

Pest Update (July 25, 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

The smooth hydrangeas are in full bloom now, very typical for this time of year. They do not look so happy about flowering during the heat and since hydrangeas are known as “water pigs” – keep the hose on them if you are not receiving enough rains.

Timely Topics

Green ash versus Kentucky coffeetree – how do they compare?



Kentucky coffeetree

I am certain that most South Dakotans have moved beyond the denial phase of emerald ash borer and to acceptance. There are not many people planting ash anymore in the state, though plantings – both in yards and windbreaks – have not completely stopped.

The question for most is not whether to plant ash, but what else should they plant. A tree that is often named as a substitute is the Kentucky coffeetree. Now substituting trees in a yard or windbreak is like substitutes for the Sunday brunch at a restaurant; “*May I substitute the pancakes with biscuits?*” The two are not similar other than they are food for breakfast.

The same with our ash substitutes. They are not the same tree though may share some similar characteristics. Let’s look at green ash and Kentucky coffeetree.

Characteristics	Green ash <i>Fraxinus pennylvanica</i>	Kentucky coffeetree <i>Gymnocladus dioica</i>
Native to South Dakota	Yes	Yes

Green ash and Kentucky coffeetree are both native to South Dakota. However, green ash is native throughout the state while native populations of coffeetree are limited to Clay, Lincoln, Minnehaha, Union, and Yankton Counties.

Native habitat/ Adaptability	Floodplains	Floodplains (once upland)
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While both ash and coffee trees naturally occur along or near floodplains (though not usually swamps), they can perform well on a wide range of soils. They both can tolerate slightly alkaline soils (pH 7.4-7.8) and some coffeetrees can be found on higher pH soils, near 8, doing fine, while a nearby ash is chlorotic.

Climate

3a

4b

While both trees are listed as USDA Plant Hardiness Zone 3a or 3b, coffeetrees do not seem to perform well in the northwestern part of our state. I believe this is more related to cold, than precipitation, as it will grow in the drier areas of the state and has done well in the drier areas of more southern states such as Oklahoma and Texas.

Average mature height and spread

45-70 feet, spread 2/3's height

40-60 feet, spread equal to height

Both trees can become medium to large trees. Coffeetrees open-grown shape may be related to gender. Male coffeetrees tend to be more ovate, while the female trees rounded.

Growth rate after establishment

More than 2 feet/year

About 1 to 1.5 feet/year

Green ash trees have a relatively fast growth rate beginning almost right after planting. Coffeetrees have a slow to moderate growth rate until about five or so years after planting. After that their growth rate is only slightly slower than ash.

Wildlife value

Seeds

Flowers



Fresh pods with seeds eaten by squirrels.

Ash seeds are consumed by insects, birds and mammals. Deer will browse on ash seedlings and sapling. While it's loss to emerald ash borer will have some impact on wildlife, ash is not regarded as a species critical to most wildlife other than its cover and value to cavity-nesting birds.

Squirrels and deer will feed on immature coffee tree seeds, but no animal consumes the mature, hard seed of the Kentucky coffeetree (wild boars feed on the seeds to the Asian coffeetree species in Laos and China). Coffeetrees, unlike, ash, do depend on insect pollination of their (slightly) fragrant flowers so are a nectar source for bumble bees.

Why few mammals consume the seeds of Kentucky coffeetree and none have the seed germinate after passing through the digestive tract has led to the thought that this tree is an example of ecological anachronism – a species whose animal means of dispersing and stratifying the seeds has gone extinct. It's believed that one or more species of Pleistocene megafauna fed on the sweet pulp surround the seeds and, in the process, ate and pooped out the intact, but stratified, seed. Once the megafauna died off about 7,000 years ago, the tree became dependent on root sprouts and an occasional seed that was soaked in water long enough to germinate. Perhaps one reason this tree, once found on upland sites, is now mostly relegated to floodplains.



Uneaten mature pods and seeds.

Pests

Numerous borers,
defoliators and leaf
diseases

None

Even before emerald ash borer, green ash was hardly described as pest-free. The tree is attacked by the clearwing ash borer, the banded ash borer, the redhead ash borer and carpenterworm. The leaves are infested with ash sawfly, the ash leaf curl aphid, and plant bugs. Ash anthracnose and ash rust infected the leaves. The seeds are infested with ash weevils.

There are no major insect or disease problem with Kentucky coffeetree.

Concerns

Emerald ash borer

Poisonous seeds and
leaves

The appearance of emerald ash borer in North American spelled the end of this tree and other native ash. This Asian borer is only a threat to declining ash in its native habitat, the forests of northwestern China, as these trees have active defenses to protect them. North American ash are recognized as suitable hosts to the emerald ash borer but lack the capability to activate defenses to protect themselves.

There is far less potential for Kentucky coffeetree to suffer the same fate as the two (or three) Asian coffeetrees are found in Laos and southeastern China and are not climatically suitable to our region nor are likely their few pests.

Instead, the concern to Kentucky coffeetrees centers around their poisonous seeds and leaves. Despite the name coffeetree, this tree had very limited use as a coffee substitute and then only after the seeds were roasted. The seeds are reported to contain cytisine, a quinolizidine alkaloid found in some Leguminosae plants that ingestion can result in vomiting, abdominal pain, drop in blood pressure and increased heart rate and respiration.

The concentration of cytisine appears to be low in coffeetree and has not even been at detectable levels in some studies. There are no documented, verifiable human poisoning from eating the seed. The only sources I was able to find mentioned that there was a report someone had died in New York many years ago.

I was able to find a frog that died. This was in an *American Journal of Medical Science* article in 1886, but they injected the frog with an extract from the bean. However, there were two reports in Maryland cited in an Agriculture Experiment Station bulletin (and an extension publication) of fatal poisoning of cattle that were fed the seeds and sheep when fed recently harvested foliage and shoots. Feeding, as oppose to free-choice, might be a factor as most herbivores consume a variety of plant material - leaves, shoots and fruit – rather than eating just one, perhaps as a means of avoid accidental toxicity.



Kentucky coffeetree leaves.

I have not been able to find the original Maryland reports, only references to these reports. Interestingly, the only state experiment station and extension publications missing from the Briggs Library at SDSU are Maryland. I also checked the on-line resources and the only year that is missing is 1942, the year of publication. I think a lot of papers have been just citing what they read in other papers rather than going back to the original source.

This does not mean the seeds and leaves are not toxic, just actual verifiable reports are either nonexistent or rare. Still error on the side of caution and avoid planting coffeetree where cattle, horses or sheep may have limited choices of feed, don't eat the raw seeds, and never inject a frog with an extract from the seed. There was also an undocumented report of a dog that died after drinking out of a puddle that the seeds soaked in for several days. No reports on cats...hum.

Japanese beetle adults feeding on leaves now



As mentioned in last week's *Update*, Japanese beetle adults are feeding away in communities across the state. One of their favorite foods are roses. The adults seem to love the taste of rose leaves and flowers.

Many people use traps as a means of controlling the beetles in their rose gardens. I had a few calls from folks saying the beetles are destroying their roses despite using the traps. The problem? They set the traps in or near the rose garden. First, do not set the traps in one spot for more than a day or two as they start becoming a permanent draw for beetles throughout the area. Second, never set them near the plants you are trying to protect. The traps do not capture all the beetles, many lose interest as they are drawn to the trap (squirrel!) and instead go to a nearby plant.

Hang any trap at least 100 feet from the rose garden and on a tree, such as a pine, that is not a host for the insect. Also move the traps to other locations, about 100 feet or so away from the roses, every few days.

Roses are a favorite of Japanese beetles as they contain volatile chemicals, eugenol and geraniol, that are attractive to the insect. These chemicals are released as the insects feed on the leaves. Roses in the sun are more attractive to Japanese beetles as well as those with white or yellow (their favorite) flowers.



Japanese beetles feeding on Easy Elegance High Voltage Rose (Rosa 'BALage').

Spotted wing drosophila is infesting fruit in South Dakota.

I mentioned this last week and have talked to several small fruit growers on current losses. So far, the reports are that the population of these fruit flies and their damage to crops is down from past years.

Treating chlorosis on oaks



Chlorotic swamp white oak.

Chlorosis, leaves with yellow tissue and green veins, can usually be attributed to an iron or manganese deficiency. The deficiency is not generally related to the lack of these microelements in the soil, just that under alkaline conditions they are increasingly insoluble. Any environmental condition, such as poor drainage, that limits root growth, can also reduce absorption as well as increase alkalinity due to increased soil bicarbonate levels due to limited gas exchange.

The best solution is not to plant susceptible trees on alkaline soil, those with a pH greater than 7.3. Many oaks (other than our native bur oak) and river birch will suffer iron deficiency and have “golden” leaves and many red and silver maples (also the Freeman maple cultivars) will suffer manganese deficiencies (and sometimes iron).

Injection often do not perform very well and usually are limited to spring or early summer. Applications after that time often do not show an improvement in leaf color till the following season.

Aaron, the city forester for Aberdeen, had some chlorotic Regal Prince oak (*Quercus x warei* ‘Long’) this year. We do not see chlorosis on this cultivar every year unless on poorly drained soils, but the continual rains have made many soils poorly drained. He investigated injecting the trees and found the product GreenTree Pro Nutribooster 0-15-10.



This product is available through Arborsystem Inc and contains 15% available phosphate, 10% soluble potash, and 8% iron (derived from ferric ammonium citrate). Our soils usually contain an adequate level of phosphorus and potassium even under alkaline conditions, but the iron is certainly a problem. The directions call for injecting 1 ml every 4 inches around the flare of the tree. The label also notes while injections can be made any time during the growing season, the best times are spring



Before and after picture of Regal Prince oaks treated with GreenTree Pro Nutribooster.

and early summer. Results are often seen in two weeks.

Aaron was injecting at the end of what might be called early summer (mid-July). The results are incredible. The picture on the previous page Aaron sent of before injection and two weeks after. This product really works!

E-samples



Cedar-hawthorn rust (*Gymnosporangium globosum*) is appearing on hawthorn trees. The spots seen in the picture are related to the fruiting structures that are producing the spores that will now infect the “cedars” (junipers). The disease infects the leaves and the fruit. Infected leaves develop pale, yellow spots on the upper leaf surface. These spots enlarge and turn orange. The infected leaves often drop prematurely, though rarely does the

disease result in as severe of defoliation as apple scab on apple trees. Infected fruit may develop similar spots, typically near the base of the fruit though fruit symptoms are rarely seen in South Dakota nor is it a concern as the fruit is rarely harvested.

The disease, as with many rust diseases, must alternate between two different



hosts to survive. Cedar-hawthorn rust alternates between hawthorns and several species of junipers (though not the true cedars such as American arborvitae *Thuja occidentalis*). The fungus appears as a gelatinous orange-red mass with horns on junipers. This occurred about a month ago and the picture to the left shows the fruiting bodies on juniper. One means of breaking the cycle is to remove any eastern redcedar (*Juniperus virginiana*) or Rocky mountain junipers (*Juniperus scopulorum*) within 2 miles. This

is probably not practical in most instances. Fungicide sprays are generally the best options. The leaves are vulnerable to infection about 4 days after they begin to expand and at least three application need to be made about 10 days apart.

The Arnold hawthorn (*Crataegus arnoldiana*) and the downy hawthorn (*C. mollis*) are the two species we see this disease on the most. The Cockspur hawthorn (*C. crusgalli*) and the hybrid hawthorns (*C. x mordenensis*) are rarely affected by rust disease.



The emerald ash borer “look-a-likes” are starting to come in. Dave, a Department of Agriculture forester in Hot Spring collected this one for me. I usually receive samples and pictures of this beetle in late summer that people believe are the emerald ash borer. This is the **golden buprestid** (*Buprestis aurulenta*), an insect that feeds in dead and dying pines as well as in pine logs. The samples usually come from West River since there are more pines out there, but the insect

can be found almost anywhere in the state. The larvae have been known to take decades to mature in logs so occasionally a sample even comes from a log home!

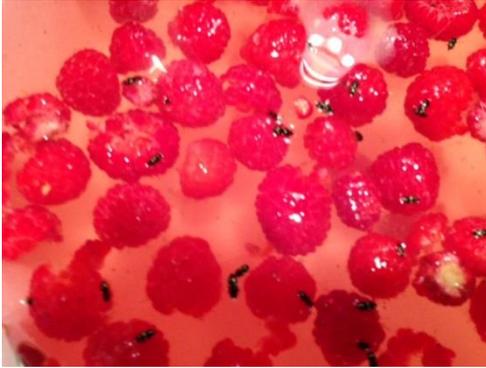


Pear sawfly (*Caliroa cerasi*) on cherry. Pear sawfly, also known as pear slug because of the slimy appearance to the larvae. The olive-green larvae are about 1/4-inch long with front of the insect just a little wider than the rear. This insect has about another 1/8-inch to still grow and will lose its green slime and become an orangish yellow.

The larvae are the damaging stage and feed on the leaves of pears (hence the name) as well as cherries and even an occasional plum or apple. They feed on only one surface of the leaf, a type of damage known as a window-paning. The damage is usually not severe enough to warrant treatments.

There are two generation per year of this insect. The adults emerge in the spring from cocoons in soil. The adults are a non-stinging wasp about 3/16-inch long. The adult female cuts slits in the edge of the leaves with her saw-like ovipositor with the eggs hatching within two weeks. The young larvae move out and feed on the upper surface of the leaves for about a month before dropping to the soil and forming a cocoon. The second-generation adults emerge in early July to start the life cycle over again. The second-generation larvae, the ones out now, are the most damaging to the plant.

While almost any insecticide will kill the larvae (but check label first to be sure they are including one it), treatments are rarely necessary. Usually the damage is not noticed until it's too late and their natural enemies provide the best long-term control.



Picnic (Fourspotted sap) beetles (*Gilischrochilus*) in the raspberry fruit.

There is nothing like picking a raspberry and finding a small beetle in the “cup.” There is something else and that is the crunching sound as you eat the beetle in the cup of the raspberry. This insect is the picnic beetle, a small beetle that loves fermenting fruit (and potato salad at picnics) and raspberries are one of their favorites. The beetle can quickly ruin a ripe raspberry as they burrow around

inside the fruit. There is little that can be done to stop these insects. You cannot spray since you are spraying fruit you are about to eat. I generally see picnic beetle become a problem when you are not picking the fruit often enough – pick all the fruit as it ripens, daily or twice a day if needed. The beetles are attracted to over-ripe fruit and by picking the fruit as it ripens you are eliminating the attractant. This also helps a little with the spotted wing drosophila.

Samples received/site visits

Davison County

What is this tree? The parent was removed, but these are the sprouts that are coming up.

This is called the Tree-of-Heaven (*Ailanthus altissima*). This is an exotic tree, introduced from China, which has become a weed in much of the rest of the country. Fortunately, our cold winters limits this tree to the southern half of the state and outside of Yankton and Vermillion, so they rarely become large trees. However, there are still a few smaller ones in the Mitchell and Sioux Falls areas.

Douglas County

What is this shrub?



When I saw the picture I thought perhaps it was a cherry but now that I have the sample it is easy to identify the plant as western sand cherry (*Prunus besseyi*). This is a suckering shrub with a mature height of about 6 feet. The summer fruit is sweet and purplish black about $\frac{3}{4}$ inch long. The flowers are its true attraction and it is one of the nicest cherries in bloom.

Grant County

What is causing this blackening of the maple leaves?



This is not tar spot, but anthracnose, mostly likely *Discula*, on Crimson King maple, a cultivar of Norway maple. The difference is with anthracnose the young leaves become blackened and shriveled, sometimes along with the shoot. Tar spot disease appears as hard, tar-like spots on the leaves. I do not recommend control of anthracnose on maples. The fungicide must be applied just as the buds are expanding in the spring with two more

treatments spaced 10 days apart – a tough thing for homeowners to time. Also, unless we have rains just at the right (or wrong in this instance) time, early May, the disease will not develop. Blame it on the continual rains and I doubt if you will see the disease next year.

Haakon County
look like this.

What is wrong with this lilac? Many of them in the yard



This faint, powdery dust is the fungal disease powdery mildew, a very common disease of lilacs, particularly if the lilacs are in an area with shade and poor air circulations (and it rains a lot like this year). However, I find the disease even on lilacs in open, windy sites. The disease is not serious enough on this plant to warrant control but if they do decide to spray a fungicide labelled for powdery mildew and containing chlorothalonil as the active

ingredient. They should make at least two applications of the chemical, spaced 10 days apart.

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