

Pest Update (February 12-19, 2020)

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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

Agronomy, Horticulture and Plant Science Department

rm 314, Berg 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.

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 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 had another cold snap, but it looks like we are beginning the roller-coaster ride of temperatures as we go into late winter. Some communities recorded temperatures into the -10°F early in the week and may see 50°F this weekend.

The weather is always interesting in South Dakota!

Timely Topics

A few weeks ago, much of the state saw heavy, wet snows that bent branches on trees. At that time, I was reminding people not to knock the snow off with sticks or other heavy tools as they might break branches. Instead either sweep it off or just let the snow melt off – branches are very flexible and can bend, remember Robert Frost's poem *Birches*.



We did see old silver maples and other trees loss decayed branches under the weight of the snow, but the younger trees, the ones you can reach with a broom, mostly just bent back. Here are two pictures of a columnar oak, Crimson Spire™ oak (*Quercus* x 'Crimschmidt'), the one on the left is during the storm and the one to the right was taken last week. It recovered just fine on its own.



Cold and emerald ash borer is a common subject during the long South Dakota winter – is it cold enough to keep the beetle at bay? Minnesota was hoping for this back in the 2000s. I remember sitting in a presentation by a representative of a large Minnesota nursery about 11 years ago, who told the audience it would never reach this far north – Minnesota and South Dakota were saved from this pest! This was just a few weeks before the insect was confirmed in the Twin Cities. Guess we forget to check that with the beetle.

Now we have South Dakotans hoping we might be spared, at least the northern part of the state. So, will this be the case? Might our winters be just cold enough to kill off the insect?



First, let's go over how this insect survives the winter. Emerald ash borer is in the larval stage during the winter months. While we occasionally find two different instars overwinter (3rd and 4th), the most common is the fourth instar, the J-stage as it's called due to the curl of the body. This is the prepupal stage and is the most winter hardy instar. It also forms the pupal cell in the outer sapwood, slightly deeper than larvae feed, and this provides a little more protection from the winter cold.

The larvae prepare for winter by replacing water (water freezing in cells will cause them to rupture) with an antifreeze of alcohols, proteins, and sugars (note: this does not work for people – eating a steak with a beer and having cake for dessert will NOT improve your winter hardiness). Many insects supercool to a below-

freezing temperature point, which varies with the season and the insect species. An interesting point is once that temperature is exceeded, the body spontaneously freezes, so how long it's cold is not as important as how cold did it get.

Dr. Venette an entomologist with the USDA Forest Service in Minnesota, has done a lot of work on emerald ash borer and the effects of winter cold. At temperatures of about 0°F, about 5% of the larvae are killed, at -10°F, about 34% are killed, at -20°F, about 70 to 80% are killed and at -30°F, 99% of the emerald ash borer larvae are killed.

Since we can have extremely cold winter, this sound like great news, but you also must consider the tree. The bark and wood provide insulation and the temperature beneath the bark is not necessarily the same as the air temperature. The larger the tree trunk, the thicker the bark and the longer to cool due to its mass. This means you might find high winter mortality in the smaller 3-inch branches than you will in a 30-inch trunk.

Years by lowest recorded temperate from 2010-2019

City	0-9°F	10-19°F	20-29°F	>30°F	EAB spread rate
Rapid City	2	8	0	0	Fast spread
Winner	1	7	2	0	
Michell	4	4	2	0	
Spearfish	3	4	3	0	Moderate spread
Yankton	1	6	3	0	
Parker	1	5	4	0	
Faith	1	3	6	0	Slow spread
Pierre	0	3	7	0	
Bison	0	3	7	0	
Platte	0	5	4	1	
Sioux Falls	0	4	5	1	
Mobridge	0	3	4	3	Very slow spread
Brookings	0	2	5	3	
Watertown	0	2	5	3	
Aberdeen	0	2	5	3	
Huron	0	3	3	4	

The intensity of the cold will be an influence in two ways; 1) the length of time to kill a tree and 2) the spread rate in the community. Communities that experience a fast spread will probably see trees die within four or five years of becoming infested and most of the trees will be killed within a eight-year period. Communities with a very slow spread may see tree attacked for eight or ten years before dying

since during some years most of the larvae will be killed by the cold. This will also slow the spread and it may take two decades to loss most of these ash canopy.

Last winter was cold enough to cause mortality of the overwintering larvae in Sioux Falls. It was one factor that helped slow the spread in 2019. We may not be this luck in 2020 as the coldest temperature so far has been -13°F and that will have little impact on the larvae snuggled within their chambers in the sapwood.

E-samples



It seems like every winter I receive an e-sample of the **pine bark adelgid** (*Pineus strobi*) on either eastern white pine (*Pinus strobus*) or limber pine (*P. flexilis*). This insect can be just a curiosity on the trunk or be a tree killed, it all depends on the density of the infestation. I have seen some pines will just a few flecks at the branch whorls where others the adelgid is so thick you can barely see the bark. I have only seen this insect on 5-needled pines, so ponderosa pine (*P. ponderosa*), along with Austrian (*P. nigra*) and Scotch pine (*P. sylvestris*) seem to be spared.

The insects overwinter as immature females and, in the spring, produce a thick coat of woolly wax as they mature. The adult female lays about 25 eggs under this woolly mass and after they hatch the young move to a new whorl of branches along the trunk to feed. There are several generations per year and some mature to winged adults which can fly to nearby trees while others become stationary adults on the same tree upon which they developed (insect couch-potatoes).

The adelgids, which resemble aphids, can suck up enough sap that the trees become stunted and have a yellow cast to the needles. If not treated, trees can decline and die though this may require a decade or more for the infestation to become dense enough. While natural enemies, lady beetles and other insects, are the best means of managing the adelgid, sometime infestations do require insecticides. The best treatment is a dormant oil as these have little impact on the natural enemies. The horticultural oil should be sprayed in early spring, once the day temperatures are above freezing, to kill the immature females.

Samples received/site visits

Yankton County

Please identify the problems on this sample

The twig with the funny growth, is a hackberry (*Celtis occidentalis*) and the disease is known as 'witches-broom' a relatively rare disease in western South Dakota but is common out East. How and why the brooms develop on some branches and not others (and some trees and not others) is not well understood.

An eriophyid mite (*Aceria* sp.) is found in association with the brooms and often a powdery mildew fungus (*Sphaerotheca phytophila*) though the presence of the mildew does not appear to be a prerequisite for the disease. There may also be a yet unknown phytoplasma associated with the brooms. The disease may look bad, but it is not usually harmful to the tree. However, a tree loaded with brooms may experience more branch breakage and reduced vitality. There are no effective controls since the disease is so poorly understood; pruning out brooms is the only

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