



Wisconsin Urban & Community Forests

A Quarterly Newsletter of the Wisconsin Department of Natural Resources, Forestry Division

Frost Cracks and Sunscald: Bad Weather or Bad Management?

by Robert W. Miller
Professor of Urban Forestry, Retired
University of Wisconsin–Stevens Point

We associate frost cracks with cold weather, and sunscald with late winter sun damage to the south and southwest side of trees. Frost cracks split open on very cold nights leading us to conclude that when a warm trunk chills rapidly, the outside layers cool and shrink faster than the inside leading to physical stresses that result in the tree cracking open. Likewise we speculate that in late winter the sun thaws the cambium on the south side of trees and rapid cooling at night re-freezes these tissues resulting in their damage. Sounds logical, but if weather was the sole source of these problems, then all trees would have cracks and sunscald. There is more to it than the weather.

For the past decade I have been teaching a course titled Tree Structure and Function where students and I learn about trees through dissection. We dissect small parts of trees and look at them under the microscope, and later in the term we go to the woods and do the same thing to larger parts with a chain saw. We pay particular attention to trees with obvious defects, including cracks, cavities, decay and sunscald.

Frost Cracks

Half of what we say about cracks is true—they do happen when it gets very cold, very fast, late at night. We hear them crack and we see the results. Since most trees do not crack, there must be reasons that some do. My students and I have dissected hundreds of trees with frost cracks, and we are *always* able to follow the crack into an internal defect where the problem originates. The defects are many, but generally fall into three categories: trunk injuries, broken or torn branches, and flush pruning wounds, all of which have been covered with new wood. As these kinds of injuries close over with woundwood, the callus tissue making the woundwood fuses



Frost cracks in trees originate through injuries, such as trunk wounds, broken or torn branches and flush-cut pruning, that result in internal structural weakness. Physical stresses such as winter cooling complete the process of splitting wood from the weak area to the surface.

Photo by Rich Hauer,
MN Dept. of Agriculture

together and seals over the injury. However, three areas of structural weakness typically form: where the woundwood joins together over the injury, and at the edges of the original wound, especially if the woundwood rolls over the edge of the wound. Years may pass until all evidence of the injury is buried under new wood. However, as the tree warms by day and cools by night, physical stresses start the process of splitting the wood from weak areas at the original injury towards the surface. Slowly the crack works its way to the surface until finally on a cold night the tree splits open. Sometimes more than one crack will form from the same injury, one from the center and one or more from the edges. Arborists used to bolt cracks closed, but often this would merely transfer the stress from one area of the trunk to another, resulting in a new crack at another location.

What can be done about cracks? They can be prevented by avoiding trunk injuries or by proper pruning. There isn't much that can be done once the problem materializes, but the tree should be evaluated for any risk it might pose. A healthy tree with a trunk crack that has compartmentalized the injury will likely pose little risk, but cracks associated with cavities, decay and/or large branches should be

continued on page 4



Volume 10
Number 3

Fall
2002



Inside this issue:

Community Profile:	
De Pere	2
Project Profile:	
Lower North Side and Depot Neighbors	3
Economic Benefits	5
Tree Profile:	
Black Gum	6
Urban Tree Health Matters: <i>Ganoderma lucidum</i>	7
What Damaged This Tree	7
Chain Saw Recall ...	8
Hunting	
Buckthorn	8
Coming Events	8
Research Notes:	
Mulch Type and Depth	9
Gypsy Moth Catches	11
Organization Profile:	
TreeLink	12
Extension Workshops	12
Idea Exchange	13
Council News	14
Arbor Day Poster Contest	14
Urban Forestry Resources	15
DNR Urban Forestry Contacts	16

Community Profile:

City of De Pere

by Don Melichar, Forester
City of De Pere

The city of De Pere lies nestled along the banks of the Fox River, just south of Green Bay. The city has many special features that give De Pere "the feel of a town, with all the advantages of a city."

As De Pere has grown, so too has the urban forest. Large, old trees abound in the core of the city. Many new trees continue to be planted in the ever-expanding and outreaching boundary. These trees serve many functions from a graceful canopy over the historic city streets to a peaceful respite in the surrounding neighborhoods. De Pere is fortunate to be graced with over sixty varieties of street trees. This diversity helps each street to establish its own unique statement.

For many years, the parks, recreation and forestry director handled all of the duties of the forestry department. In 2000, De Pere took a step to advance the urban forestry program. A city forester position was created to direct the city's urban forestry program and address the ever-expanding needs of its residents.

Some of the issues and duties that the city forester has include monitoring and educating about gypsy moth, oak wilt, bronze birch borer and other damaging insects and diseases. In 2002 the forestry department applied for and received a DNR gypsy moth suppression grant to control gypsy moth in two areas in the city. Other responsibilities have included establishing pruning cycles for all city street trees, increasing safety awareness and production pro-



Photo by Don Melichar

Members of the Westwood Elementary School's student council pose for a group photo after an Arbor Day tree planting. Also in the photo are two city of De Pere crewmembers and advisors to the student council.

cesses, coordinating with other departments on city projects, and reviewing and recommending changes on landscape plans submitted to the city plan commission. The city forester also works with developers and architects to change planting, mulching and staking guidelines according to current DNR recommendations, schedules a yearly check on all city street trees, manages all the trees and shrubs in city rights-of-way and parks, and answers questions and concerns of city residents about their own landscapes.

The department has also worked with the engineering department to revise its construction specifications for both tree planting and tree protection. De Pere has worked with area community foresters and directors and with the DNR regional urban forestry coordinator to form the Northeast Wisconsin Urban Forestry Work Group, a group that meets every other month to discuss and review common issues and ideas of the industry and the municipal environment.

In addition to the city forester, De Pere currently has two full-time arborists who perform most of the city's

continued on page 10

2



Community Profile

Tree City USA:
since 1996

Growth Award:
2000, 2001

Population: 21,332

Street Tree Pop:
8082

Street Miles: 101

Number of Parks: 28

Total Park Acreage:
346

Primary Industries:

Employers Health
(Humana) Insurance
Shopko Corporation
Moore Response
Marketing
Green Bay Packaging
Inc.

Program Profile

Staff:
Jerold Perkofski,
Parks, Rec. &
Forestry Director
Don Melichar, City
Forester
Kenny LaPlante,
Lead Arborist
John Kleuskens,
Arborist

Board of Park
Commissioners:

George Brown
Jerome Daanen
Mike Donovan
Jeanne Hibbard
Jim Hooyman
Bill Valpano
Sue Zehren

Heavy Equipment:

52' aerial bucket truck
chipper truck
chipper
stumper
4x4 tractor
5-yard dump truck

2002 Operating

Budget:
\$176,000



Published quarterly by the Wisconsin Department of Natural Resources, Forestry Division.

Address inquiries to Dick Rideout, Wisconsin Department of Natural Resources, PO Box 7921, Madison, WI 53707

Editor: Dick Rideout

Contributors: Cindy Casey, Don Kissinger, Tracy Salisbury, Kim Sebastian, John Van Ells

Layout: Georgine Price



Articles, news items, photos and ideas are welcome.

Unless noted, material in this newsletter is not copyrighted. Reproduction for educational purposes is encouraged. Subscriptions are free.

This newsletter is available in alternative format upon request.

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of the Interior, Washington DC 20240

This newsletter is made possible in part by a grant from the United States Department of Agriculture Forest Service. The USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. To file a complaint call (202) 720-5964.

Project Profile:

Lower North Side and Depot Neighbors Promote Trees in La Crosse

by Lucy Freeman

*Lower North Side and Depot Neighbors
La Crosse, WI*

A few years ago, a group of neighbors gathered together to make some needed improvements to their neighborhood. Among their many goals was the desire to add more trees to people's yards. They called themselves the Depot Neighbors, after the prominent old depot in their midst.

They discovered that the city of La Crosse had a boulevard tree program whereby the city would plant trees in the right-of-way, free of charge, at the request of the adjacent property owner. However, few people in the neighborhood knew about the program and only a few requested trees each year. The group designed a brochure informing people about the program, printed hundreds of copies and walked door to door distributing them.

The brochure was a wild success! In the previous three years, the city had received from four to seven inquiries, and two to eight people actually had trees planted next to their property. Those numbers jumped to 27 inquiries and 17 people receiving 46 boulevard trees.

The next year, the neighborhood group had grown and also expanded its boundaries. They spent many hours designing a neighborhood plan with the city planning department. They developed a list of 20 major actions that would improve the quality of life in their neighborhood. Tree planting was the number-one priority in the infrastructure improvement goals. With a neighborhood plan accomplished and expansion of the area it served, the group changed its name to the Lower North Side and Depot Neighbors.

With a lot of time and effort attending council meetings, writing letters and making phone calls, the group has succeeded in bringing many of the goals in the neighborhood plan to fruition. In the 2001 budget, the city allocated \$20,000 for tree planting in just our 10-square-block neighborhood! The response was terrific! More than 120 trees were planted in 2001, and the city has approved another \$20,000 for tree planting in the neighborhood in the 2002 budget.

As part of the boulevard tree program, the city requires somebody to be responsible for the watering and care of each tree. The city forester holds a tree care class required for each person or group receiving a boulevard tree. The city plants the trees and provides mulch and stakes. Besides individuals taking responsibility for trees, several groups also took on the responsibility. Among those volunteering their services were a Boy Scout troop, church group, the SFB Biker Club and the Hmong Mutual Association. Volunteers from our neighborhood group donated pick-up trucks, helped haul bark mulch, staked trees and helped water during dry spells.

3

*Photo by The National
Arbor Day Foundation*



The Lower North Side and Depot Neighbors were honored with a Project Award from the National Arbor Day Foundation in April, 2002. From left: NADF President John Rosenow, Lower North Side and Depot Neighbors representatives Jerry and Sue Swim, and NADF Program Services Director Mary Yager.

The Lower North Side and Depot Neighbors now walk through our neighborhood enjoying the beauty, shade and animal habitat provided by the trees that we helped plant. We hope to help plant many more trees, spreading the program throughout the whole city. And we hope to continue to educate our neighbors throughout the city about the importance of trees in creating a beautiful, healthy neighborhood. 🌳

“If you are planting for a year, plant rice. If you are planting for ten years, plant trees. If you are planting for a lifetime, educate people.”—Chinese proverb

Frost Cracks and Sunscald: Bad Weather or Bad Management?

continued from page 1

4

evaluated for potential removal and monitored on an annual basis if the tree is not removed. There are differences between species relative to their ability to compartmentalize and the strength of their wood. Likewise, healthy trees compartmentalize better than unhealthy trees.

Sunscald

My former graduate student Don Roppolo and I recently completed a research project in an attempt to better understand the source of sunscald injuries. Scientists and practitioners have noted that sunscald may be associated with flush pruning, trunk and/or root injuries, transplanting and deep planting. In a cooperative project with the City of Milwaukee Forestry Division we did all of these to transplanted Norway maples in the city nursery and on city streets. We also planted some of the trees following commonly accepted procedures. A second phase of this project involved dissecting and microscopically examining trees from the Milwaukee nursery and Johnson's Nursery with apparent sunscald injury to determine the source of that injury. In both phases of the study we were surprised by what we found.

Trees in all of our treatments developed sunscald, but trees planted on city streets and deep-planted trees had significantly fewer sunscald injuries. Of the trees that developed sunscald, 77 percent had flatheaded borer (*Buprestidae* sp.) damage associated with these injuries. The borers attacked the tree at the graft union on the south side of the tree, and the sunscald spread upward one to three feet from the attack site.

These borers are noted for attacking the south side of trees, especially stressed trees. Trees grown in the nursery are deep planted to avoid staking, but when out-planted the soil is removed from the top of the ball and the root collar set at grade. We speculate that transplanted trees are stressed, and trunk tissue exposed to direct sunlight for the first time in several years may be further stressed, making the graft union an ideal site for borer infestation. Deep-planted trees had no borer damage, and the graft tissue was buried. This is not to suggest deep planting as a way to avoid borer damage and associated sunscald. Long-term problems associated with stem girdling roots make deep planting a poor remedy for managing sunscald.

The trees planted on city streets were watered at planting and were watered by most adjacent property owners throughout the first summer, but the trees in the nursery were not ever watered in spite of a prolonged dry period in midsummer. This suggests a relationship between sunscald and stress, as a primary stress following transplanting is the inability of a much-reduced root system to meet water demands of the tree.

Dissection of trees with apparent sunscald yielded unexpected results. Some specimens with what appeared to be sunscald actually had frost cracks with dieback of the cambium at the margins of the crack. Subsequent woundwood growing over the dead cambium had the appearance of sunscald but it was not until these trees were dissected that the source of the injury became apparent. We were able to trace the origin of the stem cracks back to improper pruning of very young trees in the nursery. Other injuries that appeared to be sunscald were actually cankers, likely coral spot necrotic canker (*Nectria cinnabarina*). These cankers commonly attack the cambium after it has been injured or stressed by transplanting. There were also a few trees that had sunscald without any pathogens or insects associated with them.

It appears the primary predisposing factor to sunscald is transplanting stress, especially water stress. It is also evident that what is commonly called sunscald is more complex than cambial death related to a single causal agent. Borers and cankers are biotic factors that take advantage of stress, resulting in what appears to be sunscald. Likewise, stem cracks and associated cambial dieback on young trees give the appearance of what is called sunscald.

What can the manager do to reduce the incidence of sunscald? It may be as simple as providing adequate water the first growing season after transplanting. Since some of what we call sunscald originates from stem cracks, then proper pruning in the nursery and after transplanting can reduce this problem as well. ❁

Newly transplanted trees require frequent watering during establishment. Water deficits can leave them susceptible to invasion by borer insects (note flatheaded borer exit holes and larval galleries on so-called sunscald-damaged Norway maple trees) or canker-forming pathogens such as coral spot necrotic canker.



Photo by Rich Hauer, MN Dept. of Agriculture

Beyond Beautification: Economic Benefits of Community Trees

by Don Kissinger
DNR West Central Region

In part one of this series, we discussed the environmental benefits of trees to a community. But urban forests have another “green” side. Not only do the environmental benefits themselves save money, but community trees, and the industry that grows and manages them, have a huge, positive impact on the local and state economy.

Shading and Wind Protection

Properly shading homes, buildings and air conditioners reduces summer air conditioning costs. In Wisconsin this means placing trees on west and east sides, not directly south of buildings, because shading the south side will reduce the beneficial effects of the sun during the longer heating season.

According to David DeWalle and Gordon Heisler, winter air exchange is responsible for one-third to over one-half of the heat loss from homes, so plantings that protect buildings from winter winds can be a huge benefit and money saver. In addition to saving energy costs to individuals, reducing the need for energy reduces the cost of extracting fossil fuels and building new power plants, and reduces the potential for environmental degradation, resulting in more cost savings.

Pollution Abatement

Trees can intercept, sequester and in some cases biodegrade air, water and soil pollutants. Expanding the urban forest can cut down on the need for costly engineering solutions to pollution control. These costs can be quantified for an individual community using the nonprofit American Forest’s *CITYgreen*® ecological analysis GIS software. A 1996 ecological analysis of Milwaukee revealed that the city’s trees saved over \$1.5 million in carbon sequestration alone. A 2000 analysis in New Berlin, Wisconsin, showed that their trees removed over 29 tons of pollutants—11 tons of ozone, 8 tons of particulate matter, 5 tons of nitrogen dioxide, almost 3 tons of sulfur dioxide and 1 ton of carbon monoxide—valued at over \$135,000.

Storm Water Management

Intercepting, absorbing and filtering storm water through the canopy of trees reduces peak runoff and allows more of it to percolate through the soil, reducing needs for expanded storm sewer capacity and detention ponds. New Berlin’s trees reduced storm water peak flow by 15 percent and runoff by 12

percent—the equivalent of an 11-foot-deep, 10-acre lake. Also, lessening the amount of water to the storm drains will decrease the likelihood of raw or partially treated sewage spills such as the one this past year along Lake Michigan that affected Milwaukee and Menominee, Michigan. When situations such as this occur, communities are fined, lawsuits occur, beaches are closed and costly improvements must be made for these infrequent rain events that could potentially be mitigated at a lesser cost through green space, trees and wetlands.

Crime Reduction

This is a social as well as an economic benefit because researchers Sullivan and Kuo suggest that trees afford a place for neighbors to meet and get to know each other, and through these friendships a network of support is developed. It can be inferred that this increase in community pride will decrease violence, vandalism and robberies—less crime, less dollars spent on rehabilitation or programs dealing with this societal problem, and more funds for community enhancement such as forestry.

Individual Well-being

Getting well and staying well—our physical well-being is intimately connected to our psychological state. Daily stresses, noises and anxieties take a toll on the human mind and can suppress the immune system. Findings gathered by researchers Hull and Ulrich (1992) suggest that nature in general and trees in particular offer restoration to the human mind and body. Just how far restoration can go was illustrated in Ulrich’s nine-year gallbladder surgery study. This study dealt with patients of similar ages having identical procedures. Patients whose rooms looked out at a pleasant scene with trees required fewer painkillers and had a 10 percent shorter hospital stay than patients whose view was a brick wall. Again, money saved, insurance costs potentially reduced and productivity increased.

Patronage, Property Value and Occupancy Rates

Businesses strive to create a welcoming, comfortable and convenient environment for consumers. Studies show that customers, although not aware of it, are willing to spend more money on products in landscaped areas compared to the no-tree districts, as they tend to spend more time in the landscaped areas and feel the quality of products is higher.

continued on page 15

Community Tree Profile:

6

Black gum, sour gum, black tupelo or pepperidge (*Nyssa sylvatica*)

by Laura G. Jull
Dept. of Horticulture
University of Wisconsin–Madison

Native To: North and eastern US, Ontario to Florida over to Texas; native in extreme southeastern Wisconsin

Mature Height: 30' to 50' tall; grows taller in native environment

Spread: 25' to 30'

Form: Shade tree with pyramidal form when young, becoming irregular with age. It has distinct, horizontal branches that are at a 90-degree angle from the central leader. Lower branches point downward. A younger tree's form is very similar to pin oak (*Quercus palustris*), but is variable since the plant has a large native geographic range and is primarily propagated by seed.

Growth Rate: Slow to moderate

Foliage: Leaves are alternate and simple, broadly oval to upside-down egg shaped, 3" to 6" long, 1½" to 3" wide, with entire margins or only a couple of teeth on margin toward tip of leaf. Leaves are thick and leathery with a nice, dark-green color that has a glossy finish. Petioles are reddish in color and only ½" to 1" long.



The fruit...
... and form of the black gum.



Photos by Ed Hasselkus,
UW–Madison



Buds and Stems: Stems are smooth, grayish with spur-like growth and diaphragimed pith. The stems also have crescent-shaped leaf scars that contain three distinct vascular bundle scars. Terminal buds are pointed, yellowish-brown to reddish-brown. Lateral buds are smaller, diverging away from the twig.

Fall Color: Beautiful, yellow-orange to scarlet-purple fall color.

Flowers: Primarily dioecious (separate male and female flowers located on two different trees). Flowers appear with the leaves in spring, are small, greenish-yellow in color, not showy. This tree is also pollinated by bees, which then make the highly prized tupelo honey.

Fruit: Oblong, fleshy drupe, ¾" to ½" long; bluish-black, on long stalks; produced on female trees only. Fruit ripen in fall and are edible but tart. Birds and mammals also eat the fruit.

Bark: Dark gray, brown to blackish, broken into thick, irregular ridges which are in short segments, giving it a block-like or alligator-hide look, but bark can be variable.

Site Requirements: Prefers a moist, acid to slightly acid, well-drained soil. Black gum can tolerate wet, low-oxygen soils, but does not tolerate high-pH soils or pollution. It will tolerate moderately dry soils too. Transplant in spring; it is difficult to transplant, as it tends to form a taproot. Root pruning before transplanting is suggested.

Hardiness Zone: 4 to 9

Insect & Disease Problems: Leaf spot, cankers, rust, tupelo leaf miner and scale can attack a tree but it is generally a pest-free tree in the Midwest.

Suggested Applications: Black gum is not used often in the Midwest as a street tree as it produces lower branches that reach the ground, and is not pollution- or high-pH tolerant. However, if limbed up and placed in the right soil, it can be a street tree, particularly in the southern US. In the Midwest, tupelo makes a great lawn tree or specimen due to its form, dark green, glossy leaves and outstanding fall color, not to mention its distinct horizontal branch pattern.

Limitations: Tupelo may be hard to find in a local nursery, but larger, shade-tree liner producers currently grow this fine tree. Slow growing and requires an acid to slightly acid soil. Hard to transplant and establish in the landscape.

continued on page 10

***Ganoderma lucidum*—Roots (and Butts) Beware!**

by Glen R. Stanosz, Ph.D., Associate Professor
Departments of Plant Pathology and
Forest Ecology and Management
University of Wisconsin–Madison

Decay fungi can be the death of trees. Yes, DEATH! Although some trunk decay fungi are considered relatively passive decomposers of the heartwood in trees, many others are more aggressive. These aggressive pathogens cause trees to become hazardous and can lead to their death or sudden failure. *Ganoderma lucidum* is one of the commonly encountered landscape tree pathogens with these capabilities. In Wisconsin it commonly causes the demise of maples and honeylocusts, although ashes, oaks, elms and many other broad-leaved trees can be attacked.

Ganoderma lucidum is a basidiomycete fungus—a member of the group containing the common mushrooms, puffballs and fungi producing fruiting bodies that are bracket or shelf-like. *Ganoderma lucidum* fruiting bodies may be produced on the roots and lower trunks (that is, the “butts”) of affected trees. They are of the bracket type and commonly called conks. These conks may be broadly attached to the tree trunk or slightly stalked, or emerge from the soil above decaying roots. Conks are from a few to several inches across and reddish-brown to purplish on the upper surface. The typically shiny, lacquered appearance of the top of the conk is responsible for its common name, “varnished conk.” While actively growing, the margin and lower surface (where spores of the fungus are disseminated) are creamy white. Conks are leathery to corky and may form singly or commonly are found in groups forming overlapping arrays (see photo). Conks are annual; new conks may be produced each summer and fall, after which they die and deteriorate.

Decay caused by *Ganoderma lucidum* is **not** compartmentalized (not limited) to the interior of affected trees. The fungus is thought to infect trees by means of spores deposited in fresh wounds. Following infection, *Ganoderma lucidum* colonizes living bark and sapwood and thus can eventually directly kill trees. Tree crowns may exhibit poor growth and branch death as portions of the trunks and roots are colonized. As the amount of wood decayed can increase year after year, extensive defect can develop in the butt and roots and jeopardize the structural integrity and anchorage of the tree. Root and butt rot often lead to windthrow or sudden failure.

Ganoderma lucidum conks on trees are a good indicator of their potential to be hazard trees, and tree removal should be considered.

Efforts to prevent loss of trees from *Ganoderma lucidum* and other root and butt rot fungi begin with good tree care. Appropriate species and cultivar selection, site preparation, proper planting, appropriate fertilization and watering during dry periods will help to ensure vigorous growth and resistance to many pathogens. Wounds to both trunks and roots should be avoided. Even small injuries from mowers and trimmers can allow infection by decay fungi. 🌿

Copyright © 2002 by Glen R. Stanosz, All Rights Reserved

*Reddish-brown “varnished conks” of *Ganoderma lucidum* indicate extensive decay and impending death or failure of this maple growing in a street terrace in a southern Wisconsin community.*



Photo by G. Stanosz,
UW–Madison

What Damaged This Tree?



Photo by John Van Ells, WDNR

Turn to page 15 to find out...

CPSC, Stihl Inc. Announce Chain Saw Recall

WASHINGTON, DC – In cooperation with the US Consumer Product Safety Commission, Stihl Inc., of Virginia Beach, Virginia, is voluntarily recalling about 3,000 chain saws. Fuel can leak out of the chain saw's tank, which could cause a fire or injury hazard to consumers.

Stihl has received six reports of fuel leakage. No fires or injuries have been reported.

The recalled Stihl chain saws include model numbers MS 170 and MS 180C with serial numbers 255120848 through 255122797, and 255739074 through 255741150. The name "Stihl" and the model numbers are located on the starter housing. The serial number is printed on the housing near the bumper spikes.

Stihl dealers nationwide sold the chain saws from July 2002 through October 2002 for between \$180 and \$200.

Consumers should stop using the chain saws immediately and return them to the dealer where purchased for a free repair. For more information, consumers can contact Stihl at 800-610-6677 between 9 AM and 5 PM Eastern Time, Monday through Friday, or log on to the company's Web site at www.stihlusa.com.

To see a picture of the recalled product(s) and/or to establish a link from your Web site to this press release on CPSC's Web site, link to the following address: www.cpsc.gov/cpsc/pub/prerel/prhtml03/03037.html. 🌿

Fall is for Hunting Buckthorn

by Randy Cooper
DNR Southeast Region



Now is a good time to go hunting trophy-sized buckthorn (small ones too), garlic mustard and some other invasive non-native plants.

Common buckthorn (*Rhamnus cathartica*) is a very common invasive shrub, especially in southeastern Wisconsin. Buckthorn keeps its leaves later than most other trees and shrubs, so if you see dark green leaves in the woods now, it's probably buckthorn. These leaves will drop once we get a hard frost, so time is limited to foliar spray buckthorn. Dave Hall, retired DNR forest entomologist and herbicide specialist, suggests that a 2- to 4-percent solution of triclopyr (ester) with water will work very well for foliar treatment of buckthorn and not be likely to damage

other trees and shrubs since they have already dropped their leaves. A foliar spray is also a good way to control the carpet of buckthorn seedlings that is often found beneath mature shrubs.

An alternative to the foliar application is basal bark application (spraying the lower 12 to 15 inches of stem) with 20 percent triclopyr and an oil carrier. This can be done any time of year, but is often most effective in fall or winter when the herbicide is carried down to the roots. From now through late winter is also an excellent time to cut the shrubs and apply triclopyr or 25 percent glyphosate to the freshly cut stems. The dark fruits hang on the female shrubs well into winter and the dark shiny bark is easy to identify.

continued on page 13



Coming Events

January 8–10, 2003 — *Minnesota Green Expo*, Minneapolis Convention Center, Minneapolis, MN. Contact Minnesota Turf and Grounds Foundation at 612-625-9234 or www.mtgf.org.

January 26–28, 2003 — *Annual Wisconsin Urban Forestry Conference and WAA Annual Conference & Trade Show*, Regency Suites & KI Convention Center, Green Bay, WI. Contact Scott Nelson at 608-252-7186 or snelson@mge.com.

February 19, 2003 — *Wisconsin Urban Forestry Council Quarterly Meeting*, Madison, WI. Contact Felipe Avila at 608-267-0568 or Felipe.Avila@dnr.state.wi.us.

March 4, 2003 — *Trees, People and the Law Workshop*, Best Western Midway, Brookfield, WI. Contact National Arbor Day Foundation at 888-448-7337 or www.arboday.org/tplseminars.

March 12, 2003 — *Marketing Urban Wood Workshop* – Havenwoods State Forest, Milwaukee, WI. Contact Sue Fabera, Lumberjack RC&D, at 715-453-1253 or sfabera@newnorth.net.

The Effect of Wood Mulch Type and Depth on Weed and Tree Growth and Certain Soil Parameters

by Katrina M. Greenly and Donald A. Rakow

The use of wood byproducts as horticultural mulch has increased in the last decade as the horticulture industries and landscape architects have raised the public's awareness of the maintenance benefits to be gained from mulch use. The objectives of this experiment were to evaluate the effect that two types (chipped pine and shredded hardwood chips) and three depths (3 inches, 6 inches and 10 inches) of mulch and an unmulched control would have upon: 1) oxygen percent, moisture percent and soil temperatures; 2) growth of two thin-barked trees (white pine and pin oak); 3) establishment of weed populations; and 4) potential change in certain soil parameters (pH, nitrates and soluble salts).

After two years, no differences were found between pine or hardwood mulch, but soil oxygen levels declined (not significantly), temperatures declined and moisture levels increased with increasing mulch depth. Weed density and diversity also declined significantly with increasing mulch depth. For both species of tree, stem growth was greater with the 3-inch depth of mulch than with other mulch depths or the control. Soil pH, nitrates and salt levels were unaffected.

Percent oxygen data indicated a non-significant decline at each mulch increment, 19.8 percent at 0 inches to 18.9 percent at 10 inches (less than 1

percent overall). Moisture levels varied significantly with depth of mulch. After one week without precipitation, the unmulched control plots had a mean moisture of 9.8 percent. From the unmulched control plots to the 3-inch mulch depth there was a steep increase to 58 percent. There were insignificant additional moisture gains with increased mulch levels. The seasonal mean temperatures for June through September 1992 were 70.5°F for unmulched plots compared with 70.0°F at 3 inches, 66.7°F at 6 inches, and 65.3°F at 10 inches. There were no relationships between either pH or nitrates and mulch depth.

Mulch depth had a dramatic effect on both weed number and weed species diversity, with the greatest effect being shown from the unmulched plot to the 3-inch mulch depth. Trees with all depths of mulch displayed some increase in mean caliper compared with those that were unmulched. Overall shoot growth was not affected by mulch type; however, mulch depth had a significant effect. Both pine and oak had greater shoot growth at 3 inches than at 6, 10 or 0 inches.

This study reaffirms that the current recommendation for mulch depth of 3 inches is appropriate. Soil oxygen levels, temperature and moisture levels are all within acceptable ranges under mulch of this depth.

Reference: Journal of Arboriculture 21(5): 225-232 🌿

March 13, 2003 — *Marketing Urban Wood Workshop* – Ag and Extension Center, Green Bay, WI. Contact Sue Fabera, Lumberjack RC&D, at 715-453-1253 or sfabera@newnorth.net.

March 27, 2003 — *Tree City/Tree Line USA Recognition Banquet*, Monona Terrace Convention Center, Madison, WI. Contact Dick Rideout at 608-267-0843 or richard.rideout@dnr.state.wi.us.

April 2003, date TBA — *UWEX Landscape Workshop: Identification and Control of Invasive Plant Species*, Madison, WI. Contact Mike Maddox at 608-224-3715 or mike.maddox@ces.uwex.edu.

August 3–6, 2003 — *International Society of Arboriculture Annual Conference*, Montreal, Quebec, Canada. Contact ISA at 217-355-9411, isa@isa-arbor.com or www.isa-arbor.com.

September 17–20, 2003 — *National Urban Forestry Conference*, Adams Mark Hotel, San Antonio, TX. Contact Donna Tschiffely at 703-904-6932 or donna@amfor.org or visit www.americanforests.org/graytogreen/conference/. 🌿

If there is a meeting, conference, workshop or other event you would like listed here, please contact Dick Rideout at 608-267-0843 with the information.

City of De Pere

continued from page 2

pruning, removal and planting needs. These two also complete many other miscellaneous forestry tasks as well as many park maintenance needs. The forestry department has access to four parks department employees when the need or time arises. The efforts of this crew and of city residents (who purchase trees for the terraces in front of their homes and businesses) have allowed the program to expand. De Pere has been named a Tree City USA for six straight years and has been a Growth Award winner for the past two years.



Photo by Don Melichar

Student council members from Westwood Elementary School help to plant trees for an Arbor Day celebration.

In 2001, De Pere received its first DNR urban forestry grant. The city used this grant to promote resident education, further employee education and training and plant 53 trees. These trees were planted as part of the overall streetscape design on a newly reconstructed corridor street between St. Norbert College and the De Pere Community Center. An urban forestry management plan was also created using this grant. This plan, developed in cooperation with Ranger Services, Inc. of Appleton and with the city's existing inventory system, helped to lay out the future pruning and removal needs of De Pere.

De Pere received its second DNR urban forestry grant in 2002 to update and revise the city's existing ordinances. These ordinances include the protection of city-owned trees, planting on city rights-of-way and a tree and shrub abatement policy in cases of insect or disease infestation. This grant is also being used for employee education and the enhancement of De Pere's Arbor Day program.

De Pere has come a long way in its forestry program. Over the years, it has become progressive in its methods and policies, but there is still work to be done. Revisions, additions and growth will affect what occurs in the future. De Pere will be ready and able to change and grow with these times. 🌱

Black gum, sour gum, black tupelo or pepperidge

continued from page 6

Comments: Black gum is a beautiful shade tree for landscaping in residential or large landscapes. The glossy, dark-green leaves and distinct, pyramidal form with horizontal branches give the tree a majestic appearance in the landscape. One of the nicest native species for its consistent bright orange-red to purple fall color. Tupelo rarely needs pruning and forms strong, wide crotch angles. Good species for wet, acid to slightly acid soils. One of the richest honey-producing trees in the world (tupelo honey).

Common Cultivars or Selections: There are other cultivars, but most are not commercially available except 'Carolyn' which is to be released in 2003.

'Carolyn': will be introduced by Roy Klehm. Original tree was selected by Issac Langley Williams, who was a collector of native plants in New Hampshire. A tree of this clone was planted in 1961 next to the McKay Center adjacent to the Longenecker Horticultural Gardens at the UW-Madison Arboretum. The clone was named by Mr. Klehm after Dr. Ed Hasselkus's granddaughter. The cultivar was selected for its outstanding form and horizontal branches. It produces a distinct central leader and bright orange-red to purplish fall color. Since the tree was collected originally from a northern seed source, Carolyn black gum represents one of the hardiest forms.

References:

Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses, 5th ed. 1998, by Michael A. Dirr, Stipes Publishing, Champaign, IL.

North American Landscape Trees, 1996, by Arthur Lee Jacobson, Ten Speed Press, Berkeley, CA.

Plants that Merit Attention: Vol. 1 Trees, 1984, The Garden Club of America, Janet Meakin Poor, (ed.), Timber Press, Portland, OR.

Street Tree Factsheets, 1993, Henry D. Gerhold, Willet N. Wandell, and Norman L. Lacasse, Penn State Univ., University Park, PA.

Trees for Urban and Suburban Landscapes, 1997, by Edward F. Gilman, Delmar Publishers, Albany, NY.

Trees of the Northern United States and Canada, 1995, by John L. Farrar, Iowa State Univ. Press, Ames, IA. 🌱

2002 Gypsy Moth Trap Catch Results

by Mark Guthmiller, WDNR
and Chris Whitney, WDATCP

Gypsy moth trap catch counts continue to rise, especially in the eastern third of the state. This year a total of 623,798 gypsy moths (as of November 1, 2002) have been caught by Wisconsin Department of Agriculture gypsy moth trappers as part of the Wisconsin Cooperative Gypsy Moth Program. This is up from the 2001 moth trap catch of 378,939.

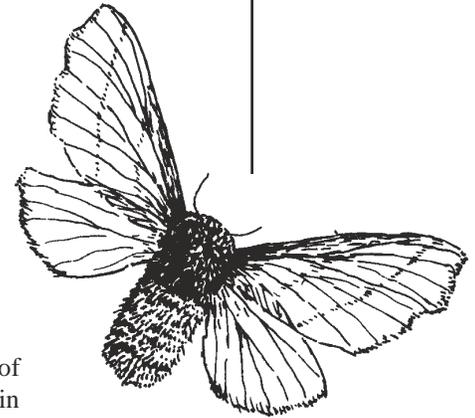
A number of factors make it hard to compare trap catch counts from one year to another. Trapping densities change as counties become quarantined, some areas may be delimited—which means setting a higher density of traps to delineate a possible infestation—or an area may have been treated with B.t.k. to kill caterpillars or with pheromone flakes as a mating disruption tactic. Areas treated with pheromone flakes are not trapped until the following year. The traps use the same pheromone that is used for mating disruption and would not be as effective in trapping moths in these treatment areas. Weather, such as late freezes and heavy downpours, also affects population levels year to year.

With these constraints in mind, here are the maps from 2001 and 2002 comparing average moth catch per trap for a county. Note that these totals were determined by taking the total moth catch per county

and dividing it by the number of traps set in the county.

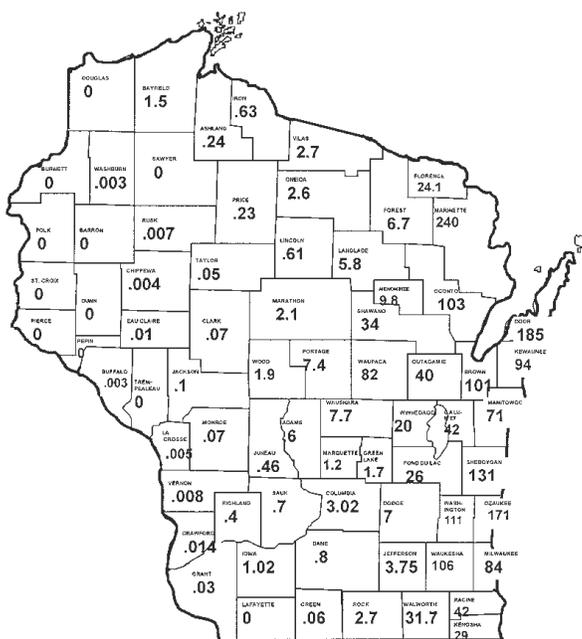
Although these “moths per trap” maps give a general idea of the population status of gypsy moth, a more visual color gradient map is available on the Internet at: www.ento.vt.edu/~sharov/stsdec/d20023/krig.gif.

The orange and pink gradient zones are areas that have gypsy moth population levels high enough in some locations to cause damaging levels of defoliation. Previous years maps can be viewed and compared by substituting the year of interest into the above address section /d20023/.

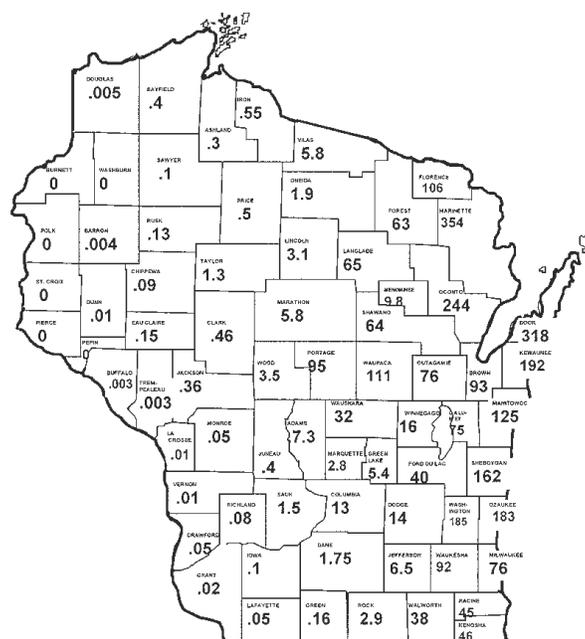


Based on the Web-site map and data collected in 2002, defoliation is likely to occur in portions of northeastern and eastern Wisconsin as well as in Portage, Waupaca and Waushara counties of central Wisconsin. For the status of gypsy moth in your area take a look at this gradient map at the above Web site. 🍂

Wisconsin Gypsy Moths Per Trap, 2001



Wisconsin Gypsy Moths Per Trap, 2002 (as of 10/28/02)



Note: These totals were determined from taking the total moth catch per county and dividing it by the number of traps set in the county.

Organization Profile:

TreeLink

by John Van Ells
DNR Southeast Region



Welcome to TreeLink!

TreeLink is a Web site created to provide information, research and networking for people working in urban and community forestry. For the researcher, the arborist, the tree board member, the nonprofit leader and the volunteer, TreeLink's purpose is to inform, educate and inspire.

Why TreeLink?

It's increasingly true that the success of urban forestry depends on information, education and communication. Funded by a major grant from the National Urban and Community Forestry Advisory Council (advisor to the US Secretary of Agriculture), TreeLink is a clearinghouse and portal providing a rich and flexible set of resources for the urban forestry community.

For example, on the Web site you'll find:

- educational materials
- how-to guides
- a research database
- discussion forums

- a quarterly Web-zine
- a comprehensive list of national, state and local resource links
- late-breaking news
- interactive tools for tree identification and selection

How to Use TreeLink

There are six primary components to TreeLink.

Mission – Find out information about TreeLink and urban forestry.

Learning Center – Find educational information on trees and urban forestry, classroom resources and books.

Take action! – Find resources and information to help you get involved.

Resources – Find links to a wide range of other resources on the Web organized by topic, and local links organized by state.

News & views – Get news updates, read the quarterly e-zine, and enter the Tree Talk forums where you can discuss your views with other users.

Search – Search the entire site for your information.

TreeLink spotlights urban and community forestry as a critical aspect of the human habitat, a vital link with the future of our rapidly growing communities.

TreeLink will mirror related Web sites and defer to nationally recognized organizations, local groups and specialists, where appropriate. They credit all reprinted material that is mirrored on their site. Visit TreeLink on-line at www.treelink.org/. 🌿

Dane County Extension Offers Classes

Green-industry professionals, master gardeners and interested gardeners will have several choices for this winter's horticulture education series. All classes are eligible for CEUs as appropriate. All workshops begin at 1:00 PM at the Dane County Fen Oak Resource Center, 1 Fen Oak Court, Madison.

- **New and Boring Insects** – Chris Williamson, January 21, 2003. Nothing dull about these insects that kill our trees and shrubs. Emphasis on invasive insect pests that may affect Wisconsin.
- **Sound Science in Turf Management** – John Stier, January 29, 2003. A review of the latest advances in turf research that may alter your lawn-care practices.
- **Landscaping Rules and Regulations** – Mark McCloskey and Liz O'Donnell (DATCP Environmental Enforcement Specialists), February TBA. Commercial pesticide applicators will have a chance to review rules and regulations regarding their work with fertilizer and pesticides usage.
- **Best Management Practices for Nursery Production** – Laura Jull, February 20, 2003. Review of new and old techniques for growing better nursery stock.

- **Landscape Weed ID** – Dan Heider, March 6, 2003. Learn the name of the weed before you kill it. Emphasis on landscape bed weeds.
- **Root Rots and Mulch** – Brian Hudelson, March 13, 2003. New research shows we may be inadvertently introducing root rots into the landscape in mulch.
- **CODIT: Why Poor Pruning and Weed Whips Hurt Trees** – Mike Maddox, March 20, 2003. Individuals that operate pruning saws or weed whips improperly will be introduced to the damage they inflict on woody ornamentals.

Participants in all Dane County Extension Horticulture programs are eligible to receive Continuing Education Units provided through the University of Wisconsin education system.

Visit the Horticulture Education Web site at www.uwex.edu/ces/cty/dane/education.html#hort or contact Mike Maddox at maddox.michael@co.dane.wi.us or Ann Munson at ann.munson@ces.uwex.edu for more information. 🌿

The Idea Exchange...

compiled by Jessica Schmidt
DNR Northeast Region

Arbor Day Opportunity

Looking for a good Arbor Day educational activity that is linked to urban forestry? Annually, the Wisconsin Department of Natural Resources' forest nursery program provides 75,000 free seedlings to fourth-grade students to plant and nurture. Every fourth-grade teacher in Wisconsin receives information and an application during November. Teachers who submit an order by January 17, 2003 will receive a free conifer seedling for each of their students during the spring planting season. Contact your local fourth-grade teacher to explore possible educational opportunities associated with the Arbor Day Free Tree Program. If the teacher or school has lost their order form, have them contact the Griffith State Nursery at 715-424-3700 for a replacement.

SMUD Trees

A program in Sacramento, California, offers free trees to houses with an east, west or southern exposure that heats up during the summer. The Sacramento Municipal Utility District heads up this program that aims to cut down energy consumption. Since 1999, 312,000 SMUD trees have been planted. The four- to seven-foot trees are free to the homeowner and include stakes, ties, fertilizer and delivery. All the owner has to do is plant and pledge to care for the tree. To get a SMUD tree, the owner must attend a free seminar to learn how to select, plant and care for their new tree. A video is available to those who can't attend the seminars. The owners that watched the video are asked for a special code to ensure the video was viewed. After the seminar or video, the owner must make an appointment with the city forester to determine the best location and species. The trees will then be delivered within ten days.

Info: www.smud.org/sacshade/index.html.

Living Memorials Project

The USDA Forest Service has responded to the desire to memorialize the tragic losses that occurred on September 11, 2001, with a Living Memorials Project. This project will use the healing powers of trees to create living memorials to the victims of terrorism. On September 9, 2002, Agriculture Secretary Ann M. Veneman announced \$933,000 in federal grants to develop living memorials in recognition of the losses that occurred on 9/11. Cost-share grants will support the design and development of community projects in the New York City metropoli-

tan area, southwest Pennsylvania and the Washington, DC metropolitan area. To show the efforts and responses to September 11 of other communities, a national inventory of Living Memorial projects will be created and made publicly available.

Info: www.livingmemorialsproject.net

Tigard's Tree Mitigation Fund

In the city of Tigard, Oregon, City Forester Matt Stine and the city's tree board have created a street tree planting program that is funded through the city's Tree Mitigation Fund. Developers are required to replace trees that are removed as a result of their project. The replacement trees can be planted on site, or off site on publicly owned property. If they do not plant enough trees to meet the "inches lost" requirement, they must pay into a fee-in-lieu account. That money is used for numerous tree planting projects, including a street tree planting program. In this program, Stine works with a neighborhood representative to determine who wants trees and who can have trees planted in the public right-of-way. The city buys the trees, mulch and soil amendments (if needed) and the homeowners and their neighbors plant the trees.

Info: Matt Stine, City of Tigard Forester,
MSTINE@ci.tigard.or.us, 503-639-4171 ext. 2589. ✪

Fall is for Hunting Buckthorn

continued from page 8

Garlic mustard is an invasive, non-native, herbaceous plant with a two-year life cycle. First-year seedlings of garlic mustard are still actively growing now, while most of the other herbaceous native vegetation is dried down and not likely to be damaged. Dave Hall recommends a 1- to 2-percent solution of glyphosate as a foliar treatment for garlic mustard *now* (on a warm sunny day), while it is still actively growing. If garlic mustard populations are small enough, they can be pulled by hand now or in the spring before the seed pods develop.

Read and follow label instructions before using any herbicide. Additional information on controlling undesirable woodland plants can be obtained from your local DNR forester. Brochures detailing how to identify and control garlic mustard can be requested from any county extension office or at: www.dnr.state.wi.us/org/land/er/invasive_species.htm. ✪

13



Does your community or organization have an idea, project or information that may be beneficial to others? Please let your regional urban forestry coordinator know. We will print as many of these as we can. If you see ideas you like here, give the contact person a call. They may be able to help you in your urban forestry efforts.



Council News:

14

View from the Chair

by Jeff Edgar, Chair
Wisconsin Urban Forestry Council

Sugar Maple Topping?

Doesn't sugar maple topping sound delicious? I bet it would be good on ice cream! But for a tree care practice, I don't think it would work very well. Earlier this week, I stumbled across an ad in my local newspaper for a new tree care company. Besides tree trimming and removal, they proudly announce they also will top your trees for you. As I understand, tree topping went out with the dinosaurs. It's unfortunate that this company and their customers probably don't know any better and may see this as a process that must be done in order to keep their trees healthy. If you're reading this, you probably know the many reasons why trees shouldn't be topped, so I won't go into details.

Oats in the Hole!

Several years ago I received a phone call from a local homeowner who was having problems growing birch trees in his yard. His neighbor had all sorts of

remedies for the problem. They tried everything, including spraying for "birch blight" (whatever that is) with some spray (didn't know what it was). The spray didn't seem to really work (duh). The "knowledgeable" neighbor finally suggested taking a handful of oats and putting it in the hole with the tree, because everyone knows a birch won't survive without planting oats with them. The homeowner finally decided to call an expert to see what else they could do to make the trees grow.

I think we all know someone who is just getting started in the business. Can we identify those folks and get them to join the Wisconsin Arborist Association or another trade related organization? I plan on inviting this company to our urban forestry conference/WAA meeting in January. Would anyone out there like to offer to write some timely articles for the local newspaper to help educate the public on tree care? It doesn't hurt much.

Next time someone says they don't feel well, I'll say go to the barber and get bled! We all know that will balance the humors in our bodies and make us well again! If you want to know firsthand if that works at all, just ask George Washington (if you know a medium). In George's last days, he was bled several times, but died anyway (go figure). Do you think he should've had some sugar maple topping on his oats instead? ✎



Council Chair
Jeff Edgar

Photo by Silver Creek
Nurseries

Arbor Day Poster Contest—Get Involved!

The eleventh annual Arbor Day Poster Contest has begun. Sponsored by DNR Forestry and the National Arbor Day Foundation, this contest will challenge state fifth graders to visually interpret this year's theme—"Trees are Terrific...From Acorn to Oak."

Contest packets, which include contest materials and a teaching curriculum, were mailed out in October to fifth-grade teachers in all public and private elementary schools. The poster submission deadline is February 18, 2003.



Wisconsin's First Place winner of the 2002 Arbor Day
Poster Contest.

The state winner is decided in late March and the poster is forwarded to the national competition for judging in early April. The top three state winners are honored at an awards ceremony at the state capitol in May and the top 12 posters will be

featured in the DNR's 2004 Arbor Day/Earth Day calendar.

There are a number of things you can do to support this educational effort. You can:

- promote the contest in your local school
- display the 2003 Arbor Day/Earth Day calendar, available in early December
- present programs in fifth-grade classrooms that relate to the contest theme
- act as a school contest judge (only one poster is accepted from each school)
- act as a regional judge (the top three regional posters go on to the state judging)

The Arbor Day Poster Contest is a great way to convey the urban forestry message to our school kids—so get involved!

If you'd like additional copies of the contest packet to distribute to your local fifth-grade teachers, please contact your regional urban forestry coordinator (see page 16). If you'd like more information about the contest check out our Web site at:

www.dnr.state.wi.us/org/land/forestry/uf/awareness/arborposter.htm. ✎

Urban Forestry Resources:

compiled by Cindy Casey
DNR West Central Region

Looking for resources that address economic benefits of community trees? Try these:

Tree Benefits Fact Sheets

Dr. Kathleen Wolf, University of Washington Center for Urban Horticulture, has conducted extensive research on various social and economic aspects of community trees. Her series of concise, user friendly fact sheets on benefits of trees to cities, small business districts, roadways, etc. are available at

www.cfr.washington.edu/research.envmind/textlist.html.

Trees Mean Business

This in-depth study, funded by a National Urban and Community Forestry Advisory Council grant, analyzes and documents the economic impact of urban forests in commercial districts in New York City and New Jersey. The complete report is available on the Trees New York Web site with full-color charts, graphics, etc., at www.treesny.com/eisreport.pdf. 🌳

15

Beyond Beautification: Economic Benefits of Community Trees

continued from page 5

Several different studies throughout the nation have compared the values of landscaped versus non-landscaped properties for similar homes on similar streets. The results showed that landscaped properties had between 3.5 and 20 percent more value than non-landscaped ones. Judith Guido, director of marketing for LandCare USA in Memphis, Tennessee, stated, "landscaping adds as much as 14 percent resale value to a building and speeds its sale by as much as six weeks."

Another study looked at 30 variables to office occupancy rates and discovered that landscape amenities have the highest correlation with occupancy, higher even than direct access to arterial routes. Tenants also remained longer in apartments in wooded areas, reducing time and money needed to fill vacancies.

Value of the Urban Forest Industry

In the early 1990s a group of concerned citizens formed the Community Forestry Council of New Jersey in an effort to stem the declining condition of their community tree programs. In less than 10 years, New Jersey now leads the northeast in government support for urban forestry at \$1.2 million per year, ranks eighth in the nation for Tree City USAs and during the past five years has averaged 20,000 trees planted on public land in the state's 566 municipalities.

In 2000, New Jersey's council did a survey to assess the value of their success to the state's economy. The survey showed that the urban forestry industry—including nursery sales, landscape planning and installation, tree service industry sales, public sector tree care, wood recycling and composting, utility line clearance, and machinery and equipment sales—contributed just under \$2 billion dollars a year to the state's economy. Wisconsin is currently conducting a similar survey which is expected to reveal an impact to the economy well above the \$1 billion dollar mark.

What does this all mean? It means that our urban forest affects all aspects of the good life we have come to expect in Wisconsin. When the majority of Wisconsinites realize the benefits, then our trees will be afforded the space and care they need to reap even more environmental and economic benefits as well as the social benefits that will be addressed in the next issue of this newsletter.

References and Resources

DeWalle, D.R. and G.M. Heisler. 1988. **Use of Windbreaks for Home Energy Conservation.** Agriculture, Ecosystems & Environment.

Sullivan, W.C. and F.E. Kuo. 1996. **Do Trees Strengthen Urban Communities, Reduce Domestic Violence?** Technology Bulletin R8-FR56. USDA Forest Service, Southern Region, Atlanta, GA.

Hull, R.B. and R.S. Ulrich. 1992. **Health Benefits and Costs of Urban Trees.** Proceedings of the Fifth National Urban Forestry Conference.

Landscaping's Net Worth. American Nurseryman, July 15, 2002.

Kuser, J.E. and M.V. D'Errico. **Urban Forestry's Contribution to One State's Economy.** International Society of Arboriculture. Arborist News, June 2002.

Also see the "Urban Forestry Resources" column in this issue for more references. 🌳

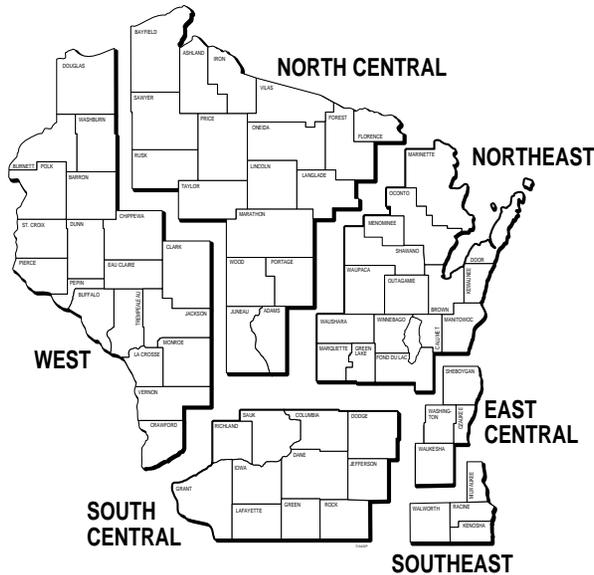
From page 7.

What Damaged This Tree?

Answer: How to deliver a one, two, three punch—disturb the root system by changing the grade, compact the soil to restrict the passage of oxygen and water to the roots, and finally, mix mortar under the tree to add harsh chemicals to the root zone. 🌳

Do you have pictures of tree damage others ought to know about? Send them to Kim Sebastian (address on page 16) and we'll print them here!

Wisconsin DNR Urban and Community Forestry Contacts



World Wide Web Site: www.dnr.state.wi.us/org/land/forestry/uf/

West

Cindy Casey
Regional Urban Forestry Coord.
1300 West Clairmont Ave.
Box 4001
Eau Claire, WI 54702
Phone: (715) 839-1606
Fax: (715) 839-6076
e-mail: Cynthia.Casey-Widstrand@dnr.state.wi.us

North Central

Don Kissinger
Regional Urban Forestry Coord.
5301 Rib Mountain Drive
Wausau, WI 54401
Phone: (715) 359-5793
Fax: (715) 355-5253
e-mail: Don.Kissinger@dnr.state.wi.us

South Central

Nathan Eisner
Regional Urban Forestry Assist.
3911 Fish Hatchery Road
Fitchburg, WI 53711
Phone: (608) 275-3227
Fax: (608) 275-3236
e-mail: Nathan.Eisner@dnr.state.wi.us

State Coordinator

Dick Rideout
State Urban Forestry Coord.
101 S Webster St
PO Box 7921
Madison WI 53707
Phone: (608) 267-0843
Fax: (608) 266-8576
e-mail: Richard.Rideout@dnr.state.wi.us



Northeast

Tracy Salisbury
Regional Urban Forestry Coord.
1125 N. Military Ave.
P.O. Box 10448
Green Bay, WI 54307
Phone: (920) 492-5950
Fax: (920) 492-5913
e-mail: Tracy.Salisbury@dnr.state.wi.us

East Central

John Van Ells
Regional Urban Forestry Coord.
Pike Lake State Park
3544 Kettle Moraine Road
Hartford, WI 53027
Phone: (262) 670-3405
Fax: (262) 670-3411
e-mail: John.VanElls@dnr.state.wi.us

Southeast

Kim Sebastian
Regional Urban Forestry Coord.
2300 N. Martin Luther King Jr. Dr.
Milwaukee, WI 53212
Phone: (414) 263-8602
Fax: (414) 263-8661
e-mail: Kim.Sebastian@dnr.state.wi.us



Presorted Standard
U.S. Postage
Paid
Madison, WI
Permit 906