



**SOUTH DAKOTA STATE
UNIVERSITY EXTENSION**

Tree Pest Alert



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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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Plant development for the growing season

This past week weather was pleasant and mild. The daytime temperatures were in the 60s and 70s throughout the state. These cooler than normal temperatures slowed the growing degree days (GDD-base 50) accumulations. We gained about another 70 to 110 GDDs. Here are the total GDDs for communities across the state.

Aberdeen	958
Beresford	1334
Chamberlain	1287
Rapid City	1106
Sioux Falls	1256

The summer flowering shrubs are now in full bloom. The falsespireas (*Sorbaria sorbifolia*) are covered in their long white panicle. The cultivar Sem is an excellent choice for a small (about three feet tall) shrub but a reminder that it suckers profusely and will expand into the surrounding space.



Drought monitor

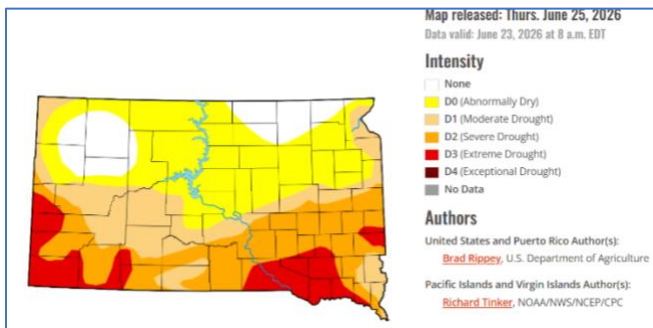
We had some sprinkles across the state. A few areas had rain. But we are still behind. Only 12% of the state is drought-free. Perkins county in the northwest and McPherson, Brown, and Marshall counties in the northeast are the only drought-free areas of the state.

The farther south you go in the state, the greater the drought intensity. Most of the northern half of the state is

classified as “Abnormally Dry” with a ribbon south of this classified as “Moderate Drought.”

About a quarter of the state from Brookings to Pennington counties are under “Severe Drought.” About 12% of the state, those counties in the southwestern corner of the state and those along the Missouri River in the east are 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 Continue or Start Soon

Apple maggot, Dutch elm disease

Apple maggot treatments should continue (see *Pest Alert* June 10 issue). Fungicide injections to protect American elms from Dutch elm disease should be started or repeated. See this issue for more information on Dutch elm disease.

The second generation of pine needle scales are beginning to hatch. Treatments were covered in the June 17th issue of the *Pest Alert*.

Timely Topics

Emerald ash borer update



We continue to monitor development of EAB but during mid-June the focus is adult emergence. We are at peak

emergence of the beetle from Brookings north to Milbank. The highest number of beetles are now flying in this area. But there will still be beetles emerging for the next few weeks. Some, like the one in the picture, just sleep in a little longer.

We are past peak from Dakota Dunes to Sioux Falls. There are still beetles emerging and flying but the numbers are declining. Eggs started to be laid in this region beginning in early June. Some of these eggs have already hatched.

These first instar larvae are very small, less than ¼-inch long, and creamy white. They are threading through the inner bark leaving thin, brown trails behind them. These thin tunnels are not a significant threat to the trees, but the larvae will become larger as the summer progresses.



The larvae will eventually become more than one inch long and plow their way through the inner bark. These larger networks of galleries disrupt the movement of sugars and water through the infested trees. We usually see the decline in infested trees increase during late summer.

Pine bark beetle update

We have three common pine bark beetles in the Black Hills. We just completed our SDDANR insect and disease workshop in Rapid City. We had an opportunity to see all three during the training.

Mountain pine beetle (*Dendroctonus ponderosae*) is the tree-killer of the group. They are the wolves of the pine beetle world. They attack large, healthy pines and their success depends upon mass attacks when hundreds of beetles attack a host within a few day period.

The host tree attempts to stop the attack by producing pitch to ‘pitch out’ the adult beetles as they try to burrow through the bark. Attacked trees usually have small pitch tubes lining the bark from about three feet to thirty feet or higher.



The latest mountain pine beetle epidemic ended a decade ago, but we see pockets of infested trees popping up in the northern Black Hills. This is normal endemic conditions where local beetle populations expand temporarily. This results in tree mortality in pockets of 10 to 100 trees.

We were out in a pocket of one hundred infested trees to survey the beetle population. While we were able to find some callow adults and pupae beneath the bark, there were few. There should have been hundreds. There will not be enough emerging from these trees to sustain or expand the pocket of infested trees.

The reason for this collapse of the population is the sawyer beetle larva (pictured below). These are wood borers that attack dying and recently dead pine trees. They are attracted to trees infested by the mountain pine beetles.



The larvae of the sawyer beetles are larger and have quite an appetite. They are literally eating the mountain pine beetles out of house and home. The sawyer beetle larvae consume so much of the inner bark that the larvae of the mountain pine beetle run out of food and die.

Since sawyer beetles do not attack healthy pine trees, they are not a threat. Instead, they are helping by damping the mountain pine beetle population.

Pine engraver beetles (*Ips pini*) are another pine bark beetle of concern. It does not rely on mass attacks for success but for weakened trees, ones lacking the defensive pitch, so pitch tubes are rarely seen. They make their home in either stressed trees or down branches that are still green.

The pines in the Black Hills have been stressed from the continuing drought. There was lots of breeding material available from the winter windstorm. The concern is whether the adults that soon will emerge from the slash will move to stressed trees.



We were able to find some pupae (above) and adults beneath the bark of green slash. The threshold for susceptibility of the pines is if the April, May, and June precipitation is less than 75% normal. The normal precipitation for these three months is about 8 inches. The total precipitation for these three months to-date is 6.2, about 78% normal. If we have a few more rains soon, we might not see success in attacking live trees.

The third beetle is the turpentine beetle (*Dendroctonus valens*). This is the largest of the three beetles. Attacked trees are easy to stop from the large globs of pitch around the base of the tree up to about three feet.



This beetle is not typically a tree-killer. It attacks weakened trees and even fresh stumps. The presence

of the turpentine beetle is an indicator that the tree is stressed and declining. I frequently see it in new developments where the forest has been cut to build homes. The stress from the construction – burying roots, compaction, bark wounds – makes the residual trees attractive for attack.

Dutch elm disease treatment time has started

The symptoms of a Dutch elm disease (*Ophiostoma*) infection are just beginning to appear on American elms in the state. We are one of a shrinking list of states where Dutch elm disease is still a widespread problem. Many states have already lost most of their mature American elms to the disease while we still have a few communities with the classic elm-lined street.



The picture is an American elm that is presenting with flagging (yellowing, browning and wilting leaves) along branches on one side of the canopy. These are usually found on the tips of the canopy and are limited to a few branches. You can often trace the flagging from the shoot tips down along a branch and eventually progressing down along the limb.

These are infections caused by spores carried by elm bark beetles as they moved from infected to healthy trees. They burrow into the two- to four-year-old branches and the spores they carry germinate and cause a new infection. There are three carriers (vectors) of Dutch elm disease, the elm bark beetle (Native), the

smaller elm bark beetle (Europe), and the banded elm bark beetle (Asia). These are all found in South Dakota.

These insects colonize different branch diameters (1-to-2-inch diameter for the smaller elm bark beetle and the banded elm bark beetle, larger for the native elm bark beetle) so flagging begins in different heights in the canopy depending on the vector. Regardless of beetle responsible for the infection, the disease usually spreads throughout the canopy by the end of the summer, the tree is dead by fall. Some infected trees will live for several years as the disease moves from branch to branch.

The fungus does not present symptoms, flagging, until at least four weeks after infection so late spring is when we first start receiving calls. The fungus appears in the vascular system which results in staining and blocking of the tissue that carries water throughout the canopy, hence wilting foliage. The staining will appear as brown streaking in the outer sapwood.

The disease can also spread from root graft from infected trees to a nearby (usually within 30 to 40 feet) healthy tree. These trees usually have symptoms that appear throughout the canopy at once.

Most communities with significant American elm populations require prompt removal of infected trees – usually within two weeks of symptoms. This is done to prevent the infected tree from later becoming a home for beetles to reproduce and carry the disease to other trees.

It also can reduce the risk of a nearby elm becoming infected via root grafts. Prompt removal does not eliminate risk as an infection carried to the canopy by a bark beetle can spread quickly down to the root system, sometimes even before canopy symptoms appear.

There are treatments to protect a tree from beetle vectored disease. These treatments are injected into the root flare of healthy, isolated American elms. The injections can be done from full leaf out in the spring until September. Injections can protect an American elm from Dutch elm disease symptoms for three years.

E-samples

Cedar-apple rust appearing in apple leaves

This is a picture of cedar apple rust (*Gymnosporangium juniperi-virginianae*) beginning to appear on apple leaves. The spores for this infection came from the cedars (*Juniperus*) a few weeks ago.

Now the infected apple and crabapple leaves have small yellow to orange spots on the upper sides of the leaves. These spots will enlarge over the next couple of weeks and develop orange-brown fringed spots on the lower surface of these leaves.



weevils creating ovipositing (egg-laying) punctures on the fruit. The wound appears as a crescent shaped scar on the skin. They also turn brown.

Once the eggs hatch, the larvae burrow into the flesh of the fruit. They spend the early summer feeding in the pit of the fruit, leaving as adults about the time the normal fruit ripens.

We are late for insecticide applications to control the curculios. Once the scars appear, there are no pesticides labelled for treatment as the insect is developing inside the fruit.

Emerald ash borer galleries appear as spaghetti!

This was a picture sent in by Weller Brothers in Sioux Falls. They are a large landscape/tree care company that also provides treatments for emerald ash borer. One of their tree removal specialists took this picture of the network of galleries beneath the bark of an ash they were removing. Obviously, the tree was dead.



This is a good reminder for ash tree owners in a community in which EAB has been confirmed. Do not wait this long to remove any ash they are not treating. Infested trees never survive.

It is too late to control the disease on these infected trees. The next window for treating the disease on the apple and crabapple hosts is next spring.

Cherry (plum) curculio scarring fruit skin

Thin skinned tree fruits – apricots, cherries, peaches, plums – are becoming scarred by plum or cherry curculios. The plum curculio (*Conotrachelus nenuphar*) will infest the fruit of all stone fruit (and even apples) while the cherry curculio (*Anthonomus consors*) infested primarily our native chokecherry but will also infest sour (tart) cherries.



Regardless of whether this is the plum or cherry curculio the damage is the same. These are both small adult

Samples received/Site visits

Brookings County, Crown gall on aspen

This was a planting of young quaking aspen (*Populus tremuloides*). The trees were declining and dying one by one. A few had already fallen over.

When entire canopies of trees decline, the problem is usually in the trunk or roots. This was the case here. The problem is possibly crown gall caused by soil inhibiting bacteria in the Rhizobiaceae. The most likely agent of the disease is *Agrobacterium tumefaciens* which has the largest host range.



A little digging around the base of the declining trees exposed old woody galls around the root collar. There were also small tumor-like woody galls on the roots near the base of the trees. These are all commonly associated with agrobacterium infection. Further testing, however, will be necessary to prove the connection.

Davison County, Ash bark beetles, not EAB

This was a stop to determine whether a declining ash tree was infested with emerald ash borer. Since this would be a new county, I need to find a lifeform – larva, pupa, adult – to confirm it. We cannot confirm it just because the ash is declining. Ash can decline for many reasons.

While the symptoms closely resemble those we see from an ash infested with emerald ash borer – sprouting, dieback, and woodpeckers blinding the bark – it was not EAB. Instead, it is our native eastern ash bark beetle

(*Hylesinus aculeatus*). This insect is common in the state. It frequently attacks dying trees or branches.

This small (1/8-inch) gray bark beetle makes very small, round exit or ventilation holes through the bark. They are less than half the size of the exit hole made by EAB. The hole made by EAB is also D-shaped.



The galleries also differ. The galleries made by EAB larva are serpentine. The galleries made by the ash bark beetle are carved by the adults and larvae. The adult burrow beneath the bark and carve galleries that run perpendicular to the grain. They lay eggs along these galleries and the larva cut galleries with the grain of wood.



The ash bark beetle attacked only one long stem of the multiple-stem ash. They were so numerous that the woodpeckers were feeding on them. This resulted in the bark blinding that is associated with EAB.

While the damage here was not due to EAB, ash bark beetles are also attracted to ash trees infested with EAB. Finding ash bark beetles is an indicator that the tree might also be infested with EAB. There were no signs, however, of EAB in this tree.

Lake County, Cottony maple scale

The cottony maple scale despite the name will infest hackberries, lindens and elms as well as maple. The scale is highly visible now with its enormous egg sac. This is when people notice the insect.



The cottony maple scale is a soft scale, meaning it produces honeydew, a sticky substance that rains down from the tree and creates a tacky surface on everything below. The deck beneath the tree was tacky and the film was covered with sooty mold, a fungus that lives on the sweet honeydew.

The eggs hatch about now – when littleleaf linden is in bloom – and the crawlers migrate to the leaves to feed then later will settle on the branches and twigs. Treatments were discussed in the June 10th issue of the *Pest Alert*.

Minnehaha County, Dogwood sawfly

This is dogwood (*Cornus*) with some leaf chewer injury (which is going to get worse if they do not treat). The agent is the dogwood sawfly (*Macremphytus*). This is a

complex of three species, but they are similar in appearance and life cycles.

The larvae look like caterpillars but do not become butterflies and moths. They become wasps. The adult wasps are not a concern to us as they do not sting. Instead, they use their ovipositor to saw small slits in the leaf veins to lay eggs.



Once the eggs hatch the larvae feed through a leaf right down to the veins before moving to the next leaf. They can reduce the foliage in a dogwood shrub to lace over a week or two. Treatment is when the larvae are first beginning to feed. They are still small enough to be treated. The treatment is an application of an insecticide containing carbaryl when the larvae are first noticed on the shrubs.

The larvae go through color changes as they develop. In the first stage they are amber and almost transparent. This is the stage we find now. The second stage they are covered with a white powder – like a donut. The third, and final, stage the larvae are creamy yellow with black patches. This stage will overwinter in the soil, usually in rotted wood such as old landscape timbers if near the dogwoods.