

Pest Update (July 15, 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 and 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

Much of the state is now in moderate drought. This is a change from the previous two years where the problem was too much moisture. We are dry in most of West River as well as the northeastern and southeastern parts of the state.

The hot, dry weather is going to start taking its toll on trees. Windbreaks planted this spring will benefit from irrigation. While this may be time-consuming, it will



greatly increase survival. I am see more belts go in with trickle irrigation and though this does add to the cost (and wasn't necessary for the past two years) it pays off in survival and growth.

Despite the typical hot, dry climate of West River, we have a few trees out there that have no business surviving. Balsam fir (*Abies balsamea*) is a northern conifer that does best with a mean July temperature of about 60°F and at least 30 to 40 inches of annual precipitation. This hardly describes the climate of Faith, South Dakota yet a mature specimen is growing there. It does not look too happy, but somehow has managed to live.

Timely Topics

Emerald ash borer update

Emerald ash borer was NOT found in Emery, South Dakota

There was a report in the *Emery Enterprise* of emerald ash borer infested trees being removed in Emery, SD. This is false. The city removed old, declining ash trees but they were not infested with emerald ash borers. We have an assemblage of native borers that are infest declining ash – ash bark beetle, ash-lilac borer, ash-privet borer, banded ash borer, carpenterworm, and the redheaded ash borer – so finding “worms” in a dying ash is normal. The trees were not infested with emerald ash borer. Emery is about 50 miles west of the closest known infestation.

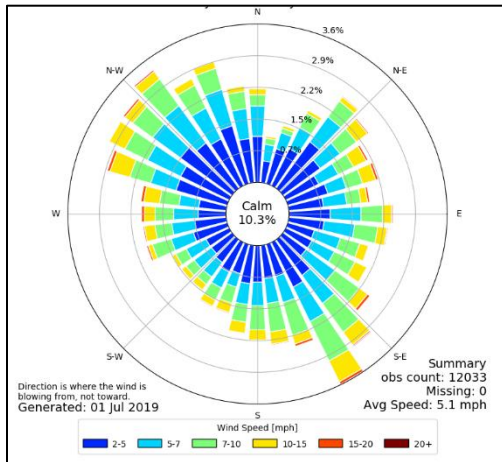
Which direction do emerald ash borer infestations spread?

Emerald ash borer flight speed is about 3 mph, you can outwalk a flying borer. They also usually fly for short periods, a minute or two, before landing. After an equally short rest, they fly again. When you are slow and rest a lot you don't get very far so an adult emerald ash borer can travel about a mile in a day in this manner. However, most are content to stay close to where they emerged if

suitable host material is available. Many will lay eggs on the same tree from which they emerged – real home bodies.

But some beetles are not content to live in their parent's basement and will take flight. These are the ones that spread the infestation throughout a community (along with people moving infested wood). An ambitious emerald ash borer can flight, without stopping, for several hours and cover distances of five miles or more in a day. These flights are usually with the wind, rather than against it, if the wind speeds are greater than 5 mph. So, infestations will move with the prevailing winds and towards suitable host material.

The infestation spread in Canton and Sioux Falls is to the southeast. Once the oldest infested trees were identified in these communities, the infestation age was traced to the south and southeast of these points. A possible reason for this is the prevailing June winds. While we assume the winds are out of the south during the summer, and they are for many days, we also have many days where they are out of the north and northwest.



I made a wind rose for Sioux Falls 2014-2019 for the month of June. The winds are predominately out of the south but there are many days where we have north winds. The cooler days, not surprisingly, have the winds out of the north and the optimum temperature for distant flights is about 78°F, a cool summer day. They do not fly far when temperatures above 90°F and this range is common during hot days when we have southerly winds.

Wind direction and air temperature are not the only factors to determine spread direction, but this may explain why we see the direction we do for these infestations.

More EAB imposters



I am receiving reports from Master Gardeners in numerous counties are seeing the green metallic wood borer (*Buprestis confluenta*). These insects are found on the sunny side of trees and logs (one was found on the windshield wipers). They infest dead and dying aspens, cottonwoods and poplars. The adults are about 1/2-inch long and have fine yellow spots on their wing covers. As mentioned in last week's *Update*, the green metallic wood borer is about 1/4-inch longer than the emerald ash borer and wider.

Dog-days of summer

Now that we are in the hot, muggy days of July, we are hearing the trees buzzing in the evening. The buzzing sound is made by the dog-day cicada (*Neotibicen canicularis*). This is an annual cicada, not the periodical 13- or 17-year cicadas we read about out in the eastern states. The annual cicada has a three-year life cycle with most of its life spend as a grub feeding on roots in the soil. It is called annual as adults emerge every year due to the overlapping generations.



The shed exoskeleton of a cicada. Tree trunks are lined with them at this time of year.

We can blame the buzzing in the trees on the males as they are “singing” to attract females. They sing by vibrating their tymbals, an organ found on the abdomen. The buzzing is more like strumming a washboard (if you remember what these are!). The males sing day and night but on a quiet evening it can be quite the racket. Some of us remember listening to them as kids at night, back when air-conditioning was uncommon, and you left all the windows open. Its nostalgic. For everyone else, it is annoying.

The females cause their own problems. They do not sing, they saw. The females have a spade-like ovipositor that use to cut open twigs to lay their eggs. The slits often cause the twig to die and the attached leaves wilt and turn brown. The cut twigs usually fall to the ground by mid-August.

The dog days cicada is just one of a dozen of species that inhabit at least a portion of South Dakota. The ranges for them overlap in the state and it can be quite the orchestra when several get together to sing!

Oak galls and woodpeckers

Bur oak are tough trees for the plains and have few serious pests. However, a decade ago woodpeckers were noticed shredding the bark away from young oak trees. The damage was so extensive that the tops and branches of many younger trees were killed.

We found that the woodpeckers were drilling into the wood in search of the small larvae of the gall wasp *Callirhytis flavipes* (no common name). This gall wasp, as with many others, has two generations per year and they feed in different parts of the same host. One generation feeds in the branches and the other forms galls on the leaves in which to feed.



During the winter, the white larvae are found in small chambers just beneath the bark of branches and twigs on mature oak trees and even in the trunks of younger trees.



The gall wasp adults emerge in the spring and move to the newly expanded leaves where they insert eggs into the midrib, the central vein, of the leaf. Once the eggs hatch, the larvae form elongated, irregularly shaped galls on the leaf veins and live out their short lives within this structure. Adults emerge from these galls beginning in mid-summer and lay eggs on the twigs and branches of the oak.

The galls formed by this gall wasp are not particularly harmful to the tree, no more than the many other galls that form on oaks. What makes this gall wasp a problem is the woodpeckers that feed on the larvae beneath the wood during the winter. The woodpeckers can shred most of the bark from young trees, enough that the trees are killed by this injury. The trees that are not killed by the woodpecker activity often have the tops killed back enough that the trees become misshaped and of little value as a windbreak tree.



*The rough bullet gall on the twig and the oak flake gall (*Neuroterus floccosus*) on the leaf.*

Not every oak is attractive to the gall wasps so many escape damage from the woodpeckers. Why certain oaks are bypassed is unknown but oaks that are attractive to this gall wasp are also attractive to the rough bullet gall wasp (*Disholcaspus quercusmamma*) that forms a woody round gall on the branches. Usually when you find the small woody galls formed by this wasp, you'll also find the other gall wasp species and woodpecker damage.

Why this problem was just noticed in the 2000s is unknown. The gall wasp species was first described in 1889 in Iowa (Gillette. 1889. Iowa Agr. Expt. Sta. Bull. 7:281) so it is not a new insect nor are downy woodpeckers new. For some reason, the woodpeckers have decided the larvae are tasty. We are currently investigating treatment measures to kill the gall wasp larvae to prevent woodpecker damage.



Beetles and pines: current issues in the Black Hills

We are seeing an increase in engraver beetles this spring (as reported in previous *Updates*). Stressed and recently downed trees are quickly being colonized by both the six-spined and pine engraver beetle. The two forestry interns with the South Dakota Department of Agriculture,

Katie and Lindsey, found this healthy ponderosa pine that fell during the recent storm. The tree had no signs of any infestations when they examined within a few days of its failure. However, within two weeks the tree had become a popular attraction for the six-spined engraver beetle (which is colonizing the trunk) and pine engraver beetles (which is in the branches). But these insects were not alone in feeding on the carcass.



Sawyer beetles (*Monochamus*) are also attacking the tree in large numbers. The adult beetles are also called long-horn beetles because of their long (2-inch) antenna. They also have powerful mandibles (and can bite but you really have to annoy them first).

They use these powerful “teeth” to chew into the bark to create a pit to lay eggs. The eggs hatch in about two weeks and the larvae burrow into the phloem to feed. They later move into the sapwood once fungi have broken down the cellulose (the adult beetles carry the fungi to the tree). The larvae are white and may reach a length of more than 2-inches. The larvae have large mandibles to masticate the wood. Between the large larvae burrowing through the wood and the fungi breaking down the cellulose, the two can reduce the sapwood in a log to mush in a relatively short period.

The development of the insect (and fungi) is temperature dependent. At warm temperatures, above 80°F, they hatch and enter the sapwood in about three weeks and can tunnel at the rate of about 1/10 inch per day. That may not seem like much but a large fallen tree can have hundreds of larvae tunneling in the wood. Trees that fell in the recent storm should be promptly harvested to avoid economic losses in wood quality.

E-samples



Cedar-quince rust

I am receiving pictures hawthorn fruit that looks like a pin cushion This is cedar-quince rust (*Gymnosporangium clavipes*). This disease alternates between junipers (cedars) and member of the rose family (hawthorn, mountainash or quince). The most common host we see with this disease in South Dakota is the thornless cockspur hawthorn (*Crataegus crus-galli* var *inermis*) and the fruit at this time of year is completely infected with this disease.

Cedar-apple rust and cedar-hawthorn rust are two other common rust diseases of our small, flowering trees. These two rusts have most of the symptoms – orange and yellow spots - appear on the foliage. The symptoms usually do not appear on the fruit. The reverse is true of cedar-quince rust. The symptoms generally appear on the fruit and twigs, and rarely on the leaves (and then only on the petioles).

The infected fruit is covered with pinkish aecia tubes that appear like little pins sticking out of the fruit. The aecia will produce spores that are carried by the wind to junipers (eastern redcedar, Rocky Mountain juniper and savin juniper).

The treatment is fungicide applications with mancozeb beginning in the spring (usually mid-May) when the spores are beginning to be released from the junipers. The spores can be released for several weeks so treatments need to be repeated for at least two more times to protect the hawthorn.

Chlorotic (yellowing) leaves



Chlorosis, a symptom where the leaf turns yellow yet the veins remain green, is commonly associated with iron deficiencies in river birch and many oaks on alkaline soils. Iron and/or manganese deficiencies are also resulting in chlorosis on red and silver maple trees. The problem is not the lack of these microelements in the soil, but they becoming unavailable due to the alkaline soils. These are not a mobile element

meaning that the tree is not able to move the microelement from older leaves to newer leaves hence chlorosis most often shows up on the newest leaves by mid-summer. This summer chlorosis is even more common perhaps due to the excessively dry soils further limiting root development.

Dog Vomit “fungus”



While it sometimes does look like a dog vomited in your mulch, it's not a fungus so the name is only half right. This is a slime mold that appears in wood chip mulch during June or July when the temperatures and humidity are high. This slime mold forms in fresh mulch so most of the calls come in about mulches that have been placed this spring. The only treatment is to break up the mold with a rake to dry it out – it rarely reappears unless you add fresh mulch.

Lilac leaves notched: root weevils

Notches in the leaves of lilacs (*Syringa vulgaris*) as well as ash were a concern to one Rapid City homeowner. The notches are along the margin of the leaf and irregular shaped so differ from the half-moon notches made by leaf-cutter bees. These irregular notches are from feeding by the adult root weevil. There are at least four root weevils in our state, the strawberry root weevil (*Otiorhynchus ovatus*), the rough strawberry root weevil (*O. rugostriatus*), the lilac root weevil (*O. meridionalis*) and the black vine weevil (*O. sulcatus*). Despite the names, they all feed on lilacs and other woody plant foliage.



The root weevils overwinter as mature larvae which have been feeding in the soil on the roots of a wide range of plants from clover to spruce. The insect pupates in the spring with the adults emerging from the soil in June. The adults do not fly but climb up on the plants at night to feed and lay eggs. If they are disturbed the adults quickly drop to the ground and hide. They are not easy to find.

However, they are darn easy to find in the house. The adults seem to have a preference for an air-conditioned home during this hot days and you can find these insect walking around in your family room looking for a place to hang out and relax. The adults are beetles about 1/3 inch long with a long stout. They also like moisture so keeping the foundation of your home wet by watering flowers next to the house encourages them to come on in.

Home control is a vacuum or cat. No treatment is really needed on the lilacs as the root feeding is usually not enough to harm the plant and the notching on the leaves is not too distracting. Yews (*Taxus*) is another matter and when I worked out East, black vine weevil was a considerable stress to these foundation evergreen plants but winter is the bigger stress for yews in South Dakota.

Samples received/Site visit

Davison County

Pine wilt disease

We received two samples from Nathan, a forester with the South Dakota Department of Agriculture to test for pine wood nematode, the causal agent for pine wilt, a disease the rapidly kills its pine host. The samples were wood cores taken with an increment borer. The cores need to be taken on the lower trunk and near or at a branch whorl.

Increment cores can miss columns of nematode but generally cores are sufficient to detect nematodes. A good indicator that the sample has the nematode is the presence of bluestain in the core. The nematode feeds on the bluestain fungus

once the tree begins to decline so when we find “blue” we usually find the nematode. This was true in this instance as the core that was blued contained the nematode while the sample that did not have the nematode was white.

Pine wilt disease has been confirmed in the state for more than 30 years now. It first appeared along the southern border, Lake Andes, in the early 1980s and has slowly spread north. It now can be found as far north as Codington County. The disease is fatal to our exotic pines, Austrian (*Pinus nigra*) and Scotch (*P. sylvestris*).



While the disease is found in the southern 2/3s of the state, not every Austrian and Scotch pine has died – yet. The disease is still killing mature pines in this region. This is a magnificent Scotch pine in Lake County that has stood for more than 70 years but was finally (and sadly) infected this year.

Kingsbury County

Cytospora canker in Black Hills spruce



There was an earlier report this year of cytospora canker on Black Hills spruce caused by the fungus *Leucostoma kunzei*. This is another appearance of the disease on this species. Cytospora canker is common disease of Colorado (blue) spruce (*Picea pungens*) but is rarely seen in other spruce species. This year we are finding the telltale symptoms of the disease, bluish-white resin blisters, forming on the branches and trunk of Black Hill spruce (*Picea glauca*).

So far only a few trees have been found with these symptoms and hopefully this is not a trend. The disease results in gradual dieback of branches on mature Colorado spruce (those more than 20 years old). The trees rarely die of the disease but the loss of branches reduce their value as ornamentals and windbreaks.

Perkin County

Fabric and windbreak pines

The e-sample was a ponderosa pine with almost all the needles turning yellow. A sample submitted had the banding associated with dothistroma needle blight but this did not explain the rapid dead of individual trees in a 15-year old belt so a site visit was needed.

The first clue to the problem was that the yellowing trees were also stunted, shorter and thinner than the adjacent trees. You could also shake the trees. These two



symptoms, stunted and unstable, usually means there is a problem with the roots. So start digging.



After digging down about 3 to 4 inches, around the trunk, not a good sign as the trunks are being buried, I reached a barrier – the fabric weed barrier. The barrier, which looked as good as the day it was installed, was girdling the trunk. The girdling slowly chokes out the movement of food manufactured by the needles to the roots and the root system begins to decline.

The black woven polypropylene fabric can increase seedling survival and growth by reducing competition with weeds. Once the trees are established and has overtopped the weeds, the need for fabric decreases – its job is done. Unfortunately, it does not leave.

Fabric was supposed to break down in five years or so as the UV light from the sun degrades the fibers. As the fibers break down, they lost their strength and the trunks can easily push against them. However, beneath conifers the shade blocks the light and the fabric does not begin to break-down. The problem become worse when soil covers the fabric – now it does not break down at all. The fabric still has its strength and can resist the expansion of the trunks.

The solution? First make the slit in the fabric to pull the seedling through 'L', 'U', or 'X' shaped so the trunk can expand longer without resistance. However, do not make the slit too wide or you defeat the purpose of fabric as too many weeds will become established next to the seedlings.

Second, consider removing the fabric about the fifth year. There are machines that can pull the fabric away. This operation should be done about five years after installation. The fabric has done its job and can be removed. However, if you wait till year 10 or longer, the roots may have become established just beneath the fabric and removal of fabric cause moisture stress in the trees.

Third, and final, do not allow tilling between strips to throw soil on the fabric. Once the fabric is covered by soil, the trees are now buried and the fabric will not break down – a fatal combination.



Dying cedar seedlings: J- and U-roots



We received a sample of dying and dead juniper (cedar) seedlings. The trees were planted in 2019. The trees mailed in did not have any symptoms or signs of common pathogens or insects of junipers – this means a site visit was needed.

Once at the site, the problem became apparent. The dead and dying cedars had J and U-shaped roots. This abnormal root shape

comes from the seedlings being pushed into the soil. The planting holes should be deep enough that the roots can be inserted vertically into the soil and the root collar at the soil surface.



When the hole is too shallow, the roots are bend or are J-shaped or even bent completely up, U-shaped. This creates an unstable tree, one more prone to blowing over in the wind. It can also shorten their lives. Shallow roots are more susceptible to drying out and cause water deficiencies, and possibly death, in a seedling.

¹ I am not identifying the county as I do not want to point a finger at a specific conservation district. Planting error can occur with anyone from districts to landscapers to lawn owner.

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