

Pest Update (June 19, 2019)

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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, instead 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 particular 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



We are right where we should be for plant development. The sweet mockorange (*Philadelphus coronaries*) is in bloom in Brookings along with the Korean spirea (*Spiraea fritschiana*). These are the last of the spring-flowering plants – how appropriate that they are blooming on the last week of spring! We are also seeing some of our early summer flowering shrubs beginning to bloom, potentilla (*Potentilla fruticosa*) and bumalda spirea (*Spiraea x*

bumalda) are both flowering this week.

It is still wet across much of the state with more rain predicted in the coming week. However, there are some dry spots beginning to appear in the southcentral part of the state.

Tasks to complete in another week (or so)

Apple maggot (*Rhagoletis pomonella*) is the most serious apple pest and treatments start soon (within 1 to 3 weeks).



Symptoms of a maggot infestation are dimpled, lumpy appearance to the surface of the apple and the flesh often turning mushy and containing the brown trails of the larvae, hence the other common name “railroad worm.” 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”), creamy white and legless larva in the fruit. The

adults, resembling houseflies with banded wings, will be flying soon and depositing eggs on the developing apples. The degree-day accumulation for adult emergence is about a week out for southeastern South Dakota and another two or three weeks for the remainder of the state.



Once emergence begins egg-laying on apples will continue 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 a week or two from now.

Treatment is either Carbaryl (Sevin) or Malathion applied starting in another week or two with subsequent applications every 7 to 10 days for three or four applications. Apple maggots tend to emerge from the soil after a 1/2-inch rains so some producers time applications with rainfall, but this is not necessary for the home production.



Another means of management is to place 3-inch diameter bright red balls in the tree, about 2 in semi dwarf trees (about 10-15 feet tall) and 5 in standard size trees (about 20-30 feet tall) that are covered with a sticky material called Tanglefoot[®]. The female apple maggot always flies to the biggest, brightest apple to lay her eggs and these 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. The “apples” can be made from material found in almost any garden store – even can find Tanglefoot[®] at most hardware stores or you can buy the completed “apples” from the Internet, try www.GardensAlive.com.

Still another possible control measure is to spray Kaolin clay on the fruit. The clay is not a true pesticide, but it irritates the adult apple maggot and they tend to fly to other fruit. The clay must be reapplied if we have some heavy rains so expect to make several applications during a season. It often takes at least three applications to work. The clay is sold as ‘Surround At Home[®] and can also be obtained from www.GardensAlive.com.

Timely Topics

Where in the state should ash trees be treated for EAB?

Ash owners in Sioux Falls are continuing to reach the decision to inject their trees to protect them from the emerald ash borer. The general recommendation in the United States, and one we are following in South Dakota, is for ash owners to delay beginning treatments until the insect has been confirmed within 15 miles of their location. At this time that would include all of Sioux Falls as well as the surrounding communities of Harrisburg, Valley Spring, Harford and just south of Dell Rapids. This is based on a maximum flight distance of about 15 miles for an adult emerald ash borer.

This is a conservative boundary since emerald ash borers fly only as far as the closest ash to the tree they emerged from and often will lay eggs on the same tree they came out of. There has been discussion among emerald ash borer researchers to reduce this radius to 10 miles or even 5 miles. At this smaller radius, trees within Sioux Falls north of 69th Street and then west to Ellis, north to Crooks and east to Brandon should be treated.



Canopy of a tree NOT infested with EAB

borer (*Podosesia*), an insect that makes pencil-size round hole, but otherwise these trees were not presenting any symptoms or signs of an emerald ash borer infestation. No woodpecker blanding the bark or drilling holes in the tree.

I continue to receive reports that emerald ash borer has been found in communities surrounding Sioux Falls or even in the southern fringe of this community. These are often by a company injecting ash trees that find a few holes in a tree and pronounce the tree is infested with emerald ash borer. The latest one that I followed up on was a report from a homeowner that a tree company found emerald ash borer on their property so he was convinced to treat all eight ash trees. One of the trees was infested with our clearwing ash



Holes were pencil-size, NOT EAB

The importance here is the report came from Lincoln County. Once the insect is confirmed in Lincoln County, the entire county will be included in the quarantine. Ash tree owners and commercial applicators that believe they have an infested tree anywhere outside the city limits of Sioux Falls should report it to me at the address at the top of the *Update* or through the South Dakota Division of Resource Conservation and Forestry website (look for EAB site). This will be followed up and an announcement will be forthcoming from the state. If an ash tree owner in Sioux Falls believes their tree is infested, or has been told its infested by a commercial pesticide applicator, they can report it to the city forestry department as well as the previous mentioned means and an announcement will come from the city.

Ash tree owners outside of Sioux Falls should be caution about taking the word of a commercial pesticide applicator that their tree is infested. While the insect will spread throughout Sioux Falls and the surrounding communities, and eventually the state, there is no need to prematurely begin treatments.

How do you know the company is treating the tree correctly?



Inject near ground, not up on trunk.

Tree owners should also be sure that their tree is being treated properly. First, there is little value in treating small diameter trees, those under 10 inches in diameter at 4.5 feet above the ground. These trees are inexpensive to remove and a new tree will soon grow to replace it. Second, if a tree is to be injected, the injections should be done near the base of the tree, not more than a foot up from the soil level. I have seen trees injected three or more feet from the base and injections done this high may result in incomplete distribution of the insecticide throughout the tree.

While the injections should be made low to the ground, they should not be placed in stem-gridling roots, roots that circle the trunk. Injections should not be made in trees with extensive decay as this will also limit uptake. And while it might seem obvious, injections should not be made in dead wood, though I have seen this done in several trees.



Do not inject circling roots.



Do not inject trees with cavities.

A decision to begin injecting an ash to protect it from emerald ash borer is a commitment to a process that involves treatments on a two- or three-year basis indefinitely into the future. Ash tree owners should be good consumers and be sure that the company they hired can identify ash trees, knows which ash are good candidates for treatment, and they inject the trees following established protocols and at the correct rate. Unfortunately, some ash tree owners may not know their tree were not treated properly until the tree dies from emerald ash borer.

As always be a good consumer and rely more than just price when deciding who to hire. They should be able to identify your trees and explain the injection process.

Fireblight is appearing across the state

I am receiving pictures of apple trees and a few pear trees with flagging spurs and shoots. The leaves on these spurs and shoots are yellow to brown, dry and

hanging from the twigs. The tips of the twigs are often curled, a symptom referred to as a Shepard's crook. The problem is fireblight (*Erwinia amyovora*), a bacterial disease. It is a very common disease in our state but this year the reports are more frequent than in the past couple of years.



The bacteria can enter the tree through the flowers and this mode of transmission is more common in wet years. The bacteria are carried by the bees and deposited on the flower's stigma where it can survive but does no harm. If we have a wet spring, the bacteria are washed down from the stigma to the base of the flower and enters through the nectar pores. Once inside the spur it can quickly kill the tissue resulting in wilted flowers and leaves. The disease can move from the spur into the shoots and eventually to the limbs and trunk killing the entire tree.

There are limited options for the management of fireblight on homeowner trees. Infected branches can be pruned out to reduce the spread to other parts of the tree. The common recommendation is to remove the entire affected branch or shoot back to its origin (the trunk, limb, or branch it is directly attached to) or at least 8 to 12 inches beyond the infection. However, the disease may have spread further into the plant yet not expressed symptoms. Pruning is best applied in late winter as the disease is not active then but summer pruning can be useful to halt the spread from spurs into shoots. The pruning should be completed only during dry weather as wet surfaces (and pruners) are a means of transmitting the disease. Regardless of timing, pruning tools should be disinfected between cuts and at the end of the day to avoid spreading the disease. Lysol disinfectant is one of better products to use as it will sterilize the metal surface and is not corrosive.

E-samples

Aphids beginning to appear in trees

I received this picture from Tony, forest health forester with the South Dakota Department of Agriculture, of a plum with twisted and curled leaves at the tips of branches. If you "uncurl" these leaves you'll find small insects known as aphids.

I have received picture of aphids on many different trees in the past week – they seem to proliferate in wet years. While just about every tree or shrub species can have aphids, they are not the same aphid. The aphids on the cherry are not the same ones on the quaking aspen.



These sucking insects are very small about 1/16-inch but feed in colonies so are easy to spot in young trees. Aphids also cluster on the new growth of the trees, near the tips, as they are looking for the most nutritious tissue. At the end of their abdomens are two protruding tubes called cornicles which secrete a defensive fluid. The fluid aphids are most known for is honeydew – a sticky by-product of their absorbing a tremendous amount of sap for food. This undigested material is excreted from the aphid and rains down on leaves, decks and cars. Sometimes you can find more than just aphids in the colonies. There can be ants which treat aphids as “cows” milking them for the sweet honeydew.

The best treatment for aphids is to let their numerous natural enemies do their work. Aphids are the perfect snack for many insects, ladybird beetles, lacewings, and parasitic wasps, and these can bring a population down.

If you really feel the need to spray, use insecticidal soaps as these are very effective on aphids but do not little harm to their natural enemies. Systemic insecticides can also be used but these need to be applied before we see the aphids as they can take 30 days or more to be absorbed throughout the tree and by then the aphids are usually gone. Insecticides containing acephate or Malathion are also effective as a spray but will kill the natural enemies.

Basswood ‘leaves’ falling.



Considering all the ash and crabapple leaves dropping due to fungal diseases, it's not too surprising people start noticing leaf drop on other trees. The most recent is the “leaf” fall from American linden, also known as basswood (*Tilia americana*). The long, narrow leaves falling to the ground are not leaves, but leafy bracts that are attached to the flower and fruit (a small round nutlet). This year they seem to be dropping earlier and the drop is heavier than normal. I have seen trees where the entire ground beneath the tree is covered by these bracts. While a nuisance, they are not a cause for alarm.

Forest tent caterpillar

South Dakota is a state home to the western extent of the eastern forest and the eastern extent of the western forest. Everything comes together here, including insects. South Dakota has the eastern tent caterpillar in the eastern half of the state and the western tent caterpillar in the western half of the state. We also have forest tent caterpillars (*Malacosma disstria*) in northeastern South Dakota as this picture from Sisseton shows. The forest tent caterpillar is a little different from its cousins in that it does not form a dense tent of silk but instead strands that line branches – it's easy to miss. The other difference is the characteristic “keyhole” pattern on the back of the larvae.



Regardless, all the tent caterpillars are at the end of feeding and treatments at this point may be fun, they do little to limit defoliation and will have no affect on the extent of defoliation next year.

Herbicide injury in trees

At this time of year, I begin to receive pictures of curled and cupped leaves that appear to be due to herbicide drift with most of the samples being hackberry (*Celtis occidentalis*). While I like hackberry, and it is become the substitute for ash in windbreaks due to its tolerance of our climate and soils, it is sensitive to herbicide drift. This species along with boxelder (*Acer negundo*) and Siberian elm (*Ulmus pumila*) are the ‘canary in the coal mine’ for herbicide drift. They some of the first tree species affected by drift.



This tree appears to have been exposed to a growth-regulator herbicide, most likely 2,4-D since it's in town but drift from a dicamba application is also a possibility since that chemical can drift. The cupped leaves and curled petioles are common symptoms of exposure to these types of herbicide.

If somebody is concerned that their trees may have been impacted by drift from an ag producer, a complaint may be made within 30 days of the application or the first appearance of damage (the sooner the better, preferable within days of the application). The complaint is made through Ag Services, South Dakota Department of Agriculture. They can be contacted at 605-773-4432. A pesticide complaint can be filed on-line at:

Inky cap mushrooms



The wet weather is resulting in a lot of mushroom calls this spring. The most common lawn mushroom is the inky caps (*Coprionopsis atramentaria*). The short (1 or 2 inches tall) mushroom is found in clumps throughout a lawn. The mushrooms initially have a grey brown bell-shaped cap but these soon turn flat and disintegrate into a black, inky blob.

While these are edible (if harvested before they disintegrate), they are poisonous if consumed with alcohol. Also even assume a mushroom is edible unless you have experience collecting them or you have an experienced mushroom hunter with you. Do not risk your life on Goodling!

Most South Dakotans get enough to eat that they are not calling me wondering what is coming up in their lawn they can use as a meal. Instead, the most common reason for calls on inky caps is how to get rid of them. The short answer is you cannot. They are living off the organic matter of old, dead tree roots. Usually there was a tree nearby the clumps. And until the organic matter completely decays, a process that can take a decade or two, these inky caps will keep coming up.

Mowing does remove the mushrooms but not the fungus so they will just keep coming back.

June bugs



I received this picture of defoliation from Dave, one of the South Dakota Department of Agriculture foresters in Hot Springs, that appears to be from June beetles (*Phyllophaga* spp). The adults are night feeders so many people are puzzled by what is chewing the tree leaves as they never see any insects. The adults are the defoliators in this instance, the C-shaped larvae feed on roots in the soil. Some times people will notice holes in the soil where the adults emerged beneath defoliated trees.

The adults are shiny reddish-brown and about an inch long and stout. But this insect spends most of its life underground as a C-shaped larva, about 1 to 1 ½ inches long, while feeding on the roots of grasses, crops and other plants. They are one of several larvae in the soil commonly referred to as white grubs. The larvae take about three years to complete their life cycle in the soil and emerge in the spring (May-June) as adults. The adults feed on the young leaves of many tree species, but seem to have a fondness for ash and oak. The adults are nocturnal so many people cannot figure out what has been chewing on the tree's leaves since they never see the insect. The adults are also a nuisance as they buzz around light fixtures at night so you can find them in the parking lots of gas stations.



Since the foliage damage is not noticed until the insects are almost done feeding, there is little value in treatments. Unless the tree has already been severely stressed (e.g. new planting, construction damage, other defoliators), they will soon have a new flush of leaves.

Samples received/site visits

Davison County

Is this herbicide injury?

Based upon the symptoms, cupped and curled leaves, that is a distinct possibility. However, to be certain we will have to test for residue from these chemical.

Faulk County

Is this herbicide injury?



The samples of the cherry and hackberry were just a little moldy so hard to determine much but there were no symptoms on the cherry that are associated with herbicide exposure. The cherry looks like the leaves are infected with shot hole disease, these are the BB-size holes in the leaves.

The hackberry does appear to be distorted due to exposure to herbicide but it was too moldy to tell much from the sample.



If anyone ever wondered what the symptoms of pine wilt disease really looked like – check out this picture. The entire canopy of the Scotch pine appears to have been scorched – browning needles throughout the tree. The tree looked just fine in the spring. Another Scotch pine had similar symptoms last year and it was just cut down.

Pine wilt disease is caused by a nematode, the pine wood nematode (*Bursaphelenchus xylophilus*). The nematode is introduced into the tree by sawyer beetles as they munch on the needles. Apparently, a single sawyer beetle can transmit thousands of nematodes into its new host. The nematode, and a blue-stain fungus that is also carried by the beetle, can quickly spread throughout the entire trees, clogging the water-conducting tube, which results in a rapid death of the tree.

The disease can be prevented by injection, but once the tree is presenting symptoms the only management option is to remove the tree and destroy the wood to prevent a new population of sawyer beetles from emerging and carrying the nematode and fungus to new hosts.



silver maple.

A report of a possible emerald ash borer infestation was submitted to the state through the South Dakota Division of Resource Conservation and Forestry website. The picture submitted to the website showed a frass-filled gallery and a larva and while the tunnel and insect did not look like emerald ash borer, the picture was not clear enough to make a decision. Upon arriving at the site, it was clear it was not emerald ash borer as the tree is a

The tree was filled with dead and rotted branch stubs and one of these had fallen to the ground. The larva was a pigeon tremex (*Tremex columba*), a borer common to rotted wood.

Minnehaha County

Why are the leaves curling on this oak?



While leaf curling can often be traced back to herbicide injury or aphids, they are not the only possible agent. There is also a group of insects known as leaf rollers and these insects pass their larval stage living within a silky home made from a rolled leaf. They make notch marks in the major veins to help bend the leaf.

The leaf roller on this bur oak was the oak leaf roller (*Archips semiferana*), an occasional pest of bur oak in our state. The newest foliage does not appear to be infested so there is no need for treatment. The tree is recovering on its own.



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