



Tree Pest Alert



June 2

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Samples

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

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.

Reviewed by Master Gardeners: Bess Pallares, Carrie Moore, and Dawnee Lebeau

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Plant development for the growing season

While April was warm, it cooled down in May, which slowed plant development. Now we are at about 500 growing degree days (GDD) in Sioux Falls, right where we typically are by early June.



The Miss Kim lilacs are in bloom along with the black locust. The appearance of the fragrant white flowers of the black locust are also a sign that emerald ash borer emergence has begun. The insect started flying in Sioux Falls right on schedule – just like the swallows to San Juan Capistrano but not as welcomed!

Treatments to Begin 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.

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 sticking out of the emergence 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 *Pest Alerts*, 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, 2018 and 2019 which resulted in a lot of infection in some trees. Last year was dry but the disease persisted.

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 juniper-ovora*) 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 yellowish 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 half 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.

Timely Topics

Emerald ash borer update

The coppery colored adults are beginning to fly in Lincoln and Minnehaha Counties. The adults are about 3/8 to 1/2 inch long but only 1/16 inch wide, so they are very slender, often described as torpedo shaped. The metallic coppery green color stands out against the bark.

The adults fly during the mid-day, about 10 am to 3 pm during sunny weather. They prefer day temperatures in the 70s or lower 80s. If it is a nice day for a walk, it's a nice day for them to fly.

Despite coming from almost halfway around the world, emerald ash borers are homebodies and content to hang out on or near (within 300 feet) the tree from which they emerged. While they can fly more than 15 miles (over their 3- to 6-week lifetime, not generally in a day!), if there are living ash near them, they will just stay there.

Pine wilt disease found in Aberdeen, South Dakota

Aaron, the city forester in Aberdeen, noticed a Scotch pine (*Pinus sylvestris*) that died very quickly either last fall or this spring. When we arrived at the tree, it was clearly dead. The needles were discolored and hanging. When you reached up to touch a twig, it breaks, rather than bends.

These are common 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 during the summer, so it dries out by fall and dies.

The typical symptom pattern is for the tree to present 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, though may not be noticed until spring. The twigs are dry and snap easily.



Once the tree is cut down, the tree has dried out so much that 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.

Pine wilt disease has been gradually moving north in the US since the 1970s. It was in southern Nebraska and Missouri in 1980, the southern border of South Dakota by the late 80s, the middle of the state by 2000 and now covers the entire state from Spearfish to Canton, Yankton to Aberdeen.

We can blame the gradual increase in summer temperatures for the movement north. The disease is not expressed until the mean July temperatures exceed 70-72°F. Aberdeen July mean temperatures were about 70°F in the 1990s and were almost 73°F in the past decade. We need global cooling to take care of this problem but without that, Scotch pine should be removed from anyone's planting list as we will gradually lose them all.

The nematode is native to southern US so most of our native pines, such as ponderosa pine (*P. ponderosa*), are not killed by the disease. The most susceptible hosts are our introduced pines, Scotch pine, followed by Austrian pine (*P. nigra*) and even mugo pine (*P. mugo*). Spruces are not susceptible to this disease.

Winter injury still appearing on 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 might be 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 temperatures were still mild, reaching in the upper 70s and 80s but then on October 27th, it dropped to -5°F. Eastern and Central South Dakota also experience temperature fluctuations, though not quite the extreme as the western part of the state. It was still cold with Sioux Falls reaching 14°F on October 27th, before warming up again in early November (with a high of 81°F on November 6th!).



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 shut down early in the fall regardless of the mild temperatures. Buckeyes (*Aesculus*) and oaks (*Quercus*) almost always have dropped their leaves by mid-October. These species were not affected by freeze injury.

Other tree species seem to continue to maintain their leaves if the weather is favorable. These trees, Siberian elm (*Ulmus pumila*) and hackberries (*Celtis occidentalis*), are "fooled" by a warm early fall and are susceptible to these abrupt cold snaps. This is one reason (the other is our spring frost) that elms and hackberries look sparse this spring. They were caught by the sudden cold snap at the end of a mild October.

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 remembered 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 were killed by the thousands 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, lindens, had the leaves harden enough they survived the cold. Other trees, oak, had not leafed out yet and were spared.

E-samples

Erineum mite on lindens

I had a text about a “funny” growth on their linden leaves. The concern was that this was a serious 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.

Maple bladder gall mites

I am receiving pictures of “growths” on silver maple leaves. These are maple bladder galls caused by the feeding of a tiny (less than 1/32-inch) eriophyid mites (*Vasates quadripedes*) feeding on the expanding foliage.



The adult mites move out from beneath the bark in the spring, just as the maple buds are beginning to open. The crawl out to the new leaves and feed on the underside of the blade. As they feed, they inject a chemical into the leaves that reacts with plant hormones to form these galls.

The adult mites lay eggs in these galls and the young mites feed within the gall until they emerge to also lay eggs on any new foliage. If it is a dry summer, new growth stops early and there are no new galls. If the summer is wet (not likely this summer), new leaves continue to be produced and with that, new galls.

When the new leaves stop appearing and summer is coming to an end, the mites move back to the bark and overwinter. There are usually several generations each year.

The galls turn from green to red and yellow, and eventually black by the end of the season. While the galls can be numerous on a leaf, they do not usually affect photosynthesis and the damage is more aesthetic than health.

Samples received/Site visits

Davidson County, Spruce problems

A disease that is appearing in many spruce samples is spruce needle drop (aka sudden needle drop) also known as SNEED. The pathogen associated with SNEED is *Setomalonomma holmii*. While it has not yet been proven that this pathogen is responsible for the problem, it is often associated with tree presenting SNEED, older needles turning yellow or a yellow green before dropping prematurely. Infected tree will often have only the current year's needles present.

Affected trees do not have the fruiting bodies appearing on the foliage. Instead, the twigs on these shoots will be covered with tiny black fruiting bodies of the pathogen. However, these same trees are also suffering other stresses, such as drought, so there is most likely some other agent – an abiotic one – responsible for the decline.

Faulk County, Frost injury on ash and hackberry

I receive pictures of an ash, but the samples enclosed were hackberries. The marginal discoloration on the ash and the wilting of the hackberry leaves are like the frost injury described in the next sample from Kingsbury County.

Kingsbury County, Hackberry defoliation

The hackberries in the yard appeared defoliated with the sparse foliage drooping and tattered. The problem was not an insect or pathogen but the unpredictable spring weather common to our state.

The freezing temperatures that occurred in early May caught the hackberries just as they were leafing out. Expanding leaves are tender and susceptible to frost injury. Trees such as basswoods that had leaf out earlier and their foliage is tougher, more resistant to frost. Other trees, such as oaks, still had their leaves in the buds so were well protected from frost.

Hackberries and ash are the two trees that seem to start leafing out just when frosts are most likely to occur. The good news is that the hackberries will soon put out new leaves and the damage will disappear.

The buds were also infested with hackberry budgall psyllid (*Pachypsylla celtidisgemma*). These are “cousins” to the hackberry leaf gall psyllid (*P. celtidismamma*). This is the insect responsible for the bumps appearing on the underside of hackberry leaves. The difference with the bud gall is the insect infested the buds and these become enlarged. Either are serious threat to the tree and not a concern.



The other concern was the “funny” shoots that were appearing through the tree. These are called witches’-brooms. These clusters of shortened shoots, the brooms, detract from the appearance of the tree and are one reason hackberry is not a poplar ornamental despite being a tough, hardy tree.

The witches’-broom are the work of two organisms, a powdery mildew fungus (*Sphaerotheca phytoptophila*) and an eriophyid mite (*Eriophyes celtis*, syn. *Aceria snetsingeri*). It appears that the mite initiates the bloom –

the proliferation of buds - and the mildew fungus causes the buds to form stunted shoots.



Most of the stunted shoots die the year they appear but new brooms occur almost every year. Many hackberries are resistant to brooming while other trees have them occur every year. Fortunately, the brooms are more an annoyance than a problem.

Lincoln County, Ash bead gall mite

Everyone is out closely looking at their ash trees and noticing anything that is out of the ordinary. This means plenty of site visits to ash trees that are NOT related to emerald ash borer.

Still, these can be interesting stops such as this one. The concern was the appearance of the leaves – the light-colored elongated blister-like bumps on the leaflets. These are the work of the ash bead gall mite, *Aceria fraxini*.



The galls do not harm the tree (or the leaves). It just makes them look a little unsightly, not the lethal threat of emerald ash borer. But both share one thing in common, they are introduced here and probably welcome each other just as neighbors do when they meet in some other country.

Minnehaha County, Ash bullet gall midge

This was another emerald ash borer call that turned out not to be the borer but an interesting pest. These colorful reddish bumps that appear along the veins are not due to a mite but a fly. This is the work of the ash bullet gall midge (*Dasineura pellex*).



This midge does not harm the tree or the leaf. The bullet-shaped galls may be considered unsightly by some but that is the only concern. Ash has far bigger problems right now.