

Pest Update (June 15, 2016)

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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

We seem to be right on schedule for plant development if not slightly ahead with all this recent hot weather. The catalpa and lindens are getting ready to flower and the bristly locust (*Robinia hispida*) and old-fashion favorite is in full bloom. This means that some of our treatments performed at the end of June may be applied a little earlier.

Tasks to complete in another week



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 in another week as the adults should be flying by then. This is a little earlier than normal as some years the treatment is applied at the beginning of July.

Timely topics



Emerald ash borer (*Agrilus planipennis*) was discovered in a declining ash tree in Omaha, Nebraska last week. This brings the closest known infestation within 100 miles of the South Dakota border. The previous closest infestation was in the twin cities of Minneapolis-St. Paul, Minnesota, about 200 miles away.

The emerald ash borer, as most readers of the *Update* know, is an exotic phloem-feeding beetle introduced into Michigan sometime during the 1990s. While the borer was a tree-killer, its accumulating ash mortality was attributed to other known stressors such as drought and ash yellows. It was not until 2002 that the borer was identified as the reason of the widespread ash mortality in southeastern Michigan. However, by that time the beetle had spread, via infested firewood, though many portions of the state as well as Indiana and Ohio. The insect is now found in 27 states all east or south of South Dakota with the exception of an infestation near Boulder, Colorado.

The day is now a little closer to when we finally discover the beetle in South Dakota. It may be this year, it may be several years from now, but it is inevitable. However, we have had almost 15 years to plan for this insect's appearance and we may even have a few more years. Also the primary movement of this insect from one community to the next is through infested firewood and we can slow the spread by preventing the movement of ash out of infested areas. There are still borer-free areas in Michigan, more than 20 years after its arrival in the state. Once found in South Dakota it may take 20 years or more to cover the state meaning some communities will have more than 30 years to prepare.

So what should we be doing? As I mentioned in the February 22, 2004 issue of the *Pest Update*; *Considering the heavy reliance we have on ash in this state, this is a real “wake-up” call to begin to diversify the landscape.* Nurseries were fairly slow in halting sales of ash. It was still being commonly sold in the state ten years ago and I could still find it for sale at some garden centers last summer. We were slow to “wake-up” though there is still time to dilute the dominance of ash in our communities by diversifying the landscape.

Diversification does not mean merely switching to another tree, Freeman maples (*Acer x freemanii*) for example. There is no reason another exotic borer, yet unknown, couldn't enter our country and kill maples, as emerald ash borer is doing to native ashes, Dutch elm disease to native elms and Chestnut blight did

to American chestnut. The key is really to look at what your neighbors are planting, and plant something else!

But whatever is planted, the tree must be adapted to the site. The easy trees, green ash and American elm, trees that could adapt to almost any site or soil, are no longer planted or at least not planted very often. The other trees available in a community plant palette are a little fussier to their planting site. A tree such as Yellowwood requires a deep, organic soil; European alder a moist soil, for examples. This means homeowners better know their soils before choosing a tree. There are still trees that are adapted to about every site and soil, just not the same tree. Let's begin or continue our efforts to diversify our community trees but with some planning; avoid having more than 5% of a communities trees in any one genus and be certain that a planted tree's requirements met the specific soil and site condition.



Pine wilt disease appears to be advancing northward. Pine wilt disease in the 1990s was confined to the extremely southern border of the state, but by the early 2000s it was detected in declining pines as far north as I-90. We now can find it as far north as Highway 212. Pine wilt disease is caused by a nematode (*Bursaphelenchus xylophilus*) though there may also be bacteria involved as well. The disease is vectored by sawyer beetles

that carry the nematode from infected to healthy pines. The disease is most common in Scotch (*Pinus sylvestris*) and Austrian pine (*P. nigra*), but mugo pine (*P. mugo*) can also die from the disease. Our native ponderosa pine (*P. ponderosa*) appears not to be affected by the disease.

The symptoms of the disease begin with the sudden discoloration and death of the tree. A common remark from owners of infested trees is that the tree looked fine in the spring but by summer the needles were turning yellow then brown and fell hanging. Infested trees are also easy to identify from their dry wood that is almost free of pitch. The logs cut from infested trees are extremely light and there is almost no sticky pitch exuding from them. The wood will also be stained blue by a fungus. While these are all common symptoms of the disease, the only way to be sure this is the disease is to extract the pine wood nematode from the tree. The nematodes are easiest to extract from a "cookie", a 1-inch thick cross-section of wood cut from the trunk at a lower whorl of branches. The wood should be placed in a plastic bag and mailed so it arrives



on campus within a few days (and the same week, do not mail samples on a Thursday or Friday).

Pine wilt disease is not a serious problem in areas where the mean July temperature is less than 70°F. Watertown, the farthest north we have found the disease, had mean July temperatures in the high 60's back in the 1980s and 1990s. The mean July temperature is now in the low 70's. This may be why we are seeing the disease advance farther north in the past decade. The treatment for infected pines is to removal (cut flush to the ground) and destroy the wood before April 1. This kills the sawyer beetles before they can emerge and spread the disease. Healthy Austrian or Scotch pines can be injected with avermectin products, abamectin or emamectin benzoate, by a commercial services. The treatments can be done anytime during the summer but are most effective with a fall application. These treatments only protect a tree from becoming infected, they will not cure an infection.



Dutch elm disease (*Ophiostoma novo-ulmi*) reports are increasing as we move into midsummer. The infected trees have one or more branches with leaves that are curling and turning yellow to brown, symptoms referred to as flagging. While flagging is a common symptom of trees infected by Dutch elm disease, flagging can also be from broken branches, branches girdled by squirrels and sap-sucking insects such as aphids and soft scales.

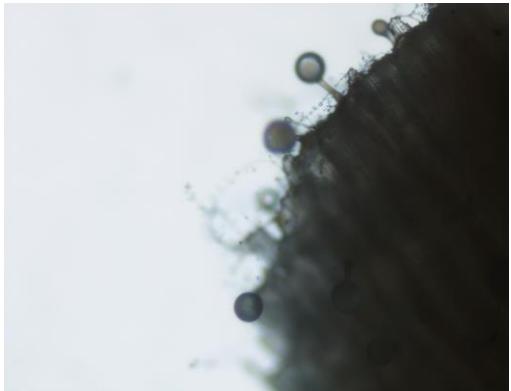
If the bark is peeled away from a section of these branches, there may be brown streaks running along

the surface of the wood. This streaking is a good indicator of Dutch elm disease and is usually sufficient to determine the presence of the disease and have the tree removed. However, the only way to be certain the tree is infected with Dutch elm disease is to send a sample to our clinic for isolation and identification to confirm its presences.



The sample should be taken from a branch that is flagging, not dead. The branch should be about ½-inch in diameter and the sample piece about 8 inches long. Place the sample in a plastic bag and do NOT add water or moist paper towels. The sample should be mailed on a Monday or Tuesday so it will arrive before the weekend. If the sample is cut later in the week it may be best to refrigerate it until Monday and mail.





Once they arrive at the SDSU diagnostic lab, a small piece of the streaked sapwood is cut out and placed on a plate for isolating the pathogen. After a short time period the coremia, the asexual fruiting structures, will occur. They look like little lollipops sticking up on the wood. This is positive identification of the pathogen. However, to find the pathogen in the tree, it must be present in the sample so collecting branch samples from recently flagging branches is

the key to positive identification of the pathogen.

The best means of managing Dutch elm disease for the community is to quickly remove infected trees. Valuable elms can be protected with injections of any number of fungicides but these need to be applied by a commercial applicator and treatments must be redone every two to three years.

E-samples



Forest tent caterpillar (*Malacosoma disstria*) is appearing in the northeastern part of the state. The forest tent caterpillar is one of three tent caterpillars found in our state and is mainly found in the northeast. We also have the eastern tent caterpillar (*M. americanum*) East River and the western tent caterpillar (*M. californicum*) West River. The forest tent

caterpillar has a very characteristic keyhole pattern on its back and it also does not form the large silky tent or nest as do the other two tent caterpillars. All three tent caterpillars can defoliate a tree. Usually a tree can survive one year of defoliation so it is not a big concern if your tree is almost bare at this time. However, two or three years of defoliation can be significant threat to the tree's health. Fortunately we rarely see two or three years of defoliation by these insects as their populations rise and fall over a five to eight year period. The larvae have just about finished their feeding and treatments are probably not going to be of much value at this time.



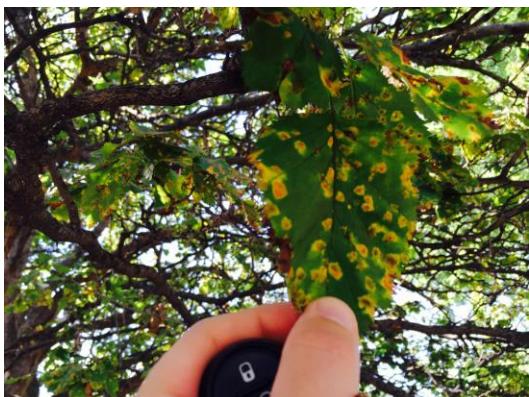


Powdery mildew appears during wet, hot, humid summers – just like this year. The most common host is lilac but I have received a number of pictures of the disease on purple leafed ninebarks such as Diabolo^R (*Physocarpus opulifolius* 'Monlo'). The disease is characterized by a powdery, almost cloudy, appearance to the leaf surface. Sometimes you can find

small black dots in this powder and these are the cleistothecium, fruiting structures, to the fungi. There are many different species of powdery mildew fungi, almost 100 and they cover several different genera. These fungi are very specialized and usually a powdery mildew species is limited to a specific plant genus. The mildew colonies continue to enlarge through the summer and by early autumn most of the leaves on the plant may be covered with a white powdery material. While the leaf surface appears powdery, the foliage itself may turn yellow.

The simplest management of powdery mildew is to alter the growing environment making it less favorable for the development of the disease. This requires pruning to open up planting beds to decrease night humidity and improve air flow. Fungicides may be used to manage the disease, but are best applied before the problem appears. The picture above shows all the leaves at the time completely white and this usually means the infection grew out of the bud. However, fungicide treatments during the summer can protect the remaining foliage, though expect to see some development even with treatments.

This is still is a “rusty” year! I received several e-samples of rust diseases other than the other rusts which were in the last issue of the *Update* as **cedar-apple rust and cedar-hawthorn rust (*Gymnosporangium*)**. It is probably the second most common foliar disease of apples and crabapples after apple scab and the



most common disease of hawthorn. 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 (or hawthorn for cedar-hawthorn rust) 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 treatment is

effective; the fungicides must be initiated in the spring just as the leaves have opened and the spores are being released from the galls on the junipers. Fungicides containing Myclobutanil as the active ingredient can be applied at that time and repeated three more times at 7 to 10 day intervals. Captan, a common fungicide for apple scab is NOT effective against cedar-apple rust.



Pathogens are not the only pests making galls. Here is a picture of a **spindle gall** (you can see why it is called spindle). These are not due to a pathogen but an eriophyid mite. The mites overwinter on the bark and then move out to the developing leaves to feed and lay eggs. Once the eggs hatch the young mites feed and this activity causes the leaf to develop a gall to enclose the mites. Since the galls are plant tissue, there is

nothing you can spray to make them disappear. They also do not harm the tree at all. The tree just looks a little ugly – no worse than a case of zits on a teenager (though some readers may remember back to that as being a traumatic experience).



Another picture of a tree infested by **bronze birch borer** (*Agrilus anxius*) came in this week. This is the cultivar Royal Frost^R (*Betula 'Penci-2'*) which is noted for its purple-bronze leaves. *Agrilus* insects are attracted to purple, that is why we use purple traps. Why someone developed a birch that essentially advertises itself to the borer is beyond me, but this is a cultivar that says lunch is here (actually Royal Frost^R is one of the more heat tolerant birches so may be more resistant to the borer). The tree can be protected with bark applications of an insecticide containing permethrin when buckeyes begin to bloom (early June) and repeat three weeks later. Imidacloprid can

also be used as a soil drench in the fall to kill newly hatched larvae the following year.

Samples received/site visits

Minnehaha County
ash tree?

No, or at least we were not able to isolate the pathogen from the samples submitted. Verticillium wilt (*Verticillium dahliae*) is a common disease of ash

Is this verticillium wilt on this maple and

(*Fraxinus*), catalpa (*Catalpa*), elm (*Ulmus*) and maple (*Acer*) in South Dakota. The most common symptoms are leaves wilting during July or August either the entire tree or just a branch. However, other stressor can cause this same symptom pattern and this is one of the most misdiagnosed problems. These trees may have the disease and we were not able to isolate it or there may be another, perhaps underground, cause for the decline.

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