Pest Update (June 5, 2019)

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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/

Plant Development

We finally had a week of dry, hot weather. It looks like that is not going to be the trend for the reminder of the month. A return to cooler and slightly wetter conditions is expected for the rest of June.

The Miss Kim lilacs and pagoda dogwoods are in bloom in Brookings. The dogwood has bloomed anywhere from May 15 to June 15 in Brookings during the past two decades, so we are just a little behind for plant development.

Treatments to do now

Dothistroma treatments should be started by now. This is a very common disease of Austrian pines this year (also ponderosa pines in East River shelterbelts and the Black Hills) and is responsible for some of the discolored needles we are seeing on pines this year. The symptoms are dead needle tips beyond the yellow to tan spots. The spots have now enlarged to form brown to reddish brown bands and sometimes fruiting structures can be seen in the bands. The infection this year is so bad that the entire needle may be discolored. The treatment is a copper fungicide applied now as the candles are expanding and repeated in late June and again in mid-July. There are several copper-containing fungicides available such as Camelot for those individuals who must spray several or more trees.

Treatments you missed

Apple scab

If you missed the first two foliar fungicide applications for apple scab – no need to start now, you are too late. As anticipated, the cool, wet weather we had the past month provided near perfect conditions for the development of this disease. Apple and crabapples already have leaves with olive-drab spots and many of these infected leaves are already yellowing. I suspect

these infected leaves will start falling by the end of June and some susceptible trees will be bare of foliage by August. All fungicide treatments available to the homeowner are protectants – meaning they prevent the spores from germinating and entering the plant. Once the fungicide is established within the tissue, these treatments are of no value.

Tent caterpillars

The eastern and western tent caterpillars are rapidly completing their larval development. A couple weeks ago they were just beginning to hatch, and the young caterpillars were no more than about 1/8-inch long. Now many are approaching 1-1/2 inches long, almost mature, and most of their feeding has been completed. I have seen some apples and plums almost completely stripped of foliage this weekend.

Treatments at this time are really revenge spraying, it makes you feel better that you got even with a lot of small critters that defoliated your tree. It is not going to have any impact on the trees – they are already defoliated – and will have no influence on next year's population.

Timely Topics

What happens to the emerald ash borer after it kills all the trees in a community?

This is a common question asked when I am discussing emerald ash borer in a community meeting. Since the beetle will kill all our untreated ash, what happens to the beetles once all the ashes are gone?

Well, the beetles never disappear once they are introduced into a community. Once almost all the mature trees are killed in a town, a process that can take anywhere from five to ten years from its original discovery in a community, the beetle will persist in saplings that continue to sprout up.

This spring I was in Michigan and the woods there are fill with young ash trees. These trees get just large enough to produce seed before they are killed by the borer. Hence a community maintains just enough ash to keep a residual population of beetles.

I saw this same process occurring in Columbus Ohio during a recent visit. This community lost about

25,000 trees during the early 2010s and now you only occasionally see a mature ash. However, there are still lots of ash saplings growing in vacant lots and ditches. All these trees are infested by the borer, but they persist for a while.

The point is once emerald ash borer become established in a community; it will always be in a community.

The other host for emerald ash borer

While emerald ash borer does not attack mountainash (*Sorbus)*, the small trees with the white flowers in the spring and the red-orange fruit in autumn, they do attack one other plant that is not an ash. The fringetrees (*Chionanthus virginicus*) have occasionally been attacked in the eastern United States. These unusual shrubs are more common in the eastern US but appear to be hardy to at least as far north as Brookings. The white strap-like flowers are very fragrant (they are related to lilacs) and the late summer bluish black olive-like fruits also add to their ornamental appeal (and are enjoyed by the birds). While there are some plantings in our state, I doubt it will become popular due to its susceptibility to attack by the emerald ash borer.

So how long am I treating my ash tree to protect it from the borer?

First, no treatments should be done until the beetle has been confirmed in your community. At this time the only known infestation in the state is Sioux Falls and its still mostly concentrated in the northern third of the community.

The standard recommendation is to expect to treat your ash tree every two years for at least 10 years, meaning five applications. After that time, most of the ash in a community will be dead and the borer population will decline as its food source shrinks. Fewer borers means it takes longer to kill a tree so the treatment internal may expand from every two to every three or even four years. However, it may never end. In Ohio a homeowner association stopped treating their trees after 12 years assuming the problem was over – all their trees were dead within two years.

Therefore, I do not expect to see a lot of ash in Sioux Falls in 20 years. The treatments are very effective and if the 8,000 trees currently being treated continue to be treated, they should still be part of the community forest. However, tree

owners either move or loss interest over the years and most discontinue treatments after six or seven years.

Pine pollen

Pines throughout the state are releasing their pollen. Conifers do not produce true flowers or fruit. Instead they produce male and female cones. The female cones are the cylindrical woody structures containing the seeds. The male cones are usually much smaller and are very temporary, usually disappearing right after pollen dispersal.

While pine pollen does cause an allergic reaction in some people. Symptoms include a runny nose, nasal congestion, and sneezing, like the symptoms of hay fever. However, pollen is also considered a food for many others. Pine pollen extract contains antioxidants and contain small amounts of protein, calcium, magnesium and vitamin B. The health benefits have not been documented, but you can find numerous internet articles claiming many benefits. It supposed to slow aging, reduce fatigue and boost testosterone. Humm – think about all this the next time you are breathing the pollen laded air in the Black Hills.

E-samples

Ash rust (*Puccinia sparganioides*) pictures are coming in and this may become a bad year for the disease. I received this picture of a new infection from Josh, one of the SD Department of Agriculture foresters out in Rapid City. The disease begins as bright orange spots on the petioles and undersurface of the leaves. These enlarge during the season, becoming almost gall-like and further distorting the leaves. These infected leaves usually drop prematurely resulting in another round of telephone calls and emails from alarmed tree owners as their yards become filled with fallen leaves in July and August. The disease can also affect the young twigs and shoots though this is rarely seen (except back in 2008).

However, this year the conditions were just right along the eastern edge of the state for the development of the disease, cool and wet, and I have received numerous reports and pictures of this infection. The disease, as with many other

rust diseases, has two hosts, one is the ash and the other is several grasses. The disease can be managed with a single application of a fungicide containing myclobutanil made just as the leaves come out so it's too late for treatment this year. Treatments are not usually recommended anyway since the disease is not a tree-killer.

Crown rust (*Puccinia coronata*) on buckthorn is also showing up. While no one cares about buckthorn (except for the few folks that think it is a non-flowering crabapple in their yard), I usually get a few pictures of this disease every year. As with apple scab and ash rust, this may become a bad year for this disease as the cool, wet conditions were perfect for the development of the disease.

Crown rust, as with most rust diseases, alternates between two host. In this instance, the other host is oat. This is a serious disease of oats and can reduce yields up to 20 percent. One common recommendation for management of this disease is to remove all buckthorn within a mile of the oat field. Considering the amount of buckthorn growing in windbreaks across the state, this is almost an impossible task.

Maple bladder galls are continuing to appear on silver maple leaves. The galls are due to the feeding of a very small eriophyid mite called (you guessed it) the maple bladder gall mite (*Vasates quadripedes*). The mites overwinter under the scaly bark of the trunk then move to the expanding leaves in the spring. The mites feed on the underside of the leaves causing a pouch or bladder to form. Eggs are laid in this bladder and the young mites live and feed within this protective structure. The galls turn color during the season from green to red to black and usually the color is what catches the eye of the tree's owner. The mites and the galls do not harm the tree, the leaves are still able to manufacture food, so no management is needed. Besides, once the galls are noticed, it would be too late for any treatments as nothing can remove the bumps (unlike pimple treatments for acne plagued teenagers!).

Dieback of smokebush (*Cotinus*) and ash (*Fraxinus*) are continuing to come it. I have seen numerous smokebushes that have dieback back more than 50 percent and there are ash out there that also have shoots that have died back quite a bit. This dieback may be the result of the long winter, smokebush is only marginally hardy in the state and we often see dieback after long winters. The ash may also

be due to the winters, but the winter cold but that spring cold snap that killed a lot of buds that were coming out of dormancy. In both instances the plants are recovering and producing new buds and shoots.

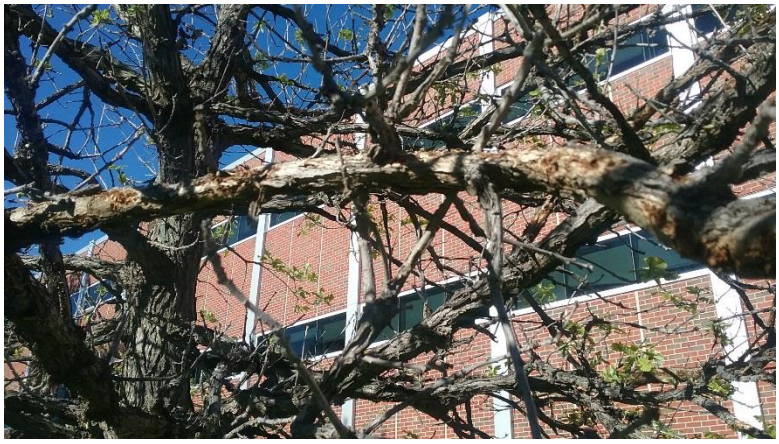
Venturia leaf and shoot blight (*Venturia*) is a disease we seen developing on aspens and cottonwoods in the Black Hills area during wet years and this year is no exception. The symptoms of the disease are brown to blackened irregular shaped blotches on the leaves which causes them to become distorted. The shoots are also affected, and these have blackened tips that often curl into what is called a shepherd's crook. These shoot die and canopy of the tree becomes filled with many short dead tips. The tree does not die, but the distortions detract from the appearance.

As with almost all tree fungal disease, once you see the problem its too late to treat. Regardless, the disease is usually not treated for as it only becomes a problem during years with cool, wet springs.

Woodpeckers and oaks are still a bad combination. I looked at several samples, and bur oak on the SDSU campus, this past week that were declining and all had the bark shredded from the twigs and branches. The problem is woodpeckers drilling into the bark searching for the small larvae of the **gall wasp** *Callirhytis flavipes*. During the winter these small, white larvae are found within the inner bark of the branches and twigs of mature oak trees and the trunks of young trees. The gall wasps emerge in the spring as adults 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 a gall on the vein and live out their short lives within this structure. Adults emerge later in the season and lay eggs on the twigs and branches.

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 during the winter. The woodpeckers can shred most of the bark from young trees, enough that the trees are be 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.

Management of the problem is difficult. Some people have tried protecting their small oaks with Tanglefoot Bird Repellent^{R} on the trunk. This is a sticky material that comes in a caulking tube that can be smeared on the trunk to discourage woodpeckers. This is a very time-consuming task and must be repeated every year. Insecticides to kill the gall wasps have not be completely evaluated yet. The timing for insecticide sprays is critical and the gall wasps are flying for an extended time period in the spring and late summer. Injecting insecticides to kill the larvae as they feed have not proved successful yet for *Callirhytis*. Not all trees are infested by the gall wasps. It is very common to find several bur oaks growing near one another and only one tree infested by the wasps. The bark on the infested trees appears to be less furrowed than the uninjured tree but this is difficult to evaluate as the woodpeckers have often removed so much bark it is hard to tell the origin texture.



Samples received/Site visits

Charlies Mix County **Is this pine wilt disease?**

Yes, the nematode was found in the core samples submitted. For more information on the disease, see the sample for Minnehaha County.

Hughes County **Is this emerald ash borer?**

No, first there is not the classic thinning of the canopy that is typically associated with an infestation. There is also no evidence of woodpecker activity along the stems and branches in the upper canopy and this is one of the best means of identifying infested trees – woodpeckers are laser focused on these insects!

The only sign of any insect infestation is the large – almost pencil-size – at the base of the tree. These holes are commonly associated with our native clearwing ash borer (also known as the ash/lilac borer) which was the most common insect problem on ash before the arrival of emerald ash borer. The difference is that our native borer only attacks declining trees while the emerald ash borer will attack and kill any ash tree, regardless of its health.

Minnehaha County **Do my pines have pine wilt?**

Last year one of their Scotch pines turned brown and died within the same season. We sampled for the pinewood nematode and was able to isolate this species (you can usually find nematodes in a tree the trick is do you find the pinewood nematode). This year another Scotch pine is beginning to decline, and they wondered what the hope for the remainder of the stand was. Would they eventually lose all their trees? The short answer is yes. Pine wilt disease has moved north into South Dakota and all exotic pine south of a line from Spearfish to Watertown can become infected. The disease only affected exotic pines – most often Austrian, mugo, and Scotch pines, with Scotch pine being the most susceptible. Our native ponderosa pine is not affected.

The causal agent for pine wilt disease is a nematode (*Bursaphelenchus xylophilus*) though a bacterium it carries has also been considered as a possible agent of the disease. The nematode kills its host by plugging up the tracheids that carry water up the tree – the reason the needles turn brown and wilt within a season. The nematode is aided in this process by blue-stain fungi. Once the tree has died, the nematode feeds on the fungus during the fall and early spring.

In late spring, the nematodes are carried to a new host tree by sawyer beetles (*Monochamus*). The beetles carry the nematodes on their surface and in their respiratory system from the dead, infested tree to its new host. The nematodes

are deposited during the maturation feeding by the sawyer beetles – when the beetles are feeding on the tender candles. The wounds created by their feeding provides the primary introducing site for the nematode. Subsequent introductions can occur as the beetles create oviposition sites on the tree.

Management of pine wilt disease is by felling and burning infected trees by mid-April, before the sawyer beetles emerge and carry the nematodes to nearby healthy pines. This has a minimal impact as the sawyer beetles can fly considerable distances and trees can become infected from sawyer beetles carrying nematodes from more than a mile away.

There are preventative treatments to protect valuable Scotch pines from this disease. The treatments are preventative and do not work if the tree is already showing symptoms of an infection. They also only suppress the nematode population, not eliminate it, so if treatments are stopped the tree can die rapidly.

The treatments are injected into the trunks of the tree. The two most common active ingredients used are avermectin and emamectin benzote. The emamectin benzote treatments are considered the most effective and, in some studies, have provided three-years of protection. However, the cost of these treatments and the fact they must be repeated indefinitely generally means tree owners forego this expense and remove the trees as they die.

Miner County **Is this pine wilt disease?**

No, the core samples did not contain the nematode. This does not mean the nematodes are not present, they may just not have been contained in the cores.

Moody County **Is this emerald ash borer?**

No, the canopy of the trees were not thinning but just had some branch dieback which is common on mature ash. The sprouting along the trunks was not the sprouting typically associated with an infested tree. Instead, these are from burls. Burls are large misshapen swellings on tree trunks. They are common on ash, maples and oaks. The twisted and gnarly wood within these burls makes them highly prized by wood workers. No one know why burls form on a tree, stress is believed to be a factor, however, these are not generally associated with emerald ash borer infested trees.

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