# Pest Update (November 20-27, 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.



## Plant development for the growing season

The growing season is long over and we are well into winter. The plants are dormant (though some root growth still occurs if the soil is above freezing). Air temperatures are expected to dip into the negatives during the next week but most of our woody plants should be harden off enough to survive these colder temperatures.

## Timely Topics


**Ice melt products and plants.** The wintery weather we experienced this past week left icy roads, sidewalks and driveways. Homeowners are combating these hazards with melt products. While these are effective at melting ice, their use may also injure turf and ornamental trees and shrub come spring.

Ice melt salts are designed to break the bond between the pavement and the ice allowing the slush to be shoveled off the surface. The three different salts in ice melt products, used alone or in combination, are calcium chloride, magnesium chloride and sodium chloride. Homeowners sometimes wonder if any one of these salts is less harmful than the others in term of plant damage, but the injury is due to the chloride in the salt and all three of these contain chloride.

Chloride enters plants through two routes: 1) being absorbed by the roots though runoff or 2) absorbed through the buds and foliage from aerial deposition. Runoff can result in injury if the plants are growing in a slight depression where melt water can accumulate in the spring or if salt-laden snow has been piled on the plants during the winter. However, chloride quickly leaches through the soil so for most situations runoff and root absorption is not the primary means of chloride entering the plant. Instead, salt as small droplets or as dried dust particles are common means for plants to accumulate chloride.

Homeowners can reduce damage to their lawn and their ornamental trees and shrubs by 1) using salt substitutes, 2) minimizing their use of salts to clear ice and 3) flushing the salts from the soil and vegetation in the spring.

Sand, cat litter and even sawdust can be used to improve traction on ice. While the overuse of these materials can also create spring clean-up problems, they provide traction when the temperatures are lower than 10$^{o}$F as salts are not effective at or below this temperature. A little sand, less sand and more shoveling are the best ways to have a safe drive or walk and healthy plants.

The use of salts can be minimized by clearing the snow from the walk or drive and then spreading a light layer of salt over the icy surface. Only apply enough salt to

break the bond of the ice to the surface. Once the bond is broken, the icy slush can be removed with a shovel or scoop. It is not necessary to completely melt the ice from the surface, just enough to break the bond.

Finally, once the weather begins to warm next spring, wash all the dried salt from the pavement and soak the surrounding grass and plants with water about three or four times during warm weather so the chloride leaches away from the surface. Next spray water on the buds of deciduous trees and shrubs and the needles of evergreens to wash the dried salt from the plants before it is absorbed.

**The elongate hemlock scale appears again on Christmas wreaths**

The elongate hemlock scale (EHS) (*Fiorinia externa*) was introduced in the first *Pest Update* of 2019 and the pest is back again. This Asian insect was first detected in New York in 1908 and slowly spread out until about the 1970s when it quickly extended its range to 14 states along the east coast of the United States and inward to Ohio. The scale was first discovered in North Carolina in 1993 and became a problem in southern plantations of fir tree used for decorative greenery and wreaths by the 2000s.

This insect was discovered here last year during the Christmas holiday in fir wreaths and other decorative greenery, though not on Christmas trees. The source for this material is believed to be from the southeastern US so the material was found at chain stores rather than local garden centers that source material from regional suppliers.

The insect was found in South Dakota again this year on wreaths and decorative greenery. Some of the material had as many as three or four scales on a single needle. EHS is only found on the underside of the needles. Mature female scales are covered with a waxy, translucent material – it appears that you can almost look through the shell – and has an elongated body that is parallel-sided and fits along the rows of stomata in the needle.

Adult female scale on needles from a wreath sold in South Dakota.

The scale is a problem on Canadian hemlock (*Tsuga canadensis*) and seems to be spreading faster than the other exotic threat to hemlocks, the hemlock woolly adelgid (*Adelges tsugae*) – not a good time to be a hemlock.

This is not the only host for scale. They are also found on firs (*Abies*) and this is the greenery shipped into South Dakota. Firs, such as Frasier fir (*Abies fraseri*) make excellent wreaths and other holiday decorations as the soft, bright green needles have excellent branch retention.

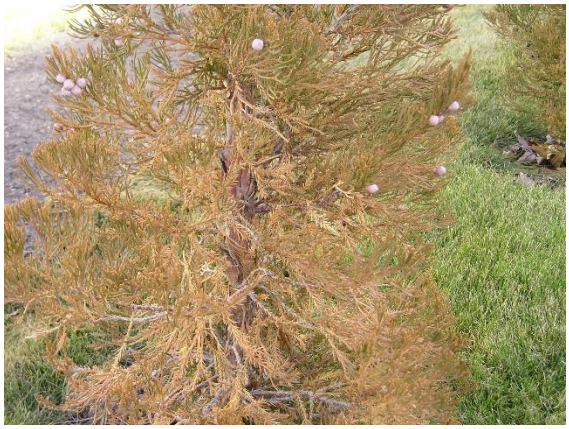
We do not have many hemlocks in the state and even firs are relatively rare so if these two genera were the only host, it would be more of a curiosity than a serious threat. Unfortunately, it also infests spruce (*Picea*) which apparently makes a better host then its namesake, hemlock.

The insect has not become a major pest in eastern US on spruce so perhaps it might only be just one more sucking insect on spruce that we occasionally see. The insect, however, has the potential to be a problem as firs that are heavily infested can have the needles become discolored and shed prematurely which leaves a stunted and weakened tree.

Adult scale with eggs (small black dots).

At this time, the best approach is to dispose of any wreaths or decorative greenery in city or county landfills – when the material is buried or chipped/burned - rather than just tossed on the backyard compost pile. The eggs (which we found) can still hatch this spring and the young move to nearby trees.

## E-samples



**Junipers are also turning color, but it's brown (and its normal)**. I had a couple of calls and pictures of juniper during the past week. The concern is about the color change. Many junipers have a color change as they enter the winter. Eastern redcedars (*Juniperus virginiana*), Chinese junipers (*J. chinesis* syn *J.* x *media*) and Savin (*J. sabina*) all can develop an unattractive yellow-brown foliage. This usually appears as patches, rather than uniform across the plant. It's ugly, but the needles will green up again in the spring. Creeping juniper (*J. horizontalis*) and Rocky Mountain juniper (*J. scopulorum*) can turn almost purple and this can even be pretty.

## Samples received/site visits

Jackson County **What are my ash trees dying?**

This is becoming a common concern across the state now that emerald ash borer has arrived. The ash trees, native trees along a woody draw in western South Dakota, were not likely to be infested by the borer but still it's worth the stop. There is always the possibility that out-of-state hunters carrying infested firewood into the state.

However, when I arrived and walked the draw with the landowner, the problem was very apparent. The trees were dying, but it was old age and the stress of enduring the South Dakota climate. The trees were infested with our clearwing ash borer and the redheaded ash borer, two native borers that infest declining ash. The trees were also infected with a decay fungus, and the conks (the fruiting bodies) were visible along the trunks.

There is not much that can be done for these older trees, further decline is inevitable and natural. However, a greater concern is the lack of regeneration within the draw. There are older trees, but no young ones – cows have a way of eliminating them. If the landowner wants to maintain this wooded area, now is the time to correct this conversion from woods to grass.

The management of these woody draws and regeneration of trees involves two manage strategies 1) restricting the use of these areas to cattle and 2) slowing the movement of water. While the ideal might be the elimination of cattle from the draws that is not always possible or desirable. Instead a combination of fencing, rest-rotation and summer grazing deferment can all be used to give seedling and saplings time to grow. The mature trees on the site – American elm, green ash and hackberry – are still producing seed and we just need to provide conditions to allow the seed to germinate and the new trees to become established.

Moisture can become critical during drought year and small dams to slow, not hold, water can be helpful. These structures can slowly leak water to provide the sub-irrigation to allow the young trees to establish.

I was impressed with the number of hackberries that were growing along the bottoms and these should regenerate if provided better management. The existing trees can be supplemented by planting (in tubes) if the landowner wants to speed up the regeneration of the draw. American elms will seed in and establish on their own as well as the green ash.

These two species, while part of the regeneration plan, probably should not dominate the new stand as the Dutch elm disease is still killing trees in these western location and emerald ash borer will one day reach here as well though that day may be two decades away.

Minnehaha County **What caused the silver maple to have chlorotic leaves?**

Chlorosis, a symptom that describes leaves with abnormal yellow leaf tissue but with narrow green veins, is a common occurrence on some tree and shrub species on the Great Plains. The disorder is generally due to a micronutrient deficiency in the leaf though there is also heat-induced chlorosis which sometimes appears on tree in parking lot islands.

The most common micronutrient deficiency is iron though manganese has also been reported. The deficiency is not due to a lack of these elements in the soil, but it becomes increasingly unavailable as the soil pH becomes alkaline.

Iron deficiencies are associated with oak, mostly eastern pin oak, northern red oak and swamp white oak in South Dakota. Iron deficiencies appear on silver maple, red maple and their hybrid, the freeman maples. However, maples have also become chlorotic from foliage deficiencies of manganese though iron is often also deficient in these instances. Hence some maples may have chlorosis corrected by applications (usually by injection) of iron, others by manganese, and some only by a combination of the two.

The only way to proper diagnose chlorosis on maples is a soil test to determine the pH and foliage analysis to find the concentrations of these same microelements in the tissue. Guessing is not appropriate as an application of iron in maples suffering only a foliar manganese deficiency may result in more severe chlorosis since the higher concentration suppresses manganese uptake.

This problem of manganese, rather than iron, in maples occurs out east, Michigan and Ohio, where the alkalinity of the soils is not as severe as on the Great Plains.

Iron deficiencies are a problem here on chlorotic maple but sometimes maples have been treated for iron chlorosis only to have the symptoms remain the same or even become worse.

We had a chlorotic silver maple in Sioux Falls that we put it through this test. Soil samples were collected from the upper 12 inches of the soil and within an area from the trunk to about 2/3's the height of the tree.

The soil samples indicated a soil pH of 7.5, an organic matter content of 4.8%, and a phosphorus and potassium concentration of 87 ppm and 150 ppm respectively. This is a typical soil sample for residential lots near the center of Sioux Falls. When the older (pre-1960s) part of the community was developed the construction of the home involved digging out the soil to build the basement and that was about all the disturbance. Now construction typically involves removing all the topsoil from the lot and replacing it with a thin layer of subsoil.

The foliage results were 122 ppm iron and 235 ppm manganese. What should we be finding? The scientific literature describes normal green silver maple foliage as containing about 160 ppm iron and 525 ppm manganese. Trees having less than 100 ppm iron and 250 ppm manganese generally present chlorosis.

At least with this silver maple it appears that deficiencies in both iron and manganese may be resulting in the chlorosis. The tree has been treated with both iron and manganese and I will report on the results next spring.



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