



**SOUTH DAKOTA STATE
UNIVERSITY EXTENSION**

Tree Pest Alert



August 5, 2026

Volume 24, Number 25

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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 listing 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: Carrie Moore and Dawnee Lebeau

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

Plant development for the growing season

This past week's weather was warm with daytime temperatures in the 80s and 90s for much of the state. But there were a few hot days. Some communities – such as Rapid City – had at least one day last week that was over 100°F.

The growing degree days (GDD-base 50) accumulation was another 160 to 180 GDDs during the past week. Here are the total GDDs for communities across the state.

Aberdeen	1,959
Beresford	2,360
Chamberlain	2,370
Rapid City	2,128
Sioux Falls	2,326

Now that we are in the heat of summer, the panicle hydrangeas are at their peak floral display. The name panicle comes from the appearance of the inflorescences – the flower clusters – that line the tips of every branch. The cone- or pyramidal-shaped clusters are referred to as panicles.



These are branched flower clusters where the main axis divides into multiple shorter branches along its length. These shorter branches each support more than one flower or divide to support more flowers. A panicle has flowers on the lower axis opening first and the end of the terminal last.

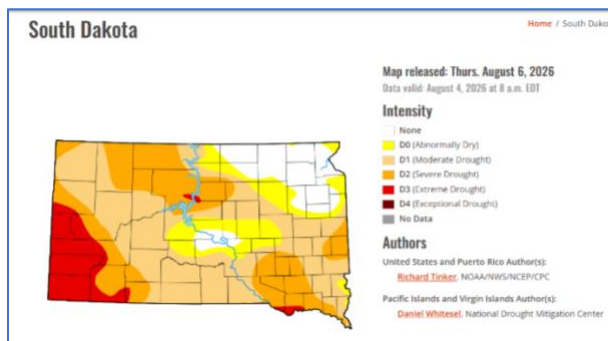
Many botanists called these hydrangea inflorescence dichasial cymes instead of panicles. The two floral arrangements look similar, but a dichasial cyme has inflorescences with the flower at the tip open first followed by flowers on pairs of subtending branches.

Panicles bloom “bottom up” while dichasial bloom “top down” which is the pattern for panicle hydrangeas. While they may be dichasial cyme, calling these shrubs panicle hydrangea sounds nicer!

Drought monitor

About 41% of the state is classified as “Moderate Drought,” another 26% “Severe Drought.” About 12% of the state is either “Abnormally Dry” or drought-free. Eight percent of the state is classified as “Extreme Drought.”

Here is the current map from the National Drought Mitigation Center at the University of Nebraska-Lincoln. We need rain!



Treatments to Start Now

Pick up fallen fruit from your fruit trees!

Tree fruit is maturing across the state with harvest of our stone fruits already started. Apples and pear harvest will begin soon. But we also can find some damaged fruit that is already dropping to the ground from apples to plums.

There are many fruit pests that feed inside tree fruit. Once the damaged fruit drops, the “worm” (larva) crawl out to pupae in the soil. Apple maggot, codling moth, and plum curculio are insects that live this way.

Picking any blemished fruit before it falls is a good sanitation practice to reduce the population of these pests for the following year. Any fallen fruit should always be promptly picked up and discarded.

Timely Topics

Emerald ash borer updates

We are continuing to monitor the larval development of emerald ash borer (EAB). The larvae are mostly 3rd instar larvae. This third stage is about 1/2- to 3/4-inch

long, flat, white with distinct bell-shaped abdominal segments.

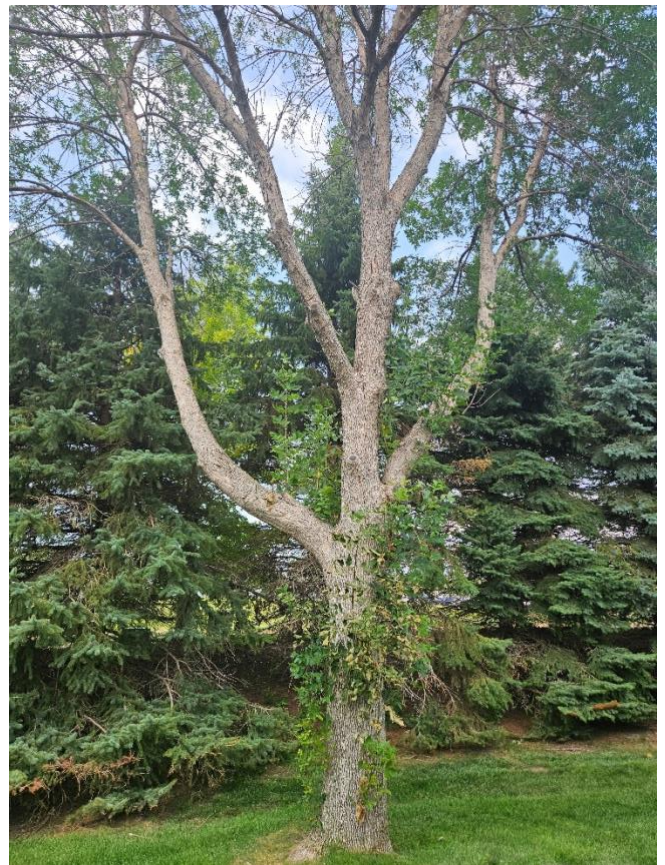
These are feeding just beneath the bark. If the bark is pulled away from an infested tree, the powder-filled serpentine galleries are easily seen. At the end of these galleries is where EAB larva is found. They will continue to feed during August then become a larger 4th instar. The 4th instar will continue to feed until October when they move into the sapwood to overwinter.

Emerald ash borer in Sioux Falls

Emerald ash borer was confirmed in Sioux Falls in 2018. The original detection was north and east of the airport. It probably arrived in Sioux Falls sometime between 2014 to 2015.

Infested trees can now be found throughout the city limits of Sioux Falls. Most tree owners have either removed their ash trees or are having them treated by a commercial applicator. But we do have tree owners that have (surprisingly) been unaware of the insect or choose to do nothing.

I found this tree in the back yard of a house about seven miles south of the original detection. The tree has not been treated but was pruned by a tree company about two years ago.



Unfortunately, it is now too late to begin treatments. The tree has about 40% canopy decline. These trees are not good candidates for treatment due to the extensive tunneling by the insect. The network of galleries disrupts the movement of the insecticide in the tree.

I have seen trees with 30% canopy decline survive after treatments. But the 30% that has died back does not recover. A tree company must still remove all this brittle wood. Usually, it is best just to remove the entire tree by that point.

Pine wilt disease update

The disease continues to appear across the state from Bison to Beresford and Lemmon to Yankton. The common symptoms are pines that appeared fine in the spring – a full canopy of green needles – to one where almost all the needles have turned tan to yellow by late summer or fall. The needle discoloration typically starts at the top of the tree and progresses downward.



While this is the typical pattern of symptoms for pine wilt, and one we almost always see for Scotch pines (*Pinus sylvestris*), Austrian pines (*Pinus nigra*) may present a different pattern. Scotch pine start presenting symptoms in the summer and are dead by the same fall. Austrian pine may present the first year with only a few upper branches showing tan and wilting needles. The following summer the entire tree wilts and dies.

Last week we cut down a Scotch pine that had a few branches with tan to brown needles a month ago. Two weeks later the entire canopy was brown. The needles and twigs were dry. They snapped with the lightest touch. The disease moves fast.

The cross-section of the tree showed streaks of blue. The discoloration is caused by a bluestain fungus (*Ophiostoma*). The fungus is also food for the pinewood nematode (*Bursaphelenchus xylophilus*). The nematodes are easy to extract from this discolored wood.



The pinewood nematode is the primary causal agent of pine wilt disease. It feeds and reproduces in the cells surrounding the resin ducts. This stops resin production, so the wood no longer feels sappy. The nematodes also disrupt the sapwood which blocks the movement of water from the roots to the needles. The trees quickly dry out.

Pine wilt disease requires months of hot, dry weather to develop. This describes the weather during this year, so it is no surprise that the disease is appearing in so many Scotch pines. The other common pine, ponderosa pine (*Pinus ponderosa*) is not affected by the nematode. The nematode only feeds on bluestain in ponderosa pines so the wood does not dry out.

The nematode and bluestain fungus are carried from an infected pine to a healthy host by sawyer beetles (*Monochamus*). These boring long-horned beetles attract the nematodes to them before they emerge in the spring. The sawyer beetles also carry the bluestain fungus.

The sawyer beetles deposit the nematode and fungus into the new host by cutting egg niches in the bark – they look like small slits – or through their feeding on the needles. Infected trees should promptly be removed and destroyed to prevent sawyer beetles from carrying the nematode to other trees next spring.

Codling moth larvae appearing in apples

I have been receiving pictures of apples with large holes on their sides or bottoms. The holes are covered with reddish-brown granular debris. When people cut into the distorted apple, they find the core covered with dark, crumbly frass (insect poop).

The seeds are also missing. This is the clue that the culprits were the “worms” of the codling moth (*Cydia pomonella*). This insect does not feed on the apple flesh but burrows through it to feed on the seeds.

There may still be some small white to pink larvae (with a brown or black head) near the center. But most have

already dropped to the ground to pupae or are in a fallen apple.



Codling moths have two generations per year in southeastern South Dakota. The first-generation larvae appeared in June and did most of the damage. There may be a few small larvae present now. These are larvae from the second generation.

There is not much that can be done at this time. Once the larvae are in the fruit there are no insecticides that can be used. The best approach for late July and August is to remove and destroy any infested fruit.

E-samples

Grafted lilac incompatibility

This is a nearly dead grafted lilac. These globe-like lilacs are popular ornamentals. The globe is formed by a shrub lilac, typically a cross between the dwarf Korean lilac (*Syringa meyeri* 'Palibin' and a littleleaf lilac (*Syringa pubescens* subsp. *micropylla* 'Suberba'). The cross creates a dense globe with fine foliage and small clusters of fragrant flowers in the spring.



The lollipop appearance of the plant is created by placing this globe on top of a Japanese tree lilac (*Syringa reticulata*) trunk. The graft is made about four feet from the ground. The scion is the crossed lilac shrub; the rootstock is the tree lilac.

Unfortunately, the graft sometimes fails between the scion and the rootstock. This is often a delayed incompatibility where the scion declines and dies years after planting. Usually, the scion dies but the rootstock sprouts. Now this tree is only a Japanese tree lilac which will become 20 to 25 feet tall rather than form a globe.

Japanese beetle damage to linden leaves

The lacey appearance of the leaves is what is called skeletonization. The tissue between veins is consumed leaving a network of veins. While there are many insects that will skeletonize tree leaves, the most common on lindens (*Tilia*) is the Japanese beetle (*Popillia japonica*).



The adults are about 3/8-inch long with a dark metallic head and dark tan wing covers. There will be two white rear tufts and five white lateral tufts of hairs. The adults emerge in July and defoliate trees by chewing leaf tissue between the veins. The larvae are white grubs that feed on turfgrass roots.

The adults are just about to finish their feeding. People may not see the beetles but the damage to the leaves will remain for the rest of the growing season. Lindens are one of their favorite hosts, but they can also be found on buckeyes (*Aesculus*) and mountainash (*Sorbus*). But as any rose grower can tell you, the favorite food of a Japanese beetle is rose petals!

Lightning strike on a linden - can the tree be saved

This linden was struck by lightning during one of the storms that passed through Sioux Falls last week. The lightning split the tree, leaving half of it as large splinters. The powerful electrical discharge can cause the water in the sapwood to instantly become steam. The pressure

wave of the superheated air can compress the bark and wood. Both these mechanisms are common explanations of why lightning strikes leave shattered trees.



The question was whether the tree could be saved. This is unlikely. The split is large enough that the interior is now open to decay fungus. This will result in an infection that will eventually compromise the stability of the tree.

But this is not the only issue. The force of the explosion of wood from the pressure changes within the tree may have caused some hidden defects. One that results in the remainder of the tree failing.

The discharge can also leave injured roots. This may result in a slow decline. It is best to remove the tree and start over.

Samples received/Site visits

Codington County, Leaf blotch disease on buckeye

There are some buckeyes with leaves covered with brick-red to brown lesions surrounded by a yellow, chlorotic halo. Some trees just have small lesions dotting leaves while others the lesions have coalesced, leaving infected leaves appearing hit with a blowtorch.



These are symptoms of a foliage disease caused by the fungal pathogen *Guignardia*. The infection begins in the spring as spores land on wet, emerging leaves. Mild temperatures and wet leaves are the perfect conditions for spore germination.

We had a brief period last May that met these requirements. If the weather remained wet during the summer, rather than turning hot and dry, secondary infections would have developed. Fortunately, the disease was held in check this year by our drought.

Not all buckeyes are equally susceptible to the disease. One cultivar that seems not to be affected by leaf blotch disease is 'Autumn Splendor' buckeye, a complex cross of yellow (*Aesculus flava*), red (*A. pavia*) and Ohio buckeye (*A. glabra*). This Minnesota release is far superior to the Ohio buckeye that a squirrel planted in your garden.

Deuel County, Wild cucumber vine

This year the trees and shrubs in shelterbelts and roadside ditches are covered with a rambling vine. This is particularly noticeable now as the vines are covered with clusters of larger white starry blooms – impossible to miss.

This is not an invasion of some alien plant, but the native wild cucumber, *Echinocystis lobata*. Wild cucumber is a member of the cucurbit family. Its relatives are the tastier garden cucumber, pumpkin, and squash. While the wild cucumber does produce fruit in late summer, it is anything but edible.

The 2-inch oval green fruit is covered with soft spines. If you cut into the fruit, it is nothing more than two cavities, each containing two seeds held in place by webbing –

not much to eat (and do not eat them)! The fruit also tends to explode (imagine that with pumpkins!) which spread the seeds everywhere.



The vines provide benefits for game and songbirds. The rambling vines provide good cover and concealment from their predators. That is about all they are good for. If they sprawl out into corn or soybean fields they can interfere with the harvest.

The vines can become so massive that they shade out small trees and shrubs. While it takes a lot of vines to block enough light that it harms the small tree or shrub, this does occasionally happen. Larger trees and shrubs have enough foliage surface area that the vines rarely interfere with their development even if they completely engulf them.

The vine is an annual so spraying now is not a solution. The best treatment is to pull the young vines out in the spring. If that is missed, try to pull out the larger vines before they go to seed which means you better move fast. If you do try to remove the vines from small trees or shrubs, be careful. The tendrils hold very tightly and must be cut away. Merely pulling the vine can result in broken branches and uprooted woody plants.

Kingsbury County – Mystery decline of ash

The appearance of declining ash with extensive woodpecker blanding usually means the emerald ash borer was at work. But not always.

This ash, along with several surrounding ash, all had the common symptoms of being infested by emerald ash borer. There was blanding where woodpeckers had removed the bark from the tree in their search for insects. There was also numerous drill holes made in the blanded wood.

There was also sprouting at the base of the trees and watersprouts on the lower branches. They looked like the typical infested tree. But there was a major difference.

The stunted foliage on the shoot tips was almost white. The foliage was also clustered together in tufts. The leaves were not otherwise distorted. The leaflets were not cupped or curled.



I suspect herbicide based on the symptom pattern, but not certain what herbicide could be responsible for this presentation, especially on trees near the center of town. Also, no other nearby trees or shrubs were affected. The lilacs and elms were fine.

We are analyzing the foliage for herbicide, but it is more complex process when working backwards. Usually, we know the name of the suspected herbicide and are analyzing specifically for it. There are other instances where we do not know the specific herbicide, but the pattern is common in a herbicide group – growth regulator herbicides as an example – so it narrows down the search.

We must cast a wider net on this one. It may be one of the photosynthesis inhibitor herbicides. Some of these such as mesotrione are used on turfgrass for weed control, but this lawn is filled with weeds! It may be a few weeks before we have result. Hopefully, I can report on the cause in the *Pest Alert* by the end of the month.

Minnehaha County, More cytophora canker

If I reported every stop I made to look at twenty- to thirty-year-old spruce with cytophora canker (*Leucostoma kunzei* formerly *Valsa kunzei*) I could fill each issue of the *Pest Alert*. The problem is that common. The canker disease is common in Colorado spruce (*Picea pungens*).

Once the tree is stressed by age, shading or moisture deficits, the cankers begin killing the lower branches. The cankers are easily seen on infected branches. They have a slightly sunken center surrounded by bluish white pitch.

The disease is becoming a serious problem in Sioux Falls. Many developments planted Colorado spruce on ten-foot spacing along the main street surrounding the

housing. This provided a dense privacy screen and sound barrier from the busy main road.



Many of these developments planted trees between twenty and thirty years ago. Now these mature spruces are crowded together so the lower branches are shaded. The trees are losing their lower branches which defeats the purpose of having the trees.



Some developments have started planting younger spruces in openings. But the crowding by the larger trees will stunt their growth. It is better to remove the belt and start over.

Turner County, Honeysuckle aphid witches' broom

The brooms – dense clusters of twigs and distorted leaves – are easy to find on Tatarian honeysuckle (*Lonicera tatarica*) at this time of year. Most of the calls I receive about these brooms are whether they were caused by herbicide drift.

These brooms are not caused by herbicides but aphids. These honeysuckle aphids (*Hyadaphis tataricae*) feed in large colonies sucking the sap from the plant while injecting the tissue with a growth regulator. This results

in the formation of witches'-brooms. These are clusters of stunted shoots and leaves that form at the tips.



The aphids overwinter as eggs in the witches' brooms; there are multiple generations per year. The feeding rarely kills the host but does reduce growth and makes the plant unsightly. While there are some insecticides labelled for this insect, the most effective are those applied as systemics. These are absorbed into the foliage to kill the aphids as they feed. Contact insecticides will not reach the aphids inside the folded leaves.