Pest Update (November 2-9, 2016)

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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, instead please send a digital picture of the pest or problem.

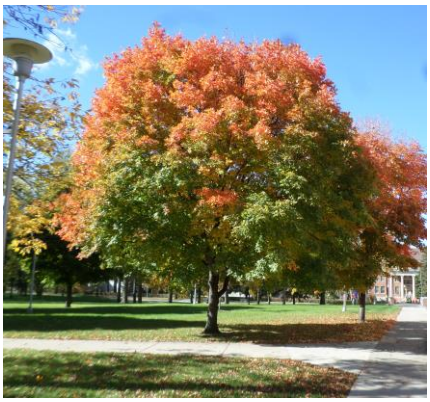
Available on the net at:
http://sdda.sd.gov/conservation-forestry/forest-health/tree-pest-alerts/

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 particular 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.

Timely Topics

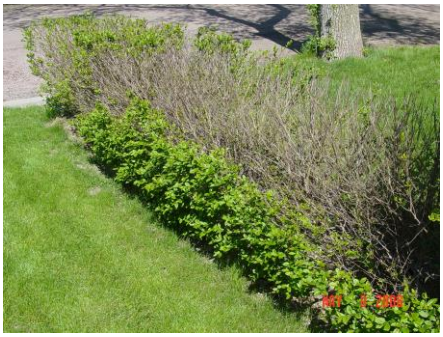
What a fall so far. I hope everyone is enjoying the weather!

The warm autumn and the risk to trees



As I mentioned in the last *Update*, the long relatively frost-free autumn is resulting in some spectacular foliage color. However, as good South Dakotans we cannot just enjoy the pleasant weather. No, we know we will pay for this later in the winter. Remember back on these pleasant days when it's been below zero for three weeks and snow has trapped you in the house for days. Any weather as nice as we have seen lately has to be followed by something bad, at least that's our attitude.

Our trees are also worried about the coming winter and they should be. A tree has to prepare for winter's cold. They gradually become hardened to the effects of freeing weather by reduce their free water and putting an antifreeze in any remaining water. This acclimation process has two stages and the first is triggered by the shortening days of late summer and early autumn. Trees use this as a consistent and dependable indicator that winter in coming. As the days become shorten the tree begins a series of biochemical and physiological changes to tolerant below-freezing temperatures. However, to adapt to the sub-zero temperatures of midwinter, the tree must complete stage two. This is accomplished during autumn weather where the nights are below freezing and the days above freezing. The more of these freeze/thaw cycles the tree experiences in autumn, the deeper the hardening the tree attains. If all goes well by late autumn the tree may be ready for -30^{o}F weather.



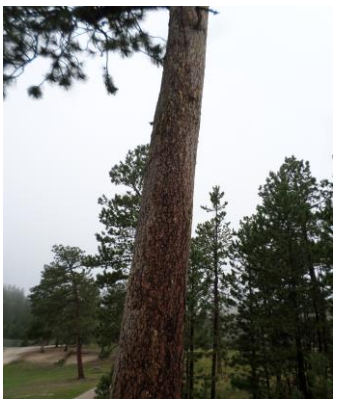
The problem this year is we have not had a lot of frost at night. The nights across the state have generally stayed in the high 30s or low 40s so this second stage of hardiness is not complete. If trees (and even shrubs such as privet pictured to the right) are now suddenly hit with extremely cold weather, they will experience substantial dieback come spring. Those that remember the famous 'Halloween Freeze' of 1991 can remember that we had a relatively warm October. It was 48^{o}F in Brookings on October 26. However by November 3, the temperature had dropped to 3^{o}F. This resulted in a lot of tree mortality by the following spring. Let's hope we gradually go into winter - soon.

The mountain pine beetle epidemic is just about over. The mountain pine beetle has been in the news for more than a decade while it was killing millions of pine in the Black Hills forest. While some people held that the epidemic would not end until the last tree was killed, most folks knew better. After all, this was

the 4th recorded epidemic since the 1890s and they always ended with plenty of pines left standing. We are now entering the endemic phase and hopefully can catch our breath for a couple of decades before the beetle population rises once again.

Endemic does not mean gone. The mountain pine beetle is a native insect, not an invasive one. It has been the Black Hills probably as long as there have been pines. Endemic populations are when the tree mortality from an attack is less than about one tree per two acres (or about 20 female adults flying per acre, less than that it's hard to coordinate an attack on a tree). We have reached that point in many areas of the Black Hills either last year or this year. However, there are still a few areas of the Black Hills that are still witnessing significant beetle attacks and tree morality. While these will fade too, hopefully in a year or two, its clear epidemics do not end all at once. They sputter out.

During the epidemic mountain pine beetle favor choice for attack was healthy larger diameter pines in dense stands. Since their strategy is to mass-attack a tree, often by the hundreds, they can whelm the pitch and successfully tunnel into the pine. However, now as their numbers dwindle, they often cannot recruit enough beetles to go after the big, healthy trees and instead their attacks are focused on dying or small trees when the tree is too weak to mount a defense. It is common to see a few 6-inch diameter trees attacked



despite standing next to a tasty target, a 16-inch pine.

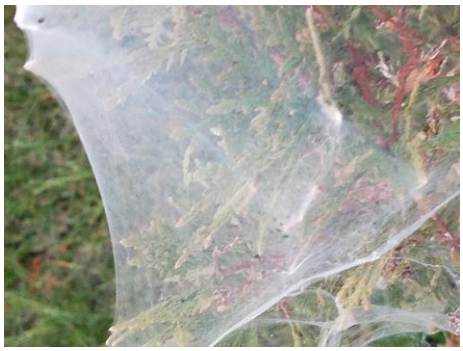
The successful attacks are also different. Successful attacks once resulted in a long, straight parent gallery running straight up or down the trunk and lined with perpendicular galleries filled with their offspring. Now as the epidemic ends, often the parent galleries are short and meandering (as highlighted in black). They also have fewer larvae galleries coming from them. A much weaker attack and not one that likely will generate many new adults for the 2017 flight.

The pitch color is also changing, smooth creamy white than a granular reddish-brown. The reddish-brown pitch was an indicator that the beetle was successful and had bored into the inner bark of the tree. Large creamy white pitch tubes often indicated that the tree won, and it was able to pitch out the beetles. Color, however, has never been the best indicator of success. The number of pitch tubes were often a better reflection of the attack status. Many pitch tubes, more than five or so round the trunk at about eye-level and seeing

even more as you looked up was generally a sign that the beetles won. Seeing only a few pitch tubes said that the tree won and the few beetle foolish enough to attack were killed.

This year it is possible to find trees that are covered with pitch tubes, but all the tubes are white. Sometimes if you cut beneath the bark you'll find healthy beetles chewing away, other times not one beetle can be found. All this means is it is getting harder to pick out the trees that were successfully attacked. Sometimes the only way to tell for sure is to cut a small section of bark by a tube and see what is beneath.

E-samples

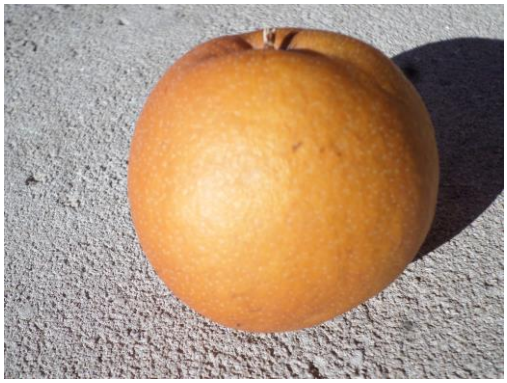


The attack of the spider mites! No, this is not an invasion of late-season spider mites but ordinary spiders, typically funnel weaver spiders, and their webbing. These spiders produce large webs that can span 2 feet or more and some place in these webs is a funnel and at the bottom of the funnel is a brownish to grayish spider – gotcha. The webs are not sticky to catch the prey but instead the vibrations of the prey on web clue the spider that food is on the way. The spider is beneficial so leave them in peace.

While mountain pine beetle is in the news out in the Black Hills, it is not the only borer affected pines. I received some pictures of pitch masses caused by an infestation by the **Zimmerman pine moth**. This insect burrows into the trunk usually near branch whorls and the damage is often broken or dead branches. Trees repeatedly attacked will often be deformed with several twisted tops rather than the single straight trunk more typical of pines. The location of the pitch masses, near branch whorls, rather than along the trunk, and the size and color of the pitch masses, often larger than a couple of inches so larger than that typically found with bark beetles, and yellowish white instead of a clear white or reddish brown, will help separate it from a mountain pine beetle attack. Zimmerman pine moth is a complex, rather than a single species and the treatment times differ among the species. The Zimmerman found in the Black Hills, *Dioryctria ponderosae*, has a treatment time of the first week of June to kill the adult moth as it lays eggs. Insecticides containing permethrin as the active ingredient are among the most effective means for treatment.

Samples received/site visits

Brookings County **What is this fruit?**



This is the fruit from an Asian pear, also known as the apple pear. These pears differ from the common pear in shape, round like an apple, hence the common name. The skin is a yellow-green or russet. The flesh has a more grainy texture, often drier and may have a bland flavor. They store very well and can be left out for several weeks. While they can be eaten fresh, they are often used in cooking.

Fall River County **What is wrong with this spruce?**

There was not much to go on as many of the needles had already fallen off. We were able to see that the annual shoot growth was normal and that tends to rule out many abiotic agents. The only pathogen we were able to find was needlecast and this is discussed in more detail in the Roberts County sample.

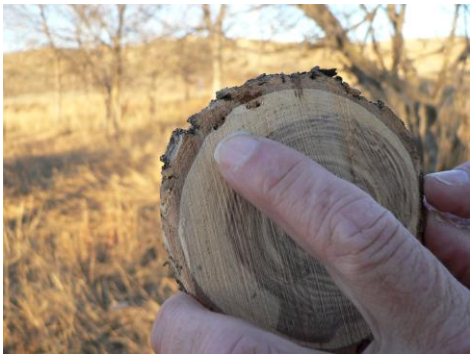
Lake County FL1600056 **A tree spade was used to move these trees about five years ago. They are declining.**

The shoot growth on these trees is much less than is normal for a spruce in your area. While spruce are relatively easy to plant, the coarse root system often means they do take several years before they remove from the loss of roots. A tree spade can remove more than 75% of the roots, surprisingly not fatal, but may result in shorter than normal growth for several years afterwards.

Lyman County **Are these emerald ash borers?**

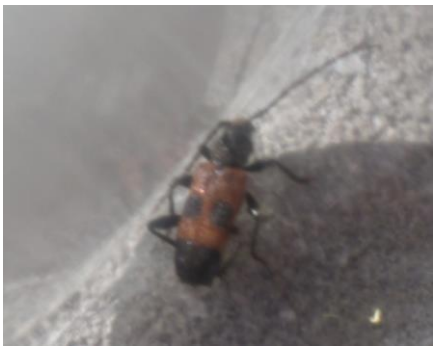
Earlier this year Jason from the NRCS office in Kennebec had a question about detecting emerald ash borer. He wanted some purple traps to place in some trees by the Missouri River to see if emerald ash borer was in the area. While purple traps are used across the country, including South Dakota, for detecting this invasive insect, they not the best means. Girdling an ash tree is one of the best ways to catch the borer as they are attracted to freshly wounded trees. Jason girdled two trees in a shelterbelt earlier this summer and this past week,

Dale Anderson from the Department of Agriculture and I went down to fell the trees and check for borer.



As expected, these trees were a real attractant for the redheaded ash borer (*Neoclytus acuminatus*), a native insect that infested dead and dying ash. The redheaded makes an oval, not D-shaped exit hole, but they are close enough in appearance that they can be confused by the general public. The redheaded ash borer larvae also spend some of their time feeding in the cambial zone, just like the emerald ash borer. There tunnels are also filled with powdery frass so it can be hard to separate the two. A major difference is the tunnels created by the emerald ash borer larvae are serpentine, twist back and forth while the redheaded ash borer has tunnels that are more meandering. I was also able to find larvae in two of the tunnels and they both were the redheaded ash borer. The redheaded ash borer larvae are round and have tight segments while the emerald ash borer is flat and divided into bell-shaped segments. Fortunately no emerald ash borers were found!

Lyman County **What kind of borer is this in the cedar trees?**

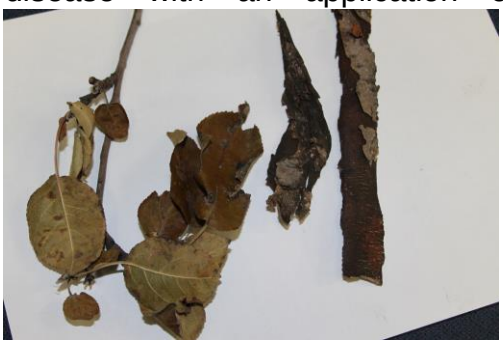


This is *Semanotus amplus*, a cerambycid beetle that attacks juniper. According to the literature it is not found east of the Continental Divide, so this may be the first record of it in South Dakota. However, it is sometimes considered a subspecies of a *Semanotus* that is found throughout the country. Regardless this borer does infest junipers (cedars) though it typically is found in dead and dying trees rather than healthy ones.

Minnehaha County FL1600058 **Why is wrong with my apple tree? The leaves have blotches and the bark is falling off.**

The blotches are symptoms associated with apple scab, probably the most common fungal disease of apples. The disease infection results in dull, brown irregular spots on leaves, which change to olive-green velvety spots as the season progresses. Infected leaves often drop prematurely and I have seen

trees completely defoliated by the disease in August. Homeowners can treat the disease with an application of a fungicide containing propriconazole, myclobutanil, chlorothalonil or captan every 7 to 10 days beginning as the flower buds swell and continuing until three weeks after the petals fall or dry weather prevails.



The loosening and shedding of the bark is normal for apples and crabapples. The bark naturally exfoliates and as long as there is smooth bark appearing beneath the rough bark that is falling off I would not be concerned.

Roberts County FL1600057 **I noticed these spruce trees were developing brown needles and was told it's a fungus.**

You are correct, this is Stigmina needlecast caused by the fungus *Stigmina lautii.* Infection results in discoloration and eventual loss of older needles, usually beginning with the lower branches. The disease is similar to Rhizophaera, another common needlecast disease, except Stigmina can affect needles throughout the canopy while Rhizosphaera is limited to the lower limbs. The fruiting bodies differ as well with Stigmina having a rough margin with hair-like projections. This disease is becoming more common than Rhizosphaera. Treatment is a fungicide containing Chlorothalonil applied when the new growth begins to expand then every 10-days through August. Treat the entire canopy, not just the lower branches.

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