Pest Update (November 4-11, 2020)

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Note: samples containing living tissue may only be accepted from South Dakota. Please do not send samples of plants or insects from other states. If you live outside of South Dakota and have a question, 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 as 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.

Plant development for the growing season

We are still experiencing seasonal temperature fluctuation with sunny days in the 60s to snowy night in the single digits – a typical South Dakota late autumn. An annual event at this time of year is the harvesting of the Capitol Christmas tree. This year it was an Engelmann spruce (*Picea engelmannii*) from Onida. Yes, Onida. How a perfectly formed Engelmann spruce managed to grow in this prairie community is a Christmas miracle.

The backstory is the tree was brought in from Colorado in the 1970s. The owner was impressed by the appearance of these mountain trees. This western species is close in appearance to Colorado (blue) spruce (*P. pungens*) but the foliage is glaucous blue and the cones look different, more of tapered toothed scale than the blunt tooth of the Colorado spruce.

The tree was beautiful but had outgrown its location, so the current owner offered it as the Capitol Christmas tree. The tree was about 45 feet tall, 2 feet in diameter at the base, about 6,000 pounds and 46 years old. It will make an attractive tree for the Capitol this season. Time to start thinking about your Christmas tree.

Timely Topics

A Christmas tree lot will be a common sight by next week.

Real or Plastic? Christmas tree lots are already beginning to spring up around the state. Thanksgiving marks the start of the Christmas tree season with more than 30 million natural trees being sold between Thanksgiving and Christmas. Another 60 million homes use artificial trees either for convenience or environmental concerns.

However, the natural Christmas tree can be the environmentally friendly way to celebrate the holidays. Real Christmas trees can come as close as the nearest choose-and-cut while the journey to your home for artificial trees may starts in Asia. The real tree is made of wood (obviously), a renewable resource, while the artificial is plastic. And while you don't have to buy an artificial tree every year, artificial Christmas tree may have a life span of ten years before ending up in a landfill and will remain there for a

long, long time. The natural Christmas tree, while used for only one season, can become valuable mulch, a winter bird feeder, or even used as a fish habitat after the holidays.

Here are some tips on picking out the perfect real tree. The best way to obtain the freshest tree is to harvest it yourself at a nearby choose-and-cut Christmas tree farm or obtaining a Christmas tree permit from the Black Hills National Forest.

If cutting your own tree is not possible, here are some tips for checking freshness of a tree at a Christmas tree sales lot. First, give the tree a light, but vigorous, shake. If it is fresh, only a few interior needles should fall out of the tree. If a pile of brown needles appears on the ground after shaking, it is not a fresh tree. Next, reach into a branch and pull the needles *gently* through your hand as you move out towards the tip.

The needles should bend, not break, as your fingers run across them; the branch should only slightly bend to the touch. If the needles break off completely this is another indicator that the tree has already dried out too much. Likewise, if the branch does not bend slightly but seem more like a wooden stick, the tree has already dried out and is not worth buying

The stand should hold at least a half-gallon of water and the tree

Once you get the tree home, leave it outside in the shade while you set the stand up indoors. The choice of a stand is probably the most critical factor in maintaining the freshness of the tree once in the home. The stand should be able to hold one-half to one gallon of water as the new tree may absorb this much water on the first day. A good rule-of-thumb is a tree will use 1 quart of water per day for every inch trunk diameter at the base. If you have a tree with a 3-inch base, it may use 3 quarts per day.

Just before you bring the tree in the house, cut the base between a half and one inch from the bottom. This will open the sap-filled pores that transport water through the tree. The base cut does not have to be slanted. The angle makes little difference in the amount of water absorbed, so cutting perpendicular to the trunk is fine. Do not drill holes into the trunk or whittle the trunk smaller, neither will improve water uptake.

Also brush off any debris or dirt on the base before placing it in the stand. And start out with a clean stand. Wash it with a solution of about a capful of bleach to a cup of water, rinse and let it dry before using. A clean stand does not increase the life of the tree but does eliminate the mushy odor from an old, dirty stand.

Once the tree is in the stand, add water and then *never* let the stand become empty. If the stand becomes empty for more than six to eight hours, the tree's pores plug up again. Water uptake will be significantly reduced, the tree will dry out sooner than expected and the needles will soon begin to fall. If the tree stand does dry up for half a day or more there is nothing that can be done other than pull the tree out of the stand and recut the base – not a pleasant task once the lights and ornaments are already up.

Nothing needs to be added to the water in the stand to improve needle retention. The commercial "tree fresher" products do not significantly increase the life of the tree. The home remedies such as aspirin, sugar, soft drinks, and vodka do not work and may be harmful to pets (or partiers) that may drink from the stand.

Place the tree in a spot that receives only indirect light from the windows and not near any heat duct, fireplace, or your attempt to deep fry the turkey. Also keep the house at 40% humidity or higher, as lower will dry out the tree faster. And use lights that emit less heat, such as the LED (light-emitting diode) Christmas lights. This will reduce water loss from the tree and prolong its freshness.

What do you want from a real Christmas tree? There are three main qualities, 1) pleasant fragrance (we all love the Christmas tree smell), 2) stiff branches to hold all those ornaments, and 3) long needle retention so we do not have a "Charlie Brown tree" before Christmas.

Which is the best tree? Each species has its good points, but the Fraser fir (pictured to the left) is probably one of the top favorites. The tree has a very pleasant fragrance, excellent needle retention - they will last the entire holiday season - and the branches are stiff enough to hold most ornaments (however, if heavy ornaments are to be placed on the tree go with a spruce). The bright green needles are white on the underside and this makes a very attractive display.

Balsam fir is another good choice though the needles do not last quite as long, and the branches are not as stiff. Canaan fir is like Frasier fir, and it is another popular Christmas tree.

Pines are very popular as trees with Scotch pine, pictured to the left, probably the most popular Christmas tree in the country. It has a pleasant fragrance; excellent needle retention and the branches are stiff enough to hold heavy ornaments.

Eastern white pine is another pine commonly sold at Christmas tree lots. The needle retention is not quite as good as Scotch pine, and the branches are very flexible, meaning heavy ornaments may fall off. White pines do have very soft needles and if you are going to run into the Christmas tree in the middle of the night, this is the softest one!

Spruces are not as popular of Christmas trees due to their relatively poor needle retention. If you want to have a Colorado blue spruce as your Christmas tree, you probably should wait until a couple of weeks before Christmas to set it up. The needles may only last that long. Once the needles begin to fall, blue spruce are about the worst tree in the house as the fallen needles are sharp and seem to find their way into socks and slippers. The branches are very stiff, however, and can support the heaviest ornaments. On a positive note – cats do not seem to like to climb blue spruce trees!

White spruce, or Black Hills spruce is not a commonly available Christmas tree at lots though it can be cut from the National Forest (with a permit). It does make a nice tree, particularly when cut fresh, though needle retention is poor. The tree also does not have much of a fragrance and occasionally Black Hills spruce trees can produce a slight musky odor when the foliage is bruised.

Emerald ash borer development

The insect development survey found that almost all the larvae in their 4th instar and were curled in their winter cell. The curled shape is described as J-shaped. These larvae have completed their feeding, cut a tunnel up to the bark (which the adult s use to emerge next spring) and now are ready to survive the winter in a cell cut into the wood.

The insulation of the bark and the sapwood allows the overwintering larvae to survive our cold winter temperatures. While we do see significant winter mortality when the temperature dip in the -20sF, this only slows the population expansion of the insect the following year, not eliminate them.

Pine mortality across central South Dakota

We have been investigating the widespread discoloration and decline of pines in central South Dakota this year. The calls came in this summer, almost at once, and were across the region (including southcentral North Dakota). People reported their mature pines were dying and the needles were either turning color or falling. Pines presented with loss of the current needles on many shoots and often the terminal buds had not expanded but turned dry and hard.

Usually when symptoms appear at once, and across a wide area, a causal agent is abiotic and typically weather related. The North Dakota Forest Service has been investigated the problem as well and here is our opinion on what caused this widespread and sudden discoloration and decline.

The key to the decline appears to be the above-average precipitation that fell during 2019. The wet soils may have killed roots, especially the fine roots critical to water and nutrient absorption. While trees require water, wet soils have less oxygen moving into the ground, and poor gas exchange can result in root mortality. The soils do not have to be flooded, but just wet for a long period.

Mobridge receives about 17 inches of annual precipitation with about seven inches falling between the beginning of July to the end of October. Last year more than 14 inches fell during this same period. The soils did not freeze as quickly last year as this same region experienced above-normal autumn snow fall, with Mobridge receiving more than six inches in just one day. The combination of wet soils insulated by snow may have also contributed to delayed hardening of the roots.

Trees that experience root mortality due to wet soils are more susceptible to drought injury. The spring and early summer of 2020 was drier than average, almost a mirror image of the precipitation pattern the previous year. The reduced root system was not able to support the water needs of the entire canopy.

While the discoloration and decline was widespread, it was not uniform, not even within the same windbreak. Some belts would have a few trees here and there that had died, while others it was almost the entire belt. In some belts the ponderosa pines were fine, but the Scotch pines were affected. Many of the affected trees were in low areas but some were on slopes. However, the problem was wet soils, not saturated soils, so the problem is not confined to depressions.

There are also discolored or dying trees surrounded by healthy trees. Why only one tree? No one knows. It may be differences in genetics, but it could also be slight difference in the soil. We saw the reverse of this about five years ago where only a few junipers (cedars) were alive in a row killed by drought. The live ones were on just a slightly different soil texture – maybe enough to make a difference in survival.

My most recent inspection of the tree decline in the northcentral part of the state found that the discoloration and decline that I saw in earlier this summer had not spread. The trees that were affected are still presenting the same symptoms, though some are slowly recovering but the symptoms are not spreading to adjacent trees.

A sampling of the roots of the affected pines showed many of the small roots were dead. The branches of the same trees were green beneath the bark earlier in the season. Now these same branches were also dead. This pattern where the roots appeared to die first, followed by the branches, is an indication that the problem started underground.

Dothistroma and diplodia were and still are serious problem in the region. There are many ponderosa pine windbreak in this region that are severely affected by diplodia. However, it may be that root decline may have been the stress that permitted these diseases to flourish this year.

E-samples

Acorn weevils

A person had gathered acorns to plant next spring and noticed many were infested with "worms." These are the larvae of the acorn weevil (*Cucrulio*). The adults laid eggs in the developing nut. The larvae feed on the acorns while the fruit is still attached to the tree and continue munching away after the acorns fall to the ground (the insect pupates in the soil). It is very common to find most acorns beneath a bur oak infested with these small weevils. One reason many of the acorns beneath an oak have holes in them (and worms inside) is the squirrels are good at separating out the wormy acorns and caching the good ones.

Black knot on chokecherry

The black swollen galls that form on the cherry branches are in sharp contrast to the snow. A reader noticed these along a hiking trail and wondered what they were. These are the fruiting bodies for the fungal disease known as black knot (*Apiosporina morbosa*). This is a common disease of plums and cherries throughout South Dakota and most of the country.

The "knots" are the main symptom to the disease but the initial infection is hardly noticeable. It starts as a small, light green swelling along the new shoots. This is the first year infection. The swellings enlarge and become olive-green and eventually hard, blackened knots. These knots can coalesce to form large, fist-size galls. The galls are attractive to borers and plum borers can be found burrowing through them. The borer and the knots can kills the branch distal to the infection.

Borers in firewood

Insects in firewood are a common question as we go into winter. People stack firewood in their homes to avoid a long carry and are often surprised they carried some unwanted guest in with the wood. This was silver maple that was cut more than a year ago and stacked as firewood. They just noticed some holes appearing in the bark and tunnels beneath the bark and wondered what was the cause.

There are many insects that will live in firewood. They are not attracted to firewood to lay their eggs (with a few exceptions) but attack dead or dying trees. Once the eggs hatch the larvae begin to burrow into the wood. If the tree is cut down and

turned into firewood the larvae burrowing inside can continue to chew away in the cut and split wood. These wood borers can survive for more than a year inside the firewood, cutting meandering oval-shaped tunnels in the firewood.

The most common group of insects to live this way are the long-horned beetles (Cerambycidae). Sawyer beetles and horntails are two, either the pine sawyer beetle in pine firewood or the pigeon tremex, a horntail found in ash, elm, and maple. The adults leave a round exit holes, about 1/4 inch in diameter, the size of a No. #2 pencil. The pictures show horntail exit holes and tunnels.

The best way to keep the adults from emerging and flying about the house is to only bring in enough firewood to burn that day or evening. Even a few days of warmth may be sufficient for few adults to start emerging. This also goes for storing firewood in the basement or heated garage.

Burn the oldest wood first and try not to carry firewood over from year to year. After a year or so, infested wood can become degraded by the network of tunnel and decay from the boring insects. It is best to burn it the year it was cut to retain the heat value.

Finally, another insect, the emerald ash borer can also be transported in ash firewood so avoid moving ash firewood in from distant locations and no firewood, regardless of the hardwood species, can be moved out of Lincoln, Minnehaha, or Turner Counties. Out West, the pine engraver beetle is attracted to freshly cut pine so do not stack freshly cut pine logs between pine trees – oddly a common practice out in the Black Hills – as the insects can soon move from the logs to the trees.

Vine identification

I had a question about a vine found growing on some bur oak trees near Timber Lake. This is American bittersweet (*Celastrus scandens*), a vine native to much of the state, though I find it more often West River than East. The vine is best known for its colorful winter fruit, yellow-orange, with crimson seeds. It is often collected and sold for use in seasonal flower arrangements. The gathering of the fruit from this native vine was so prevalent in the 1930s, that N.E. Hansen, the head of our

Horticulture Department back in the 30s and famous plant explorer, was concerned that it might disappear in the forests and woody draws.

Samples received/Site visit

Brookings County **Bumps on the wreath needles**

The bumps are caused by the balsam gall midge (*Paradiplosis tumifex*), a small fly native to eastern North America. The larvae cause a gall to form around it as it feeds in the current year's needles. These usually drop out of the needles at this time of year and survive in the soil during the winter.

The insect is not going to be a major problem in our state. We do not have many balsam or Frasier firs in our state. However, infested trees can lose many of their needles and we might find the infested wreaths loss their foliage a little sooner during the holiday season.

Custer County **Bumps on pine needles**

The bumps are aphid (*Cinara*) eggs. These are from the giant aphids discussed in the October 7-14 Update. They are large, long-legged aphids that almost look spider-like. The aphids are large enough that they are noticeable in young trees as they feed in groups on the foliage. They have now laid eggs on the pine needles and the eggs are large as well. You can easily see these shiny dark eggs lining end to end on the tips of the needles.

The trees with the eggs are also covered with honeydew. This is a sticky, sugary substance that the aphid secretes as they suck the sap from the tree. This rains down from and through the tree and some large pines in the Black Hills are almost glistening from the coating.

The sugary substance is a good medium for growing fungus and bacteria. One, sooty mold, is commonly found living on and from this film and they turn the surface into an almost black, powdery substance.

Hutchinson County **Colorado spruce is losing its needles**

The sample had signs of two common spruce pests, the spruce needleminer and the spruce spider mite. The needleminer tunnels into the current year's needles during late summer and by autumn is too large to fit so emerges and lives within a spun web of detached needles. The spruce spider mite causes bronzing and stippling on the needles as they feed from their piecing-sucking mouthparts.

The treatment windows have passed as the pests are dormant. Next spring about the time silver maples begin to leaf out, apply a high pressure stream of water through the young tree and the lower branches of the mature one. This will dislodge the spruce needleminer and spider mites and is often the only treatment needed.

Minnehaha County **Browning and wilting Scotch pine**

Sioux Falls is not only enduring an emerald ash borer epidemic that is slowing killing the untreated ash in the community, but also the loss of their Scotch pine to pine wilt disease. In the former it's an introduced pest attacking native trees. In the latter, it is a native pest attacking an introduced tree.

The nematode responsible for pine wilt disease is native to the United States and our native pines have moderate to high resistance to the disease. However, the disease is fatal to our introduced pines, Austrian and Scotch. The disease moves quickly in its host. The tree appears fine in the spring, but by the end of the growing season the tree is covered with hanging, brown needles. The infected tree is bone-dry and the twigs and branches snap rather than bend. The tree is merely a stick by the following spring.

The best treatment is to remove the dying trees and destroy the wood before April 1. The reason for this deadline is the sawyer beetles that carry the nematode from the dead trees to nearby live trees begins emerging at about that time.

Minnehaha County **Defoliation of lilacs**

We saw an increase in report of bacterial blight (Pseudomonas) on lilacs this past year, but this was not the only disease problem. Leaf spot diseases, pseudocercospora and septoria among others, caused discoloration and defoliation of common lilac in a few spots in southeast part of the state during late summer. The disease requires warm, humid conditions to flourish, and much of state was dry this year, but we did have a few spots that had summer rains.

The symptoms of these fungal diseases differ from bacterial blight in that only the foliage is affected. Usually lilacs infected with the bacterial blight will present with blackened shoots that curl at the tip. The leaf symptoms also differ. Bacterial blight causes the leaves to wilt and blacken, while leaf spot disease present as brown spots starting at the margins and progressing to blotches.

This leaf spot diseases are not a threat to otherwise healthy shrubs. Lilacs can withstand a year of defoliation, so no control is necessary. The diseases are not likely to reappear next year so no need for spring preventative fungicide sprays.

Reviewed by Master Gardeners Dawnee Lebeau, Carrie Moore, and Bess Pallares

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