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About the Cover:

Photo credit to Jim Walsh of Vineland Treecare.
This issue of Hole Notes is focused on tree care.

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2010 MGCSA EVENTS

Jan. 7
MGCSA Annual
Business Meeting
1:00 PM
Auditorium 3
Minneapolis Convention Center

Jan. 6, 7 and 8
Northern Green Expo
Minneapolis Convention Center

Feb. 10
MGCSA Hospitality Night
at the GIS in San Diego
Dick's Last Resort

March 3-4
MGCSA Mega-Seminar
Delwood Hills GC

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SHARP SHOOTING AT THE FALL MIXER

Judd Duininck, Duininck Golf, participated in the Fall Mixer at the Minnesota Horse & Hunt Club and helped lead his team to a top 10 finish. (See story by Arrangement Chair Tom Proshok on Page 5.)



PRESIDENT'S MESSAGE

Thank you, Membership, for Two Great Years!

By Richard B. (Rick) Traver, CGCS

One of the hardest things I have to do as president is write a monthly column for this fine publication. I can jabber on for hours if you want to talk politics, sports or turf, but having to put something down on paper for two years that sounds presidential is a little difficult. I have a hard time coming up with the topics, so thank goodness this is my last issue. I do want to thank all the people who have complimented me on the content of this column.

* * * *

I would like to thank the membership for allowing me to hold this position for the last two years. It has been quite an honor. I doubt that my presidency will go down as the greatest era in the MGCSA, nor was I your guy if you were looking for "change." I do hope however that you all felt comfortable knowing the association was in good hands. It has also been an honor to serve with and get to know the gentlemen who have also been on the board during my tenure. They are a hard working dedicated group of people you should be proud to have at the helm of the MGCSA.

* * * *

Coming up at the MGCSA Annual Business Meeting is a vote on several bylaws changes. The first is a change of wording to create continuity throughout the bylaws. There are 35+ places where the term Executive Board and Board are used interchangeably, and those will all be changed to Board of Directors. The second bylaws change creates a designated position for the Class C members on the board of directors. This position will be voted on solely by the Class C members much like we do with the affiliates. The Class C members will still be able to run for Directors positions; however Article VI of the bylaws states that a majority of the board must be composed of Class A members. The third bylaws change allows the affiliate members to become life members. If anyone has any questions with regard to these changes please contact me @763-271-0167.

* * * *

Thanks to Tom Proshek for the great job he has done all year on the MGCSA Arrangements Committee. We have been looking at alternative activities for some of the monthly meetings, and Tom was responsible for organizing the outing at the Minnesota Hunt Club and it was a fun time for everyone who shoots skeet. I wasn't able to stay and participate, but it sounds like it was a blast and I will certainly be a part of it next year.

* * * *

Thanks also to the members of the board who will be leaving this year. First and foremost a thank you goes to **James Bade**. He has served for over 10 years and his wisdom and insight will be greatly missed. Thanks also to **Jeff Vinkemeier** who introduced the Environmental award to the MGCSA, and also to **Tom Meier** who was instrumental in seeing our scholarship program through some tough times. Thank you all for the time you have served, it has been a joy getting to know you.

* * * *

I want to say a special thanks to Jack MacKenzie, CGCS as well for the nice article he wrote about my family and me in the last issue, but also for continuing to serve as editor of the *Hole Notes*. He is a talented writer and could have certainly made that his career if he decided not to be a superintendent.

*- Respectfully
Rick Traver*

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HOLE NOTES

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Trading "Sticks for Guns" at the Fall Mixer

By TOM PROSHEK

Superintendent, Brackett's Crossing CC
MGCSA Arrangement Chair

Fall Mixer event for this past fall we've decided to change the venue a bit by trading in our "sticks" and replacing them with "guns." With a great turn out for both the educational portion along with the sporting clay shoot, we believe it was a successful event.

The educational portion from Mary Reinders on the proper applications and details about the different ice removal products were very interesting along with informative.

Our goal to fill the event was achieved with 50 participants. The consensus was very positive. To summarize, this event was mentioned to us by Brad Zimmerman, Theodore Wirth Golf Course, "fun was had by all." Thanks to all whom attended. By popular demand, we are planning to have our 2010 Fall Mixer again at the Minnesota Horse and Hunt Club on Oct 4. Our goal will be 75 participants next year so mark your calendars.

As always, if you have any suggestions for an event, or willing to host an event, please contact me or the association office and we'll appreciate your input. Remember, this is our association.



Mike Kelly, Bayer Environmental Science, takes aim while Scottie Hines, CGCS, Windsong Farm Golf Club, looks on. These two paired with Nick Morter, also of Windsong Farm, and Thomas Schmidt of Hillcrest Golf Club of St. Paul, to capture first place honors with a cumulative score of 33.

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MGCSA FALL MIXER SHOOTING RESULTS

33

(First Place)

Scottie Hines, CGCS, Windsong Farm
 Nick Morter, Windsong Farm
 Jeff Pint, New Prague GC
 Thomas Schmidt, Hillcrest Golf Club of St. Paul
 Mike Kelly, Bayer Environmental Services

32.4

Corey Brinkman, Medina G&CC
 Erin McManus, Medina G&CC
 Nick Folk, The Minikahda Club
 John Jarosz, The Minikahda Club
 Craig Paskvan, Paskvan Consulting

31.8

Paul Diegnau, CGCS, Keller GC
 Brett Wenzel, Keller GC
 Tom Wanner, Minnesota Wanner Company
 Bob Porter, Hiawatha GC

29.2

Jim Rienka, Dwan GC
 Chris Carpenter, Frontier Ag & Turf
 Matt Mears, Red Wing CC
 Jason Raabe, Dwan GC
 Mike Hoffman, Dwan GC

26.8

Paul Eckholm, CGCS, Heritage Links GC
 Tom Proshok, Brackett's Crossing CC
 Arik Hemquist, Brackett's Crossing CC
 Bill Gray, Brackett's Crossing CC
 Ken Adams, Jr., Brackett's Crossing CC

26.4

Jim Walsh, Vineland Treecare
 Amy Caldwell, Vineland Treecare
 Connor Walsh, Vineland Treecare
 Tim Wicklund, Cedar Creek GC
 Dennis Berning, Rush Creek GC

26.2

Judd Duinick, Duinick Golf
 Larry Thornton, Superior Turf Services Inc.
 Matt Schmid, Superior Turf Services Inc.
 Michael Cauley, Wayzata CC
 Dustin Koskela, Wayzata CC

23

Brad Smith, Precision Turf, Inc.
 Brad Zimmerman, Theodore Wirth GC
 Justin Koepp, Gertens
 Dan Hill, Birnamwood GC
 Rob Adams, The Ponds at Battle Creek

20.6

Kevin Norby, Herfort Norby Golf Architects
 David Oberle, Excel Turf & Ornamental
 Pat Walton, CGCS, Meadowbrook GC
 Nick Fisk, Chisago Lakes GC
 Mike Kelly, Tiller Corporation



2ND PLACE

From the left: John Jarosz and Nick Folk, The Minikahda Club; Erin McManus and Cory Brinkman, Medina G&CC, and Craig Paskvan, Paskvan Consulting.



3RD PLACE

From the left: Bob Porter, Hiawatha GC; Paul Diegnau, CGCS, and Brett Wenzel, Keller GC, and Tom Wanner, Minnesota Wanner Co.



8TH PLACE

From the left: Dan Hill, Birnamwood GC; Brad Smith, Precision Turf; Brad Zimmerman, Theodore With GC, and Rob Adams, The Ponds at Battle Creek.

INSIGHT: ONE SUPERINTENDENT'S PERSPECTIVE

By **JERRY WEBB, CGCS**
RIVERWOOD NATIONAL & VINTAGE



I have been a Golf Course Superintendent for 29 years and a Certified Golf Course Superintendent for 23 years. I received my Bachelor of Science Degree from Iowa State University in Agronomy with emphasis in Turfgrass Management and my Master of Agriculture Degree from Iowa State University with emphasis in Turfgrass Management and Pest Management. In 29 years I have had golf course experience, which includes being the construction superintendent at Brookside (now Bulrush) golf course in Rush City and Riverwood National. I have been a golf course superintendent at six different golf courses in Iowa and Minnesota. I have been involved with golf courses all my life. My father and brother are both Class A PGA Golf Professionals.

Built in 2005, the par 72 Riverwood National is an 18-hole, daily-fee, championship golf course located in Otesego. David A. Kirscht was the course architect.

The par 55, Vintage 18-hole executive course was built in 1999.

Why an/or how did you enter the turf management industry?

I worked for my father at the different golf courses he was the golf professional at throughout his career. I started as a caddy in Fargo, then as a bag boy, followed as a cart boy. I then worked in the pro shop for my dad while in high school in Des Moines. I knew from that point I didn't want to be on the golf professional side of the golf business but I still wanted to make my profession golf related. So I decide to pursue Agronomy at Iowa State for my bachelor's degree. I played golf and hockey while attending Iowa State. Then after one season in the International Hockey League I came back to Iowa and began my golf course superintendent career. I received my Masters from Iowa State while I was a golf superintendent at Ames Golf and Country Club.

Who was your professional mentor and why?

It would be my three advisors I had while my many years at Iowa State. Dr. Bill Knoop, Dr. Ron George and Dr. Nick Christians. They all had a large influence on my professional career.

What has been the highest point in your career?

It would be being involved with two golf courses from the beginning of construction all the way through to opening day. A great feeling. Another would be going with my father; who is 86 and brother to the 2008 Masters in Augusta. An equally great feeling.

What has been your lowest point?

There have been a few, but my wife says "everything happens for a reason." After 29 years I'm beginning to actually believe her. So I will leave it at that.

Are your greatest challenges political, agronomic or managerial?

Rounds are down as is the sale of golf equipment. We are not getting the revenues in the golf industry that we had in the 90's. Owners and managers are asking superintendents to have better conditions with less operational money and less staff.

What is the most difficult disease to manage on your course and how do you?

Snow mold diseases are the most variable from year to year because of the changing winter conditions. Over the years I have used different fungicides and tried covers but the constant has always been some kind of anti-transparent with the fungicide. I feel it has helped save my greens and tees in most of the years.

Is it hard to find good help in your area of the state?

For me right now it is easy to find help. Most of my retired part timers return year after year. Then I fill in around them with college kids home for the summer. Then I try to add two turf student interns from Iowa State or another turf school. Counting myself, I only have 12 people for 36 holes so it is not hard to fill in the few positions I have open each year.

Do you have a dog on your crew?

I don't have a dog at Riverwood/Vintage, but I had a Springer Spaniel named "Boo" when I was a superintendent at Ames Golf and Country Club in the 80s. At the time the course had quick coupler fairways so I had a night water person. Boo would go around and chase water all

night and then sleep all day. He was trained to stay out of the bunkers and off the greens. Boo was a memorable dog.

Where will our industry be in 10 years?

Right now course closings are outnumbering openings. In the foreseeable future we won't see growth like the 1990s in the U.S. again. I see equipment getting more efficient with less maintenance required. I think the largest improvements will be in plant breeding and research at the University level. This will provide better quality playing surfaces with less mowing, lower fertilization and less fungicide/herbicide/pesticide needs.

Where would you like to be in 10 years?

Hopefully I'll be looking at retirement. Living in the present home I am in now on the lake and taking care of "my" yard. Working part time at a local golf course in the summer and still playing "senior" hockey with the guys until I can't anymore.

What is your perspective of our state association?

Being a Central District Director back in Iowa in the 80s, I realize how much time and effort is involved "being involved." The MGCSA Board of Directors does a wonderful job in communication with the association, the publication and information in the *Hole Notes* along with the setting up of the many events. I don't know how they find the time and I thank them for it.

Name your foursome:

Wayne Gretzky, Mario Lemieux and Alex Ovechkin would be included in my foursome.

We would play a round of golf and talk about their careers in hockey and then off to the hockey rink afterward for a little pick up hockey game. Alex and I against the Great One and Mario. What a dream.

PEER-TO-PEER: BETTER TURF THROUGH NETWORKING

MGCSA Superintendents were asked:

Tree removal and trimming are critical and dangerous aspects of golf course maintenance. Do you employ an on staff arborist, contract the work out, or do the best you can in house? What do you do with the wood?

At Southview Country Club we do as much of the tree removal and clean up in-house as possible. We do not employ an arborist but however will contract any removals or trimming that are questionable in safety. I am not willing to take any chances when it comes to safety. We wear hard helmets and Kevlar chaps whenever we are running chainsaws. These essential personal protective devices should never be over looked and have prevented injuries for us on more than one occasion. We chip all or our own brush and either give the wood away for firewood or dispose of it if it is not suitable for heating.

- Jeramie Gossman
Southview Country Club

At Minikahda, we contract all of our work out. We have been working with Tim's Tree Service for the past 30 years. All of the wood is hauled off site.

- Jeff Johnson
The Minikahda Club

At Olivia Golf Course, we do the best we can in-house that our greens committee selects trees for removal and major trimming, trees that are to be removed are felled (by myself or an experienced member/volunteer) a day or two before our course member work days. We generally have one work day in the fall and one in the spring with most of the tree removal done in the fall. Members bring trailers, rakes, saws, tractors, loaders, etc to remove the wood. Members are free to take as much of the wood as they would like the rest is piled on the course brush pile and burned once a year as a training exercise for our city fire department. We have a couple of members with access to boom/man lift trucks and trimming is done when ever conditions allow...typically after the ground is frozen in the fall. Often the resulting brush on the ground doesn't get completely cleaned up until our spring work day.

- Rolly Rauenhorst
Olivia GC

At Minocqua, we recently hired an individual who previously worked for a



forestry/tree service company. Prior to this we did a small percentage of work within our staff and contracted the majority out to a tree service contractor. Occasionally we will rent a boom lift to do any jobs that need to be done in the air. We haul brush off on a trailer, and would like to get a chipper in the future as our brush pile is enormous. The logs are usually taken home by staff and used as heat for the winter.

- Bill Stein
Minocqua CC

At Somerset Country Club, we do not have an on staff arborist. As much tree work as we do, we certainly could have one. The tree chipper is one of our most valuable tools. A power pruner with a homemade tree bucket has saved us a lot of money too. The Somerset staff does most of the tree work. We do have special pruning done in trees too big for us. And we hire-out the work where the property line borders the highways.

We used to have a fire burning stove at the maintenance facility. Now we put the wood outside the fence and it is gone within hours. The wood that is too big to handle we haul down to the tub grinder. The wood chips that we make are used to mulch evergreen trees and new plantings. Somerset used to have a stump grinder for the dutch elm that moved through. With all the ash trees that may need to come down it may be time to purchase another

stump grinder.

- James Bade
Somerset Country Club

At Tanners Brook, we remove the dead trees ourselves. With a parkland style golf course, we don't have a lot of trees anyway. We pile and burn the brush in the winter time and sell the wood to the golfers. We use the money generated to pay for upgrades in our shop.

-Kevin Clunis CGCS
Tanners Brook GC

There is another thing that MGCSA members can do with the trees they cut down. They could recycle them. There are various people that are always looking for logs to cut into lumber, especially hard woods. As you know I am involved with recycling used and scrap lumber to make my bluebird boxes. Many hobbieist, furniture makers, cabinet makers, farmers, etc. have their own small lumber mills where they cut, dry, and store for use. You probably could find them on the web via Google. Just a thought.

- Jack Hauser
Bluebird Recovery Program

At Hiawatha, we have a Forestry Service within our Park Board. The branches are chipped, large trunks are haul away by a service. The smaller pieces are cut up by the staff and used for firewood.

- Robert Porter
Hiawatha GC

At The Ridge at Castle Pines North in sunny Colorado, we perform the work in-house and burn some of the wood in fire pits outside the clubhouse entrance during the winter evenings. The remainder of the wood is stockpiled and eventually chipped at the end of the winter season. Once the wood has been chipped, we use it around our Ponderosa Pines throughout the property.

- David Soltvedt
The Ridge at Castle Pines North

(Continued on Page 9)

Peer-to-Peer-

(Continued from Page 8)

At Dellwood, we use a tree service to do trimming and precarious removals. We do most of the tree removals and canopy raising. All wood is dealt with in-house. Trimmings and softwood trees are burned on site. Hardwood trees are given to members or split for bonfires at the clubhouse. We recently hired a certified arborist to do a tree inventory, evaluation and management plan.

- Eric Peterson
Dellwood GC

At New Richmond, all of our tree removal is done in house. We have a wood chipper for much of the clean-up and rent a stump grinder for a week each year to clean up the stumps. The wood chips are used on the course for mulch plus we give them away to members. A couple of the crew members use the wood. One heats his house with it and then he sells some of it. Any major tree trimming is done by a tree service.

- Tom Johnson
New Richmond GC

At Ruttger's Bay Lake Lodge, we remove most of our wind/storm fall trees ourselves. Any trees that I feel are too dangerous to fall or are close to buildings we hire a local tree company to drop for us. All of the wood that we generate from trees is used for the more than 15 fire pits that we have at the resort for our guests to enjoy. In an average season we will use in excess of 25 cords (that's not a typo) of firewood in fireplaces and the outdoor fire pits.

- JW Wollner
Ruttger's Bay Lake Lodge

At St. Cloud Country Club, we do not employ an arborist. The only tree trimming done in-house is from the ground only with pole saws. All of our trimming is contracted each year. Removals are done in-house if the tree is manageable to our staff and this is determined by the supt. or asst. supt. The wood is sometimes offered to members and/or burned. When contracted out we retain the woodchips and use them in areas of our golf course.

- Dan Hanson
St. Cloud CC

At Crosswoods Golf Course, we just completed a renovation of our 5th hole that included widening the fairway and construction of a new green. All in all, it

required about 3 acres of trees to be removed. We hired a commercial logger to remove the trees. Holy cow! They sheared the trees in three hours and chipped them all in three hours, quite an operation. The chips were hauled off to burn in coal fired power plants. Nothing was left except stumps. Aside from this project, we usually drop/trim trees in house and offer the fire wood to members at no charge.

- Michael Stone
Crosswoods GC

At Chisago Lakes Golf Course, we complete tree removal and trimming in-house. Also we have a member work day in which the trees we want removed we fall and the members can cut-up and take the wood. We concentrate on a few heavily wooded areas that we want to thin. They pile the brush and wood they don't want and we haul it to our burn pile. The work day is on a Saturday in December from 9am-noon with the course providing lunch afterwards. We usually have around 25 participants with only a handful taking wood. Many members enjoy the camaraderie with the other members and start asking about the day early in the fall. We also tie the day to our pro shop clearance sale and the following year golf memberships are available.

- Brian Brown
Chisago Lakes Golf Course

At Minnesota Valley Country Club, we budget roughly \$20,000 annually for a line item called "trees and shrubs." We expense tree and shrub trimming, removals, and new plantings into this category (approx. \$13,000). We also expense annual elm tree injections and ash tree drench spray into this line item (approx. \$7,000). We trim trees in-house on an annual basis during the winter months, rather extensively, but from the ground only, no climbing. We pull a burn permit for the month of March and burn the trimmings on a gravel road at our driving range. Any climbing work for thinning and deadwood is completed by professional arborists that are brought in annually during the winter. They also do any large removals and difficult hangers for us, and are brought in for major storm damage. Typically, this wood is removed from the property by the arborist. We have a total tree inventory of 1,230 mature trees. Great topic!

- Mike Brower
Minnesota Valley CC

Any minor pruning we would do on our own throughout the winter, including

basal pruning. I had the good fortune to fell over 300 trees before I left the great Midwest, only one fell to date though since I have been in Oregon. They grow them a lot bigger out here. At the golf course we would cut all logs to 8'8" and stockpile them near the shop. By the spring time we would typically have enough for at least one load for the local timber company and usually make enough money to cover the labor and then some. Anything that was not big enough to sell for timber, but still good for firewood I would let a few wood hounds from my staff go out and cut and haul away. We would then try and chip any debris that was not worth anything as firewood and use the chips in the perennial beds. It is that time of year, and I am beginning to miss the smell of my Husqvarna, please fell for me.

- Tod Blankenship
Oregon State University

At Marshall Golf Club, we usually contract out our tree removal issues. Last year we removed about 20 old Poplars on the course during the month of February. The company was excellent in their detail. They supplied clean-up and stump removal in all bids. This year we have only 4 poplars that are marginal but are removing them along with some other older trees. For the most part we keep our membership informed during this process and fortunately many who have heated workshops have collected most of the wood for burning. The leftover debris we chip ourselves with our chipper and use this material as mulch for newly spaded trees. Any old and weak Elms that are removed during this time or throughout the year are immediately disposed of off-site at the local tree dump. We have found out that in most cases it's cheaper to contract it out if the price is reasonable, which allows more time to concentrate on more important issues on the course.

- Kurt Hovaldt
Marshall Golf Club

At TPC Twin Cities, we contract out large tree removal and trimming. We will do some pruning and trimming that we can reach from the ground with a pole pruner or chain saw. We chip all of the wood. Most of our tree work stems from losses to Oak Wilt so chipping is the preferred solution.

- Roger Stewart
TPC Twin Cities

Emerald Ash Borer Control Project Mendakota Country Club

By **BOB MCKINNEY, CGCS**
Mendakota Country Club

Bob McKinney, CGCS of Mendakota Country Club has been employed by the club for 35 years. He was hired by Harold Stodola in 1974 and has been Superintendent for the past 19 years.

Mendakota Country Club is a private club in Mendota Heights, Minn. The course is on 130 acres. We've been averaging approximately 22,500 rounds per year the last six years.

What is known as Mendakota Country Club began its golf history in 1926 when Louis Fischer laid out five holes in his pasture land using empty tin cans for cups. By the end of the first year they had nine holes. By 1929 "the course" was expanded to 18 holes. Eighteen grass greens were constructed in 1933 allowing the course to be awarded the 1934 State Publinx Championship. Somewhere along the way the course was named Riverview Country Club, a name that stuck until 1942 when it was changed to Twin City Country Club. In 1956 the club was sold to a corporation made up of members and in 1957 the name was changed to Mendakota Country Club.

What Prompted You To Consider 'In-House' Tree Injection?

As reports of Emerald Ash Borer (EAB) discoveries got closer to the Minnesota border, I became much more interested in learning more about this pest and methods to control it. I took an inventory of Mendakota's ash trees to determine not only how many we have, but also what effect it could have on our golf course if we lost all of these trees. Unfortunately for us, I found we have over 350 ash trees on the course and most of them play a very important role either strategically or aesthetically to our course. Many of our golf holes would be devastated without them. Also, our ash trees are large, averaging 20



inches in diameter.

I have to give my friend, Kevin Manley, who works for JRK Seed, a lot of credit for helping me understand this pest and the various control methods being used for control. I attended two seminars put on by JRK Seed and Arborjet and researched all I could find on the internet about EAB. The research being done by professors Smittley and McCullough at Michigan State University is extremely useful. Everything I learned steered me towards injecting our trees "in house" using Arborjet equipment and the insecticide Tree-äge. There are a number of reasons why I chose Arborjet and Tree-äge but basically this method has proven to be the most effective and environmentally safe product to date for controlling EAB.

I reported my thoughts and plan of attack to my committee and Board of Directors. The plan was to inject 300 of our 350+ ash trees at a cost of \$70 per tree. At this cost, I could treat our trees for 25 years compared to the cost of removal and replacement. We all agreed that this golf course could not afford to lose these trees. Mendakota assessed each of its golf members \$100 to cover the cost of injection. I would say that our members welcomed this assessment.

I would say the injection method is very simple and easy to use. A bit of a

learning curve at first but after six trees or so it really goes smoothly. The process is basically measure, drill, plug, and inject. First the tree diameter is measured at breast height (DBH). I use a special tape measure made for measuring tree diameter. I then look at a "use rate table" that will tell me the number of injection sites per DBH as well as volume of Tree-äge to be injected. For example, a 20" DBH tree will require 8 injection sites and 110 ML of Tree-äge. Using a cordless drill with a 3/8" bit, 8 holes are drilled approximately 1-5/8" deep and as evenly

spaced as possible around the tree.

Typically the holes are drilled about 6" up from ground level and away from damaged areas of the tree or compressed bark areas. Root flares are excellent locations for injection sites. Arborplugs are then tapped into these holes. An arborplug is a plastic "plug" with an internal septum which keeps the injection site leak proof. Two I.V. bottles with four delivery tubes each are used to deliver the product. I've been using one part water and one part Tree-äge for my mix whereby I'll add 55 ML of each to each bottle for a total of 110 ML for this tree. Using the Arborjet hand pump, each bottle will be pressurized to 60 psi. There is a blow-off valve on each bottle that limits the pressure to 60 psi. The delivery tubes which each have a needle and valve at their ends are then purged of air before being inserted into the arbor plug. The valves are then opened and the mix flows into the tree. I would say that it takes about 15 minutes for this entire process.

The best time for injection is when the trees are fully leafed out in the spring and actively transpiring. Typically, it takes more time for drilling and set up then it takes for the product to move into the tree. I've had it take from seconds to hours for the bottles to empty.

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