

Winter 2004



COMMUNITY FOREST PROFILE

Two Harbors Develops An Urban Forest Management Plan

By Judy Slater

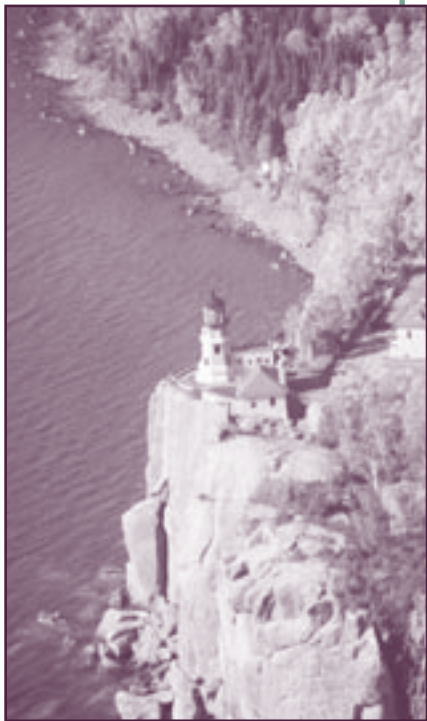
The City of Two Harbors, located in northeast Minnesota, is a small town on the shores of Lake Superior. The area's natural beauty, year-round recreational activities, and friendly people attract many visitors. The city has also been attracting new development.

There were no plans in place to protect the natural resources, including the urban forest, from development pressures. Degradation of the urban forest was also negatively impacting water resources. To examine these problems, the Two Harbors Tree Commission was organized in 2001.

The Commission determined that the city needed an urban forest management plan. Wayne Seidel, a natural resources and environmental educator with the University of Minnesota Extension Service, is a member of the Tree Commission. He and the other members of the Tree Commission helped the city to apply for a Lake Superior Coastal Program grant to help pay the cost of developing the urban forest management plan.

"The city received almost \$57,000 for urban forest management," reports Seidel. "As a first step, the city hired a consulting forester to develop a long-range management plan and to complete a tree inventory. The consultant is also writing a tree ordinance to protect the city's trees and to meet the city's objectives to reduce storm water runoff."

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Split Rock Lighthouse



Deborah Rose, MNDNR

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The Minnesota Shade Tree Advisory Committee's mission is to advance Minnesota's commitment to the health, care and future of all community forests.



Happy Trails

By Lorrie Stromme

Several years ago, I started attending the Shade Tree Short Course. Like all Tree Care Advisors, I was invited. However, I felt so out-of-place, even though I had taken for-credit University courses in shade tree diseases, plant pathology, entomology, tree identification, plant propagation, and landscape design, and even though I was a certified tree inspector. I knew my stuff! But I wasn't a practicing arborist, and I didn't have anything close to a tree-related job. I could imagine people wondering what I was doing there. I even recall clutching a copy of the poem "If" by Rudyard Kipling. (You can take the girl out of the English major, but you can't take the English major out of the girl). It gave me the confidence I needed to fit in with the audience of tree professionals. Really!

Looking back, that uneasiness seems odd. I overcame it and became a member of MnSTAC and the Minnesota Society of Arboriculture (MSA). Heck, in 2001, I became president of MnSTAC! I felt honored to be the female president of the guys-only (well, mostly) treehouse. I've met so many knowledgeable people, all dedicated to trees and their well being. I've even made some close friends along the way. I now have a bona fide comfort level among tree people.

It was this comfort level that enabled me to work side by side with the many committed MnSTACers who helped bring MnSTAC into the electronic age, establish a web site that serves as a clearinghouse for the latest urban forestry news and advancements, press our legislative agenda, collaborate with government agencies and nonprofits, and broaden MnSTAC's outreach to include more citizen advocates and environmental organizations statewide.

One of my goals when I became president was to help introduce the phrase "urban forest" into the vocabularies of elected officials and public servants. And it's happened! I now hear park board commissioners, city council members, planners, firefighters, school teachers, the media, and meteorologists regularly drop the phrase. And they know what it means. We've made progress. What a pleasure.

In 2004, MnSTAC will have a new president who will lead us in our proactive approach in dealing with emerald ash borer, Asian long-horned beetle and other threats; continue our advocacy at the Capitol; foster urban forest stewardship across the state; and in 2004, celebrate MnSTAC's 30 years of fulfilling our mission: "To advance Minnesota's commitment to the health, care and future of all community forests." I am sure the new president will be privileged, as was I, to work alongside MnSTAC's many remarkable professionals, educators, city foresters, arborists, and community advocates.

Signing off,
Lorrie

Lorrie Stromme served as MnSTAC President from 2001 through 2003. She is a graduate student in horticulture at the University of Minnesota and works for the City of Minneapolis.

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Additional highlights of the Two Harbors urban forest management plan include:

Education—

Urban forest management training for city employees.

Labor—

Hired a Minnesota Conservation Corps crew to conduct tree maintenance activities including pruning and tree removal.

Storm Water Management—

Use trees more effectively to slow down storm water runoff.

"The grant money also allowed the city to purchase a tree chipper," Seidel notes. "The city can use the chipper to take care of trees that have been destroyed by storms. The city can use the chips for mulching material and the chips are available to city resident for their gardens. The city also uses the chips for trail surfaces. In the past, waste materials were trucked to a remote site and burned. Now the city can convert valuable product and avoid a potential fire and smoke problem."

Last spring, city employees attended a tree maintenance and urban tree management class sponsored by the U of M Extension Service and paid for by the grant. An inventory of the city's trees has been started. The city is also working on a GIS data base which will allow employees to keep records on tree maintenance history.

"The Two Harbors urban forest management plan sets the foundation for the future," says Wayne Seidel. "I think we have a tremendous starting point." ❁

Judy Slater is the editor of the Minnesota Shade Tree Advocate Newsletter.



Thomas Gelineau, Assistant Public Works Director, feeds a log into the tree chipper. ♦ ♦ ♦

How I Built a Trail By Thomas Gelineau

I was raised in Two Harbors and have lived in the city most of my life. In 1970, I bought three lots that overlook Lake Superior. I have always been drawn by the beauty of the lake, and the huge white pines, white cedar and spruce trees that border my property.

My grandfather owned 120 acres on the French River between Duluth and Two Harbors. He maintained an apple orchard, a garden, and a tree plantation. He was proud of his land and he strongly believed in preserving the environment. He taught me many things about maintaining a good balance between man and the land.

A few years ago, I noticed that much of the urban park system along Lake Superior had grown together so heavily that the lake was no longer visible. The paths to the lake were rugged and only accessible by those who are quite agile. Many of the senior citizens were not able to access the areas that they love, the places where they played as children. I felt that a safe trail could be built on the waterfront from the Two Harbors Campground to Lighthouse Point.

I contacted a member of the city council with my idea for a trail. I told him that if I could get the city's blessings, I would volunteer to remove the brush, prune the trees, and build the trail. I received the go ahead.

In 1990, I started removing brush in Lake View Park. The homeowners on Park Road were happy beyond belief, because, for the first time, they were able to get a glimpse of Lake Superior, which was only a few hundred feet away.

One of the residents, a local businessman, thanked me for my work and asked about my intentions. When I told him that I wanted to build a safe walking trail through the park, he thought it was a fantastic idea and he offered to help. I told him that the city had no money to contribute to the project and that I would probably have to seek private donations. Then he told me that his company had set aside a civic pride fund and they had \$50,000 that could be used for materials. I was in heaven! So I approached the city council and presented my ideas. Since I am an equipment operator, I asked the council if I could use the city's equipment to accomplish my goal. They agreed.

I started building the lighthouse section of the trail, but I ran into some controversy. People were concerned that the trail would take away from the rustic setting of Lighthouse Point. When I planned the trail, I carefully wove it through stands of white pine, white cedar, birch, aspen and maple trees. My goal was to find the path that would impact the fewest number of trees and also to stay far enough away from the lake to preserve

the trail from storm damage. To find the right path was difficult, however, after weeks of studying the land, I felt I had found the best course. So I began my work.

Not long after I started, a group of citizens voiced their concerns to the city council. The city stopped the project and hired an engineer to lay out the trail. When that work was done, the engineer has marked the same trees that I had marked. Once again, I was able to continue. The citizens raised more concerns, so I had to stop my work until my plans were examined by a biologist from the Department of Natural Resources. My work resumed when the biologist approved my plans.

I started building the trail one bucket at a time. The process was very tedious because the more trail I built, the further away I was from my stockpiles. I don't know how many hundreds of trips I made up and down that trail. As I neared the halfway point, a large stand of tag alder stood between the trail and the lake. I removed the tag alder and created a very scenic overlook. The trees that I removed were transplanted.

A member of the city council had doubts about my project and my work was stopped once again. This time, however, city hall and city council members received many phone calls from the citizens who saw the beauty of my work and wanted to have the trail finished as soon as possible. The city council told me to resume my work, and this time, I was able to finish my trail. Everyone loved it! The trail was dedicated in 1999. The city is now proposing to extend the trail all the way around the City of Two Harbors.

Since I finished the trail, I have become very interested in urban forestry. I have attended several forestry seminars and classes. I think that the city's boulevards and parks never received a lot of attention because we live in the land of trees and forests. Many people think that you don't have to take care of the urban resource. The Dutch Elm Disease epidemic opened many eyes. Urban trees need a lot of care. A good maintenance program can reduce damage to trees.

The City of Two Harbors has received a grant to develop an urban forest management plan. The city has also purchased a tree chipper. We use the chipper to dispose of debris, such as tree limbs damaged by storms, and the mulch we produce is free for anyone who wishes it. City employees are being trained on tree pruning, planting, disease awareness and maintenance. Information about how to care for boulevard trees and privately owned trees is available to city residents. The city is also going to establish a compost site. I feel that the community has made great strides in a very short time. 🌿

Thomas Gelineau is the Assistant Public Works Director with The City of Two Harbors. He is also a member of the Water Soil Commission and the Trail Commission.



Timing Pest Management with Ornamental Plant Development

By Patrick Weicherding

The great diversity of ornamental plants, each with its own host of insect pests, creates a real challenge for planning and implementing successful pest management programs for commercial and residential landscapes. Insecticide applications, when and where appropriate, must be timed precisely to maximize their effectiveness and minimize the number required. This is especially true with certain pesticide products like “biorational” insecticides (horticultural oils and soaps) for controlling pests that are only susceptible during specific life stages (for example, the crawler stage of scale insects). In addition, many pests are difficult to detect and monitor requiring considerable time spent in the field scouting, which increases the cost of pest control. Given these complications, pesticide applications are frequently scheduled on a calendar-day basis. However, because of variations in macro- and micro-climates from place-to-place and year-to-year, calendar-based scheduling is frequently inaccurate, ineffective, and costly.

The use of ornamental plant development or “plant phenology” provides an excellent alternative approach for predicting insect activity and consequently, for timing pest management activities. Phenology is the study of periodic biological phenomena and their relationship to weather. Bird migration, hunting and gathering seasons, blooming of wildflowers and trees, and the seasonal appearance of insects are examples of phenological events that have been recorded for centuries (Glendenning, 1943 and Levitt, 1981). Because the development of both plants (Rathcke and Lacey, 1985) and insects (Tauber and Tauber, 1981) is temperature dependent (see “Degree-Day Accumulation” sidebar), plants may accurately follow the environmental factors that affect insect development. In fact, the use of plant phenology



Glendenning, R. 1943. “Phenology: The most natural of sciences.” *Canadian Field-Naturalist* 57:75-78.

Hermes, D. A. 2001. “Degrees of separation.” *American Nurseryman* (August 15, 2001): 34-40.

Hermes, D. A. 1999. A biological calendar: Using plant phenology to predict insect activity. *Special Circular* 173-00. Ohio State University, Columbus, Ohio.

Huberman, M. A. 1841. Why phenology? *Journal of Forestry* 39:1007-1013.

Levitt, D. 1981. *Aboriginal Uses of Plants*. Groote Eylandt. Australian Institute of Aboriginal Studies, Canberra, Australia.

Orton, D. A. 1989. *Coincide: The Orton system of pest management*. Plantmen Publications, Flossmoor, Illinois.

Rathcke, B. and E. L. Lacey. 1985. Phenological patterns of terrestrial plants. *Annual Review of Ecology and Systematics* 16:179-214.

Tauber, C. A. and M. J. Tauber. 1981. Insect seasonal cycles: genetics and evolution. *Annual Review of Ecology and Systematics* 12: 281-308.

to predict insect activity is an old practice, with recorded observations that date back at least to the 18th century (Huberman, 1941). More recently, Donald Orton published a book titled "Coincide" which contains many observations on relationships of plant phenology and some key arthropod pest life stages (Orton, 1989).

The critical assumption underlying plant phenological indicators is that phenological patterns remain constant from year-to-year even when weather patterns differ greatly. Numerous studies have confirmed this assumption. Hermes noted that despite dramatic differences in weather at the Secret Arboretum at the Ohio Agricultural

Research and Development Center in Wooster from 1997 to 1999, the order in which the phenological events occurred was generally quite consistent, with only minor deviations from year-to-year (Hermes, 1999). And, Orton's research has shown that the development stages of pests and indicator plants correlate positively (Orton, 1989). In other words, plant phenological indicators act as valuable reminders of a pest's seasonal development and can be used to predict when the pest's most vulnerable stage is occurring in any given year.

The best plant phenological indicators have easily recognizable development stages that occur at the same time as the vulnerable stages of

selected insect pests. Good plant indicators should be commonly found in the landscape (widely distributed) and have development stages that are easily observed on drive-by surveys. Some examples of the growth stages of plants that can be correlated with insect activity include bud swell, leaf emergence/expansion, stages of flowering, and elongation of new growth (conifers). An example of the use of a plant phenological indicator would be the correlation of egg hatch of gypsy moth (*Lymantria dispar*) with the bloom of shadbush or serviceberry (*Amelanchier laevis*). Other good indicator plants for our area of the country include silver maple (*Acer saccharinum*), bridal wreath spiraea (*Spiraea x vanhouttei*), and common lilac (*Syringa vulgaris*). The following table illustrates the relationship between these indicator plants and some common insect pest in Minnesota.

For insect pests that are not listed in the table, it is easy to start keeping a diary of weather variations (for example, minimum and maximum daily temperatures), plant development and when the pests emerge each year. With careful observation, you can expand your database to monitor pest occurrence and time schedule pest management activities. 🌿



Patrick Weicherding is a Regional Extension Educator with the University of Minnesota Extension Service.

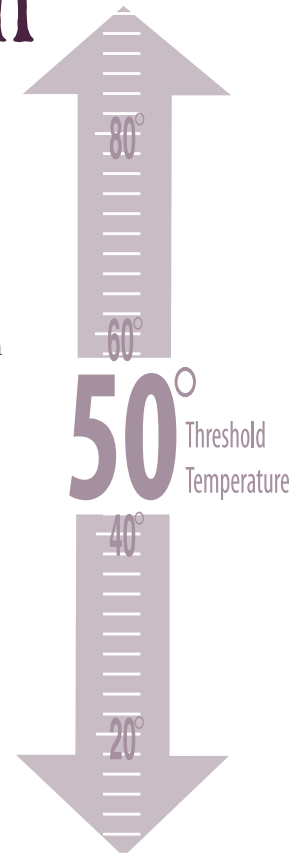
Degree-Day Accumulation

Phenological timing methods are based on the fact that both plants and pests respond to the same degree-day accumulations. Below a certain temperature, plants and pests are essentially dormant, and growth and physiological development are arrested. Above a certain temperature, growth and development occurs. This temperature is known as the “threshold temperature” and for most species of plants and pests is 50°F.

Degree-day accumulation is a total of the number of degrees each day’s temperature is above the temperature threshold. Here’s how it works: First, you determine the average temperature for each day. Then, you determine the degree day, which is the daily average temperature minus the threshold temperature. Finally, you total the degree days for each day. “Figuring Degree-Day Accumulations” (below) explains this process in more detail.

After so many degree days have accumulated, the pest or plant will be at a certain stage of development. For example, research by Don Orton, author of “Coincide,” shows that after 297 degree days, bridal wreath spiraea (*Spiraea x vanhouttei*) is in early bloom and pine needle scale (*Chionaspis pinifoliae*) is beginning to hatch. Begin accumulating degree days on March 1st (for most Minnesota plants and pests), continuing until the pest’s vulnerable stage is past. Monitoring the number of degree days until a pest reaches its vulnerable stage will tell you when to spray to control the pest.

You can determine degree-day accumulations on your own. Also, some IPM programs for climate/pest management calculate degree-day accumulations. Or you can easily monitor indicator plants for the same information.



Figuring Degree-Day Accumulations

1. Determine each day’s average temperature:

$$\text{Daily maximum temperature} + \text{Daily minimum temperature} \div 2 = \text{Average daily temperature}$$

2. Determine the degree days:

$$\text{Daily average temperature} - 50 = \text{Degree-day temperature}$$

3. Total the daily degree days for each day, beginning March 1st and continuing until the pest has reached its vulnerable stage.

Sample Degree-Day Accumulations

Date	Maximum temperature	Minimum temperature	Total	Average	Minus 50	Accumulation over time
5/21	68	40	108	54	4	4
5/22	72	42	114	57	7	11
5/23	74	44	118	59	9	20

Taken from COINCIDE: The Orton System of Pest Management. D. A. Orton and T. L. Green. Plantsmen’s Publications. 1989.

Phenology and Associated Degree-Days for Some Common Tree Pests in Minnesota

Common Tree Pest	Life Stage	Degree Days (base 50)	Silver maple <i>Acer saccharinum</i>	Serviceberry <i>Amelanchier laevis</i>	Bridal wreath spiraea <i>Spiraea x vanhouttei</i>	Lilac <i>Syringa vulgaris</i>
European pine shoot moth <i>Rhyacionia buoliana</i>	Larvae	50-100		Flower buds show		
Spruce gall adelgid <i>Adelges abietis</i>	Adult female	50-100	First leaves separate from emerging shoot	Grandiflora' blossom buds show		
Spring Cankerworm <i>Paleacrita vernata</i>	Larvae	100-200		Blooming		
European pine sawfly <i>Neodiprion sertifer</i>	Larvae	100-200		Blooming	Blooming	Late to finished blooming
Spruce budworm <i>Choristoneura fumiferana</i>	Larvae	100-200		Blooming		
Eastern tent caterpillar <i>Malacosoma americanum</i>	Larvae	100-200	Leaf blades 1 to 2" long	Blooming		
Birch leaf miner <i>Fenusa pusilla</i>	Larvae	275-500	Dropping seed		Blooming	Late to finished blooming
Lilac borer <i>Podosesia syringae</i>	Larvae	275-500	Seed ripe, many dropping		Full to late blooming	Late to finished blooming
Bronze birch borer <i>Agrilus anxius</i>	Larvae	400-600			Finishing bloom	
Elm leaf beetle <i>Pyrrhalta luteola</i>	Larvae	400-600			Finishing bloom	
Bagworm <i>Thyridopteryx ephemeraeformis</i>	Larvae	700-800		Some fruit ripe		



Shared Foresters

In these days of tight budgets, two communities may decide to share one forester to save money. Is it a good idea? Two city foresters, working in joint forester positions, talk about their experiences:

Joint Forester Positions

By James Burks

Joint forester positions provide a financially viable means to professionally manage community forest resources. In my case, two smaller cities in close proximity split the costs. I actually work for the City of Crystal, which has a contractual agreement to share my services with the City of Robbinsdale. While working in each city according to an assigned (50-50) schedule, both cities agree that allowing me to rove as necessary increases responsiveness, keeping track of time and balancing it out. This year, we were lucky to hire an intern who worked in one city while I was in the other.

I am assigned two workspaces, two trucks, two computers, and (thankfully,) one cell phone. Organization is important. In Crystal, I work in the Public Works (Engineering) Department. In Robbinsdale, I am part of the Parks, Recreation, and Forestry Department (this difference presents differing perspectives, clout, and challenges). Contracts (separate pruning, removing, and planting) are let by each city yearly.

On the surface, it would seem that Crystal and Robbinsdale operations and management would be carbon copies of one another. They are both smaller first-second-ring Minneapolis suburbs (little undeveloped land, with accompanying revenue limitations). Socioeconomic data from the two look similar. Both contract out the bulk of their arboricultural and planting services yearly.

Robbinsdale boasts the more mature forestry program. Most of its (slightly older) sidewalked streets welcome medium to mature street trees. Unfortunately, as the trees have grown, the forestry budget has not sufficiently to keep up. The pruning cycle has grown embarrassingly long.

Crystal's City Code, until three years ago, prohibited tree planting in the city-owned easement. Thus, planting spaces outnumber older, residual trees in neighborhoods. A small capital budget allows forestry to begin filling the void.

The politics and administration contrast markedly. This means work gets done through different channels, and accountability is not always clear.

If I could set it up, one office would increase efficiency. Both cities have independently supported a full-time forester in the past, and unmet work needs could justify it now.

James Burks is a city forester in Crystal and Robbinsdale.



Two Programs Merged into One

By Rick Wiskey

The Cities of New Brighton and Mounds View have shared city foresters since 1981. Before that time, each city had separate programs. Then, when one of the foresters died, the programs were merged to save money.

There are advantages and efficiencies with having shared city foresters. One person is familiar with the conditions and problems of adjacent locales, such as oak wilt and Dutch elm disease. One person most likely will deal with the same ordinances in a uniform manner.

New Brighton and Mound View are both Tree Cities USA and they apply for the same grants in various amounts. Neither city has to foot the bill for a full-time person. The cities have a joint Christmas tree recycling program, they share equipment (this saves a lot of money), and they jointly purchase planting stock. Removal and maintenance contracts are let separately.

They are some disadvantages to putting two full-time programs into one. At peak times, it is sometimes unfair to some citizens that might require more time with their tree problems. They may not get full time attention. The split is 70% to New Brighton and 30% to Mounds View. The programs are based out of the Parks and Recreation Office in New Brighton. The position exists under the City of New Brighton with Mounds View buying in through the joints powers process.

Educational programs, such as speaking to homeowner, community, and school groups, suffer due to lack of time. I use the community newspapers, the Mounds View cable TV network and the New Brighton web site for educational purposes. Despite the challenges, the focus remains to deliver the best service that time allows to both communities.

Rick Wiskey is a city forester in New Brighton and Mounds View.

Protecting Trees & Shrubs Against Winter Damage

By University of Minnesota Extension Service

Minnesota's harsh climate is often responsible for severe damage to landscape plants. Winter sun, wind, and cold temperatures can bleach and desiccate evergreen foliage, damage bark, and injure or kill branches, flower buds, and roots. Snow and ice can break branches and topple entire trees. Salt used for deicing streets, sidewalks, and parking lots is harmful to landscape plantings. Winter food shortages force rodents and deer to feed on bark, twigs, flower buds, and foliage, injuring and sometimes killing trees and shrubs. All is not bleak, however, as landscape plants can be protected to minimize injury.

Cold Temperature

Cold temperatures can damage plants in several ways. Plants that are not hardy in Minnesota will be killed or injured during the winter unless protected in a microclimate. Plants that normally grow in hardiness zone 3 (northern Minnesota) and hardiness zone 4 (southern Minnesota) may also be injured if winter conditions are abnormally severe or if plants have been stressed by the environment. Injury is more prevalent and more severe when low temperatures occur in early fall or late spring, when there is little or no snow cover during the winter or when low temperatures are of prolonged duration. Pronounced fluctuations in temperature can be extremely detrimental to plants throughout the fall, winter, or spring.

Sun Scald

Sun scald is characterized by elongated, sunken, dried, or cracked areas of dead bark, usually on the south or southwest side of a tree. On cold winter days, the sun can heat the bark to the point where cambial activity is stimulated. When the sun is blocked by a cloud, hill, or building, bark temperature drops rapidly, killing the active tissue.

Young trees, newly planted trees, and thin-barked trees (cherry, crabapple, honey locust, linden, maple, mountain ash, plum) are most susceptible to sun scald. Trees that have been pruned to raise the lower branches, or transplanted from a shady to a sunny location are also sensitive to sun scald because the lower trunk is no longer shaded. Older trees are less subject to damage because the thicker bark can insulate dormant tissue from the sun's heat ensuring the tissue will remain dormant and cold hardy.

Sun scald can be prevented by wrapping the trunk with a commercial tree wrap, plastic tree guards, or any other light-colored material. The wrap will reflect the sun and keep the bark at a more constant temperature. Put the wrap on in the fall and remove it in the spring after the last frost. Newly planted trees should be wrapped for at least two winters and thin-barked species up to five winters.

Protecting continued on p. 4

Clip and Save



Protecting Trees and Shrubs



Winter Discoloration of Evergreens

Browning or bleaching of evergreen foliage occurs for four reasons:

1. Winter sun and wind cause excessive transpiration (foliage water loss) while the roots are in frozen soil and unable to replace lost water. This results in desiccation and browning of the plant tissue.
2. Bright sunny days during the winter also cause warming of the tissue above ambient temperature which in turn initiates cellular activity. Then, when the sun is quickly shaded, foliage temperature drops to injurious levels and the foliage is injured or killed.
3. During bright, cold winter days, chlorophyll in the foliage is destroyed (photo-oxidized) and is not resynthesized when temperatures are below 28° F. This results in a bleaching of the foliage.
4. Cold temperatures early in the fall, before plants have hardened off completely, or late in the spring, after new growth has occurred, can result in injury or death of this nonacclimated tissue.



MN DOT

Foliar damage normally occurs on the south, southwest, and windward sides of the plant, but in severe cases the whole plant may be affected. Yew, arborvitae, and hemlock are most susceptible, but winter browning can affect all evergreens. New transplants or plants with succulent, late season growth are particularly sensitive.

There are several ways to minimize winter injury to evergreens. The first is proper placement of evergreens in the landscape. Yew, hemlock, and arborvitae should not be planted on south or southwest sides of buildings or in highly exposed (windy, sunny) places. A second way to reduce damage is to prop pine boughs or Christmas tree greens against or over evergreens to protect them from wind and sun and to catch more snow for natural protection.

Winter injury can often be prevented by constructing a barrier of burlap or similar material on the south, southwest, and windward sides of evergreens. If a plant has exhibited injury on all sides, surround it with a barrier, but leave the top open to allow for some air and light penetration.

Keeping evergreens properly watered throughout the growing season and into the fall is another way to reduce winter injury. Never stress plants by underwatering or overwatering. Decrease watering slightly in September to encourage hardening off, then water thoroughly in October until freeze-up. Watering only in late fall does not help reduce injury.

Anti-desiccant and anti-transpirant sprays are often recommended to prevent winter burn. Most studies, however, have shown them to be ineffective.

If an evergreen has suffered winter injury, wait until mid-spring before pruning out injured foliage. Brown foliage is most likely dead and will not green up, but the buds, which are more cold hardy than foliage, will often grow and fill in areas where brown foliage was removed. If the buds have not survived, prune dead branches back to living tissue. Fertilize injured plants in early spring and water them well throughout the season. Provide appropriate protection the following winter.

Dieback

Deciduous trees and shrubs can incur shoot dieback and bud death during the winter. Flower buds are more susceptible to injury than vegetative buds. A good example of this is forsythia, where plant stems and leaf buds are hardy, but flower buds are very susceptible to cold-temperature injury.

Little can be done to protect trees and shrubs from winter dieback. Plants that are marginally hardy should be planted in sheltered locations (microclimates). Plants in a vigorous growing condition late in the fall are most likely to suffer winter dieback, so avoid late summer pruning, fertilizing, and overwatering. Fertilize in the spring on sandy soil or in the fall on heavy soil after the leaves have dropped.

Root Injury

Roots do not become dormant in the winter as quickly as stems, branches and buds, and roots are less hardy than stems. Roots of most trees and shrubs that grow in Minnesota are killed at temperatures at or below 0 to +10°F. These plants survive in Minnesota because soil temperatures normally are much higher than air temperatures and because soil cools down much more slowly than air temperature.

Many factors influence soil temperature. Moist soil holds more heat than dry soil, so frost penetration will be deeper and soil temperatures colder for sandy or dry (drought) soils. Snow cover and mulch act as insulators and keep soil temperatures higher. With newly planted trees, cracks in the planting hole backfill will allow cold air to penetrate into the root zone, reducing fall root growth or killing newly formed roots.

To encourage fall root growth and to reduce root injury, mulch new trees and shrubs with 6 to 8 inches of wood chips or straw. If the fall has been dry, water heavily before the ground freezes to reduce frost penetration. Check new plantings for cracks in the soil and fill them with soil.

Frost Heaving

Repeated freezing and thawing of soil in fall or spring causes soil to expand and contract, which can damage roots and heave shrubs and new plantings out of the ground.



MN DOT

A 4 to 6 inch layer of mulch will prevent heaving by maintaining more constant soil temperatures.

Snow and Ice Damage

Heavy snow and ice storms cause damage by bending and breaking branches. Multiple leader, upright evergreens, such as arborvitae and juniper, and multiple leader or clump trees, such as birch, are most subject to snow and ice damage. Relatively small trees can be wrapped together or the leaders tied with strips of carpet, strong cloth or nylon stockings two-thirds of the way above the weak crotches. These wrappings must be removed in spring to prevent girdling, and to allow free movement of the stem. Proper pruning, to eliminate multiple leaders and weak branch attachments, will reduce snow and ice damage. For trees with large wide-spreading leaders or large multi-stemmed trees, the main branches should be cabled together by a professional arborist.

Salt Damage

Salt used for deicing walks and roads in winter can cause or aggravate winter injury





and dieback. Salt runoff can injure roots and be absorbed by the plant, ultimately damaging the foliage. Salt spray from passing autos can also cause severe foliar or stem injury.

To prevent salt damage, do not plant trees and shrubs in highly salted areas. Avoid areas where salty runoff collects or where salt spray is prevalent, or use salt-tolerant species in these areas. Burlap barriers may provide protection to some plants from salt spray.

Animal Damage

Mice, rabbits (rodents), and deer can all cause severe damage to plants in the winter. These animals feed on the tender twigs, bark, and foliage of landscape plants during the winter. They can girdle trees and shrubs and eat shrubs to the ground line. Deer can cause significant injury and breakage by rubbing their antlers on trees during the fall.

Rodents

Trees can be protected from rodent damage by placing a cylinder of 1/4-inch mesh hardware cloth around the trunk. The cylinder should extend 2 to 3 inches below the ground line for mice protection and 18 to 24 inches above the anticipated snow line for rabbit protection. Hardware cloth can be left on year-round, but it must be larger than the trunk to allow for growth. For small trees, plastic tree guards are also effective. You can protect shrub beds from rabbits by fencing the beds with chicken wire; however, check such fenced areas frequently to ensure a rabbit has not gained entrance and is trapped inside.

If you have many trees or shrubs to protect, using screens and wraps may be too expensive and time consuming. In such situations, repellents may be the best solution. Remember that a repellent is not a poison; it simply renders plants undesirable through taste or smell.

The most effective repellents for rodents are those containing thiram, a common fungicide. You can either spray or paint repellents on trees and shrubs. Repeat applications are necessary particularly after heavy precipitation.

If these methods are ineffective, commercial baits containing poisoned grain are available. However, baits may be hazardous to humans, pets, and beneficial wildlife. Injury or death can result for animals that eat the

bait directly and for animals that consume bait-killed rodents. Shelter or containerize baits so they stay dry and are accessible only to targeted rodents. Beverage cans laid on their sides work well for this purpose. Trapping and shooting, where legal, will also control rodents.

Deer

Deer feed on and damage terminal and side branches of small trees and shrubs. Repellents containing thiram provide some control if feeding pressure is not extremely heavy. Plants can be sprayed or painted with the repellent; however, the most effective procedure is to hang heavy rags, that have been dipped in concentrated repellent, near the plants to be protected. Repeated plant applications or dipping of rags is necessary. Deer can also be successfully excluded with fencing. To be effective, fences must be high and constructed properly. If deer are starving, there is little that will prevent feeding. Providing a more palatable forage may help, but it may also attract more deer.

Conclusion

Although plant cold hardiness and winter injury are common concerns associated with Minnesota winters, appropriate plant selection, selecting the proper site, proper cultural practices, and preventive maintenance will significantly reduce or prevent severe injury or loss of landscape plants.

Even though plants respond differently to winter stress and each winter provides a different set of stressful conditions, plants possess a remarkable ability to withstand extremely severe winter conditions. Minnesota winters should not discourage planting of traditional or new plant species. Learn to take advantage of microclimates to enable interesting or different plants to be grown. ❁



Myth: There's Nothing for an Arborist to do in the Winter

By Judy Slater

Is there nothing for an arborist to do in the winter? It's easy to think that the business of caring for trees closes its doors for the season. The truth, however, is that arborists have plenty of work—all year round. Two certified arborists, David J. Sundmark and Katie Himanga, dispel the myth that there's nothing for an arborist to do in the winter.

"Winter is a great time to prune trees," says Katie Himanga. An independent consultant, Himanga notes that tree owners often don't prune trees until they look awful. Then the owner wants to prune only to improve the appearance of the tree."

"Even when a tree looks OK," Himanga reports, "it may have defects. In the winter, it's easy to spot dead, cracked, or broken branches, weak forks and other structural defects. And when the soil is frozen, it can support heavy equipment, such as bucket trucks, with little or no lawn damage. With winter pruning, there is little risk of spreading disease since pathogens are dormant. You will also find better availability of qualified arborists and tree workers."

"Winter is also a good time to plan ahead," says David J. Sundmark, a certified arborist with the City of Saint Paul. "In the winter, I update flyers and educational handouts that we need in the summer. It is also the time to begin planning for Arbor Day ceremonies and to connect with school and community groups. Information about the Arbor Day Poster contest is mailed to elementary schools and seedlings for Arbor Day ceremonies and other special projects are ordered."

"When the leaves drop", Sundmark reports, "my work changes from identifying diseased trees to making sure such trees have been removed. I must also verify that the stumps were debarked or ground out. And I also check nearby elm trees for root graft infection and mark them for removal."

Throughout the year, Sundmark and Himanga attend meetings, answer phone calls, and respond to requests that reach their desks. They recommend the winter months as a good time to attend courses and conferences. Perhaps, best of all, winter is the chance to plan ahead and look forward to the arrival of spring. 🌿

Judy Slater is the editor of the Minnesota Shade Tree Advocate Newsletter.

National Urban Forest Conference— San Antonio, Texas *By Michael Max*

The 2003 National Urban Forest Conference—with the theme Engineering Green—was held September 17–20 in San Antonio, Texas. It consisted of a series of general sessions, concurrent sessions, workshops, educational tours, exhibits, and other formal and informal opportunities to meet and network with colleagues from across the country—in total 900 attendees and 100 speakers. Minnesota was represented by nine attendees and three speakers.

ENGINEERING GREEN

2003 NATIONAL URBAN FOREST CONFERENCE—SAN ANTONIO, TEXAS—SEPTEMBER 17–20

One of the recurring subjects centered around new technologies such as Geographical Information Systems (GIS) and handheld data collectors. A good deal of time was spent on the technologies themselves—interesting to the more technically oriented but sometimes forgetting to reinforce how the technology makes a difference in community forestry. Fortunately, projects applying those technologies were ubiquitous and comprised the backbone on the conference. One such application was natural resource assessments, an example of new technologies allowing us better and faster perspectives of the places we live. At least four cities, as well as multiple military bases, presented their findings. The military bases had some interesting challenges to balance cultural issues in foreign countries and the obvious security considerations with best management practices.

Also related to natural resource assessments was a series of presentations to quantify the benefits of trees. Computer models are being formulated and tested which quantify many of the benefits of trees, such as increases to real estate value, reduction of air pollution, decreases of air-borne particulates, absorption of storm water, and reduction of energy for heating and cooling.

In one analysis using City Green® from American Forests, the Twin Cities metropolitan statistical area was estimated to receive annual

benefits well in excess of one billion dollars! The implications of this data is enormous.

Benefits are measured using various combinations of satellite imagery, statistical sampling, tree inventories, and computer models. Geographical scales range from metropolitan statistical areas—the Twin Cities MSA consists of 11 Minnesota and two Wisconsin counties—to modest communities, depending on the techniques employed.

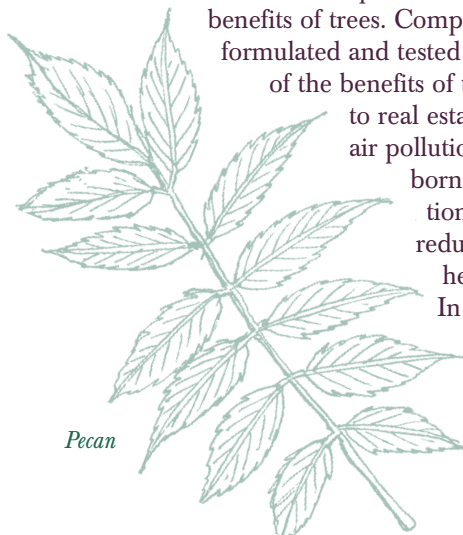
Other presentations looked at social benefits of trees, such as reduction of social service budgets, decreased police calls for domestic violence, decreased incidence of child abuse, better relations with and stronger ties to their neighbors, physical crime rate reduction, faster hospital recovery times with fewer complications, and health improvements for students with various attention disorders.

An entirely different perspective of Engineering Green looked at multiple aspects of development such as rapidly developing corridors, building with trees, use of structural soils, reclaiming urban brownfields (very applicable to Minnesota's Iron Range, by the way), and improving storm water runoff. The Sanitation District No. 1 of Northern Kentucky and the Davey Resource Group jointly developed a computer model that allows a user to compare and contrast multiple development options and visualize their relative impacts on the quality and quantity of storm water runoff on the watershed.

I was particularly impressed with a session on harvesting urban timber. Urban trees can be used to manufacture objects ranging from surveying stakes to beautiful furniture and even musical instruments. Steve Bratkovich at the USDA Forest Service in St. Paul, Minnesota, has written a book about harvesting urban timber. Steve Bratkovich can be reached at 651-649-5246.

Prior to the conference, three meetings were held: state coordinators, Urban National Forest Coalition, and Alliance for Community Trees (ACT). A meeting for students attending the conference would have been valuable.

Further information about the conference can be obtained from Michael Max at 763-753-5505 or by e-mail at mmax@pclink.com 🌿



Pecan

About MnSTAC

The Minnesota Shade Tree Advisory Committee (MnSTAC) was established in 1974 by a group of concerned citizens to address the health and well being of community forests. MnSTAC is recognized throughout Minnesota and the country for its expertise, advice, coordination and support for community trees. It is an organization of diverse individuals who represent a broad spectrum of tree-related interests. It fosters and supports local community tree programs across the state so healthy community forests are fully integrated into community development, infrastructure, education and management.

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Secretary/Treasurer/Technical Advisor: Dan Jordan, IRRRA Mineland Reclamation—218/254-7967

Calendar

Events

January 7-9, 2004 **Minnesota Green Expo.** Minneapolis Convention Center. www.minnesotagreenexpo.com/

February 1-3, 2004 **Wisconsin DNR Urban Forestry Conference and Trade Show.** Green Bay, Wisconsin. Contact: Brian Cassidy. Phone : 262.886.5224. E-mail: casitree@hotmail.com

February 9-10, 2004 **Minnesota SAF Winter Meeting.** Brainerd, Minnesota www.mnsaf.org

February 11, 2004 **How to Teach Forestry to Kids.** Brainerd, Minnesota. Contact Laura Duffey. Phone: 651.296.3406. E-mail: laura.duffey@dnr.state.mn.us

March 7-9, 2004 **Minnesota Shade Tree Short Course.** Bethel College and Seminary, St. Paul, Minnesota.

March 29-31, 2004 **11th Annual Trees & Utilities National Conference.** Omaha, Nebraska. www.arborday.org/conferences

April 20-21, 2004 **The Practice of Restoring Native Ecosystems.** Broadhead, Wisconsin. www.arborday.org/conferences

April 22, 2004 **Building With Trees Seminar.** Minneapolis, Minnesota. www.arborday.org/conferences

June 28-30, 2004 **Community Forestry at It's Best.** Nebraska City, Nebraska. www.arborday.org/conferences

New Publications

Applied Environmental Economics: A GIS Approach to Cost-Benefit Analysis. Ian J. Bateman, Andrew A. Lovett, and Julii S. Brainard. 2003 Cambridge University Press.

Dam Politics: Restoring America's Rivers. William R. Lowry. 2003 Georgetown University Press.

National Park Ranger: An American Icon. Charles R. Farabee. 2003 Rowman & Littlefield.

The Full Value of Parks: From Economics to the Intangible. David Harmon and Allen D. Putney. 2003 Rowman & Littlefield.

Web Sites

Harvesting Urban Timber. <http://www.harvestingurbantimber.com>

Snowflakes & Snow Crystals <http://www.its.caltech.edu/~atomic/snowcrystals/>

The National Arbor Day Foundation Online Tree Guide. <http://www.arborday.org/treeguide/>

Urban Parks Online: A Resource Center for Urban Parks <http://pps.org/upo/>

USDA First Annual Natural Resources Inventory <http://www.nrcs.usda.gov/news/>

For handy up-to-date links to web sites of interest, be sure to visit www.mnstac.org

Minnesota Shade Tree Advocate

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Managing Editorial Group:
MnSTAC Education Committee (Gary R. Johnson, Mark Stennes, Jeff Rick, Ken Holman, Gail Nozal, Patrick Weicherding and James Burks)

Editor-in-Chief:
Judy Slater
judyslater@earthlink.net


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Address inquiries to:

Judy Slater
Minnesota Shade Tree Advocate
115 Green Hall
1530 Cleveland Ave. N.
St. Paul, MN 55108

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115 Green Hall
1530 Cleveland Ave. N.
St. Paul, MN 55108
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Need Help with Grant Writing?

Tree Link offers an online tutorial to help urban and community forestry groups to identify funding sources and to write successful grant proposals. Topics covered include the basic steps of fundraising, overcoming doubts and anxieties, how to write successful grant proposals, and links to valuable resources. The tutorial is available at <http://www.treelink.org/grants/>.

Nominations Due for MnSTAC Awards

MnSTAC is currently accepting nominations to honor groups and individuals whose time and talents have improved community forestry in Minnesota. Awards for 2003 will be given in various categories. The deadline to submit applications is February 18, 2004. Information and application forms are available at http://www.mnstac.org/WH/mnstac_awards_forms.htm or by calling Lara Newberger at 763-509-5945.

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