

# If Not Maples, Then What?

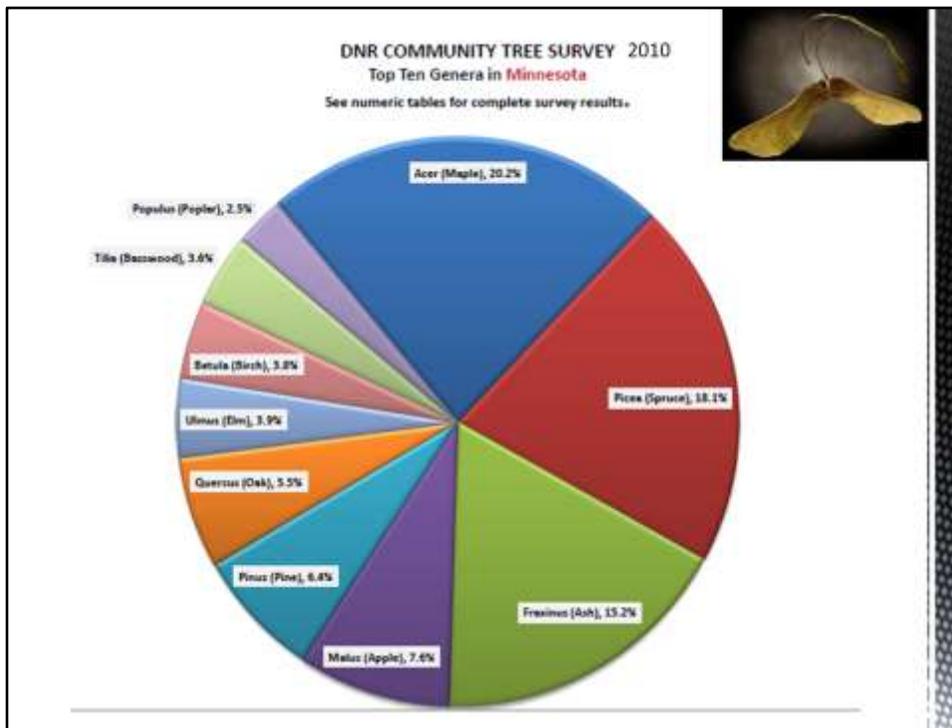
The Midwest Movement  
to Minimize Maples



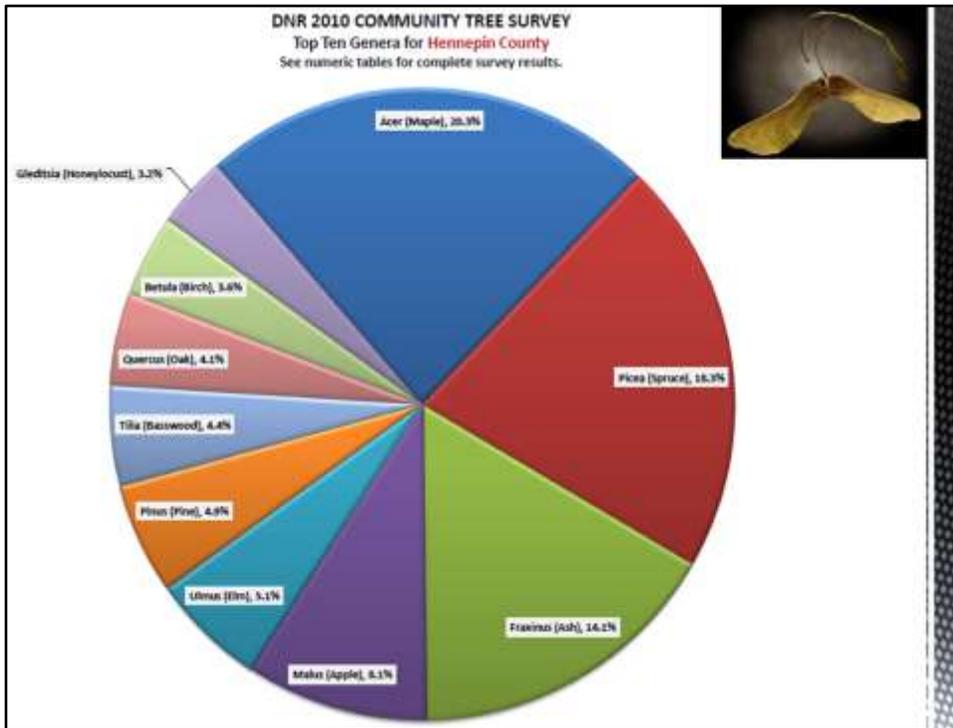
## Frequency of Maples In Minnesota's Urban Forests



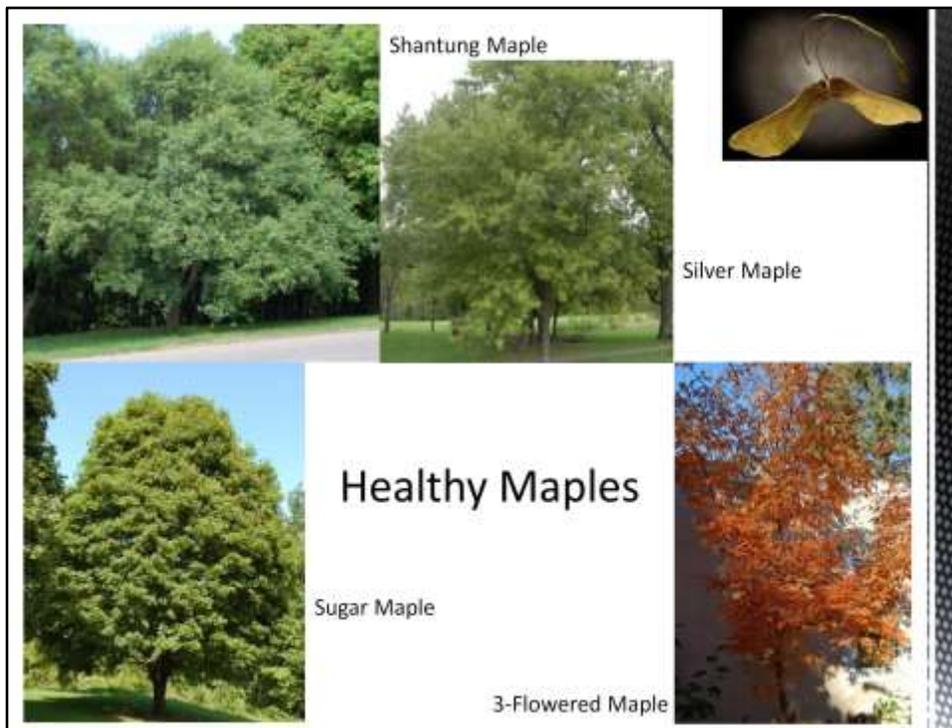
The genus *Acer* ranks as the most common genera in Minnesota's urban forests, according to 2010 rapid assessments conducted by the Minnesota Department of Natural Resources.



Acer makes up a little over 20% of all urban forest trees in Minnesota's 800+ communities, 5% more than Fraxinus (ash).



Hennepin County, the largest county in Minnesota, follows suit with almost the exact statewide average for Acer with 20.3% (compared to 20.2% statewide).



There are many healthy maples thriving in Minnesota's landscapes including these specimens. They are all characterized as growing in spaces appropriate for them, characteristically dense canopies, live crown ratios (LCR) of 60% or more (LCR is the % of the tree's height that contains photosynthetic material...leaves).



## The Maples People Buy

Unfortunately, this is how most people buy maples...are they red? Site requirements, size and predisposition to problems are rarely considered.

- *Acer negundo* – Boxelder (N)
- *A. saccharinum* – Silver Maple (N)
- *A. freemanii* – Freeman Maples (N)
- *A. saccharum* – Sugar Maple (N)
- *A. platanoides* – Norway Maple
- *A. rubrum* – Red Maple (N)
- *A. ginnala* – Amur Maple
- *A. tataricum* – Tatarian Maple
- *A. triflorum* – 3-Flowered Maple
- *A. saccharum* subsp. *nigra* – Black Maple (N)
- *A. campestre* – Hedge Maple
- *A. truncatum* – Shantung Maple
- *A. spicatum* – Mountain Maple (N)
- *A. palmatum* – Japanese Maple

N = Native to Minnesota



## Acer Species in Minnesota's Urban Forests

Note the variety of maples that are available and grow in Minnesota, at least southeast Minnesota. They range in size, site preferences and area of origin.

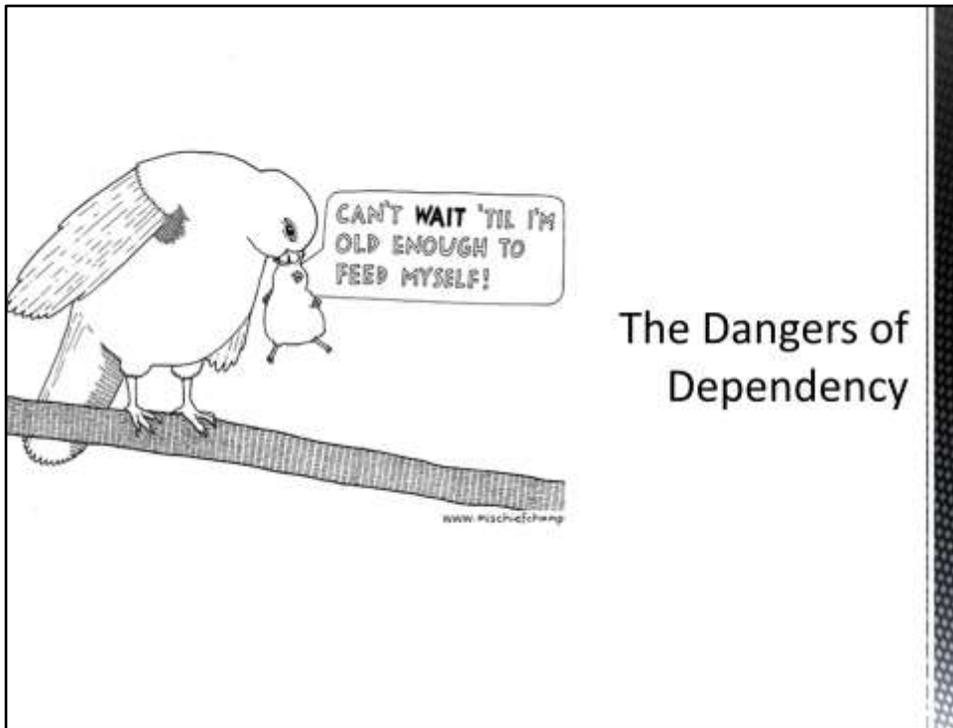


Species	pH	Water	O.M.
Boxelder	T	T	T
Silver	< 8.0	I	T
Freeman cultivars	6.5-8.0	I	T
Sugar	<7.5	S	S
Norway	<8.0	I	T
Red	<7.5	S	T
Amur	<8.0	T	T

S= Sensitive; T= Tolerant;  
I=Intermediate

### Site Requirements for Acer Species

These maples are the most commonly planted in Minnesota, with a brief review of their site requirements or tolerances.



Frank Santamour, the former director and plant geneticists at the National Arboretum warned communities decades ago of the dangers of depending on monocultured landscapes. Genetic diversity offers a significant degree of protection from pathogens and insect pests, since most of them tend to be host-specific, that is, they tend to prefer a single species or a limited number of species.

## Gypsy Moth...It's Here



Mid-summer  
Defoliation

Gypsy moth, a defoliating insect similar to Forest Tent Caterpillar, is in Minnesota. As with all insects, once they enter an area and begin breeding, they're here to stay. This scene taken in the middle of the summer is pretty typical for the damage and host range for gypsy moth.

## Gypsy Moth...It's Here:



*Tastiest:*

*Oaks, etc.*

*Second-Tastiest:*

*Maples, etc.*

Gypsy moths do have preferences for food, just as we do. They prefer a diet of oaks, but they are perfectly willing to move on to maples if they're nearby and the oaks have been defoliated.

# Asian Long-horned Beetle ...It's Near



ALB Control  
Tactic

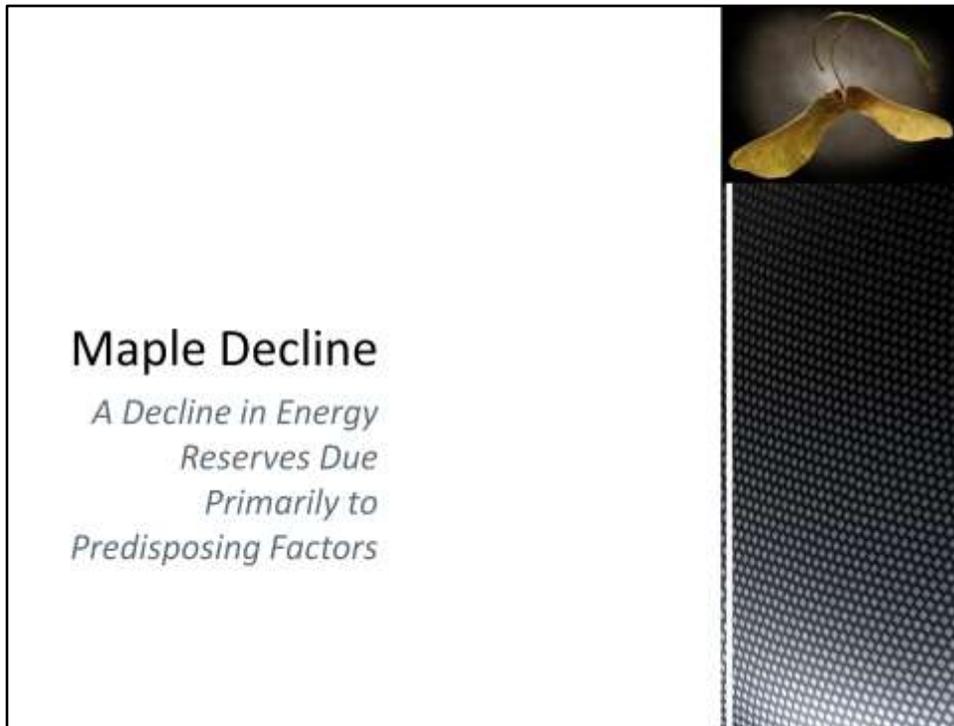
UGA1253007

Asian long-horned beetle (ALB) is near, as near as the Chicago area. There's really no reason to believe it won't eventually be in Minnesota since it's vectored (carried) by wood products, especially packing materials for large and heavy machinery, etc. In Chicago, this scene typifies the normal control tactic: removal. Wholesale removal.

# Asian Long-horned Beetle ...It's Near: *Tastiest: Maples, Elms, Willows*



The insect is a voracious feeder and as opposed to emerald ash borer, it structurally weakens the tree with its boring activities deep into the wood of branches and tree trunks.



Predisposing factors are those that are chronic (long-lasting, repeated) and decline the energy reserves of a plant. With declined energy reserves, plants are much more susceptible to normal stresses, tending to die easier and prematurely.



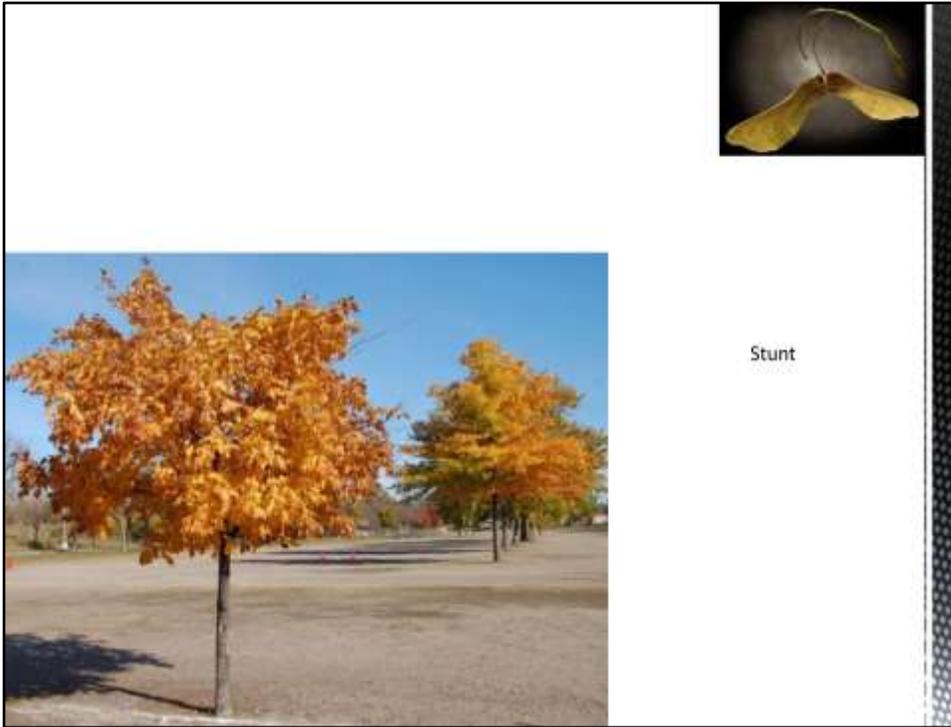
- Scorch
- Stunt
- Early Fall Color
- Early Leaf Drop
- Die Back
- Stag-heading
- Canopy Thinning/Clumping
- Abnormal Winter Injury

## Symptoms of Maple Decline

These are the common symptoms of maple decline, which are also symptoms for lots of other problems. So they're not very conclusive.



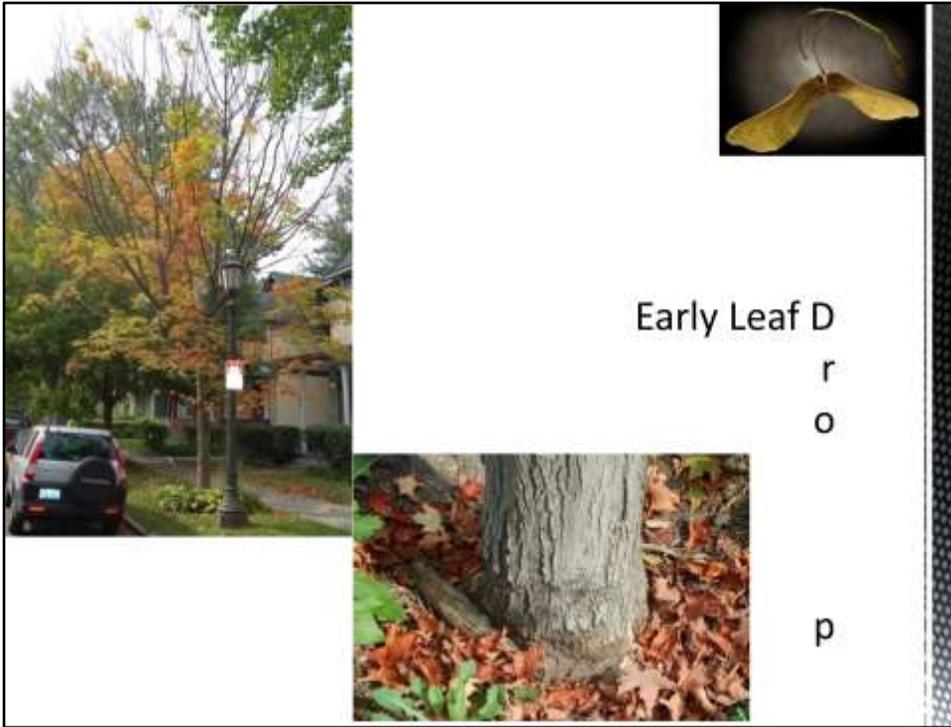
This could also just be drought or flood stress.



This could be due to nutrient-poor soils, so it, too, isn't conclusive for decline. Smaller than normal leaves, shorter than normal annual twig growth.



Early fall color could be due to water stress, either from chronic drought, deicing salts in the soil, stem girdling roots.



Early leaf drop could be due solely to drought or unrealistic expectations. However, that wouldn't explain why the other trees in this picture are still green and growing.



Die-back

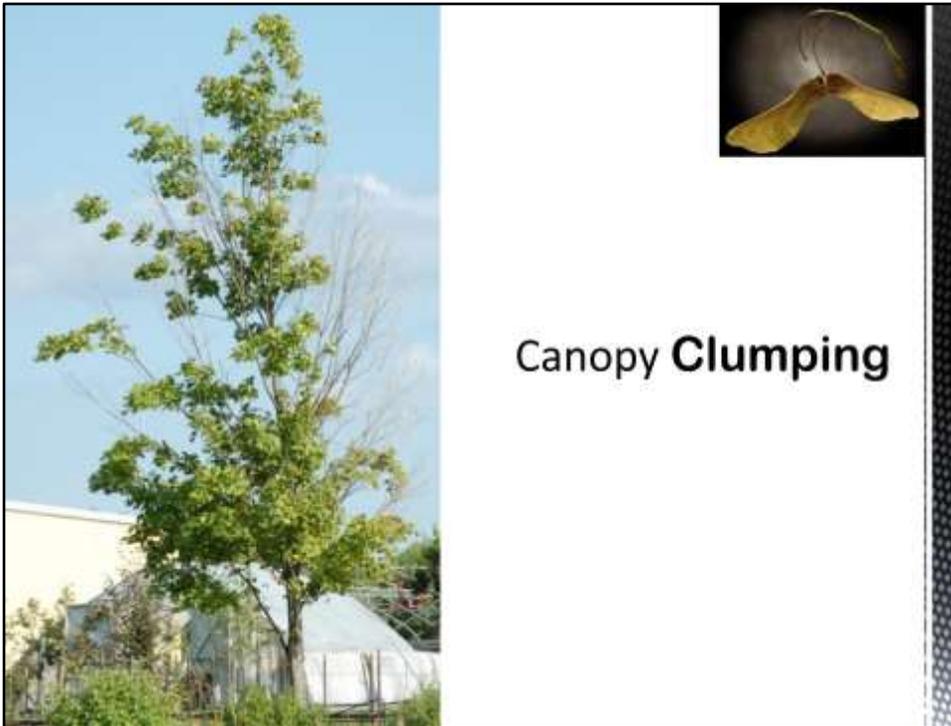
Die-back can also be due to a number of problems, including drought, hard winters, recent root injury.



Stag-heading is more serious. This means entire structural branches have died, and this is almost always due to extensive root damage/loss.



Canopy thinning is usually a tell-tale sign that the tree/s are reaching the end of their useful life. This is one of the later stages of decline. It's also a common transplant shock symptom, so it's not conclusive as the only symptom.



Clumped growth is typical for trees near the end, instead of normal leaf distribution. The point of all these confusing symptoms is that people tend to blame a tree's problem on one symptom, rather than perform a thorough diagnosis and determine what is predisposing that plant, setting it up for decline.



## Why Do They Fail?

- Poor Siting
- Buried Roots
- Stem Girdling Roots

These are a few, but a common few, reasons for maple decline in the Midwest.

## Poor Siting

- Alkaline Soil
- Deicing Salt
- Small Root Space
- Heat
- Drought



Sugar and red maples in particular are native to sites like this...



...not like this. These trees are subject to chemical pollution, drought-like conditions, messed-up soil, and unintentional vandalism (wounding).



Barely enough room for a weed to grow yet someone thought these were good sites for maples.



## Deeply Buried Roots

Buried root systems has become a very common problem for all trees, and maples (depending on species) can be very vulnerable and sensitive. It doesn't matter what the soil is like – clay, sand, loam – every extra inch of soil over the main order branch roots means less oxygen and moisture to support them.



All of these maples had been buried too deep at some point. The tree to the right had more than 15" of soil over its roots. Note that all trees lacked any trunk flare at the soil line.

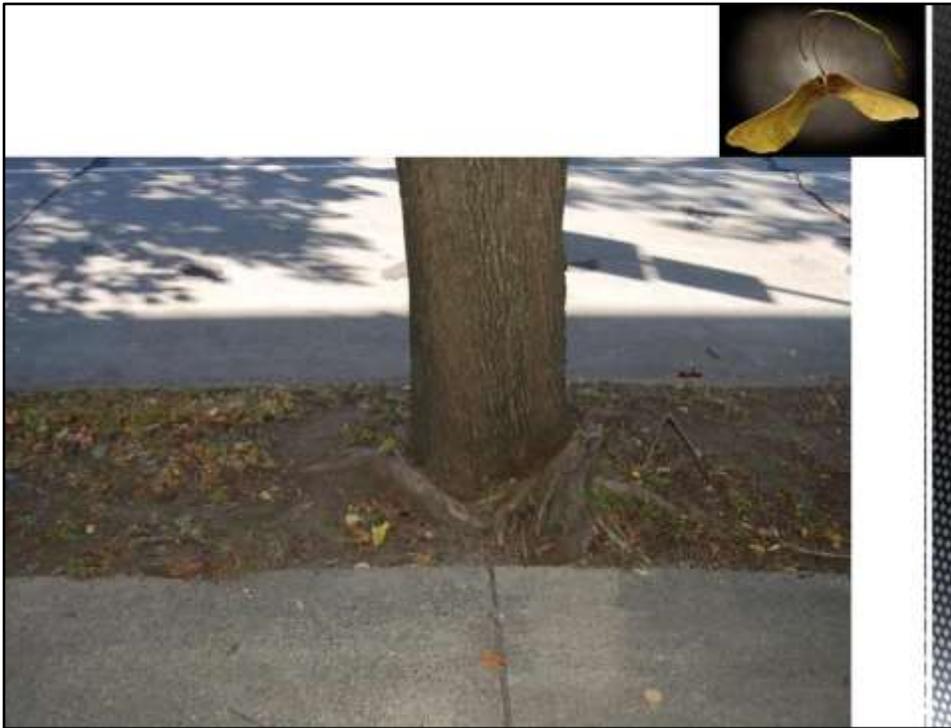


## Stem Girdling Roots

Stem girdling roots are associated with trees buried too deep, which means that trunks (stems) are buried too deep. As the roots grow against the buried stems and expand, they compress normal water and photosynthate movement, causing the tree to decline.



A maple with 100% of its trunk compressed (girdled) by surface roots; even more were girdling it below ground.



Same situation on another maple. These tend to cause most damage on trees 12-20 years after they were planted and are one of the primary reasons why these trees topple easier and more commonly in wind storms.



A root collar exam reveals the mess below ground of a deeply buried maple.

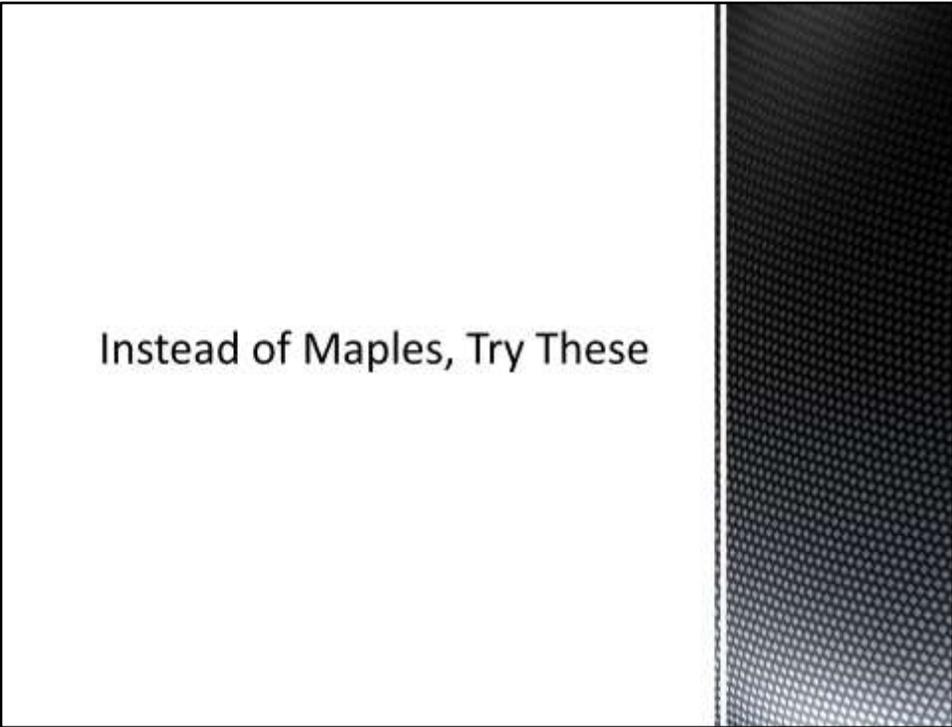


## The End Results

Decline if not corrected leads to premature death. A healthy maple, even a silver maple, should live more than 125 years, not the 10-35 years that is most common in landscapes!



The tree to the death finally died (less than 30 years old). The trees to the right are well on their way to an early death (less than 10 years in the ground).



## Instead of Maples, Try These

The following frames offer some options to maples in the landscape. Some are large, some are small, some are native, some are introduced...just like the maples used in Minnesota's urban forests. By the way, all are available in Minnesota. Not every nursery will carry them, but if they are the right tree, they can be purchased/ordered from nurseries in Minnesota.



Good tree for smaller landscapes due to its narrow spread. Good heat and drought resistance for a birch...note that it's a North Dakota State University release, so it deals with alkalinity, heat, wind, and drought better than other birches.



Amur maackia is a legume, so like other legume trees it performs better on hostile soils. The flower is okay, but the emerging foliage in the spring is beautiful, kind of a silver blue. It's a smaller tree, again, good for the small to medium landscape. The bark alone is worth a placement in a landscape.



Another smaller tree with a beautiful entrance into spring. Another legume to boot. The Minnesota strain is reliably hardy to southeast Minnesota.



A large legume, tough as nails, tolerates heat, drought, alkalinity. Nice autumn foliage. Dioecious, so a male variety is without the seed pods.



Hackberry  
*Celtis occidentalis*

Another large tree, often mistaken for elms. The berries are actually not bad to taste but are mostly taken up by seeds. Drought and wet soil tolerant, alkaline to acid soil tolerant, heat tolerant. Yellow to gold in the autumn.

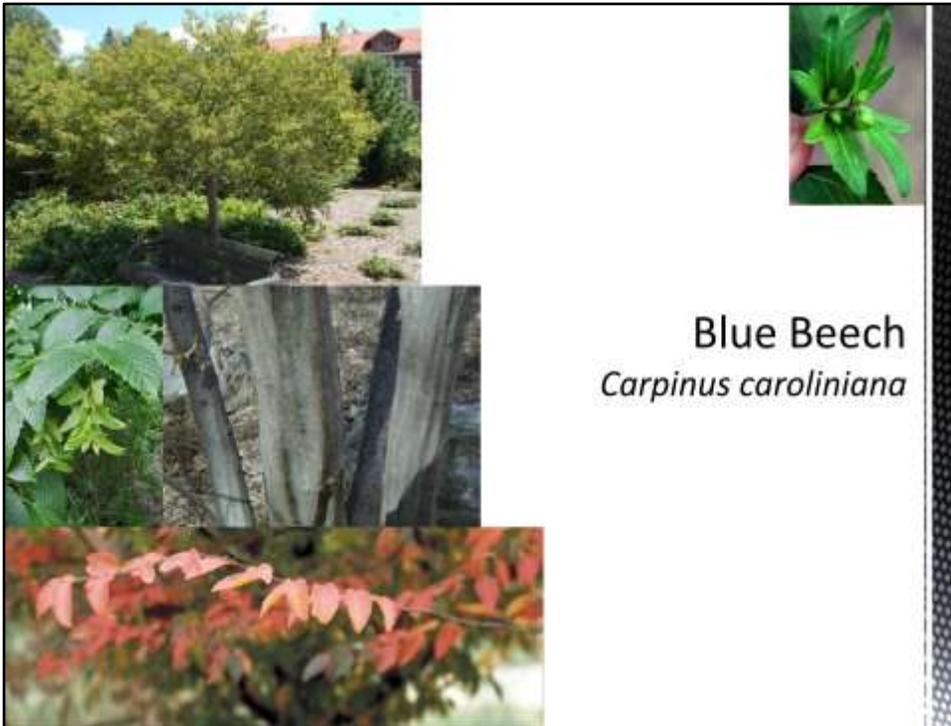


Photo Credit: Dave Hanson

Black alders are like the rest of the alders...tolerate regular as well as wet soils.  
Pyramidal shape, medium size, excellent tree for small to medium-sized landscape.



Great “junk-yard dog” tree. Another legume, compound leaf, tolerant of any soil thrown at them as well as deicing salt. Northern Acclaim is reliably hardy to zone 3, which is 3 zones hardier than I am.



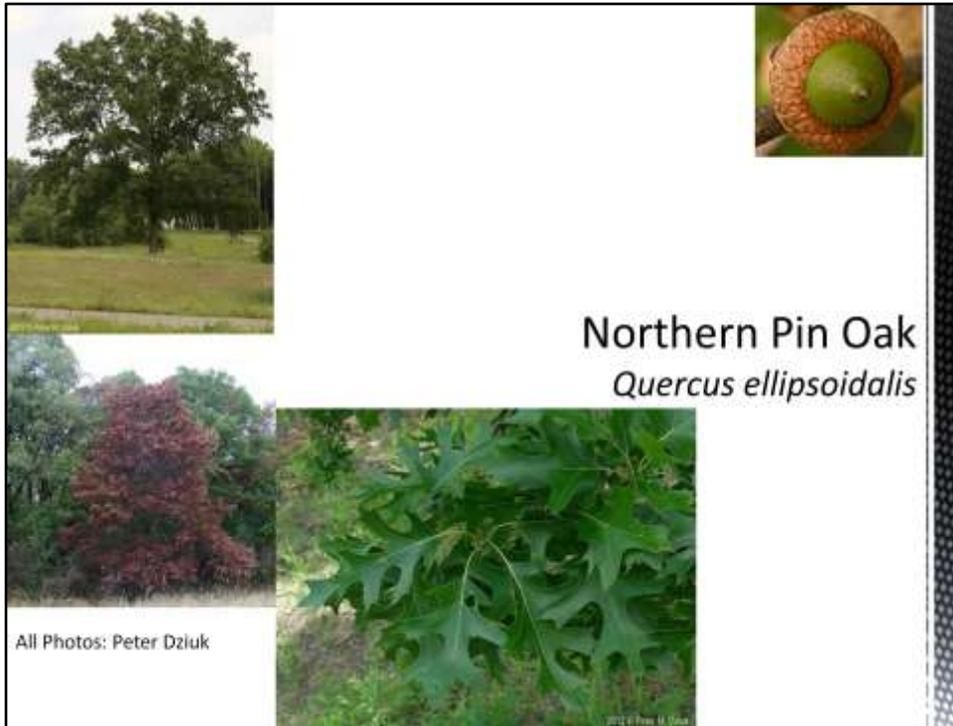
Sun, shade tolerant, alkaline soil tolerant. Small tree native to southeast Minnesota. Beautiful fall foliage.



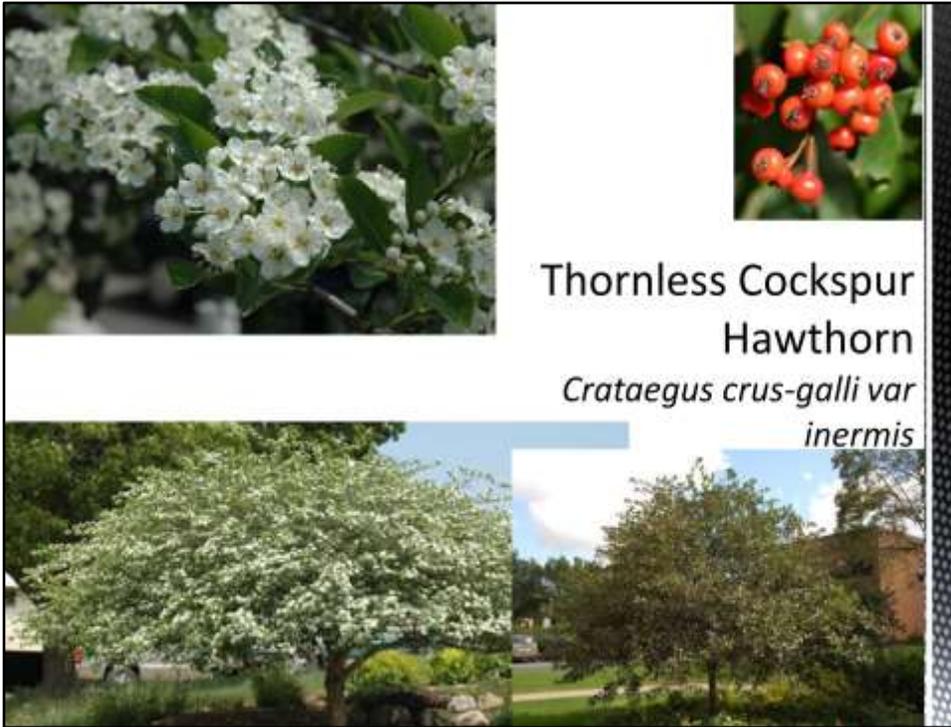
Once established in the landscape, it's hard to find a tree more heat and drought-tolerant than Turkish filbert. Reliably hardy to southeast Minnesota. Edible nut.



All of the larches do well in Minnesota...as long as they are in full sun. That's pretty much their only requirement. Absolutely gorgeous autumn foliage.



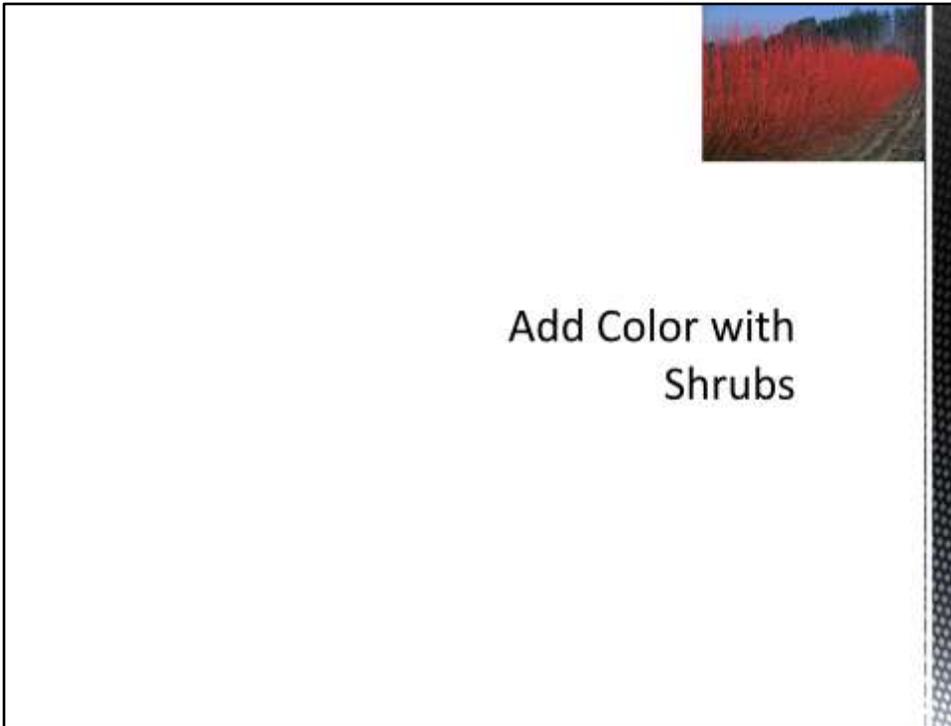
Absolutely wonderful oak for Minnesota's urban forests. Large, strong, good growth rate, beautiful autumn color (maroon). Stop worrying that oak wilt will kill these out if you plant one in your yard.



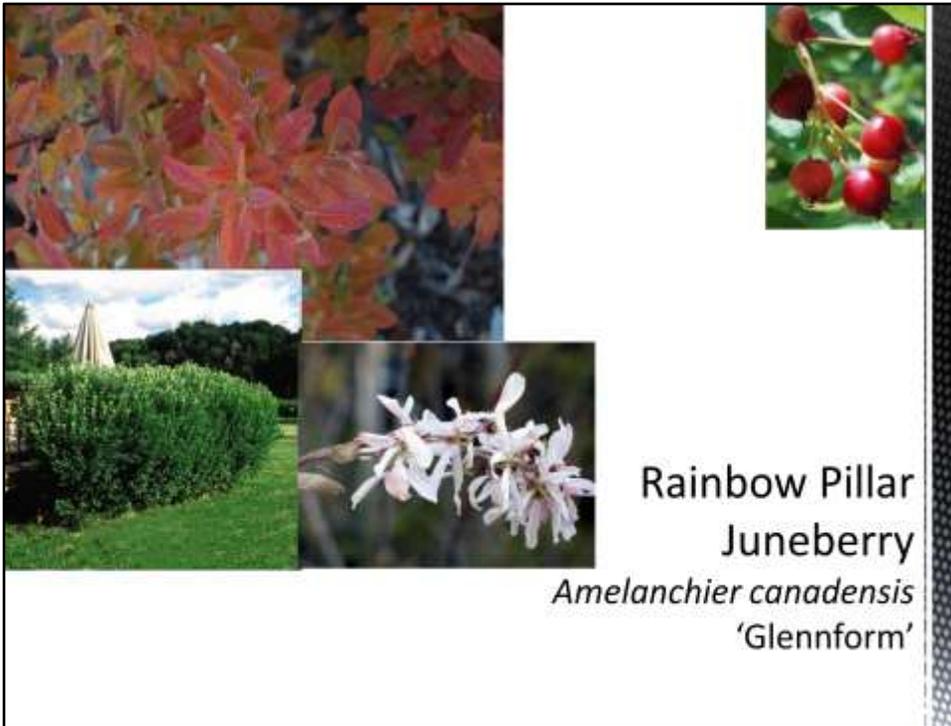
One of if not the best hawthorn for Minnesota. Get the thornless variety. Excellent flower show only surpassed by berries in the autumn/winter. If you like birds, plant this tree. Excellent choice for small to medium landscapes.



This is just one of the excellent elm varieties that have pretty good resistance to Dutch elm disease and deserve to be planted in landscapes...just not as much as American elm was planted a generation ago. Accolade, Triumph, Princeton, Valley Forge, Discovery, Frontier...look them up and see if one is right for your landscape.



If red is still the desired color, it can be provided in the shrub layer.



Juneberry does very well in Minnesota, and the variety Rainbow Pillar along with others gives that autumn red addition to the landscape...along with beautiful flowers in the spring...and tasty fruit in the summer.



A lot of people grow smoketree as a woody perennial. If you don't protect it, the rabbits will chew it to the ground in the winter. If planted too far north, it winter kills to the ground but then grows back 6-8 feet in the summer. Interesting, fuzzy-looking flower and seed head. There are a couple of varieties with purple leaves through the summer, yellow in the autumn.



Diabolo ninebark has dark red...okay, purple...leaves in the summer, red seed heads and there's hardly a landscape site that it won't thrive in. Give it as much sun as possible.



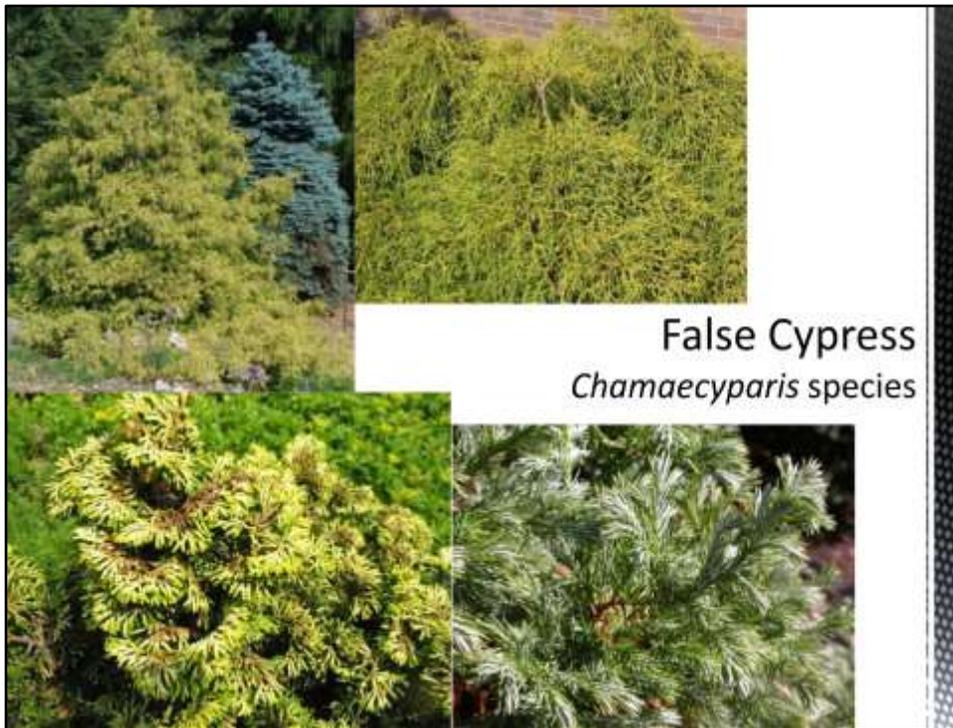
**Black or Red  
Chokeberry**  
*Aronia melanocarpa*

Chokeberries, not choke cherries, are among the most underutilized and appreciated landscape shrubs. Nice flower, great fruit for juices and birds, beautiful autumn foliage.



Pagoda Dogwood  
*Cornus alternifolia*

One of Minnesota's native dogwoods. A small tree, large shrub with gorgeous autumn foliage. Spring flower isn't too bad, either as well as the pretty, dark blue fruit load in late summer/autumn.



For evergreens, it's hard to beat the colors of the many *Chamaecyparis* that grow in Minnesota. The best place to view all of the species and cultivars is the Minnesota Landscape Arboretum, but the gold-colored varieties are spectacular in the landscape.



Rarely used in the Midwest...and it's a shame. Fothergilla will survive and grow quite nicely in southeast Minnesota. One of the most unique flowers available and the autumn foliage reminds one of a miniature sugar maple.



To access this ppt with notes, visit [www.trees.umn.edu](http://www.trees.umn.edu) under Gary's Notes.