

Pest Update (June 3, 2020)

Vol. 18, no. 17

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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



The weather continues to warm and with the temperatures predicted to be in the upper 80s this week we will see an acceleration in plant development. Many of our late spring shrubs such as Tatarian honeysuckle are already in full bloom in Brookings.

The growing degree-days for Sioux Falls are at 472 (as of Saturday, May 30) so emerald ash borer adults will be emerging and flying very soon. The peak to emergence is expected to be around the third week of June.

Treatments to do now

Now that the growing season is in full swing there are numerous treatments to be applied. These treatments are necessary to protect the plant from becoming infested or infected by a pest or pathogen. Waiting until you see symptoms of an infestation or infection is usually too late for effective treatments.

Clearwing ash borer (*Podosesia syringae*) treatment with an insecticide containing permethrin as an active ingredient also begin now. The bark must be sprayed to protect the tree as the insecticide will kill the adults as they are walking on the bark to lay their eggs. The insecticide will also kill the newly hatched larvae before they burrow into the wood. Trunk injections or soil treatments with imidacloprid to kill the insect once it burrows into the tree are ineffective. However trunk injections with emamectin benzoate are effective.

The adults are usually out flying about a week or so after Vanhouttee spireas begin to bloom and this shrub is flowering throughout the state. You will know the adults are flying when you see the pupa skins (picture above) sticking out of the emergent holes on infested trees.

Dothistroma treatments should be started now. Dothistroma (*Mycosphaerella pini*) is a common disease of Austrian pines this year (also ponderosa pines in East River shelterbelts and interestingly in some Black Hills communities). The most common symptoms are brown needle tips with 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. However, as noted in several previous *Updates*, these symptoms are common to many other diseases and disorders. Only a lab can determine whether the symptoms are due to this pathogen.

We have had two wet years so there is a lot of infection in some trees. 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 copper containing

fungicides available such as Camelot[®] for those individuals who must spray several or more trees. Mancozeb fungicides, a mixture of zinc and manganese, have shown effectiveness for treating the disease.



Phomopsis twig blight (*Phomopsis juniperovora*) is showing up on juniper (cedar) plantings throughout the state. The typical symptoms of this disease are the young growing tips turning pale green then light yellow-green, then reddish brown and finally ash gray by late summer. Near the base of these infected twigs you can find small, black fruiting bodies of the fungus. The symptoms, and even the fruiting bodies, can be easily

confused with another common twig blight fungus *Kabatina juniperi* so it is always a good idea to send in a sample for diagnosis.

Phomopsis twig blight can be managed with applications of a fungicide containing copper or propiconazole as the active ingredient applied now and continuing at two-week intervals until the spring growth matures usually by mid-June but it might be late June this year.



We should begin shearing pines now. Pines set only terminal buds, not along the new shoots as do spruce and fir, so the only time to shear them, removing a portion of the current season's shoot growth, is during the candle phase where the expanding new shoot is still tender. Removal of a portion of the shoot during this time will allow the new shoot to set buds. If the pine is sheared after the new growth has completed expansion and hardened, no new buds will be set, and the shoot will dieback

after the older needles are shed, usually in a couple of years. Shearing begins now and can be performed until the new needles along the candle are about ½ the size of the older needles. After that time, probably in a few more weeks, it will be too late. Shearing is only necessary if shaping an ornamental pine such as a mugo pine to keep it more compact. Other than Christmas trees (and mugo pines) we do not usually shear pines in a formal shape.



The new shoots are expanding on spruce, so it is time to apply a fungicide to protect against **rhizosphaera** or **stigma needlecast**. These are the most common foliage diseases of blue spruce. These diseases cause the older foliage to turn yellow by midsummer and then purplish brown. Usually small black fruit bodies can be found in the spring lining the stomata along the needles. Stigma



needlecast fruiting bodies have fuzzy edges (as pictured above) while rhizosphaera fruiting bodies are smooth (as pictured to the right). The disease results in premature needle drop and a thin and discolored canopy. The disease can be managed by an application of chlorothalonil now and a second application in

about two weeks. If the needlecast is due to Stigmina the applications may have to continue every 10-days till August. It is important to treat the entire canopy, not just the lower branches when treating for Stigmina.



Timely Topics

Why are my broadleaf trees “dying”?

Last week I covered the issue of winter-burn and freeze injury on conifers. This week it is time to cover broadleaf trees. I am also receiving calls and pictures of what appears to be dying broadleaf trees. Most of the callers (or texters) mention the tree looked fine last year and now are leafing out slowly or not at all. Many of these same trees had leaves clinging on them for most of the winter. That is a clue to the problem – this is winter-kill due to the fall freezing temperatures.

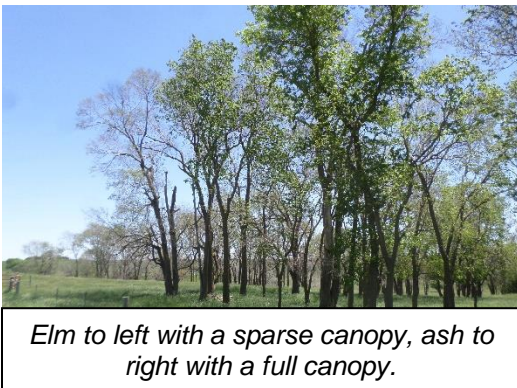
Winter freeze injury occurs when water in the cells freezes. Despite the word ‘winter’ this injury often occurs in late fall, not mid-winter. Woody plants go through a process in the fall called acclimation where the free water in cells is reduced and replaced with a natural antifreeze. While decreasing day lengths are the trigger for this process to begin, a gradual drop in temperatures also ensures this process is completed by winter.

But a gradual drop in temperatures is not dependable characteristic in South Dakota, a land defined by extremes in weather. We had a relatively warm fall last year. Rapid City saw an October where the average maximum was 51°F and the minimum a mild 26°F. October 25th the high was 66°F but by 6 am, October 30th, it dropped to -1°F. Eastern and Central South Dakota also experience temperature fluctuation, though not quite the extreme as the western part of the state. It was still cold with Sioux Falls reaching 4°F in early November.

This abrupt temperature change caught many trees not fully acclimated yet for winter. The freezing temperatures resulted in ice rupturing cells in the shoots and buds. These dead cells resulted in shoot dieback and slow leaf out as the new leaves are being produced from new shoots arising from adventitious buds.

The injury is not uniform across all species. Some trees exhibit determinate growth. They produce all their growth in spring and regardless of the weather during the summer and early fall they do not continue to grow. Trees with preformed growth include ash and oaks. These species were not affected by freeze injury.

Other tree species exhibit indeterminate growth. They continue to extent shoot growth as long as the weather is favorable. Trees with sustained growth include elms and hackberries. These trees are “fooled” by a warm early fall and are susceptible to abrupt cold snaps. This is one reason (the other is our spring frost) that these trees look sparse this spring. They were caught by the sudden cold snap at the end of a mild October.



Elm to left with a sparse canopy, ash to right with a full canopy.

This was an unusual, but not unprecedented, event. We suffered far worse tree injury in past winters. Two weather events that resulted in the loss of thousands of trees, mostly elm, were the Halloween freeze of 1991 and the Armistice Day blizzard of 1940. These dates are remembers for their mild temperatures (60 to 80°F) that quickly turned extremely cold. There are Great Plains forestry reports from both periods that noted Siberian elms by the thousands were killed or suffered extensive dieback.

This spring was also hard on elms and hackberries. They were leafing out about the same time we had frost in early May. Trees that leafed out earlier, ash, had the leaves harden enough they survived the cold. Other trees, oak, had not leafed out yet and were spared. We are seeing the same problem with spruce.

Freeze injury on spruce being confused with herbicide drift



Pictures are coming in of spruce and firs that present with twisted new growth. Curled foliage is a common symptom associated with exposure to plant growth-regulator herbicides. However, curled foliage is also a common symptom associated with freeze injury. Late spring frosts can kill cells in the tender, expanding shoots. These injured shoots will curl or droop usually within a few weeks after the weather event. Some of the needle tips will also turn black

The early morning of May 10th or 11th saw temperatures drop to near or below freezing in many areas of the state. The weather previous to this date was mild and many trees were breaking bud at this time include spruce.

While herbicide drift can present similar symptoms, one difference to the pattern is herbicide drift appears on one side of a spruce windbreak, obviously the side facing the field. Frost injury will be random throughout the row with some trees affected more than others and the injury will appear around the entire tree.

EAB update



Since we are entering the time for adult emerald ash borers to emerge (though D-shaped holes) from infested ash, it is time to begin monitoring. We have switched over to the green funnel traps rather than the purple panel traps due to continual problems with the panels. First, they do not survive strong winds intact, and strong winds are common in our state. Second, adults stuck to the traps can easily wash off in heavy rains so the traps may capture adults that are not present when the traps are checked.

The green funnel traps are attractive to adults (both the color and the lure that is attached to the funnel) and the slippery funnels cause the beetles to slide down into the white cup and be captured. These traps are being placed in Minnehaha and Lincoln Counties as well as throughout the southeast and in industrial parks in selected cities in the state.

Widespread injections began two years ago after the confirmation of the insect. Many infested trees were injected as therapeutic treatments – to kill an existing infestation – and others as preventative – to protect the tree from becoming infested. The value of the therapeutic treatments are clear to see this spring. Ash trees that were infested, but only presenting 5 to 10% canopy decline, have recovered. However, nearby ash trees with similar decline but not treated have continued to decline and now are presenting 30 to 50% canopy decline.

E-samples

Crown rust on buckthorn

The bright yellow to orange spots of crown rust (*Puccinia coronata*) are appearing on buckthorns. The spots contain the fruiting structures (pycnia) release spores (pycniospores) in a sweet liquid that attract insects which carry the spores to infect the buckthorn leaves. This infection produces orange-yellow aecium on the

underside of the leaves which release aeciospores that are carried by the wind to the other host – oats, barley and other grasses. You can see yellow to orange spots on both the upper and lower leaves at this time.



Common buckthorn (*Rhamnus cathartica*) is the principal alternate host for crown rust. This woody shrub/small tree is native to Europe and western Asia and should have been left there. Unfortunately, someone thought it would make a good hedge and was brought to the United States. An Iowan by the name of Miller was so taken by the plant that he introduced it to South Dakota in the late 1800s – we should have built a wall.

The only positive thing you can say about buckthorn is it is indestructible, any soil, any climate. The negative is the fruit (its will give you and birds the runs), soybean aphid likes to live on it during the winter, the spotted wing drosophila feeds on the fruit in the fall and then invades raspberry fruit the next summer, and it also serves as a host for crown rust. What was that Iowan thinking.

The glossy buckthorn (*Rhamnus frangula*) is rarely mentioned as an alternate host but here is a picture of one showing the infection. While this plant has some ornamental value (the cultivar 'Tall Hedge' is a columnar hedge shrub), it probably should also be on the no-plant list since it can serve as an alternate host.



Variegated Norway maple reverting

I have received pictures from two tree owners wondering what is wrong with their maple tree. Did their neighbor spray a weed-killer? The problem is not winter or herbicide but genetic.

These are Harlequin (variegated) maple (*Acer platanoides* 'Drummondii'). This cultivar is noted for its light green foliage fringed in white. The overall appearance of the tree in early summer is striking but rarely seen throughout the tree. The problem is new branches continually revert back to the normal uniform green.

Remember most tree cultivars originated from a single bud mutation that resulted in a shoot with new, and valuable, characteristics. This might be tasty fruit in a fruit tree or brighter fall color in a shade trees. Almost every woody plant in the ornamental landscape or orchard can be traced back to one bud on a single tree or shrub that was a rebel and wanted to be different.

Despite their rebel nature, most of these mutant buds are like baby-boomers, they settle down and while true to their rebel origins, do not continue to change. When you buy a 'Haralson' apple tree or a Sunburst^R honeylocust, you know what you get.



But not all. Some mutations do not settle down, they are a little nostalgic. They long to be normal again and cannot decide whether to stay true to their rebellious characteristic. One of these is the Harlequin maple. When you buy the young rebellious tree, all the leaves are variegated. But as the tree reaches middle age, more and more new shoots produce green leaves. These shoots are more vigorous (all their leaf tissue has chlorophyll) and crowd out the branches with variegated leaves. Eventually the mature tree has forgotten its rebellious past and is now just a green leafed Norway maple.

The solution? It is just like dealing with those annoying ear hairs that come with age – cut them out. Any shoot that comes out with green leaves must be pruned off and just like ear hairs, this is a continual process (well once a year, not monthly).

Oh, and why did the tree owners just notice that only some of the leaves on their mature tree were variegated? They each had bought their home last winter.

Winter-kill on maples

It was a hard winter, really a hard fall with its extreme temperature fluctuation. As already discussed in this, and previous, *Updates*, many trees have experienced freeze injury from last fall. The trees that presented dieback from this episode were mostly younger trees - these tend to grow later in the fall if there is adequate moisture - and marginally-hardy cultivars that are more susceptible to cold injury.

One tree that is susceptible to this injury is the Crimson King Norway maple (*A. platanoides* 'Crimson King'). The Crimson King maple was selected as a seedling from the original purple leaf Norway maple, the Schwedler maple (*A. platanoides* 'Schwedleri'). The species and this cultivar are native to Europe and are adapted to the milder climate common to that continent.

Crimson King maple can tolerate mid-winter temperatures to -25 to -30°F. However it acclimates late so in October it can tolerate temperature



only as low as 10°F and -5°F by late November. The cold snap experience in the state exceeded this threshold and there is branch dieback on Crimson King maples throughout the state.

Samples received/site visits

Hutchinson County

Split tree



I receive a call to look at a large tree in Freeman. The owner was concern the tree was split and might fail. The tree is a green ash and this species often produces codominant leaders, two upright stems of equal size. The two stems continue to expand and eventually become pressed together at their base. The stems do not graft together but remain as two separate stems with the bark imbedded between them. This creates a weakness which results in a crack which eventual results in tree failure.

The solution is to prune the tree to a single leader when the fork begins to form. Once these become two large (over 6-inch diameter) stems there are only two choices, either remove the tree or use a support system. These systems involve placing screw rods through the trunk above and below the split as well as flexible cables in the canopy. This is not for amateurs but professional arborists that have the equipment, materials, and knowledge to do the work. Too often tree owners resort to wrapping a chain around the split trunk. This eventually girdles the trunks and kills the tree.

Kingsbury County

Spruce bud scale



This was a thinning Colorado spruce adjacent to an equally thinning Norway spruce. The tree owners noticed some “tears” on the needles. The tears were not the result of a sad tree but honeydew being produced by the spruce bud scale.

The scale resembles a small round, reddish bud and they can be found on near the tips of the branches where the side branches attach to the shoot. They, and their mobile young called crawlers, suck the sap from the shoots resulting in dieback and decline of the lower branches. Since these are soft scales they produce honeydew that results in a black, sooty appearance to the needles and twigs.

The scales have one generation per year and the crawlers' hatch about the time littleleaf lindens are in bloom which is a few weeks away. The best treatments are insecticides containing carbaryl as the active ingredient applied on the foliage and shoots near the tips. Products containing imidacloprid can be effective as a soil drench but need to be applied in the fall for control the following year.

Minnehaha County

Linden erineum mite



I had a call about a “funny” growth on their linden leaves. The concern was that this was a disease and they wanted to know the treatment. The problem turned out not to be a pathogen but a mite. Tiny eriophyid mites, about 1/100-inch long, are responsible for the erineum, the felt-like patches that appear on the underside of the linden leaves. The felt is really thousands of tiny hairs growing out of the leaf. If you look at the felt in the microscope (need at least 40x) you might see the very tiny mites moving among the hairs.

The mites are common on boxelder, sugar maple, and lindens among other trees. Each host has its own mite species but the feeding and injury is the same – felt on the underside of the leaf and bumps on the upper side. The mites feed by sucking cell contents from the leaves. The injury is usually minor and treatments are not necessary or effective.

Yankton County

Pine wilt disease

The call was about dying pine trees in a cemetery. When I arrived I noticed a few Scotch pines in the border presenting the typically symptoms of pine wilt disease. This disease is caused by a nematode (as well as a blue-stain fungus and possibility a bacteria) which stops the flow of water through the tree so it dries out very quickly and dies.



The typical symptom pattern is the tree starts presenting yellowing needles in the upper canopy by mid-summer. The yellowing needles expand throughout the canopy and then turn tan by early fall. The tree usually dies by late fall. The twigs are dry and snap easily.

Once the tree is cut down, the tree has dried out so much the wood has about half the weight of a normal tree. The wood is also streaked with blue from the blue-stain fungus. Cutting down the tree is the best management of the disease. In the spring, longhorned beetles fly out of the dead tree carrying the nematode to nearby healthy trees.

The most susceptible host is the Scotch pine (*Pinus sylvestris*), followed by Austrian pine (*P. nigra*) and even mugo pine (*P. mugo*). Ponderosa pine (*P. ponderosa*) is not susceptible to this diseases nor are spruce.

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This publication made possible through a grant from the USDA Forest Service.