South Dakota State University Extension

Tree Pest Alert

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In This Issue

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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Plant development for the growing season

This past week was warm. Daytime temperatures were in the 80s and 90s across the state. High temperatures were in the 60s and 70s.

The consistently warm temperatures pushed the growing degree days (GDD-base 50) up another 140 to 170. Here are the total GDDs for communities across the state.

Aberdeen	778
Beresford	1106
Chamberlain	1072
Rapid City	940
Sioux Falls	1036

The catalpas (*Catalpa speciosa*) are in bloom across the state. These tall trees with their orchid-like flowers are a sign that summer is here! The large, elephant ear, leaves also provide great shade on a hot afternoon.

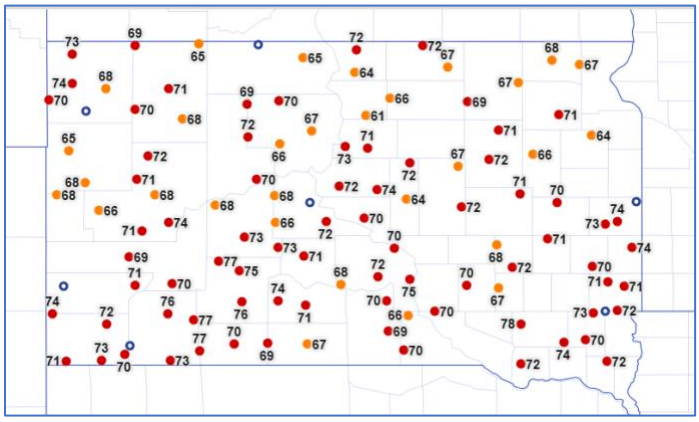
Another tree that blooms as summer begins is our native basswood (*Tilia americana*). These sweet-scented flowers perfume the surrounding air. A street lined with basswood in bloom makes for a nice evening stroll. Not only does this flowering note the beginning of summer (meteorological summer not the summer solace) but also that emerald ash borer emergence has peaked in a community.

Soil temperatures

We are now at the soil temperatures (60s) for optimum root establishment and growth for the trees and shrubs planted this spring. We are not likely to see the soil temperature cool during the summer but there is always a concern that they may become too high.

Soil temperatures in the 90s can cause root injury to small trees. Fortunately, the soil temperatures at a 4-inch depth peak in the high 70s or low 80s by early August in South Dakota. These soil temperatures do not harm the tree roots, though their growth will slow. This reduced growth can reduce water uptake.

This will be the last soil temperature map in the *Pest Alert* for the season.



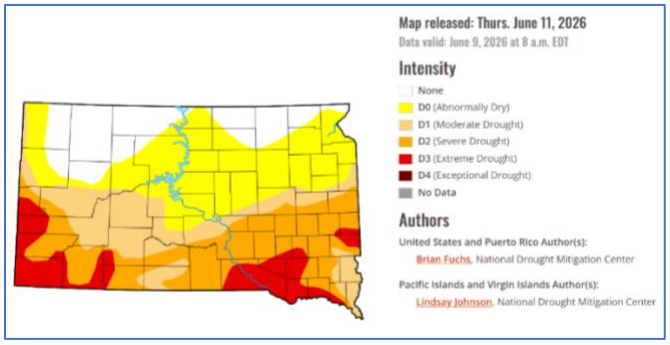
Drought monitor

The recent rains are helping to hold the levels of drought intensity across the state. The drought-free region of the state remains about 17%. Brown and Perkins counties in the northwest and McPherson, Brown, and Marshall counties in the northeast are still in the drought-free areas of the state.

Another quarter of the state to the south is classified as “Abnormally Dry.” There is another quarter of the state - a ribbon through the middle - classified as “Moderate Drought.”

About a quarter of the state from Brookings to Pennington counties are under “Severe Drought.” The only change is a slight increase around the state under “Extreme Drought.”

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



Treatments to Start Now or Soon

Apple maggot

Symptoms of an apple maggot infestation are a dimpled, lumpy appearance to the surface of the apple. Inside the mushy flesh, the apple will contain the brown trails of the larvae, hence the other common name “railroad worms.” A sure sign of the pest – an unpleasant one if you happen to find one, or *half* of one, while eating the apple – is a small (1/4 inch), creamy white and legless larva in the fruit. The adults, resembling houseflies with banded wings, are beginning to fly and depositing eggs on the developing apples.

Once adult emergence from the soil begins (900 GDD), egg-laying on apples begins and continues for about a month. The larvae burrow immediately into the apple and feed for several weeks or more before dropping to the ground (usually in the infested apple). The apple maggot pupates in the soil and remains there until now when it becomes an adult fly.

Treatment for homeowner apple trees is either carbaryl (Sevin) or malathion applied starting now with repeated applications every 7 to 10 days for three or four more times. Apple maggots tend to emerge from the soil after a 1/2-inch rain so some producers time applications with rainfall, but this is not necessary for home production.

Another means of managing the maggot is to place 3-inch diameter bright red balls in the tree - about two in semi dwarf trees (about 10-15 feet tall) and five in standard size trees (about 20-30 feet tall). Each ball is covered with sticky material to trap the adult fly. These are sold as red sphere traps.

The female apple maggot always flies to the biggest, brightest apple to lay her eggs and these balls will be the biggest, brightest “apples” in the tree. You cannot eliminate the pest by using this control, but the population can be significantly reduced.

Another control measure is to spray Kaolin clay on the fruit. The clay is not a true pesticide, but it irritates the adult apple maggots, and they fly to other fruits. The clay must be reapplied if we have heavy rain. Many summers you can expect to make several applications during the season. It may not require as many this dry summer. The clay is sold as ‘Surround At Home^{R}.

Timely Topics

Emerald ash borer update

We continue to monitor development of emerald ash borers in ash trees. The adults are continuing to emerge from their D-shaped exit hole. The peak for emergence is around 1000 GDD. We have reached that peak in Minnehaha to Union counties. Brookins to Grant counties have another week or two to go before they reach peak emergence.

The adults live for three to six weeks so they will be out in force for the next few weeks. They spent their days in the sunlit areas of ash canopies nibbling on ash leaves.

If you want to see an adult beetle, stand near a small (20 foot tall) ash that has been previously infested and about one-third of the canopy is already dead. Pick a time between 10 am and 3 pm on a sunny warm day (70 to 80^{o}F) with no wind.

Stand on the south side of the tree but be prepared to stand there for an hour or more (perhaps a day or more!). The beetles are out there, but they are hard to spot. First, they blend in with the mottled bark and green leaves of the ash trees. They also do not stay in one spot for very long. Emerald ash borer adults rest for about a minute or two, then zip around for about three or four minutes before landing again – usually on the same tree.

Still people do manage to accidentally catch them during their momentary landings. The picture is an emerald ash borer caught in Sioux Falls earlier this spring.

Release of EAB natural enemies in South Dakota

A means of slowing ash mortality is through the release of natural enemies, insects that feed on the emerald ash borer. While the introduction of these insects will not eliminate the threat, nor are they a substitute for removing or treating ash trees, they can help to slow the spread of tree mortality in a community.

These insects, known as parasitoid wasps, are from Asia where they feed on emerald ash borer in the native forests. These insects were brought to the United States and are being reared at a special USDA facility in Michigan. They are provided through the Animal and Plant Health Inspection Service (APHIS) to state cooperators at no charge.

These parasitoid wasps are also known as non-stinging wasps and pose no threat to humans, other animals, or even insects other than the emerald ash borer and other Agrilus insects. They are so tiny, about 1/8-inch, that they are difficult to see. They have been released in communities where EAB has been confirmed – from Dakota Dunes to Milbank.

One of these insects, *Oobius agrili*, inserts an egg into an emerald ash borer egg. The wasp develops in the egg and then emerges as an adult. Each *O. agrili* can parasitize about 60 emerald ash borer eggs. Since an EAB adult typically lays about 80 eggs, this wasp can provide significant control and help slow the spread of infestations.

The other parasitoids being released, *Spathius galinae* and *Tetrastichus planipennisi*, attacks emerald ash borer larvae. The wasps search for EAB larvae as they feed beneath the bark. Once a wasp locates a larva, they thread their ovipositor down into the emerald ash borer and deposit their eggs inside this host insect. After the eggs hatch, the wasp larvae devour their host then emerge as adults.

We cannot depend on these releases, or future ones, to solve the problem of EAB in South Dakota. They can be a help, so the releases are valuable to our efforts to slow the spread. However, observing our state quarantine and in communities where EAB has been confirmed treating valuable ash trees and removing the infested ones are the key strategies.

Pine engraver beetle update

We are surveying green slash piles in the Black Hills to monitor development of pine engraver beetles (*Ips pini*). The adult beetles began burrowing into green slash in

mid- to late May. Eg laying began in late May. Now there are numerous larvae feeding along the gallery carved by mom.

The larvae are legless, creamy white with brown head. They are about 3/16-inch long. They will be feeding for another week or so before pupating. The second generation of adults should be flying about the third week of June.

If there is fresh green slash available, they will be content to burrow into this material. If there is no green slash, these adults may attack standing pine trees, especially drought stressed trees.

Trees are susceptible to attack if the April to June precipitation is less than 75 percent average. We were behind up until the end of May but we need a few more inches of rain in the next few weeks to close this gap.

If we do, the pines will be able to pitch out any attack and survive despite the high population of beetles. If it turns dry again, we may see the water stressed trees vulnerable to attack.

E-samples

Ants and tree watering bags

Tree watering bags have become a popular means of irrigating young trees for the first few months following transplanting. Most can hold about 20 gallons of water. Valves or more commonly micro-perforations slowly released this water over six hour or more to provide better infiltration of the water into the soil and less runoff.

The dark, cool, moist environment beneath the bag is attractive to ants. If you lift a bag, do not be surprised, as this tree owner was, to find agitated ants milling about. These small ants will not harm the tree. They may even provide some benefit as they improve element availability through their waste and turning of the soil.

Transplant stress on pear

Why are the leaves on my tree turning yellow or falling? This is one of the most frequent questions about newly planted trees this spring. Yellowing or falling leaves are common symptoms of moisture stress on transplanted trees.

The loss and disruption of the roots means that recently planted trees may suffer water deficiencies even with irrigation. The only treatment is to continue to water several times a week at the rate of one gallon of water for every inch caliper (diameter of the tree six inches above the soil) and add a wood chip mulch to hold moisture and reduce weed competition.

Samples received/Site visits

Brookings County, Dutch elm disease

This was a visit to look at some dying trees that had holes in them. When I got to the property I found they were large American elms (*Ulmus americana*) that had died from Dutch elm disease (*Ophimostoma novo-ulmi*).

The American elms had been heavily infested by the banded elm bark beetle (*Scolytus schevyrewi*). The small (1/16-inch), round holes from the beetles were evident along the trunk bark. The egg gallery is straight and narrow running parallel with the grain of the wood. The larvae galleries radiate out from the egg gallery. At first, they are perpendicular to the egg gallery, but later become meandering, often crossing one another.

These galleries differ from the smaller elm bark beetle, another vector of Dutch elm disease. While the egg galleries of both run parallel with the grain, the larvae galleries are asymmetrical while the smaller elm bark beetle larvae galleries fan out in a symmetrical pattern.

This Asian bark beetle was first discovered in Colorado and Utah in 2003. It was found in South Dakota by 2005. This bark beetle is attracted to stressed elms. The long-term drought in south-central South Dakota has provided an abundance of hosts. The beetle can also serve as a vector for Dutch elm disease so once a tree is attacked it quickly dies.

Landowners can slow the spread among elm trees by promptly removing dead and dying elms and disposing of the wood – burning is best – during the winter. This will kill the overwintering beetles.

Codington County, Maple bladder galls

Maple bladder galls are beginning to appear on silver maple (*Acer saccharinum*) and freeman maple (*A.* x *freemanii)* leaves. The galls are from the feeding of a small eriophyid mite called (you guessed it!) the maple bladder gall mite (*Vasates quadripedes*). The mites overwintered under the scaly bark of the trunk then moved out to the expanding leaves this spring.

The mites feed on the underside of the leaves causing a pouch or bladder to form on the upper side of the leaf. Eggs are laid in the bladder galls. 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 trees, the leaves are still able to manufacture food, so no management is needed. Besides, once the galls are noticed, it is too late for any treatment as nothing can remove the bumps.

Lake County, Crown rust on glossy buckthorn

The bright yellow to orange spots of crown rust (*Puccinia* Series *coronata*) are appearing on buckthorns. The spots contain the 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. No one manages crown rust on common buckthorn. Removing common buckthorns eliminates an overwintering source of the disease for cereal crops.

The alder buckthorn (*Frangula alnus* syn. *Rhamnus frangula*) is also an alternate host (pictured above). This is a Fine Line^{R} buckthorn (*Frangula alnus* 'Ron Williams') with the leaves covered with rust spots and galls. Fine Line buckthorn is a popular shrub with a narrow, upright form. The fine, feathery foliage is like another cultivar, the cutleaf alder buckthorn (*Frangula alnus* 'Asplenifolia'). This cultivar is also susceptible to rust. There are no fungicides labelled for control of this disease on buckthorn.

Minnehaha County, Cottony maple scale

Cottony maple scale (*Pulvinaria innumerabilis*) is very noticeable during June. The adult female scales – the dark bumps on twigs – are small (1/4 inch), flat oval brown insects that lack legs, wings, or antennae. They will soon be developing their white cottony eggs masses called ovisacs.

As these egg sacs expand from beneath the shell they look like Jiffy Pop. But rather than containing popcorn, these sacs release tiny mobile crawlers starting about a week ago. The young crawlers migrate to the leaves to feed. They feed by sucking sap from the leaves and excrete a sticky, sweet substance called honeydew.

Cottony maple scale infests more than just their namesake - maples. Buckeyes (*Aesculus*) and lindens/basswood (*Tilia*) are also common hosts. Many injectable systemic insecticides cannot, and should not, be used on lindens because of their flowers which are extremely attractive to bees and other pollinators.

If the tree is small, insecticidal soaps are effective. But read and follow the label very carefully as soaps can be phytotoxic if used improperly. Maples and buckeyes can be treated with insecticides containing dinotefuran that are labelled for this use. These may be applied as a soil drench or injection.

Foliage applications of insecticides containing bifenthrin or permethrin, and labelled for this use, can be applied once lindens/basswoods have finished flowering.

Union County, Transplant stress on birch

This stop was to look at a young birch tree that was planted this spring. The tree owner thought that dicamba herbicide drift from nearby ag fields was responsible for the yellowing foliage that dotted the tree.

But only a few leaves were turning yellow, and these were the older leaves. The new foliage looked fine – a healthy green. More telling, the newest foliage and shoot tip appeared normal, not twisted or curled as is typical for exposure to growth regulator herbicide.

The tree just needs watering several times a week this summer.

Union County, Self-inflicted herbicide injury to spruce

This was a good description by landowner. The spruce trees in the windbreak had twisted and curled growing tips. The needles were yellowing and stunted. The grass beneath the trees was normal and most telling, there were no broadleaf weeds.

The landowner had applied Milestone which has aminopyralid as the active ingredient. This herbicide can cause yellowing and twisted foliage to spruce. Corteva Agriscience has a bulletin outlining the cautions with using Milestone around trees. Spruces are on the list that includes species that Milestone should not be used beneath or near.

The landowner had wondered who might have been spraying. They did not read the Milestone label before making the application. They were surprised to find their application was the cause of the injury, not drift from some distant application.

The landowner said, “I guess this was self-inflicted.” A good description for this application and a good reminder to always read the label!