Pest Update (July 8, 2015)

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John Ball, Forest Health Specialist SD Department of Agriculture,
Extension Forester SD Cooperative Extension

Email: john.ball@sdstate.edu
Phone: office 605-688-4737, cell 605-695-2503
Samples sent to: John Ball
Plant Science Department
rm 230, Agricultural Hall, Box 2207A
South Dakota State University
Brookings, SD 57007-0996

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. **Walnut samples may not be sent from any location – please provide a picture!**

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.

Sample received/site visits

Plant development

The ural falsespireas are in bloom in Brookings. This is one of our summer flowering shrubs and it usually begins flowering at this time of year and will continue to bloom until October. We seem to be now just about normal for plant development this year, though the year started out a little slow. We might even be a little ahead as the Amur maackias are in bloom about two weeks early.

Pest treatments to be started now

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

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 emerges as an adult beginning in early July. However emergence and egg laying do not really begin until the middle of July 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^{R}' and can also be obtained from www.GardensAlive.com.

Timely topics

Pine wilt disease

Rick, a forester for the South Dakota Department of Agriculture, submitted a sample from a mature dying Scotch pine in the Dell Rapids area. He suspected that the decline was due to pine wilt and we were able to extract the pine wood nematode from the samples he sent in (but only females, oddly enough). Pine wilt is a serious disease of exotic pines, most commonly Austrian (*Pinus nigra*), mugo (*P. mugo*) and Scotch pine (*P. sylvestris*). The disease is caused by a microscopic nematode (*Bursaphelenchus xylophilus*). The nematode feeds in the cells surrounding the resin ducts. This causes leakage into the tracheid (the water-conducting pores in a conifer) which disrupts and blocks water movement throughout the crown of the tree. This is why the most common symptom of pine wilt is the wilting and yellowing of the needles. The symptoms may initially appear in early summer on only an upper branch or two, but progress lower until the needles throughout the crown are wilted and brown by that autumn. A diagnostic clue for the presence of the disease is that the wilted and browning needles do not fall but remains attached to the branches into autumn. While infected Scots trees in South Dakota and Minnesota usually progress from a healthy green to a wilted brown in a single growing season, Austrian pines sometimes decline branch by branch.

The disease has become a common problem in southern South Dakota (south of Highway 14) and the states south and east of us. Nebraska has lost many of their Scotch pines to the disease during the past decade. It has been reported in Colorado. The nematode responsible for the disease is native to the United States, but was “rediscovered” in 1979 killing exotic pines in Missouri. At first the fear was that this was a new pest introduced into the United States but it was soon observed that only the non-native pines were dying from an infection. Pine wilt has become a serious problem in Japan and other nations are concerned that wood chips and other products shipped from the United States may contain the nematode and transmit pine wilt disease to their pine forests.

The nematode is transported from a dead host to a healthy one by sawyer beetles. These insects are commonly found in dead pines and when they leave these trees can carry the nematode with them. The nematode also travels on the sawyer beetle with a blue-stain fungus and both can be deposited in a new host. The nematode also feeds on the fungus during its time within the tree. Pines infested by pine wilt usually have blue staining in the cross-section of the trunk (see picture on previous page), though blue stain can occur without the sawyer beetle or nematode. Mountain pine beetles in the Black Hills, for example, also carry a blue stain fungus as it moves to a new host.

Symptoms alone are not always enough to determine whether the tree has pine wilt disease. We need a sample to determine the presence of the nematode. The sample can be a 1-inch cross-section of the lower trunk (often called a “cookie”) of the recently dead pine, usually at a whorl of branches, or if this is not possible, increment cores collected at the lower trunk. These need to be kept cool and moist and shipped quickly. However, it is best to send picture first of the tree so we can determine whether sampling is needed. There are many other pine problems that have similar symptom patterns. Pine wilt is not the only serious disease to affect pines in our state. Diplodia tip blight and dothistroma needle blight are two other diseases that appear in the area and require other treatments to protect trees. It is important to identify what disease is affected the pine before treatments are initiated.

The disease often appears in a tree or two within a row and then disappears for a couple of years only to appear in other trees in the same row. Occasionally an entire row of pines develops symptoms at once but clusters of dying trees is more common. The disease also does not appear in younger trees. Infected trees are generally more than 10 to 15 feet tall. Why all these difference

is not known at this time but pine wilt is a complex disease and involves not only the sawyer beetle, a nematode and the host response but also possibly a bacteria or two and even a mite!

The management of this disease centers on promptly removing and destroying any infected pine tree. This removal can take place any time during the fall or winter but should be completed before the end of April. This is the time when the sawyer beetles may begin to emerge from the dead, infected tree and move to a new host. The wood should be either burned or chipped to kill the beetles before they emerge, merely removing the bark from the wood is not sufficient to kill this insect. The infested tree should also be cut a flush to the ground as the nematode and insect can also remain in the stumps. The insect and nematode can survive in firewood so recently killed trees should not be cut into firewood and stored.

The disease can also be spread by nematodes in wood chips, but only if the chips are fresh and then infection can only take place if these chips are placed against the trunk of a healthy pine tree. Storing the chips for six weeks will dry them sufficiently that the danger of disease transmission is minimal. There is also pesticides containing abamectin as the active ingredient, Greyhound and Pinetect, that can be inject into a healthy tree to prevent infection. However, due to the expense, about $200 a tree, and the need to inject the chemical every three years it is best limited to high-value Scotch pines in a residential landscape.

Emerald ash borer

Emerald ash borer (EAB), *Agrilus planipennis*, is still a looming threat to our state's extensive plantings of ash, both in communities and windbreaks, and our native forests. The insect has not yet been found in our state either in a tree or a trap but we are continuing to be on the lookout for this pest. The adults fly during the summer with emergence from a dying ash beginning in late May and continuing through the summer. This means firewood brought in from out of state is the most likely source for an infestation. We are encouraging campers to buy their firewood in the state rather than bring some with them.

South Dakotans are also being more observant of dying ash and I get calls every week to check out a suspected EAB infested trees. Most of these trees are ash, though occasionally I still get calls about a mountainash (*Sorbus)* and but these trees are not closely related, mountainash is not a host.

Dying ash are common in our state. However, when I receive pictures or reports of dying ash with serpentine tunnels just beneath the bark it is worth investigating. The most recent suspect was sent in by Hamlin Conservation District to

Rick who passed it along to me. The galleries occurred just beneath the bark, as common with emerald ash borer, but they did not appear serpentine enough to be this insect. The redheaded (*Neoclytus acuminatus*) and banded ash borers (*N. carprea*) are native insects that infest ash and carve meandering galleries (tunnels made by the larvae) beneath the bark though theirs can also extend deeper into the wood unlike EAB. Fortunately upon inspection, the insect was the redheaded ash borer and not emerald ash borer. The trees were in a low area and appear to have been declining for some years now. The dieback patter pictured here, with branches dying back to the trunk is common for trees infested with our native borer. Tree infested with emerald ash borer tend to have thinning crowns rather than dieback. There is no need to treat these trees for the redheaded ash borer as they were merely taking advantage of weakened trees, rather than being the sole agent of the decline. The search continues…

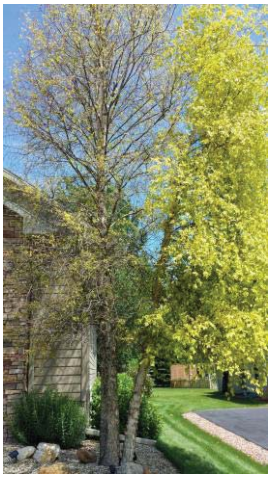
E-samples

The problem that keeps showing up as e-samples is the **ash leaf curl aphid** also known as the woolly ash aphid (*Prociphilus fraxinifolii*). The symptoms are curled leaves forming rosettes at the ends of ash shoots; particularly the rapid growing terminal shoots. If you unfolded the leaves you'll find these little "fuzzballs" that are aphids. You might also find lady beetle larvae that are feeding on the insects. Management at this time is let it be – since any treatment will not uncurl the leaves and the lady beetles are doing a pretty good job of control. Treatments to management the aphid next year can be found in the past couple of issues of the *Update.*

This is a "rusty" year! I received several more e-samples of **ash rust disease** this past week. While ash rust that has dominated the past issues of the *Update*, it is not the only rust disease out there. **Cedar-apple rust** (*Gymnosporangium juniperivirginianae*) is also a common problem this year (see the June 10, 2015 issue of the *Update*). This is probably the

second most common foliar disease of apples and crabapples after apple scab. Cedar-apple rust, as most other rust diseases, requires two different hosts to survive and it must alternate between them. One host is either apple or crabapple and the other is juniper with eastern redcedar and Rocky Mountain junipers being the most common 'cedar" hosts. The disease appears as swollen lesions on the leaf that begin as greenish yellow but eventually become more of an orange-yellow and bordered by a band of red. The disease often results in premature defoliation and I have seen trees with the disease that are almost completely defoliated by the end of July. At this time no fungicides are effective. Application must be initiated in the spring just as the leaves are expanding.

Cedar-quince rust (*Gymnosporangium clavipes*) is showing up as well. This disease is very similar to cedar-apple rust but instead its deciduous host is hawthorn along with quince and serviceberries rather than apples and crabapples. The pinkish aecia tubes are covering hawthorn fruit at this time and I have seen Arnold and cockspur hawthorns with very fruit looking like it had a fight with a porcupine! The list of "cedars" that serve as alternate hosts is also a little expansive than cedar-apple rust with creeping juniper (*J. horizontalis*) and savin junipers (*J. sabina*), all common ornamental junipers, also serving as hosts along with eastern redcedar and Rocky Mountain juniper. The disease can be managed with applications of a fungicide containing mancozeb applied as the hawthorn leaves are expanding and repeated twice at 10 day intervals.



Chlorosis on river birch (*Betula nigra*) is appearing almost everywhere in the state. I am receiving pictures of yellow leaves with just a faint trace of green along the veins. River birch is an attractive tree (though the bark is not white, more of a cinnamon-brown and peeling rather than flaky) and it is not bothered by the bronze birch borer. But, and it's a big but, it does not perform well on alkaline soils, those that have a pH greater than 7.3 Alkaline soils are very common in South Dakota outside of the Black Hills and this is one of the tree species we should use with caution as it often will have discolored foliage when planted on an alkaline soil. It is possible to treat the symptoms, if not the cause, and these options are in the June 17, 2015 *Update.*

I always receive questions about cottonwood shedding small branches and twigs about this time of year. A common reason for this abscission, a process called cladoptosis, is usually in response to changes in the environment, typically the weather changing from moist to dry. If you look closely at the base of these

fallen branches you'll notice there is a well-defined abscission zone, rather than a shredded tear that would characterize a branch or twig broken off by strong winds. The phenomenon is most common on mature cottonwoods and poplars, though it can also occur on oaks. Usually the twigs start falling about the end of June and this can continue through September.

Another common cottonwood sample right now is cottonwood petiole galls. These rounded galls on the petiole, the leaf stalk, result in premature defoliation and are one of the reasons the cottonwoods are dropping their leaves right now. The **poplar gall aphids** that create these galls are leaving the galls now and migrating to their alternate hosts and will not return to cottonwoods until this fall. They are often more destructive on their alternate hosts, such as lettuce where they feed on the roots. There is no need for control at this time as the damage is done.

Frogeye leaf spot (*Botryosphaeria obtusa*) is appearing in eastern South Dakota. One stage of the disease causes spots on the leaves and the other a canker known as black rot. The leaf spot appears as small circular spots, the center often tan and the outer margin a yellow to dark brown. Sometimes the tiny black spots can be seen in the center of the spots and these are the fruiting bodies of the fungus. Fruit may also become infected and cankers can develop on the branches, often girdling and killing the branch after several years. Pruning out dead branches and removing any mummified fruit is the best management from summer to fall.

E-samples with the damage appearing to be herbicide related keep showing up. **Hormonal herbicides such as 2,4-D and dicamba** are often used for weed control in early summer (not always the best time) and the drift from these application can injury the young, tender tree foliage. The typical symptoms for herbicide drift of these chemicals include leaf cupping, petiole curling, abnormal stretching of the leaf margins and abnormal parallel venation patterns. Usually this is the extent of the injury with 2,4-D drift but dicamba application may result in more severe dieback. The picture shows a burning bush (*Euonymus alata*) with severe leaf curl.

Honeylocust podgall midge (*Dasineura gleditschiae*) damage is also beginning to appear across the state. The symptoms are small pod-like leaflets, often only those at the tips of the branches, turning brown or nearly black. These "pods" will begin to fall in the next couple of weeks but a few new one may continue to occur this summer as the insect has several generations per year. The adult midges (flies) are very small and the larvae inside the pods even smaller so both may go unnoticed. The female lays eggs on the new foliage and once the larvae hatches it feeds and forms a gall around itself as a home for the next three weeks before pupating. The new foliage can be treated with an insecticide containing carbaryl (insecticides containing thiamethoxam or fenoxycarb are available to commercial applicators) to protect it from becoming infested. The first spray goes on as the spring foliage expands. The treatment is repeated every two or three weeks until early July

Samples received/site visits

Codlington County FL1500013 **Why are the leaves on my buckeye sticky and black?**

This is due to aphids. We were able to find a sizeable population still on the sample. There is probably little reason to treat now as most of the damage, honeydew and sooty mold, has already occurred and really is not harming the tree. However, if you want to reduce the problem next year, a May soil drench of an insecticide containing imidacloprid as the active ingredient may help.

Custer County **What is wrong with the lilac? The homeowner mentioned the sprayer was emptied nearby.**

Spray drift is a reoccurring problem in the summer (see above on hormonal herbicide drift) but in this instance it look like bacterial blight (blackened and water-soaked leaves) was the real problem. The disease is similar to fireblight, in that it is a bacteria, so management is similar. Prune out affected canes and branches (and disinfect the pruners between cuts) farther down than the symptoms. I recommend just cutting infected canes to within 2-3 inches of the ground. A copper containing fungicide can be applied before bud break next spring to also reduce the disease problem.

Custer County **Why are the needles on this pine off-color?**

We were not able to find any signs of a pathogen in this sample. It does not mean there isn't one, just one was not in these needles and branches. This may just be related to the discoloration we saw on pines throughout the Black Hills. Regardless, the new growth appears to be coming out normal.

Grant County **What is feeding on this Nanking cherry?**

I was able to find pupa cases and silky debris in this mess of foliage that is from the ugly nest caterpillar (you can see where it gets the name!). The larvae hatched in May and have finished their feeding so no treatments are needed at this time. An application of Malathion next May, if the small larvae are observed, should take care of the problem.

McCook County **What is this growth on the ash?**

This is ash rust and I always get at least one or two samples each year from the Salem area, it must be a continual hot spot for the disease. See the article on ash rust in last week's *Update*.

Yankton County **What is this tree?**

Always get an identification question about this tree when the fruit forms. This is white mulberry (*Morus alba*) and the females (mulberry have separate sexes so there are male trees and female trees) produce these dark raspberry-like fruits at this time of year. The fruit is edible but usually people leave them for the birds.

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