Pest Update (March 10-17, 2008)

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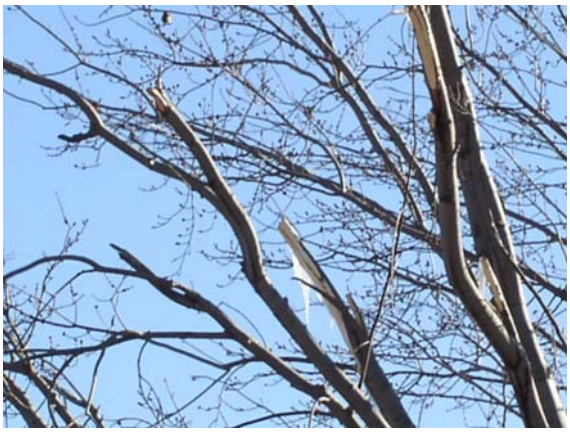
Making maple syrup

I always have a few calls once the weather begins to warm on how to tap a maple tree for syrup. People notice those "frozen waterfalls – called "sapicles" – from fresh wounds on maples and think about tapping the tree. The season is just about upon us in South Dakota as the sap begins to run when the day temperatures are above 40^{o}Fs and the nights below 20^{o}Fs and the soils are moist. Maple syrup producers in neighboring Minnesota began tapping this last week with some already obtaining more than 600 gallons of sap – about two gallons per tap for the week.



We don't have maple syrup producers in South Dakota due to the rarity of sugar or black maple stands of sufficient size to warrant the effort but you still can produce syrup from the maple trees in your yard. The best way

to tap your yard tree is to cut ½ inch diameter hollow copper tubing into 3-inch lengths. Drill a hole of equal diameter about 2 inches into the tree, slanted slightly upward as you drill, this allows for better flow, and tap the tubing about 1 ½ inch into the hole. The hole should be placed about 3 to 5 feet above the ground and the number of taps that can be placed into a tree is based upon the tree's diameter. A 10-inch diameter tree (diameter measured 4.5 feet above the ground) can have a single tap; a 20-inch diameter tree 2 taps. Do not place taps in a tree less than 10-inches in diameter and do not tap trees that have cavities, hollows or other indicators of decay.

Place a one-gallon bucket beneath the tap. You'll probably have to hang the bucket from a nail and put a cover over most of the bucket to reduce debris from collecting in the sap (but be sure the sap can drip into the bucket). Once the sap begins to flow it may continue to so for anywhere from two to six weeks. The early season's sap is light and low in sugars. As the season progresses the sap becomes dark and sweet. The season ends when the buds are beginning to expand as the sap become cloudy and less sweet as well as an off-flavor. Once the season is over, remove the tap from the tree. Do not place anything into the hole and do not use the same hole or drill one directly above or below it the following year.

During the sap run a single tap may produce anywhere from 1/4 to 1 gallon of sap per day. If the tree is a sugar maple the sap may be anywhere from 2 to 6 percent sugar. It is typically much less for other maple species. The general rule for syrup is a ratio of 35 to 1 for sugar maple, meaning 35 gallons of sap will boil down to 1 gallon of syrup. Silver maples it may be more 40 or 50 to 1 (though there are silver maples with as sweet of sap as sugar maples in South Dakota). Boxelder, a tree that many do not realize is a maple, has an 80 to 1 ratio, not too good but sweet enough that the Lakota use to tap these trees for the sugar.

Most folks are not going to obtain enough sap from their yard trees to make syrup and boiling it down is not an easy task. The best use for the sap may be for your coffee or cooking. The raw sap can be kept for several days in the refrigerator. I like to use it for my coffee water in the morning. The raw sap adds just enough sweetness for my taste and even gives a slight maple flavor to the coffee (and it's another excuse to drink a gallon of coffee a day).

Also if you see a maple or birch "bleeding" from a recent pruning cut. Don't worry; the sap flow will not hinder the tree's ability to protect the wound. Do not paint the cut or apply wound dressing. If you are one of those people that faint at the sight of sap, prune maples and birch in late summer, as wounds at that tree will not results in sap flow.

Emerald ash borer update

I had a request from one of the Conservation Districts for an update on the emerald ash borer (EAB). Unfortunately the news is not good. The beetle is continuously being discovered in areas far from the Detroit epicenter

The emerald ash borer is a metallic wood-boring insect native to northeastern Asia and found in China, Japan, Korea, Mongolia, and Russia. The insect, as the name implies, infests ash trees, members of the genus *Fraxinus* (and only ash, not the mountainash in the genus *Sorbus*). The insect was not widely known, even in its homeland, until recently as the borer is not regarded as a serious pest in Asia, at least on its native ash species. The borer at home typically infests declining ash trees, those that are already dying from other stresses or old age. The beetle just hastens the dying process, similar to the function of many other forest insects and served the same purpose, killing already dying trees. The emerald ash borer was just a native insect, attacking dying trees, no cause for concern. That was until the insect moved to this country and tens of millions of otherwise healthy ash began to die.

The summer of 2002 some people in southeastern Michigan noticed that there were some pockets of dead and dying ash. Dead and dying ash trees are not an unusual sight anywhere as the tree has a number of common stressors including our native ash borer. But someone thought there were a few more dead trees than expected and the pockets of dying trees seemed to be expanding. Once the trees were examined a little closer they found something alarming. Along the trunk were small D-shaped holes, evidence of an emerging insect. Only problem was that there was only one other insect in the United States that make D-shaped exit holes on ash trees and this was not it; this must be a new insect.

After this new insect was discovered it took some time and effort by entomologists on several continents, to properly identify the beetle as a member of the genus *Agrilus*, insects that live by boring into the inner bark of trees. There are a number of *Agrilus* native to the United States. Even within the borders of our state there are more than 15 species of *Agrilus* such as the bronze birch borer (*A. anxius*) that attack birch and the twolined chestnut borer (*A. bilineatus*) that attacks oak trees. Generally these insects attack stressed or dying trees so while a nuisance, particularly if the dying birch or oak is your yard tree, are not a threat to the survival of these trees in our state. The emerald ash borer arrived in North America without its natural enemies, other organisms that keep the population in check, and ash species that never have been attacked by *Agrilus* insect, hence no natural defenses. The beetle that was a minor nuisance in Asia became the most serious threat that our forests have experienced since Dutch elm disease.

The emerald ash borer arrived in southeastern Michigan sometime in the 1990s, the exact date and circumstances are unknown but it likely came in as larvae burrowed inside ash wood used as dunnage – wood to hold cargo in place – from a shipment of material from Asia. The larvae matured in this discarded packing wood, became pupae then adults that flew off to attack new living hosts. Freed of their natural enemies and attacking ash trees that had no natural defenses, the population quickly expanded and now, more than 10 years later, more than 25 million trees have been killed in the Great Lakes region. Communities where ash was a common street tree now are bare. Park campground and picnic areas, once sheltered beneath mature ash trees are now exposed to the hot, bright summer sun.

If the loss of ash trees in southeastern Michigan is not a serious enough, the fact that this insect is moving should be a cause for concern. The insect is now found in numerous locations throughout the Lower Peninsula of the state as well as a few locations in the Upper Peninsula. It is now found in Illinois (2006), Indiana (2004), Maryland (2003), Ohio(2003), Pennsylvania (2007), Virginia (2003) and West Virginia (2007) in this country as well southern Ontario (2003). Everywhere the insect has been discovered, it is usually noticed several years after the initial infestation and often too late to eliminate the pest. Once found, generally all ash, visibly infested or not, are removed from within a ½ mile radius of the detected infested tree, to slow the spread a process that can cost hundreds of thousands of dollars as well as leave a more open, stark landscape.

How did this insect move so far so fast? It is a poor flier, perhaps traveling as much as five miles in a lifetime, but more often never moving more than several hundred yards from its birthplace. Many of the first pockets of infestation discovered outside of southeastern Michigan were associated with summer homes or campgrounds. What was the connection? Often the primary suspect for an infestation is an earlier importation of infested firewood, though a few of the earlier detected infestations could be traced back to shipments of infested nursery stock.

The adults attack living tree, in fact they require a living host to lay their eggs. The adults are flying during the summer months and once a suitable host is found the eggs are laid on the bark. The eggs hatch in a couple of week and the new larva burrows into the inner bark, the phloem tissue, rich in food, and begins to feed. The tunnels created as hundreds of larvae feed within the tree severs the transportation between the roots and the leaves so the food manufactured by the leaves no longer moves to the roots. As the roots starve, less water is moved to the leaves and the tree dies, usually several years after the first attack. The larvae feed for a year or two while the tree declines, then pupates in the spring emerging shortly as adults from D-shaped holes in the summer, often after the host has died.

If a dying ash tree is cut down during the winter or spring, it may be filled with emerald ash borer larvae that can survive in the firewood only to emerge later the following summer as adults. If the dead or dying tree is cut into firewood and then transported to another location, the emerging adults will quickly find new hosts and an infestation

begins, unfortunately a process that has already allowed this insect to expand its range in the United States.

Many states, South Dakota among them, have begun to implement an awareness program regarding emerald ash borer to prevent the importation of the beetle in firewood. There are already controls to prevent the movement of the beetle in infested ash trees from nurseries after finding that the beetle arrived in Maryland in 2003 from infested nursery trees shipped from Michigan. Now that the movement of infested ash trees has been stopped, the primary concern is the movement of firewood, either by dealers who sell firewood, across the nation or simply a vacationer who begins firewood from their home.

The threat of emerald ash borer is of particular concern to South Dakota. Our state is not known for its forest resources, outside of the Black Hills, but we have extensively planted green ash in our parks, communities and windbreaks as well as having native stands of this tree lining our streams and rivers. Many other states may potentially lose up to five percent of their forests to emerald ash borer, as ash represents only $1/20^{th}$ of their total cover. South Dakota may loss up to a third of our trees outside of the Black Hills, as ashes represent a significant percentage of our total tree cover. Ash is a fast-growing tree well adapted to the harsh growing environment of the Northern Plains and makes a fine shade or windbreak tree. Unfortunately too many were planted.

The strategy in South Dakota is to use the time before the arrival of the beetle to increase the diversity of our tree cover and plant other species, such as hackberries, oaks and maples among others, so that the loss of ash tree cover will not be as great a loss and also to delay the accidental introduction of this insect as long as possible. Another strategy is to discourage anyone from bringing ash firewood in the state. Signs are placed prominently in locations within parks to alert campers of the concern with bringing firewood into the state and request they dispose of it. Firewood from any state carries a risk as not all emerald ash borer infestation have been identified and it is possible that states outside the known range of the beetle already have infested trees. Emerald ash borer is not the only insect threat to our trees. There are a number of other insects, such as the sirex woodwasp, an insect from Europe, Asia and northern Africa that attacks pines, which are also not welcomed to our state.

Last, note, the group most responsible for finding new infestations is not foresters or entomologist but alert individuals who notice that there seems to be a pocket of dead and dying ash trees in the vicinity that cannot be explained by drought or other common stressor. The best means of detecting EAB is an educated public that reports unusual pockets of dead and dying ash to their local conservations district, extension or forestry office.