

# Pest Update (February 26-March 4, 2020)

Vol. 18, no. 5

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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 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 temperatures are quickly warming with days in the 50s to 70s°F throughout the state. While we are all enjoying the warmer weather there is a possible dark side.

If temperatures stay warm, days above freezing and nights no colder than in the 20s°F, our woody plants will come out of winter just fine. However, if the temperatures stay mild then drop, we can expect some 'winter' injury in our trees (as happened in Rapid City 1998 when February had a low of only 14°F but March

was a frigid – 18°F, the coldest for that winter). This injury often presents as branch dieback and is more often associated with temperature fluctuations in fall and spring, rather than cold mid-winter temperatures.

We might want to delay our pruning of marginally hardy trees (many of our fruit trees as well as trees such as yellowwood) for at least a few more weeks. If we experience a sudden cold snap that kills back branch shoots, we'll will need to prune these off and might as well do all the pruning at one time.

## Timely Topics

We have been conducting our winter emerald ash borer (EAB) survey in Sioux



*Stripping bark from the base of branches.*

Falls. The survey consists of identifying trees with extensive woodpecker drills and blonding which are common indicators of an EAB infested tree. These symptoms do not appear until the tree has been infested for several years and are occasionally associated with infestations by the redheaded and banded ash borer. We also do branch sampling on randomly selected trees following the Canadian protocol to detect infested trees that may not have yet attracted woodpeckers.

The extent of the infestation has not spread out much from northern Sioux Falls. There are probably satellite infestations in the community (we know of at least one), but our survey has not detected these, most likely due to the small number of trees within these satellites.

The most interesting (and disappointing) find this year is that we have no winter emerald ash borer mortality, unlike last year. The minimum temperature so far this winter is -13°F and not cold enough to kill larvae insulated in the wood. All the larvae collected so far are 4<sup>th</sup> instar, the J-stage, that form a chamber in the outer sapwood to pupae. This additional depth may protect the larva from the cold, and this is also the instar that can survive the lowest temperatures.



*J-stage larva in the outer sapwood of the branch.*

There is a higher density of live larvae this year compared to last year winter sampling, again due to the lack of cold temperatures. Interestingly, the larval density, which varied on infested tree between 1 and 23 per square meter, while higher than the densities in 2018 and 2017, is still lower than in 2016.



*Faint gallery pattern from 2019 with older, darker, galleries from 2016.*

We are basing this yearly density figure on our cross-sectioning of sampled branches which sometimes show galleries and callus from infestations as far back as 2015. We also collected branches that were last infested in 2016 and showed no signs of infestation since that year.

The reason for this population build-up in 2015 and 2016, with a reduction in 2017, 2018 and 2019, is most likely due to winter mortality. When we have a minimum temperature of -20°F or lower, we can expect to see significant winter mortality of the insect. This does not mean all the larvae are killed, but we may have anywhere from 30% to 70% mortality depending on their location in the tree. We find higher mortality in branches and lower in large limbs and trunks. This is due to the larger mass which takes longer to cool and thicker bark which serves as an insulator.

A review of the past six winters shows that the winters of 2014/2015 and 2015/2016 did not experience low enough temperatures to kill many larvae. This was followed by three winters with extremely low temperatures which had a significant impact on winter survival.

<u>Winter</u>	<u>Minimum temperature</u>	
2014/2015	-16°F	} Low winter mortality
2015/2016	-16°F	
2016/2017	-27°F	} High winter mortality
2017/2018	-25°F	
2018/2019	-25°F	
2019/2020	-13°F	} Low winter mortality

The average minimum winter temperature in Sioux Falls has been -20°F over the past decade with four winters warmer than this (-10° to -19°F) and four colder (-21° to -30°F). Two winter the minimum temperature was -20°F. This means we are likely to see significant mortality about 2 out of 5 years.

Significant mortality does not mean that the infestation is stopped, just the spread slows. It may take longer, five to seven year, to kill an individual tree and longer to move through town. This helps the City of Sioux Falls by allowing them more years to reduce the ash populations before the inevitable rise in tree mortality. The winter mortality we achieve in colder than average winter should be viewed as buying additional time rather than an excuse to stop managing the infestation. Homeowners should continue to treat their valuable ash trees; the city should continue their program of removals.

The average minimum winter temperature in Sioux Falls over the past century has been -23°F so we are seeing a slight warming of the average minimum. If the winters do become warmer, we may see fewer years with winters cold enough to significantly reduce the insect population and tree mortality will increase.

## E-samples

*Someone wants outside!*

We received this picture of a moth flying inside a house. They wanted to know what it was and how it got there.



This is a Polyphemus moth (*Antheraea polyphemus*). It is one of the larger moths found in our state and can have a 4 to 5-inch wingspan. The adults have brown wings with a large bluish eyespot on each hind wing. The larvae are also large, cylindrical caterpillars with long hairs. The caterpillars feed on the foliage of hardwood trees but rarely are numerous enough to cause extensive defoliation.

The insect overwinters as a pupa in a large silk cocoon that is attached to a twig. Most likely the cocoon fell in an outdoor planter that was brought into the house and the warmer temperatures caused the insect to wake up a little early.

## Samples received/site visits

Union County

**Is this emerald ash borer?**



I received a picture of a mature tree with blonding, this happens when woodpeckers in their search for insects remove the outer layer of bark exposing the lighter colored layer of bark beneath. This is one of the most common symptoms of an emerald ash borer infested tree, so is a cause for concern when found outside of Sioux Falls. Woodpeckers will blond bark on other tree species and occasionally will blond an ash during their search for our native ash borers (*Neoclytus accuminatus* and *N. caprea*). I was not even sure of the tree species from the picture, so it was worth a drive down to look at the tree.

When I arrived and walked into the backyard, the tree was blonded from the top to about 10 feet above the ground – bad news. Fortunately, it was an American elm – good news. The dying elm was infested with the elm borer (*Saperda tridentata*). This is a native long-horned beetle

attacking its native host, so it is generally restricted to attacking trees already declining.

The adults cut niches in the bark crevices during the summer to lay eggs. After the eggs hatch, the larvae tunnel into the outer corky layer of bark and feed in this tissue for awhile before moving into the inner bark. They feed in this phloem tissue until fall then overwinter in their galleries. Once the weather warms in the spring they burrow in the sapwood to form pupae. The adults emerge from round holes in late spring.



The larvae are about 1-inch long at maturity and are legless. They have a swollen thorax (the area behind the head capsule), round segments and lack large pinchers at the end of the abdomen. These features separate them from emerald ash borer which lacks a swollen thorax, has bell-shaped segments and two large pinchers at the end of the abdomen.

However, since both insects feed just beneath the bark, they are accessible to woodpeckers and apparently tasty.

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This publication made possible through a grant from the USDA Forest Service.