

SuPerspective -

(Continued from Page 10)

Is the Process Economical?

I purchased the Arborjet Tree I.V. two pack kit for \$599 which gives you everything you need to get started except for the cordless drill. I added two more Tree I.V. units at \$199 each to help speed up my program. I first scoffed at the price of this equipment but after a season of use I feel that the Arborjet equipment is worth every penny, very durable and easy to use.

Also, keep in mind that this same equipment can be used to inject nutrients or fungicides into your trees. We injected a chlorotic oak with iron and a chlorotic maple with manganese this past season. I began injecting trees mid-summer and stopped in late September. Each tree that has been injected has also been tagged with a number. I keep a log with date of injection, size, location, volume of Tree-äge injected, and current appearance. I've injected 256 ash trees to date and will treat another 35-40 next season.

Any Special Licenses?

A pesticide license, an Arborjet kit, and Tree-äge is all you need to get started. Keep in mind that this pest is relatively new and that control measure research keeps coming in. All of the data that I've come across tells me that I've chosen the best possible method to combat this pest. The research tells me that my trees are going to be protected for at least two years and I wouldn't doubt that by this time next year I'll find that this single treatment will be good for three years.

Some Math:

Tree-Age case price = 53¢/ML

20" ash = 110 ML - 110 x .53 = \$58.30

Arborplugs @ 59¢ ea - 8 x .59 = \$4.72

\$58.30 + \$4.72 = \$63.02/20" tree for two years or \$31.51/year

300 x \$63.02 = \$18,906 (good for at least two years)

Versus:

300 trees x \$250 removed = \$75,000

300 trees x \$50 stumped = \$15,000

300 x \$500 tree replacement = \$150,000

\$240,000 could treat our ash trees for 25 years minimum.

SuPerspective

Tree Injection Hillcrest Golf Club of St. Paul

By THOMAS SCHMIDT

Superintendent, Hillcrest Golf Club of St. Paul

I am the Superintendent at Hillcrest Golf Club of St. Paul and have been a Superintendent 10 years.

Hillcrest is a private golf club with 12,000 to 15,000 rounds per year.

Hillcrest was a public golf course that opened in 1921. Hillcrest was established as a country club in 1945.

I have been injecting my trees at Hillcrest for six to seven years, I started out treating the elm trees and have since moved on to injecting insecticides for the Japanese beetle. After injecting, we would see the beetles on the ground around the tree. The numbers of dead beetles were in the thousands which helps my cause because they are not laying their eggs in my turf. This helped reduce my beetle count tremendously and I have seen a huge reduction in damaged turf and trees.

My tree injecting budget was \$4,000 a year just for the elm trees. I spend 1/3 of that now and am treating more trees. I have saved my club approximately \$17,000 over the period of six years with the Arborjet tree injection system.



Superintendent Tom Schmidt injects a tree at Hillcrest Golf Club of St. Paul.

This system, I found at the National show year's ago, has paid for itself many times over, it is easy to use, fast and very user-friendly.

With the ash borer approaching I will

be treating 40 key ash trees over the next couple of years and will hopefully save our club trees and our pocket books.

(Continued on Page 12)

Ash Trees and the Emerald Ash Borer Minnesota Valley Country Club

By Michael J. Brower
Superintendent, Minnesota Valley CC

Introduction

Many destructive wood boring insects exist in the United States, but rarely do they cause widespread and destructive damage to large populations of trees. As a wooded, parkland type golf course with over 1200 mature trees, a destructive wood boring insect outbreak could have a big impact on Minnesota Valley Country Club's trees. Over the past six years, citizens across the Midwest and beyond have been keeping track of the spread of a destructive wood boring insect called the Emerald Ash Borer. This report takes a closer look at the Emerald Ash Borer and how it could affect the ash tree population at Minnesota Valley Country Club.

The Emerald Ash Borer

The Emerald Ash Borer (EAB) is a species of metallic wood boring beetle that attacks ash trees, typically killing trees in one to three years. Tree mortality is caused by the larvae or immature stages, which tunnel and feed underneath the ash tree's bark. Once these galleries of larvae take up residence under ash tree bark, they quickly consume the conductive tissue of the tree, essentially shutting down the trees uptake of water and nutrients and killing it. They attack all species of ash and have been very destructive in southeast Michigan and surrounding areas of the Midwest, destroying millions of trees. A native of Asia, it was first discovered in the Detroit, Michigan area in 2002, and is now found in at least 10 states. The insect was found in Wisconsin in July of 2008, in northwest Washington and northeast Ozaukee counties, around the village of Newberg, approximately 150 miles north of Chicago and 350 miles southeast of Minneapolis-St. Paul.

The Spread of the Emerald Ash Borer

The most likely and evident source related to the spread of the problem is with infested firewood that is transported out of infested areas into other states. The insect can also be transported in infested nursery stock and ash logs. There are several levels of quarantines being adminis-



Two small Ash.

tered by both state and federal agencies in all of the affected states. All counties in the lower peninsula of Michigan are under some form of quarantine. There are also federal and state quarantines in four southeastern Wisconsin counties. Current containment of the EAB varies from state to state, and includes elimination of ash trees in infested areas, extensive surveying of high risk areas, implementation of quarantines for ash products, and insecticidal treatments of infested trees and non-infested trees in high risk areas.

Minnesota Valley Country Club Ash Tree Population

There are approximately 230 ash trees on MVCC property. They include three types of ash tree, the green ash, the blue ash, and the black ash. The predominant species is green ash, *Fraxinus pennsylvanica*. All are susceptible to hosting and damage from the EAB. The ash tree population at Minnesota Valley is spread throughout the golf course. However, seven distinct areas of the golf course account for more than half of the population. In each of these areas, ash trees are either the dominant tree species in the area or have a group of large ash trees that dominate the immediate landscape. Each of the areas would be greatly impacted by the loss of ash trees. The following is a list of the

seven areas on the golf course that would be most impacted by the loss of ash trees. The list totals 118 ash trees, or approximately 51% of the total. The remaining 49% are spread out over the course and mixed in with other deciduous and evergreen trees.

- A) Hole #18: Five large ash trees on the right side of the first landing area.
- B) Holes #1 & 16: Thirty medium to large ash trees that are the dominant tree species in the rough between these golf holes.
- C) Hole #10: Ten medium to large ash trees in the right rough.
- D) Hole #8: Twenty-two medium ash trees in the left rough and behind green.
- E) Holes #13/14- Twenty ash trees spread out between the two holes.
- F) Holes #4/5- Twenty-five ash trees spread out between the two holes.
- G) Hole #6- Six large ash in the right rough.

Estimating Values of Ash Trees on the Golf Course

Any reasonable management plan for a golf course with a considerable number of ash trees would most likely be a combination of management procedures. The

(Continued on Page 13)

SuPerspective -

(Continued from Page 12)

first step in a management plan would be evaluating each ash tree in the landscape to assign a relative value based on its position in the landscape of the golf course, its condition, the cost of removing and replacing the tree vs. attempts to keep it alive, and the willingness to invest resources in it over time. A likely starting point in the evaluation of ash trees on the golf course would be to place each into one of the following three categories.

A) Low Value Trees: Ones that are not integral to the landscape and that one does not wish to invest resources in to protect chemically, and ones in poor condition.

B) Moderate Value Trees: Ones that may be integral enough to invest resources in to protect chemically and are in good condition.

C) High Value Ash Trees: Ones which are very important to the landscape and warrant investing resources in on a yearly basis. Trees should be in good condition initially.

Preventative Insecticide Treatments

One insecticide that has shown promise in protecting ash trees from EAB is Imidacloprid.

Imidacloprid is a systemic insecticide that can be sprayed as a soil/bark drench or injected into the tree. The spray drench is the most common practice, and has been fairly effective in the control of EAB. The injection method is not as common on golf courses due to the large number of trees and the higher cost associated with it. It is however, the most effective and predictable treatment as the insecticide is immediately taken up by the trees conductive tissues. The drench method is also effective, but is less predictable, and takes several weeks for the insecticide to be fully taken up by the tree. Golf courses in high risk areas of Michigan and Illinois have, with varying degrees of success, reduced the loss of trees with preventative applications of Imidacloprid.

The following excerpts are from conversations I've had with other Golf Course Superintendents in high risk areas. Steven Sarnowski, Superintendent at Raisin River Golf Club, in Monroe, Michigan stated, "I cut our first dead tree from EAB down in January of 2001. We've been treating about

300 trees with Imidacloprid since 2003. Any trees we have not treated are dead, and that's around 400. Of the trees we have treated, we've lost about a dozen with another 20-30 with significant damage. We spend about \$10K per year on treatments, removal, and pruning." Robert Green, Superintendent at Sunset Valley GC, in Highland Park, Illinois stated, "We have been in a quarantined county for about one year. We have the pest and have continued to treat about 10% of our ash population with Imidacloprid. The remaining 400 ash trees on the property will probably succumb to the pest in a rather rapid period. My best advice came from Superintendents in Michigan, that said start cutting ash trees now so you're not faced with the sudden death of hundreds of trees." Dr. Dave Roberts of Michigan State University, who was the first person to discover and properly diagnose the EAB in the Midwest, stated, "we have clearly demonstrated that we can have 100 % success in preventing EAB infestation in ash trees with a combination of Imidacloprid and nutrients injected into the tree every two years."

It's recommended that treatments be made in early spring, with some differing opinions on how frequent these should be. It is quite typical for golf courses in the high risk areas to treat high value trees annually. The suggested rate of Imidacloprid using the drench method is .2 ounces for each 1" of trunk circumference. The current cost of Imidacloprid is \$312 per gallon. For a standard 30" circumference ash tree, the cost of one drench application would be \$14.62. Therefore, one gallon of Imidacloprid (\$312) would be sufficient to drench approximately twenty-one 30" circumference trees. These applications could be completed using MVCC staff and equipment. Total cost of Imidacloprid needed to treat all 230 of MVCC's ash trees, using a 30" circumference average is estimated to be \$3,412 on an annual basis. Using the same average circumference, drenching the 118 trees in the previously listed seven distinct areas of high impact would be an annual cost of \$1,740. Any additional nutrients to the drench application would increase the cost.

Pruning and Removal of Trees

Several factors determine the cost of cutting down and removing a tree. These factors include; location of the tree, size of

the tree, species, cutting and removal methods, method of disposal, time of year, and who is performing the cutting and removal. The current practice at Minnesota Valley is removal of medium and large trees by a professional arborist who is trained and equipped to perform such work. Small tree removal and ground pruning is routinely performed by MVCC staff. The majority of this work is completed during the winter months. In recent years, the majority of this wood has been burned on site, greatly reducing the overall cost. Removal of a single tree vs. a large quantity of trees also factors into the cost of tree removal.

When cutting and removing a large quantity of trees, overall cost is typically reduced substantially. Overall, there are a number of factors that are involved in determining the cost of tree removal. My best estimate on the cutting and off-site removal of all 230 ash trees on the golf course would be as follows. Single medium or large tree removal at \$800 each by a professional arborist and removed off-site. To remove the current 230 ash tree population at \$800 each would amount to \$184,000. I'm confident that this expense could be reduced by negotiating costs and/or burning of material on-site. Insect infestation and the subsequent cost of removing infested trees that die, is not a listed item on the club's tree insurance policy. A claim, could however be made at the time of infestation and removal, in an attempt to have the cost covered. The overall cost could and most typically would be spread out over several years depending on preventative treatment strategies.

Summary and Conclusion

The nearest confirmed location of EAB in Wisconsin, is over 350 miles away from Minnesota Valley. In addition, the population of the EAB pest in that location is very minor at this time. There are also state and federal quarantines in place in all affected states, including the effected counties in Wisconsin. Given this information, there appears to be no immediate high risk of the pest arriving here. This should allow the needed time to further analyze the value of the ash trees on the golf course, investigate preventative treatment options, and establish and adopt a management plan for the ash tree population at Minnesota Valley Country Club.



Ash under an Elm

Minnesota Valley CC Ash Tree Update - July 2009

- Summer of 2008: MVCC Green Committee discusses locations and threat of the Emerald Ash Borer, and initiates a detailed evaluation of MVCC's ash tree population.
- October 2008: Superintendent Brower presents a report to MVCC Green Committee on the Emerald Ash Borer, its spread through the Midwest, an inventory of MVCC's ash trees, and possible strategies for managing the ash trees and preventing damage from the insect.
- October, 2008:- MVCC Green Committee unanimously decides to treat approx. 150 of MVCC's ash trees with a drench application of the insecticide, imidacloprid, in the spring of 2009.
- May 13, 2009: The discovery of the first known population of Emerald Ash Borer in Minnesota. Several dozen trees in St. Paul, near I-94 and Hwy. 280 are found to be harboring the insect and are removed.
- May 14, 2009: The Minnesota Dept of Agriculture issues a State Emergency Quarantine of the Emerald Ash Borer and ash tree wood for Ramsey, Hennepin, and Houston counties.
- May 19-20, 2009: All 230 of MVCC ash trees are treated with a drench application of the insecticide, imidacloprid. Total cost \$2,920.
- June 2009: MVCC Green Committee discusses future ash tree management strategies and makes decision to further evaluate each ash tree on the property to determine the best strategy for each tree.
- June 2009: Superintendent Brower begins evaluation of ash trees on the property, gathers additional information on the state quarantine and possible management strategies for 2010 and beyond.
- July 2009: MVCC Green Committee begins discussion of future management strategies for its ash tree population.

Minnesota Valley CC Summary of 2010 Tree Management Plan

- Tree Inventory records shall be updated and reproduced during the winter months to better reflect current conditions and relative values of trees.
- Relative values will be assigned to all ash and elm trees within the inventory, based on a three level scale of low, moderate, and high values.
- Using the relative values assigned to ash trees as a guide, an annual preventative chemical treatment program will be administered to prevent damage to the ash tree population from the Emerald Ash Borer. A drench method will be utilized to protect all ash trees, and in addition, several high value trees will be chosen for an injection method.
- Using the relative values assigned to elm trees as a guide, an annual preventative chemical treatment program will be administered to prevent damage to the elm tree population from Dutch Elm Disease. An injection method will be used to protect these trees.
- Any recommendation for removal of trees of any species should be made to the Superintendent and/or Green Committee for review and evaluation, and shall be pursuant to the process outlined in the MVCC Tree Management Policy. Recommendations for tree removal should be made far enough in advance so that the review and evaluation can be completed in the golf season, and the tree can be removed during the winter months.
- New tree plantings shall be completed in the spring pursuant to the process and guidelines in the MVCC Tree Management Policy, using the funds budgeted for tree planting within the Operating Budget.
- Pruning of trees to maintain their safety, function, and aesthetic appeal shall occur primarily in the winter months, using funds budgeted for pruning within the Operating Budget.
- All tree management strategies will be completed using the funds budgeted for trees in the 2010 Operating Budget as follows.

January:

Pruning and Removals (\$11,000)

May:

Ash Tree Chemical Treatments (\$4,000)
New Tree Plantings (\$2,000)

July:

Elm Tree Chemical Treatments (\$6,000)

How to Train a Tree

By AMY CALDWELL
B.S. Urban Forestry
University of Minnesota
ISA Certified Arborist MN-0167
amy@vinelandtree.com

The single largest myth nonarborists have about trees is - "oh those trees are small we can take care of them ourselves". Surely removing a few low limbs that bump your head while you mow is not complicated. However gaining the knowledge to structurally prune young trees and having the skills to implement the pruning plan takes time and practice.

The majority of tree limbs that fail in storms fail due to the lack of training pruning. Structural (training) pruning removes weakly attached small diameter limbs on young trees and creates a strong framework for the future tree. Structural pruning is not one single event; it must be done every few years. When a larger limb is removed decay will move in to fill the space. One rule of thumb we use on young trees is using hand saws, hand pruners, pole pruners and pole saws. Using a chain saw usually means a larger limb is being removed, which can leave a tree structurally unsound in the future.



Removal of a secondary leader.

The earlier you start the more you have to gain. All too often new trees are put in the ground, mulched and watered (if they are lucky), but then forgotten until it's in the way or aesthetically needs attention. Then what? Time to do some training, if it's not too late.

First establish a dominant leader (single stem) by subordinating any codominant stems. If that's all there is to it then what's the big deal? You don't need a tree care professional right? Few people see there is an art and science behind proper pruning. Anticipating future form and knowing what your objectives are not always easy. Knowing a tree's natural form or habit can be critical in being successful with any of these objectives.

There are seven main objectives for pruning described by Ed Gilman, University of Florida paraphrased below.

1) **Reduce risk of failure:** Reduce risk by establishing a structural pruning that begins at planting.

2) **Provide clearance:** Growth can be directed away from an object such as a building, power lines or fairways.

3) **Reduce shade and wind resistance:** Turf, ground covers or shrubs can receive



Amy Caldwell

more sunlight when live foliage is removed intentionally over a period of time.

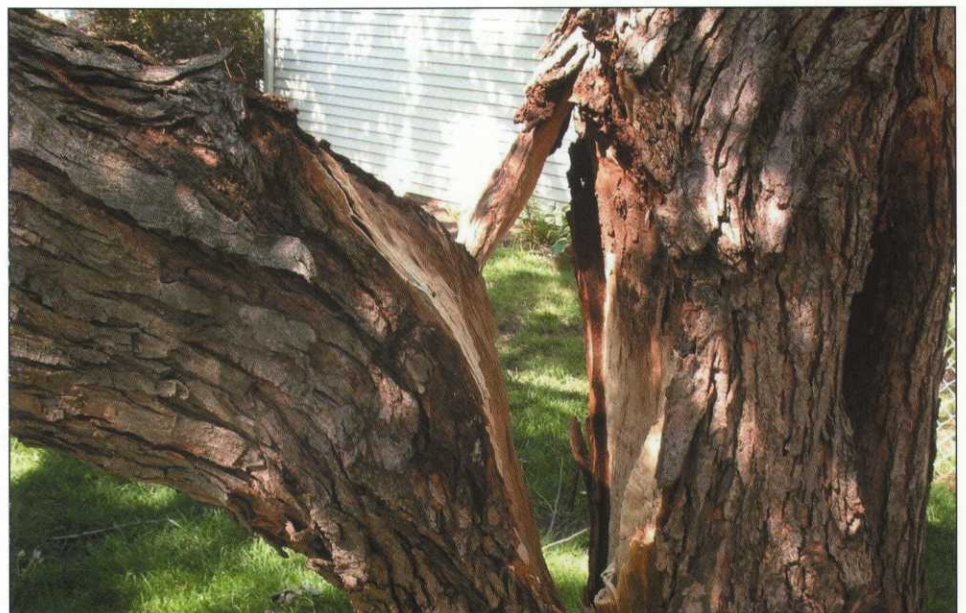
4) **Maintain health:** Remove dead, diseased and rubbing branches to maintain health.

5) **Influence flower or fruit production:** Pruning can influence the amount and size of flowers by heading back several branches. Fruit production can be eliminated or reduced by removing flowers.

6) **Improve a view:** By raising the canopy or continued crown cleaning a view can be enhanced or opened.

7) **Improved aesthetics:** Make trees look more appealing by crown cleaning or raising depending on the objective.

Take the opportunity now to do just a small amount of pruning - it will save more time and money later. Or ask for help from a professional. It's one of the best investments you'll ever make.



An example of a weak crotch that could have been avoided with training.

Season's



*In warm appreciation
we extend our Best
Holiday Season and
with Peace, J*



**MTI Distributing, Inc.
4830 Azelia Avenue N., #100
Brooklyn Center, MN 55429
(763) 592-5643
(800) 362-3665**

Greetings



*on of our association,
t Wishes for a happy
nd a New Year filled
oy and Success*

MTI Distributing, Inc.
2131 16th Street N., Suite C
Fargo, ND 58102
(701) 365-4260



Application Methods for Managing Tree Problems

By SHAWN BERNICK

Director of Research and Technical Support
Rainbow Treecare Scientific Advancements

What do we apply to trees and why do we do it?

For a golf course superintendent, managing pest problems on trees may not be a high priority on your "TO DO" list. Ensuring the course's greens, fairways and tees are free of pest problems consumes most of a typical golf course superintendent's time and maintenance budget. Despite this, trees provide numerous benefits and play a vital role on many golf courses. In addition to shade, beauty, and habitat for wildlife, trees provide a majestic backdrop to the turf and allow the golfer to enjoy a natural wooded area as they play. In deed trees can be a valuable asset to a golf course, however, as is the case with turfgrass, trees require special care and maintenance as well.

Tree care practices are commonly categorized as "Pruning and Removal" or "Plant Health Care." According to the International Society of Arboriculture's (ISA) consumer tree care website (www.treesaregood.com) the objective of a Plant Health Care (PHC) program is "to maintain or improve the landscape's appearance, vitality and-in the case of trees-safety, using the most cost-effective and environmentally sensitive practices and treatments available." Plant Health Care involves monitoring and using preventive and or therapeutic treatments to improve the health of your course's trees. This may involve applications of PHC products like insecticides, fungicides, growth regulators, fertilizers, etc. This article will discuss the methods in which PHC products are commonly applied to trees and the pros and cons associated with each method.

Before deciding what products and application methods to use, you should decide if your course will utilize in-house staff or use the services of a reputable commercial tree care company to manage the health of your course's trees. Hiring a reputable ISA (International Society of Arboriculture) Certified tree care company is great way to ensure your trees receive proper care and attention, but not all golf

courses can afford to contract out these services. Furthermore some golf courses use commercial companies for some of their tree care needs such as pruning large trees or for problems that require specialized tree injection equipment. While there are benefits to hiring a company, it is important to note that many PHC applications on trees can be easily performed when armed with the proper training.

Consider these questions when determining if you should hire a company or do the work yourself.

- Do I have someone on staff with treecare knowledge who can effectively

"Tree care practices are commonly categorized as 'Pruning and Removal' or 'Plant Health Care.'"

diagnose tree problems

- Do I have staff that can properly apply tree health care products
- Will I need specialized application equipment to manage the problem
- Do I have access to a reputable tree care product vendor who will provide tree specific application training and support
- What is my budget for tree care related services

This article will not discuss specific active ingredients or formulations, but it is important to note that some active ingredients commonly used on trees can be applied using numerous application methods while others can be applied using only a single method. For example, the insecticide active ingredient imidacloprid is formulated in numerous products and can be applied using soil, foliar or tree injection methods. Golf course superintendents should become familiar with all the ways a particular active ingredient may be applied.

Whether you want to hire a professional company or perform the PHC services in-house, consider addressing the follow-



Shawn Bernick

ing questions to determine what product and application method to use.

- What is the target pest?
 - What is application window to manage this pest?
 - Is the problem a concern for the long term health of the tree or an aesthetic problem only?
 - Is the tree currently infected/ infested by the disease or insect?
 - Are their multiple factors causing the problem?
 - What active ingredient should be considered?
 - Which formulation should we use?
 - What length of residual will I need to control the pest?
 - What will the control strategy cost to hire out or to do in-house?
 - How many trees are involved?
 - How long will it take to do?
- Answering the above questions will lead you to the application method you should use.

Virtually all tree care products are applied to one of three areas: the soil near the tree or in the drip line, the woody parts of the tree, or the foliage.

In general, there are three categories of application methods commonly used for managing tree problems. These include:

- Spray Application
- Soil Application
- Tree Injection

The remainder of this article briefly describes a variety of application methods that golf course superintendents can use to control many common insect and disease problems.

(Continued on Page 19)

Managing Tree Problems-

(Continued from Page 18)

Application Methods

Spray Application

Spraying can be applied to the leaves or to the woody (trunk and limbs) parts of the plant.

Spray applications are widely used for numerous tree care applications. Foliar sprays provide the most effective way to treat foliar diseases such as apple scab, rust and powdery mildew. Sprays are also commonly applied to the trunk and limbs of trees to prevent attack by wood-boring insects such as clear-winged borers, ambrosia beetles and pine bark beetles.

Advantages:

- Fast efficacy, often spray insecticide formulations are "knock-downs."
- Non-invasive and does not wound the tree.
- Low product cost as they are diluted in large volumes of water.
- Small ornamental trees can be sprayed with relative ease with a motorized back pack system.
- Application equipment can be used to apply multiple foliar spray products (Many superintendents have equipment to apply foliar applications).

Disadvantages:

- Broad spectrum products can impact non-target species.
- Potential for drift and applicator exposure.
- Difficult to obtain uniform spray coverage on large trees.
- Short residual, applications must be reapplied often.
- Weather can impede operational efficiency.

Soil Application

Systemic products applied to the soil are amongst the most operationally efficient available to the practitioner. These can be applied at the base of the tree using either basal drench or soil injection. Soil applied insecticides are used to manage numerous key pests on trees and shrubs. Common pests controlled include Japanese beetle, aphids, adelgids, emerald ash borer, scales, sawflies, bronze birch borer, two-lined chestnut borer and birch leaf miner. Tree growth regulators, fertilizers and soil amendments are also applied using soil techniques.

Advantages:

- Applications are quick (minutes).
- Non-invasive and does not wound the tree.
- Predictable treatment/operations, not dependent on having calm weather and not dependent on the tree's uptake system.
- More flexible treatment period, applications with some products can be made during dormancy prior to soils freezing.



Tree injections

- Equipment may be used to apply multiple products.
- Minimal exposure to applicators.

Disadvantages:

- May not be viable for highly mobile active ingredients.
- Longer time to enter into and move throughout the tree before full protection is achieved.

(Continued on Page 20)

From our family to yours



and thank you for your business!

John, Lori, Will, Tom, Randy and Larry



TWIN CITY SEED COMPANY.

"16 years and growing"

7265 Washington Avenue South
Minneapolis, Minnesota 55439
1-800-545-TURF or 952-944-7105
twincityseed@twincityseed.com

Managing Tree Problems-

(Continued from Page 19)

- Require annual applications.
- Soil injection requires specialized equipment.
 - May not be viable for highly mobile active ingredients.
 - Longer time to enter into and move throughout the tree before full protection is achieved.
 - Require annual applications.
 - Soil injection requires specialized equipment.

Tree Injection

Tree injection delivers the chemical directly into the tree's vascular system. This process requires the drilling of holes into the root flares. There are a number of tree injection devices and products being sold for management of tree problems. Tree injection treatments are categorized as macro-infusion or micro-infusion. Macro-infusion delivers a high volume of dilute chemical solution into the tree while micro-infusion delivers a low volume of highly concentrated solution into the tree. Macro-infusion fungicide treatments are commonly used to manage vas-

cular wilt diseases such as oak wilt and Dutch elm disease, while micro-infusions are commonly used for insect pests.

Advantages:

- Reduced lag time between treatment and full protection.
- Reduces applicator exposure .
- Can be used in environmentally sensitive areas where spraying or soil treatments are not feasible.
- Provide faster results as therapeutic treatments on infested trees.
- Some products provide multi-year control.
- In some cases, the only method available to treat a problem.

Disadvantages:

- Invasive technique that requires wounding.
- Time required for application. Speed of application is dependent upon how quickly the tree is able to take up the product or solution.



Basal drench

- Limited application window, optimal uptake occurs only during the growing season.

- Specialized equipment and higher product costs.

All of the above application methods have a role in plant healthcare management. Understanding the pros and cons of each will help you decide which methods will be best suited for your problems and operational needs.

HARTMAN

Quality since 1971

Specializing in classic restoration and renovation

- Topdressing
- Aerating
- Drainage problems
- Slit Drainage
- Greens
- Bunkers
- Laser Leveling
- Grading
- Irrigation
- Pump station upgrades

8011 BAVARIA RD
VICTORIA, MN 55386
952-443-2958

WWW.HARTMANCOMPANIES.COM
INFO@HARTMANCOMPANIES.COM