easy to spot at this time of year as these needles are much shorter than the mature needles from the previous year's growth.

There will also be hanging gray needles, mostly in the lower canopy and much of this portion of the tree will be bare, all the needles and branches have died. Usually the last to die is the very top of the trees so if you look up sometimes the top is green; and the rest of the tree is discolored.



The disease is so bad in the northcentral part of the state that there are also standing dead trees in the belts or groves. The treatment is fungicide applications in the spring. The first application, the critical one, is applied just before the buds open and the candle begins to expand. This is followed by two additional treatments spaced 10 days apart. Common fungicides to manage the disease contain chlorothalonil, propiconazole, or thiophanate-methyl as an active ingredient and are labelled for this use.

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