

Pest Update (June 21, 2017)

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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 seem to be still a little ahead for plant development. The Japanese tree lilacs (*Syringa reticulata*) are blooming in southern South Dakota. These are just about on schedule so the cooler weather has slowed plant development down a little from previous weeks.

Emerald ash bore - Update

The recent confirmation of emerald ash borer in Buena Vista County in Iowa, a mere 80 miles from South Dakota, is heightening concern about its eventual presence in South Dakota. The day is certainly getting closer. Confirmed infestations are found in the Omaha, Nebraska and Minneapolis-St. Paul Minnesota metro areas and now in about half the counties of Iowa.



The *Update* will provide weekly information on the location of emerald ash borer confirmed in South Dakota or a bordering county of an adjacent state. ***At this time no emerald ash borer infested trees have been identified in the state or an adjacent county of a bordering state.*** The nearest infestations are

highlighted in red; the Twin Cities of Minnesota; Buena Vista County and the counties in central Iowa and the Omaha-Council Bluff area of Nebraska and Iowa.

I continue to receive pictures of ash trees people suspect of being infested with emerald ash borer. I am pleased that all but two have been an ash tree (the two incorrect tree identifications were of a boxelder and a European mountainash, neither even closely related to ash but the leaves are somewhat close in appearance). The problem is that almost half the ash in the state are presenting some dieback. Many of these trees are also infested with one or more of our native ash borers.



This week I received a picture of a dying ash with galleries and exit holes that the arborist suspected were emerald ash borer. The inner bark did have winding galleries (tunnels created by the larvae as they feed) but the galleries were meandering rather than being the tight serpentine ones constructed by the emerald ash borer. The exit holes were also more of an oval rather than the crisp D-shaped holes formed by the emerald ash borer as it emerges from the bark. The best evidence that this was not emerald ash borer was a larvae they managed to pull out of the inner bark. It was only half a larvae but fortunately either end

of the emerald ash borer has some unique and characteristic structures. The head capsule for this larvae was wider than the emerald ash borer and the shape of the insect was round rather than the flat. The end of the emerald ash borer abdomen (and the picture is of the back end of a larvae) has two tiny pincers and these are not on the insect pictured. The larvae is either the banded or redheaded ash borer (*Neoclytus*).



Treatments to do now



Spruce bud scale crawlers will soon be hatching. The scale resembles a small round, reddish bud and they can be found on near the tips of the branches where the side branches attach to the shoot. They, and their mobile young called crawlers, suck the sap from the shoots resulting in dieback and decline of the lower branches. Since these are soft scales they produce honeydew that results in a black, sooty

appearance to the needles and twigs. The scales have one generation per year and the crawlers' hatch about the time littleleaf lindens are in bloom which should be in another week. The best treatments are insecticides containing carbaryl as the active ingredient and applied on the foliage and shoots near the tips. Products containing imidacloprid can be effective as a soil drench but need to be applied in the fall for control the following year.



We are also coming up to the time to treat for spruce needleminer. The needleminer (*Endothenia albolineana*) gets its name from it's the fact that the young larvae are so tiny they can live inside the needle, mining it as they feed. They eventually outgrow their home and then create a nest of webbed, detached needles to live in. The larvae usually feed on the lower, exterior needles, almost stripping the tips of needles but

they can also be found in the interior of the tree and even the tops of young trees. The adults are small moths that will begin flying soon and depositing eggs on the needles. The treatment is usually with a pesticide containing carbaryl as the active ingredient and labeled for this use. Infested tree should be treated now as the adults should be flying very soon. This is a little earlier than normal as some years the treatment may not be needed applied at the beginning of July.

Tasks to complete in another week

Apple maggot (*Rhagoletis pomonella*) is the most serious apple pest and treatments begin soon.



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, should be flying and placing eggs on the developing apples in another week or two and will continue egg-laying for another month. Once the eggs hatch the larvae burrow into the apple. The apple maggot pupates in the soil and probably will be emerging as an adult beginning in late



June this year. However, egg laying does not really begin until a week or so later so there is still time plenty of time to begin treatments (even if any eggs are laid now, the egg is either crushed by the expanding fruit or the larvae cannot survive in the high-acid of the newly developing apple). 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 growers 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

Cedar update

I have traveled about 3,000 miles during the past two weeks inspecting belts planted with eastern redcedars this spring. The dominant reason for mortality in many of these plantings was the lack of water. When the grass along the edge of the fabric has not even begun to grow that’s a very good clue the problem is the lack of water.



Junipers are our toughest evergreens and can survive on drier sites than pines and spruce. However, even they need water to establish. A study conducted about 30 years of plantings done in an abnormally dry year (almost no rain), no irrigation and high temperatures showed first-year survival of eastern redcedars at about 20%. Rocky Mountain junipers is more drought-tolerant (contains more insulating wax on the foliage) but even their first-year survival

averaged about 32% under these conditions. The treatment for most of the cedar mortality I have inspected so far this year would have been sprays with the chemical H₂O at planting and repeated several times each week thereafter.



I am also beginning to see a different problem. This past week I have been out looking at belts that the trees were looking brown when they called but now are turning green. A common comment is “This looked a lot worse when we called.” Young redcedars often turn brown within few weeks of planting only to green up by midsummer. This year the color improvement seems to be appearing earlier.

I checked some belts where the seedlings had some brown to yellow foliage mixed in with greening foliage, but all the foliage was soft and the shoot bend when touched. A slight scrape of the stem reveal moist, white sapwood and a similar scrape on the roots shows the same white tissue. These trees were also producing long, white tips. These seedling may appear a little off-color still, but are recovering.



If instead, the foliage is all yellow and brittle to the touch, the shoots snap rather than bend, the scrapped sapwood is brown and there are no white roots then the tree is DOA.

Regardless of care I can always find some dead transplants in a cedar belt. These are tough windbreak trees, but as a first year transplant they are not as tough as many deciduous trees and seem to take a year to establish.



I am getting a few calls regarding trees and shrubs with distorted, cupped and/or curled leaves. The most common woody plants afflicted with these symptoms this year are hackberries, lilacs and lindens. The culprit is not 8-legged, 6-legged or even 4-legged, it's 2-legged. You guessed it – people! It seems to be a special type

of person, guys who appear to have nothing better to do on a hot, windy day then to spray their lawn with 2,4-D or similar chemical! I have seen several individuals out spraying their lawn in 95°F heat (the herbicide volatilizes even better at high temperatures, any temperature over 80°F increase the risk of non-target plant injury from herbicide drift) with a 10 to 15 mph wind (which can carry the

herbicide several home yards away without any difficulty). This is not the best time to try and spray the weeds in your lawn and it is about the worst time to spray in regards to the sensitivity of your woody plants. The only treatment for this misuse of herbicide is to find them a hobby – fishing seems like a good choice and better use of time.

E-samples



Symptoms of **apple scab** (*Venturia inaequalis*) infection are becoming more apparent on crabapples and apple trees across the eastern edge of the state. The most common symptoms are olive-green spots and blotches that occur along the veins in the leaf. These blotches continue to expand during the season and often become velvety. The leaves also often become chlorotic, a symptom that many people confuse with an iron deficiency, but instead is due to the disease. We are too late now to treat for the disease as the first spray has to be applied as the buds are expanding. Once you see the symptoms – it's too late. Heavily infected trees will probably have most of their leaves drop by late July.



Ash flower galls are appearing on the twigs of ash throughout the state. The proliferation of flower buds are greenish now but will become brown to black “balls” hanging in clusters beneath the branch shoots. The galls are due to the feeding activity of the ash flower gall mite (*Eriophyes fraxiniflora*) and this mite only feeds on the male flowers of ash. Many black, green and white ash cultivars are “male-only” as most tree owners do not like to deal with cleaning up the small winged samaras that develop from the female flowers. The galls may detract from the appearance, but do not harm the health of the tree.



Ash leaf curl aphid (*Prociphilus fraxinifolii*) is showing up across the state again as it does every summer. We usually do not see it until mid or late June but this year samples and pictures are already coming in. The symptoms are curled leaves forming rosettes at the ends of ash shoots; particularly the rapid growing terminal shoots of young trees. If you unfolded the leaves you'll find little “fuzz

balls” that are aphids. You might also find lady beetle larvae that are feeding on the insects. Treatment is usually either letting it be, since any treatment will not uncurl the leaves and the lady beetles do a pretty good job of control, or acephate (Bonide Systemic Insect Control). This insecticide is a foliage systemic treatment and will kill the aphids as they feed (but not remove the damage). Most other insecticides are contact poisons and will not reach the aphids living inside the curls. A soil drench systemic insecticide will not be absorbed fast enough to provide any control for the aphids this year but a spring application next year can prevent the problem from occurring next summer.



Cedar-apple rust (*Gymnosporangium juniper-virginianae*) is a fungal disease that moves between cedars (junipers) and apples (also crabapples). At this time of year the galls on the junipers have swollen and these long orange-red horns are appearing. These horns release spores that will infect the foliage on apples. The majority of spores are only carried for less than 100 yards but can be carried several miles before landing on a susceptible host. If the spore lands on a leaf when it is wet for a few hours and warm (50-75°F), germination occurs and the fungus enters the apple leaf. The rains many areas of the eastern side of the state received this past week have resulted in horns forming, releasing the spores and collapsing.

Once the apple leaves are infected, tiny, yellow spots appear and these enlarge and become yellow-orange with a red border by midsummer. The center of these spots have tiny, black dots which become the structures that release spores that infect the junipers and the cycle begins again.

The disease is not usually serious on many apples though infections can result in significant defoliation in late summer. The disease can also infect fruit but this is rarely a problem. The disease is even less a concern for junipers as the woody galls rarely girdle a branch enough to kill it.

Cottony maple scales (*Pulvinaria innumerabilis*) are becoming very noticeable on maples, though the insect can also be found on hackberries and elms. This soft scale overwinters as an immature female on the twigs and now some are just beginning to bulge with masses of eggs – almost looks like “Jiffy-Pop” on a twig. The eggs will soon hatch and the young crawlers move about the twig until they find a suitable place to feed. Once settled, the scale loses its ability to move and remain stationary for the remainder of its short life.



The cottony maple scale is a soft scale, meaning it produces honeydew, a sticky substance that rains down on leaves as well as decks, cars and any other object below the infested tree. The best solution for small trees (6 to 10 feet) is to treat with an insecticidal soap soon, about the time littleleaf lindens are in bloom and repeat ten days later. Be sure to read the label on the soap before applying to silver maples as

some formulations may injure the foliage. A soil drench of an insecticide containing imidacloprid can also provide effective management of the scale on tall tree but the drench should be applied in early June, rather than now, to ensure good distribution of the pesticide through the tree's canopy. However, the best control for scales is all their natural enemies so often the best treatment is just to allow nature to do its work.



Mulberry identification. White mulberry (*Morus alba*) has probably one of the most common tree leaf sent in or photographed for identification. The mitten-like leaves that have may have one or more lobes (or not be lobed at all) seem to puzzle people. The tree is common throughout much of the state as the birds "plant" the seeds everywhere. The blackberry-like fruit is edible but most folks find them a little bland (apparently not a concern for birds which

find the fruit tasty). Since there are male and female mulberries, it possible for people to have a mulberry tree that never produces fruit.



Pine wilt disease is not due to a fungus or even a bacteria but a very small nematode, the pinewood nematode (*Bursaphelenchus xylophilus*). This nematode is found in dying (and dead) pines feeding on blue-stain fungi and is not considered a problem on our native pines. However, just like emerald ash borer, an Asian borer, is not a concern on Asian ash but is deadly on North American ash, this native nematode becomes a killer on exotic pines. Austrian,

mugo and Scotch pine are very susceptible to this disease. Pine wilt was confirmed killing these pines in Missouri back in 1979 and since that time has almost eliminated Scotch pine from the central Great Plains.

The nematode and blue-stain are carried to new host pines by sawyer beetle. Once introduced into the tree, the nematode feeds on the resin ducts and blocks movement of water through the tracheids, the pores pines have to move water from the roots to the needles. Affected trees have the needles turn yellow or brown, wilt and begin to shed, often all within the same summer.

The disease progresses quicker in hot summers and we have seen the disease move farther north in the state as our average summer temperatures creep higher over the past decade. Infected Scotch pine seem to quickly go from a healthy blue-green foliage to brown within a few weeks during the summer while Austrian pines linger a little longer with sometimes only a patch of the canopy turning brown during the summer and the remainder of the tree turning brown by the following June. This is what we are seeing this year and there have been a number of Austrian pines that have turned completely brown in the last few weeks and all had the nematode.

There are effective treatments to keep a pine from becoming infected with pine wilt, but none to cure a tree. These pesticides (abamectin and emamectin benzoate) are injected into the trunk during the summer and provide one or two years of protection from the disease.



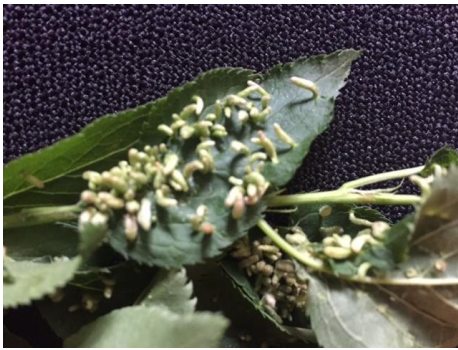
Plum curculio (*Conotrachelus nenuphar*) is a common, but often overlooked, pest of fruit trees in South Dakota. Stone fruits, including apricots cherries, peaches and plums, are easily damaged by this weevil. The most noticeable damage on the fruit is the slit (often shaped like a half-moon) cut into the fruit from the egg laying activity of the adult female. Often there is a drop or two of fluid weeping from the cut. Once hatched, the larvae burrow through the soft stone fruit

feeding on the flesh and completely ruining it.

If plum curculio is found in fruit this year, it's too late for treatments. At next year's petal fall apply Malathion and repeat the application about 10 days later. Do not use a spray containing carbaryl, as an application of insecticides containing this active ingredient can result in fruit drop if made within a few weeks of full bloom.

There is also a bacterial blight that can infected apricots and infected fruit will also ooze a sap (but will not be associated with half-moon slits in the fruit). Be sure of the problem before starting treatments.

Poplar borer (*Saperda calcarata*) is a longhorned borer found in declining poplars and aspens. The borer spends most of its life burrowing in the sapwood as a stout, yellowish-white larvae that can reach a length of an inch or more during its two or three year life. The larvae also expel the frass out of holes along the trunk. The holes often have a wet spot surrounding them along with coarse, pellet-like or excelsior-like frass and these two most common indications of an infestation. Management of these insect revolves around maintaining or improving tree health as vigorously growing trees are not vulnerable to infestations. An array of fungi, bacterial and even woodpeckers also can contribute to mortality of the larvae. The borer is generally not a tree-killer, just another nail in the coffin for a tree dying from old age (which can be 20 years for many poplars), drought or other stressors.



Spindle gall on plum (*Phytoptus emarginatae*) on plums are a common sight right now. These galls are the work of an eriophyid mite. The eriophyid mites on *Prunus* (apricot, cherry and plum) form an elongated spindle gall, the most common eriophyid mite on maples form a round bladder. These eriophyid mites spends most of their short lives in the gall. This is where Mom and Dad mite meet (Mom actually builds the gall, Dad is fairly useless but Happy

Mite Dad day anyway), raise a family of little mites and kick the teenage mites out of the house later in the season. Eriophyid mites have only two pair of legs, not the usual four pair found with other mites and since they are wingless, their mobility is severely hampered. They are so tiny that the wind carries them to other hosts. The galls do not harm the tree or even the leaves, so no need to treat them nor are there many effective mite pesticides anyway.

Samples received/site visits

**Bon Homme County
small bumps on the leaves?**

What is causing these

This is a silver maple and the clusters of multi-colored bumps on the leaves are due to the feeding by the maple bladder gall mite. These mites migrate out to the leaves as they open and their feeding causes these galls to form around them. The galls start as green but progress to red than black as the season progresses. There is nothing that can be done to treat this condition nor are any treatment necessary as the galls, despite how numerous they can become on a leaf, do not harm the tree.

Hyde County

Browning spruce



This was an unusual sample for two reasons. First, the discoloration was limited to only one side of the tree and not all the way from the base to the top. Second, the needles formed last summer are the ones with the most discoloration and these are also the ones being shed. Most diseases result in the second year needles discoloring and shedding in the fall, not the spring. There were no signs of any pathogen on the foliage so this will take a little more time to determine the causal agent. Hopefully I can give an update in next week's *Update*.

Lawrence County

Browning Austrian pine



This Austrian pine has (or had since its dead now) problems, pine wilt disease (discussed under examples in this issue) and Zimmerman pine moth (*Dioryctria*). The pine wilt was the cause of death but the Zimmerman pine moth is also a common stressor on pines. The moth lays eggs on the trunk near where limbs are attached. The larvae burrow into the trunk and there is usually evidence of this tunneling activity by the presence of globs of pitch. The burrowing by the larvae often results in broken limbs.

Lawrence County

Dying paper birch



This birch was declining in a yard in Spearfish. The owner first noticed the dieback the year after Atlas. The decline is due to the bronze birch borer. This is a native *Agrilus*, a close relative to the emerald ash borer, but is a native insect and probably found in the Black Hills as long as birch has been there. Usually bronze birch borer does not attack our native birches until the trees are stressed by age (40 years is old for a birch), drought or other agents. Not too surprising, ice and snow loading can be a stress. The poem *Birches* by Robert Frost; *But swinging doesn't bend them down to stay. As ice-storms do. Often you must have seen them; Loaded with ice a sunny winter morning.* That does make an ice storm sound poetic but while the trees do bend

back that does not mean without injury. Bronze birch borer attacks frequently follow ice storms and a common recommendation is to treat the trees for borers the summer or two after such a storm. Information on bronze birch borer can be found in the June 7 issue of the *Update*.

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