Hole Notes

The official publication of the MGCSA

Vol. 46, No. 8 September 2013

NORTHERN GREEN EXPO

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January 8, 9 & 10, 2014

Minneapolis Convention Center | NorthernGreenExpo.org

Explore the latest trends in turf disease identification and treatment options.

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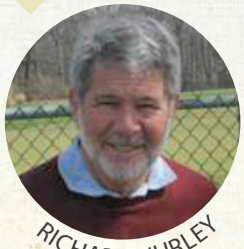


RICHARD HURLEY

My opening keynote at the 2014 Expo will help you jumpstart your year with new leadership techniques and teamwork strategies.

JOHN KENNEDY

Take a look back at 2013 with a golf course "year in review."

BOB VAVREK

Have you considered the significance of plant/soil/water interactions? I'll explain why it's so important.

DOUG SOLDAT

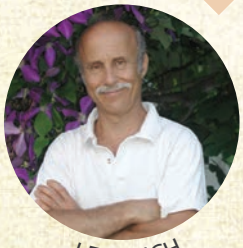
Let's dive into the latest in turf insects and control options.

CHRIS WILLIAMSON

Want to learn about turf management at Target Field? Join me for a first-hand perspective.

LARRY DIVITO

What is "Maintenance Weed-Free Gardening", and how do you do it? Join me at Expo to find out.



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Upcoming Events

October 7
The Wee One
Brackett's Crossing Country Club
Host Superintendent Tom Proshek

October 15
Fall Shoot Out
Minnesota Horse and Hunt Club
Host Superintendent Bill Gullicks
Bellwood Oaks Golf Club

November 20
Assistant's Professional Forum
Pinz in Woodbury
Host Assistant Superintendent
Casey Andrus
Interlachen Country Club

December 4
Annual Awards Banquet
Golden Valley Golf and Country Club
Host Superintendent Jeff Ische

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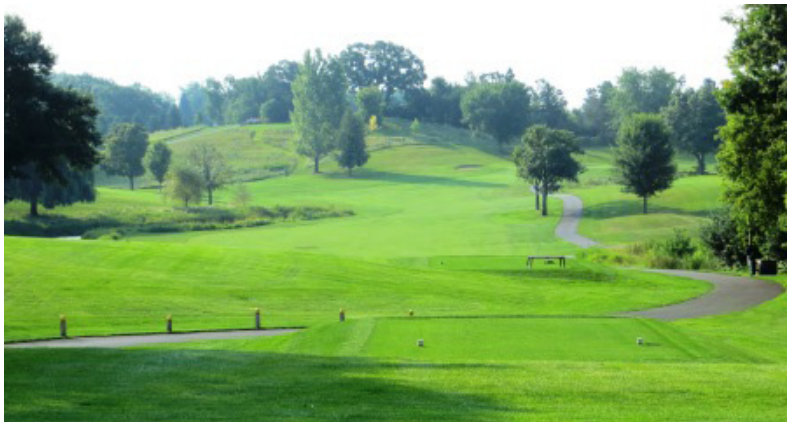
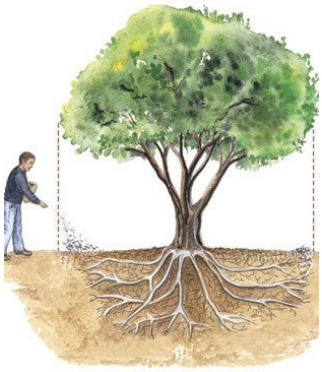
Cover Shot
Sunrise over Superior. This great shot is of the 3rd green on Northland Country Club. Have a nice photograph of your course? Send it to jack@mgcsa.org.

Wee One Tournament
October 7th
Brackett's Crossing C.C.





Feed your trees the right product and at the right time and they will stay healthy all year long

...Even More Content...

Deep Drains and Mini Channels page 18-21
By Scott Wandler, Assistant Superintendent at Missoula CC

Hole Notes (ISSN 108-27994) is digitally published monthly except bimonthly in November/December and January/February by the Minnesota Golf Course Superintendents' Association, 10050 204th Street North, Forest Lake, MN 55025. Jack MacKenzie CGCS publisher. Please send any address changes, articles for publication, advertising and concerns to jack@mgcsa.org.

Presidential Perspective

by Scottie Hines, CGCS Superintendent at Windsong Farm

Here we are, late September and I do not feel as if things have slowed one iota. I hope everyone has recovered from aerification and your course is back to mid-season form. I love fall golf! Conditions are near perfect for fun, firm and fast playing surfaces. I guess the next big battle is leaf clean-up. I am fortunate to not have much of an issue with leaves.

Two fun items to report to you this month:

Congratulations to Dr. Don White!

Historically, and this year as well, the competition has been stiff. However, with strong endorsement from the MGCSA, Dr. Don White, retired Professor of Turf Science at the University of Minnesota, has finally achieved the greatest Minnesota Golf Association recognition by being the 2013 recipient of the Warren Rebholz Distinguished Service Award. Dr. White is indeed an individual who has made a substantial contribution to the game of golf in Minnesota, and elsewhere, and whose dedication has exemplified the spirit of the game at its highest levels.

Knowingly or unknowingly, players across the state of Minnesota, nationally and even internationally have been impacted by Dr. White's scientific and educational persistence. As a professor, he taught many, many of today's finest golf course superintendents. As a scientist, he developed a commercially viable turf from what most consider a weed, Poa annua (annual bluegrass). As a consultant, his visits to courses in the upper Midwest are well documented. As a speaker, he was in high demand through his career at state, national and international conferences. As an environmentalist he was a big proponent of prairie grasses and reduced impact grasses…later to be called "sustainable" turf.

Very few individuals can lay claim to leaving a living legacy of mentees who have become extremely successful in their industry. Dr. White provided tutelage, encouragement and support to some of the best of Minnesota's golf course superintendents. Here are just a few:

Superintendent	Current or former club
John Steiner, CGCS,	White Bear Yacht Club
Norma O'Leary, CGCS	Silver Bay Golf Club
Doug Mahal, CGCS	The Jewel Golf Club
James Gardener, CGCS	Rochester Golf and Country Club

James Bade	Somerset Country Club
Jeff Johnson	The Minikahda Club
Pat Walton	Meadowbrook Golf Course
Ben Just	Midland Hills Country Club
E. Paul Eckholm, CGCS	Heritage Links Golf Course
Drew Larson	Rolling Green Country Club
Erin McManus	Medina Golf and Country Club
Matt Rostal	Interlachen Country Club
Brad Klein	Detroit Lakes Country Club
Jack MacKenzie, CGCS	North Oaks Golf Club
Chris Tritabaugh	Hazeltine National Golf Course

Of course, this list is incomplete. If you had or know of someone who had a relationship with Dr. White please let MGCSA Executive Director Jack MacKenzie know so they can be notified of the celebration to be held in his honor.

On November 4, 2013, at Brackett's Crossing Country Club, the MGA will be conducting their Annual Meeting and Banquet. At that time Dr. White will be honored with the reception of the highest Minnesota Golf Industry recognition, The Rebholz Distinguished Service Award. Please mark your calendar and plan to help celebrate this outstanding accomplishment.

The second item is the possibility of the MGCSA combining membership with the North Central Turf Foundation (North Dakota Superintendents). At their current level of membership they do not reach the required number to have a GCSAA affiliated chapter. Therefore, they are not as well represented nationally as they should be. Having them join our association as the North Dakota Chapter of the MGCSA would allow them to have a stronger voice at the national level. Jack MacKenzie, Erin McManus and myself drove to Fargo where we met Steve Randall, our GCSAA Regional Representative. We all met with the North Dakota superintendents at their annual golf benefit and this was a hot topic of discussion. We are obviously in the initial phase of working out how and if this could happen. I see it as a win/win for all associated. They have a voice, we gain members and that equals more funds for our member driven research! Stay tuned for updates as we progress through these negotiations.

As I said earlier, I love fall golf! I hope everyone takes advantage of the great weather and spends some time enjoying the game we all respect and love.

Enjoy your game-

WEE ONE MINNESOTA GOLF OUTING AT BRACKETT'S CROSSING COUNTRY CLUB

Supporting Eric Peters

MONDAY, OCTOBER 7, 2013

Lakeville, Minnesota
HOSTS: Tom Proshek, Superintendent and the MGCSA

$125 per Player / $500 per Team

Four Person Scramble *only one MGCSA member per team necessary*

Great Golf Prizes. On course refreshments. Lunch on the course. Heavy hors d'oeuvres immediately following golf with cash bar reception.

Enter Early. Field is limited to 30 teams (120 players).

Taco Bar @ Brats to go (Lunch included in registration fee)
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10:00 - 11:00 a.m.	Registration – Driving Range available
11:00 a.m.	GOLF - Shotgun
4:00 p.m.	Prizes and hors d'oeuvres reception (cash bar).

Contests:
1st Place $400, 2nd Place Draw $200, 3rd Place Draw $100 (Gross)
Skins Game - $20 per team 50/50 Split for $50 Giant Putt Contest prior to shotgun
Mulligan Purchase: 4 for $20 or 8 for $40
Closest to the pin winners on the Par 3's will draw down for a set of irons.
Featured Raffle Prizes – $5 for 5 tickets or $20 for a LONG arm's length.
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REGISTRATION DEADLINE: SEPTEMBER 15, 2012

Are You A Member Yet?

Throughout the United States only 350 individuals are members of the Wee One Foundation.
Please help support a peer in need.
weeone.org

Tournament on October 7
Brackett's Crossing Country Club

Host Superintendent Tom Proshek

In Bounds

by Jack MacKenzie, CGCS

Damon Winter/The New York Times
George Saunders Syracuse Convocation Speech

This presentation is exceptional. Please enjoy and consider his request. JM

"Down through the ages, a traditional form has evolved for this type of speech, which is: Some old fart, his best years behind him, who, over the course of his life, has made a series of dreadful mistakes (that would be me), gives heartfelt advice to a group of shining, energetic young people, with all of their best years ahead of them (that would be you).

And I intend to respect that tradition.

Now, one useful thing you can do with an old person, in addition to borrowing money from them, or asking them to do one of their old-time "dances," so you can watch, while laughing, is ask: "Looking back, what do you regret?" And they'll tell you. Sometimes, as you know, they'll tell you even if you haven't asked. Sometimes, even when you've specifically requested they not tell you, they'll tell you.

So: What do I regret? Being poor from time to time? Not really. Working terrible jobs, like "knuckle-puller in a slaughterhouse?" (And don't even ASK what that entails.) No. I don't regret that. Skinny-dipping in a river in Sumatra, a little buzzed, and looking up and seeing like 300 monkeys sitting on a pipeline, pooping down into the river, the river in which I was swimming, with my mouth open, naked? And getting deathly ill afterwards, and staying sick for the next seven months? Not so much. Do I regret the occasional humiliation? Like once, playing hockey in front of a big crowd, including this girl I really liked, I somehow managed, while falling and emitting this weird whooping noise, to score on my own goalie, while also sending my stick flying into the crowd, nearly hitting that girl? No. I don't even regret that.

But here's something I do regret:

In seventh grade, this new kid joined our class. In the interest of confidentiality, her Convocation Speech name will be "ELLEN." ELLEN was small, shy. She wore these blue cat's-eye glasses that, at the time, only old ladies wore. When nervous, which was pretty much always, she had a habit of taking a strand of hair into her mouth and chewing on it.

So she came to our school and our neighborhood, and was mostly ignored, occasionally teased ("Your hair taste good?" – that sort of thing). I could see this hurt her. I still remember the way she'd look after such an insult: eyes cast down, a little gut-kicked, as if, having just been reminded of her place in things, she was trying, as much as possible, to disappear. After awhile she'd drift away, hair-strand still in her mouth. At home, I imagined, after school, her mother would say, you know: "How was your day, sweetie?" and she'd say, "Oh, fine." And her mother would say, "Making any friends?" and she'd go, "Sure, lots."

Sometimes I'd see her hanging around alone in her front yard, as if afraid to leave it.

And then – they moved. That was it. No tragedy, no big final hazing.

One day she was there, next day she wasn't.

End of story.

Now, why do I regret that? Why, forty-two years later, am I still thinking about it? Relative to most of the other kids, I was actually pretty nice to her. I never said an unkind word to her. In fact, I sometimes even (mildly) defended her.

But still. It bothers me.

So here's something I know to be true, although it's a little corny, and I don't quite know what to do with it:

What I regret most in my life are failures of kindness.

Those moments when another human being was there, in front of me, suffering, and I responded…sensibly. Reservedly. Mildly.

Or, to look at it from the other end of the telescope: Who, in your life, do you remember most fondly, with the most undeniable feelings of warmth?

Those who were kindest to you, I bet.

It's a little facile, maybe, and certainly hard to implement, but I'd say, as a goal in life, you could do worse than: Try to be kinder.

Now, the million-dollar question: What's our problem? Why aren't we kinder?

Here's what I think:

Each of us is born with a series of built-in confusions that are probably somehow Darwinian. These are:

1. We're central to the universe (that is, our personal story is the main and most interesting story, the only story, really);
2. We're separate from the universe (there's US and then, out there, all that other junk – dogs and swing-sets, and the State of Nebraska and low-hanging clouds and, you know, other people), and
3 .We're permanent (death is real, o.k., sure – for you, but not for me).

Now, we don't really believe these things – intellectually we know better – but we believe them viscerally, and live by them, and they cause us to prioritize our own needs over the needs of others, even though what we really want, in our hearts, is to be less selfish, more aware of what's actually happening in the present moment, more open, and more loving.

So, the second million-dollar question: How might we DO this? How might we become more loving, more open, less selfish, more present, less delusional, etc., etc?

Well, yes, good question.

Unfortunately, I only have three minutes left.

So let me just say this. There are ways. You already know that because, in your life, there have been High Kindness periods and Low Kindness periods, and you know what inclined you toward the former and away from the latter. Education is good; immersing ourselves in a work of art: good; prayer is good; meditation's good; a frank talk with a dear friend; establishing ourselves in some kind of spiritual tradition – recognizing that there have been countless really smart people before us who have asked these same questions and left behind answers for us.

Because kindness, it turns out, is hard – it starts out all rainbows and puppy dogs, and expands to include…well, everything.

One thing in our favor: some of this "becoming kinder" happens naturally, with age. It might be a simple matter of attrition: as we get older, we come to see how useless it is to be selfish – how illogical, really. We come to love other people and are thereby counter-instructed in our own centrality. We get our butts kicked by real life, and people come to our defense, and help us, and we learn that we're not separate, and don't want to be. We see people near and dear to us dropping away, and are gradually convinced that maybe we too will drop away (someday, a long time from now). Most people, as they age, become less selfish and more loving. I think this is true. The great Syracuse poet, Hayden Carruth, said, in a poem written near the end of his life, that he was "mostly Love, now."

And so, a prediction, and my heartfelt wish for you: as you get older, your self will diminish and you will grow in love. YOU will gradually be replaced by LOVE. If you have kids, that will be a huge moment in your process of self-diminishment. You really won't care what happens to YOU, as long as they benefit. That's one reason your parents are so proud and happy today. One of their fondest dreams has come true: you have accomplished something difficult and tangible that has enlarged you as a person and will make your life better, from here on in, forever.

Congratulations, by the way.

When young, we're anxious – understandably – to find out if we've got what it takes. Can we succeed? Can we build a viable life for ourselves? But you – in particular you, of this generation – may have noticed a certain cyclical quality to ambition. You do well

in high-school, in hopes of getting into a good college, so you can do well in the good college, in the hopes of getting a good job, so you can do well in the good job so you can….

And this is actually O.K. If we're going to become kinder, that process has to include taking ourselves seriously – as doers, as accomplishers, as dreamers. We have to do that, to be our best selves.

Still, accomplishment is unreliable. "Succeeding," whatever that might mean to you, is hard, and the need to do so constantly renews itself (success is like a mountain that keeps growing ahead of you as you hike it), and there's the very real danger that "succeeding" will take up your whole life, while the big questions go untended.

So, quick, end-of-speech advice: Since, according to me, your life is going to be a gradual process of becoming kinder and more loving: Hurry up. Speed it along. Start right now. There's a confusion in each of us, a sickness, really: selfishness. But there's also a cure. So be a good and proactive and even somewhat desperate patient on your own behalf – seek out the most efficacious anti-selfishness medicines, energetically, for the rest of your life.

Do all the other things, the ambitious things – travel, get rich, get famous, innovate, lead, fall in love, make and lose fortunes, swim naked in wild jungle rivers (after first having it tested for monkey poop) – but as you do, to the extent that you can, err in the direction of kindness. Do those things that incline you toward the big questions, and avoid the things that would reduce you and make you trivial. That luminous part of you that exists beyond personality – your soul, if you will – is as bright and shining as any that has ever been. Bright as Shakespeare's, bright as Gandhi's, bright as Mother Teresa's. Clear away everything that keeps you separate from this secret luminous place. Believe it exists, come to know it better, nurture it, share its fruits tirelessly.

And someday, in 80 years, when you're 100, and I'm 134, and we're both so kind and loving we're nearly unbearable, drop me a line, let me know how your life has been. I hope you will say: It has been so wonderful.
Congratulations, Class of 2013.

I wish you great happiness, all the luck in the world, and a beautiful summer."

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2013 MGCSA Shoot Out Experience!

Monday, October 14 at the Horse and Hunt Club

http://www.horseandhunt.com/

Cost for the event: $40.00 and includes one raffle ticket

Additional costs include ammunition, along with gun rental if you or your team can not provide a gun.

It is suggested to buy your own ammo before hand at your local gun supply store. Our goal is to have at least one experienced hunter in each group. We are shooting (no pun intended) for 20 teams of 5 shooters on each team. Only one gun is needed per group.

9:30 – 10:00 a.m.	Registration
10:00 – 11:00 a.m.	Educational format: TBD
11:00 – 11:02 a.m.	Drawing for the shotgun, $1,000 value
11:00 – 12:00 noon	Lunch
12:00 – 3:00 p.m.	Sporting Clay Shoot

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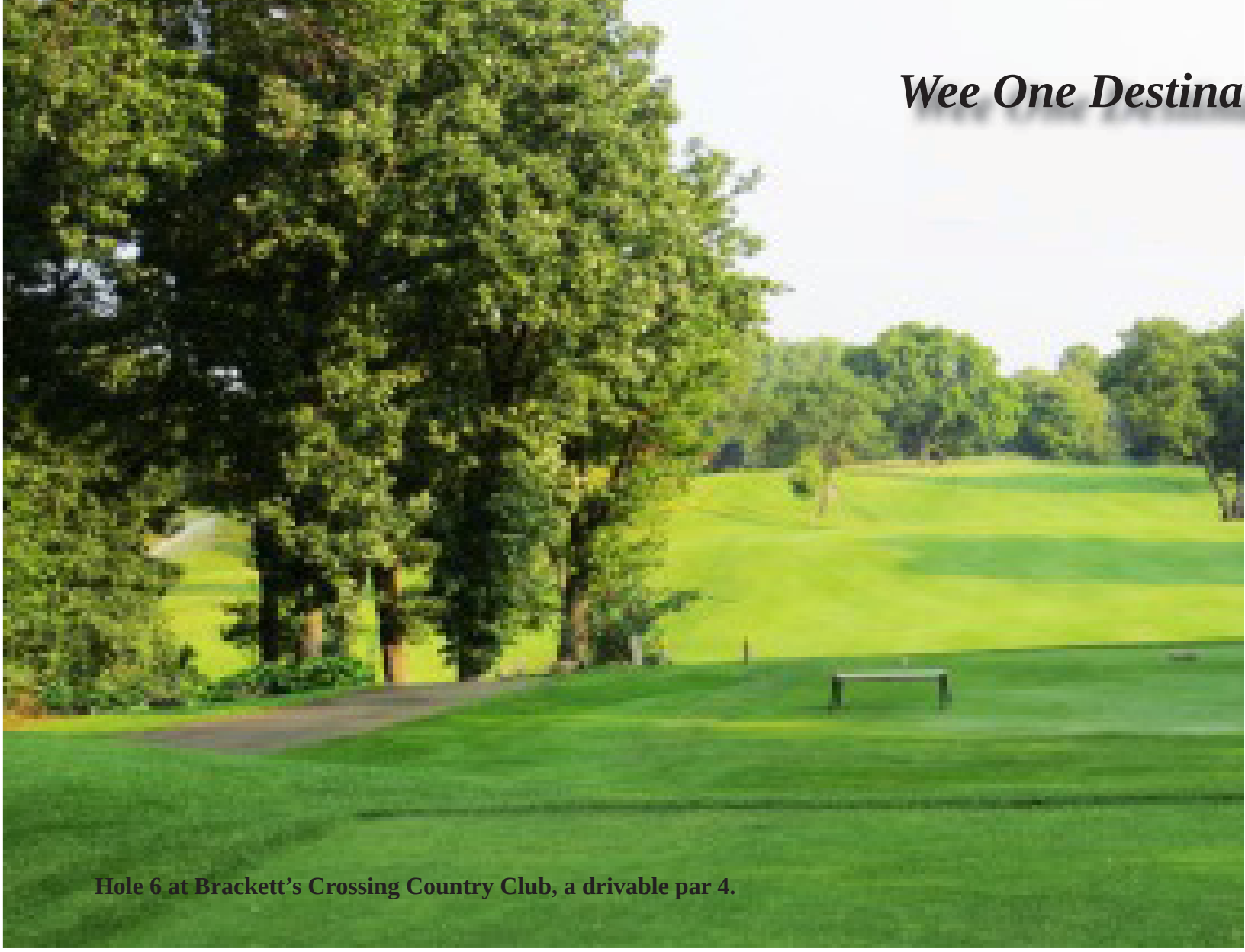

Hole 6 at Brackett's Crossing Country Club, a drivable par 4.

Once known as Honeywell Country Club, Brackett's Crossing Country Club was planned, developed and managed by the non-profit organization known as Minnregs, Incorporated. The Minnreg Organization was originally made up of male-only employees of Honeywell Inc. The financial support originally came from the receipts of vending machines used by the employees located in the various Honeywell plants and offices in the Twin Cities area. Times have changed with the development and expansion of what is now known as Brackett's Crossing Country Club.

1960- Four hundred and sixty acres located in the Village of Lakeville was purchased for the purpose of building a recreational center and a country club. The Minnesota Vikings officially became a profes-

tion: Brackett's Crossing Country Club, A Walk Down Memory Lane

Photos and content by Tom Proshek, Superintendent

sional football team in 1960.

1964- The golf course was opened to all Honeywell employees and their families who purchased golfing memberships. The course was designed and built by Harrison, Brauer & Ripple and originally used the Lakeville VFW as its clubhouse, which was moved to the golf course and located south of the current clubhouse next to the tenth tee. The Boundary Water Canoe Area gains new protections under the federal Wilderness Act in 1964.

1970- The Minnregs paid to have a gravel road installed between Judicial Road and Highway I-35. This road was paved in the late 1970's. Mary Richards throws her hat into the air on the Nicollet Mall, and a TV. Comedy is born. Mary Tyler Moore, "turns the world on with a smile" for seven years from 1970 until 1977.

1981-1982- Honeywell leases the club to private operators who change the name to Brackett's Crossing to honor early Lakeville settler J.J. Brackett. Apparently Mr. Brackett frequently crossed over the land on a trail used for mail service between Lakeville and Prior Lake. The general location of the trail still exists behind the 10th green. The Hubert H. Humphrey Metrodome is opened on April 3, 1982.

1993- The Club is purchased by current owners Tom and Peggy Smith. Since their arrival the golf course and clubhouse have experienced many positive reconstruction projects. Brackett's Crossing maintains it's private status, however the banquet facilities are open to the public. The Minnesota Lottery is initiated and state receives a visit from soviet leader Mikhail Gorachev.

A whole lot can happen over the course of 53 years, but there is one constant in the community of Lakeville, Brackett's Crossing Country Club, a destination for family golf. This fine club is also playing host to the 2013 Minnesota Wee One Foundation Golf Event on October 7. The Wee One Foundation was developed as a tribute to Wayne Otto to assist golf course management professionals (or their dependents) who incur overwhelming expenses due to medical hardship without comprehensive insurance or adequate financial resources. As a profession we have taken steps nec-

Hole 16, a 173 yard , par 3.

Brackett's Crossing Country Club Professional Turf Management Staff Welcomes the Wee One.

essary to support our own in cases of emergency and need.

Tom Proshek, Superintendent at Brackett's Crossing for the last 19 years is looking forward to the event. Proshek began his career 32 years ago at New Prague Golf Club followed by a grow-in stint at Wildflower Golf Course. According to Tom, all the staff from the pro shop to the administrative office are ready and welcoming the group for a fantastic fundraiser at a great venue.

Proshek and his professional management team of Assistant Arik Hemquist, Head Mechanic/Assistant Ken Adams and second Assistants Mark Schmitz and Larry Enwall have a combined tenor at the club of over 63 seasons. All those years add up to a well-maintained 18 hole golf course stretching to 6990 yards from the "tips" and 6,551 for the Wee One Tournament.

Agronomically, Brackett's Crossing has its challenges. The property sits upon old farm and swampland with a heavy rock and clay profile that does not drain well even in the best of seasons. Frost heaving accentuates the issues and annually changes

Pipers, three, on hole 9

drainage patterns even more. Fortunately for Tom and his crew, the club's owner understands soil dynamics and the need to be continuously maintaining and improving the surface and subsurface drainage patterns for better playing conditions.

The blend of poa/bent fine turf surfaces were also challenged during last winter's long grip of ice and an additional layer of May snow. Now however, you can't tell there was any injury thanks to the recovery efforts of Tom and his capable staff. Smooth and firm, the course will challenge the field and provide scoring opportunities for those who can craft their game as well as have a bit of luck.

The toughest hole? "Number 10", according to Tom, "It is a slight dog leg right, par four with water on the left and OB to the right of the landing area. Without a well-positioned drive you will be left with a long iron into a well-protected green that is slightly elevated. Due to some of the previously mentioned drainage challenges,

the 10th hole will be played as a par 3 while Hartman Companies remedies a few moisture issues. The easiest is number six, a short par four drivable by the real long hitters."

The trickiest hole? "Number four is a long par four that plays slightly uphill and dog legs to the right. A long, precise tee shot needs to hit the angled fairway otherwise deep rough on either side will make hitting the blind second shot very difficult," according to Superintendent Proshek.

The 2013 Wee One Event is shaping up to be a great fundraiser. Two on-course food stands, a sumptuous Italian buffet dinner, raffle prizes valued at over $3,000, a purse over $1,500, camaraderie and most important of all, support for "one of our own".

2013- The Wee One Event. It wouldn't be the same without you. See you on October 7th. The MGCSA/Wee One Event nets the highest return ever…October 7, 2013.

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Deeeeeep Drains and Mini-Channels a Breakthrough on Spring Ice Removal?

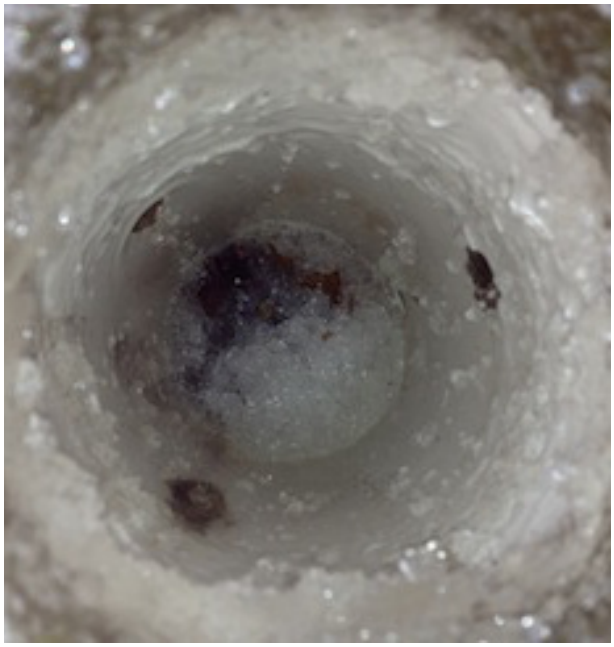
Photos and Editorial by Scott Wandler,
Assistant Superintendent at Missoula Country Club, Mt.
Re-printed from ***The Perfect Lie***, the Peaks and Prairie GCSA

As another winter approaches, we start planning how to deal with next year's formation of ice. We all know when ice melts that the problems for greens can be devastating if the water isn't removed from the surface, but instead allowed to go into a constant freeze/thaw period. But we also know removing ice by chipping can be tedious and exhausting for a maintenance crew, not to mention the marks left behind on the greens.

Over the last three years at The Missoula Country Club, we have tried to help the water run-off the surface of the green with as little ice chipping manual labor as possible. We already have some problems with soil dams in front of our greens, and with the frost heaves that accompany winter, they create a dam two times higher than during the summer. Because of this, we see very little drainage off the green until that soil dam is breached. Unfortunately, by the time a strong melt starts, the sun goes down and the water comes to a standstill and freezes. To combat this problem, we started putting drain

holes in our greens to help evacuate the water off the green faster.

In the fall of 2009, we had a soaking rain that, with a little help from the irrigation system, showed the low spots and natural drainage perfectly. I flagged each low spot with an irrigation flag and followed with a paint dot; the dots required some maintenance until the drains were put in. The number of drains varied from three to five drains per green.



Around the first of November, our crew cut the drains. We used a regular cup cutter, an old cup cutter that was modified into an auger, and four-inch drainpipe with a drain grate. The first guy cut a cup at every drain site. The second guy followed with the auger, which dug the rest of the drain hole and also collected the drain-hole material so it made almost no mess. Next, we took a stick of four-inch drainpipe and cut it just short of the surface so the drain grate could sit flush on the green. We also used a push type sod cutter, normally used to repair hydraulic leak accidents, to cut a canal through our soil dam in the front collar. Both plugs and the sod strip were stored in our nursery and overwintered. As play fell off and the threat of snow came, we removed the drain grates and put a flag next to the hole.

Around the middle of February, I went out with a broom handle and found the holes, which had been covered with snow, and exposed them. Most were already draining some water, and the holes were not iced over or filled with snow. I used the broom handle just to make sure the bottom of the hole wasn't frozen, either. The drains were working to eliminate water, and therefore ice, on the greens.

We have modified how we do things over the last three winters. We now use water to find the low spot instead of eyeing it, and we place green drain covers on the greens to finish out the year. Obviously snowfall has varied considerably these last three winters, but the results have been consistently fantastic. The drains worked so well this year that we

will probably go without the canal through the front collar in 2014. In 2013 we didn't have any solid ice in our low spots, and the ice that we did have contained an air layer, between it and the turf, that collapsed when you walked on it.

There is always going to be ice, but here at Missoula Country Club, we may have found a way to be ready whenever Mother Nature provides the unseasonal warm up.

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Trees, your "other" Plants:
Fertilizer Application

Bert T. Swanson,Swanson's Nursery Consulting,Inc., Carl Rosen, University of Minnesota and Ed Plaster, Dakota Technical College

Trees in urban and suburban landscapes are often under stress. Low moisture and fertility levels, soil compaction, competition from nearby trees, diseases, insects, damage from vandalism, and other factors can have a negative impact on plant growth. Under stress situations or poor soil conditions, fertility problems may increase. If growth is minimal, then it is necessary to determine the cause, and whether fertilizer will improve plant growth. Stress conditions often predispose trees to other problems; thus with good cultural methods, such as watering and fertilizing, trees are more likely to resist certain insect and disease problems. Fertilizer applications will ameliorate, but may not eliminate environmental stress. As a general guide, terminal twig growth should be six to 24 inches per year on young, healthy, deciduous trees and four to twelve inches per year on conifers. Growth is less on mature trees. A tree under nutrient stress may show a slow or stunted growth rate; reduced leaf, flower, or fruit size; a pale green or yellow green coloration of the foliage, or early fall defoliation. Nutrient stress can also be induced by poor drainage, incorrect pH, and other soil and plant factors. Thus, soil tests should be used to develop a fertilization program.

Soil type is important in determining the need for fertilizer. A fine-textured, clay-loam soil will hold more nutrients than a coarse-textured sandy loam. However, a

tree growing in a heavy, compacted soil may still be stunted because of restricted root growth and lack of soil oxygen to facilitate nutrient uptake. Light, sandy soils will be low in nutrients, and may also restrict growth because of low moisture levels. Soils with a pH greater than 7.0 which is alkaline, may cause deficiencies of micronutrients such as iron and manganese in pin oak, river

birch, red maple, silver maple, and other susceptible species. Deficiencies of these micronutrients, as well as nitrogen deficiencies, produce a condition known as "chlorosis," or a yellowing of the foliage. Nitrogen deficiency is characterized by uniform yellowing of the entire leaf, whereas the area surrounding leaf veins remain green when iron and manganese are deficient, thereby causing interveinal chlorosis. Low soil oxygen caused by excess water from poor drainage, flooding or compaction can also cause chlorosis. Soil tests and/or plant tissue tests should be used to determine the cause of chlorosis in commercial tree and shrub production and in large landscapes. A light fertilizer application can usually be applied to the home landscape without a soil test.

Fertilizer solubilization and subsequent plant absorption requires adequate levels of soil moisture and oxygen. If excess moisture or a lack of oxygen exists, nutrient uptake cannot take place even with adequate nutrients available. Continued fertilization under such conditions will result in excess fertilizer levels. Then, as the soil dries or becomes aerated, excess uptake may occur. Excess uptake will stimulate excessive succulent growth that is structurally weak, less likely to produce flowers, and more susceptible to diseases and insects, such as fire blight or aphids. The high soluble salt concentrations caused by excessive fertilization may also damage the tree causing root or leaf injury. Newly planted trees and shrubs should be fertilized at planting time. Fertilization at this time allows deep placement of phosphorus and potassium. Because these nutrients do not move readily in the soil, deep placement will make them immediately available to the new plant to enhance root and top growth. It is extremely important, however, that the fertilizer be mixed into the bottom of the hole and into the backfill and not placed in direct contact with the roots. A slow release fertilizer is most desirable

for mixing with the backfill. Slow release fertilizers supply only small amounts of nutrients at any one time, so the possibility of root damage is eliminated and a longer-term response is obtained.

When to Fertilize

Most trees in Minnesota have a single flush of growth in the spring, and spring is the time when trees have the greatest need for nutrients. Early spring, consequently, is the time when nutrients must be available. Fall fertilizer applications are easiest and can be the most effective, because the ground is easier to work and nutrients will be available to the tree very early in the spring when growth begins. Fertilizer may be applied from late September until about mid-November. To avoid runoff problems, do not apply fertilizer to frozen soil. Spring applications may be made as soon as the ground is workable until late April or early May. If soil conditions are extremely dry, irrigate prior to and after fertilization. On sandy soils, nitrogen should be applied only in the spring or much of it will be leached out of the soil in the late fall and early spring. If soil is extremely sandy, leaching can be minimized by applying a half rate in early spring and a half rate in late spring. However, this adds to the cost of application.

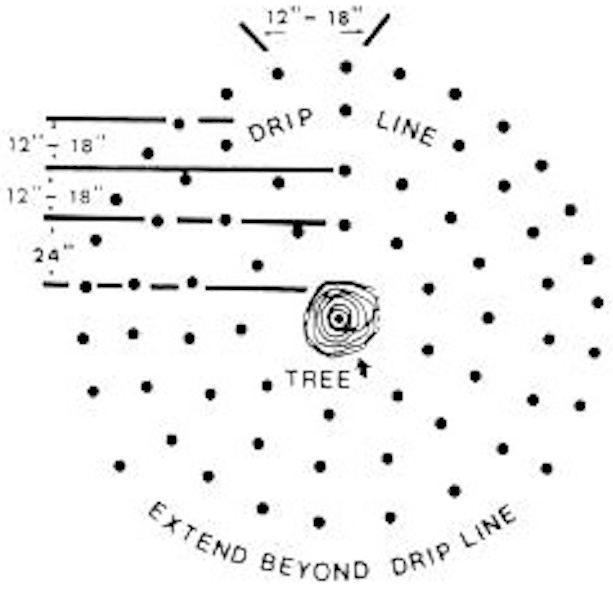
If a plant is showing symptoms of nutrient deficiency, fertilizer may be applied at any time during the growing season to correct the problem. Care must be taken, however, to provide sufficient water for absorption of the nutrients by the plant and prevent fertilizer injury to the roots. During periods of hot, dry weather, two to three inches of water should be applied every two to three weeks to wet the top 12 to 18 inches of an average soil. Heavy clay soils require more water at less frequent intervals,

while light, sandy soils require less water at more frequent intervals. Do not apply fertilizer to non-stressed plants in late August as plants may force a new flush of growth in early September. However, do not allow plants to go into the winter under a nutrient stress, as this will also increase winter injury. A light application of fertilizer may be necessary in late

August or early September to alleviate such stress.

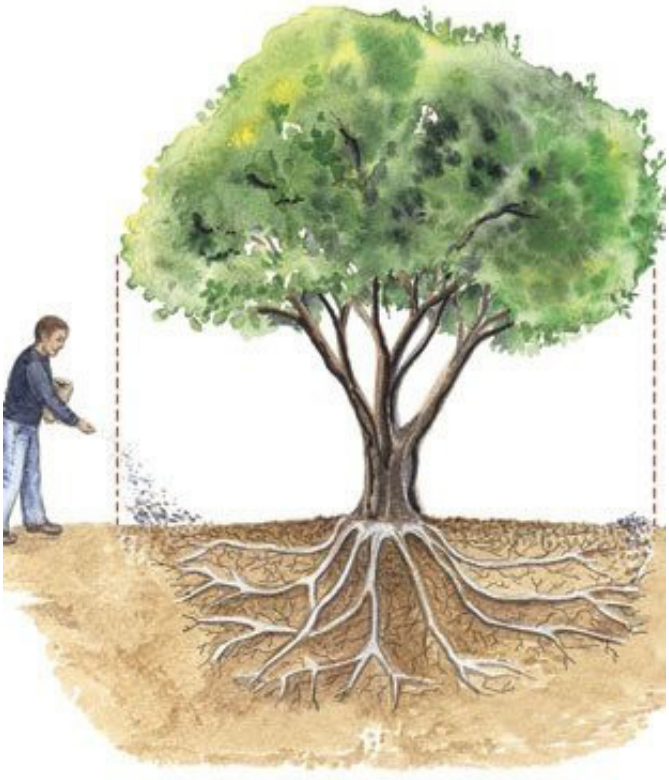
What to Apply

Unless a tree is deficient in some other element, increased nitrogen provides the most pronounced effects on the growth of all plant nutrients. Just because an increase in nitrogen produces a more visible increase in growth, however, does not mean that other elements are not required. Phosphorus, for example, is essential for good root growth. A soil test provides the best indicator of elements that may need to be added to the soil to prevent nutritional problems. High rates of P fertilizer should not be used unless a need is indicated by a soil test. If the soil test is high in phosphorus, then it is best to use fertilizers such as 24-0-15, 32-3-10, 27-3-3, or 16-4-8 with a high rate of N and a low or zero rate of P. High rates of P can negatively affect the environment by causing excessive algae to grow in nearby lakes and streams, which will in time, kill fish and other aquatic life. If phosphorus is needed, an excellent fertilizer to use is 18-18-8 with iron and sulfur. It is 50 percent slow release. Plants in sandy soils will require more fertilizer; however, it is easy to over fertilize in sandy soil as it moves quickly into the root zone. Soils with more organic matter, not only hold more fertilizer, but they also tend to release some nutrients as the organic matter decomposes. Thus, the use of slow release or partially slow release fertilizer is much more critical in a low organic soil containing less than three percent organic matter, compared to a medium or high organic soil containing four percent or greater organic matter. Most soil tests will provide the percent organic matter content of the soil.



For nursery production, the recommended rates of fertilization are three to four pounds of actual nitrogen (N) per 1,000 ft^2 per year. When needed, 3.6 pounds of phosphate (P_2O_5) per 1,000 ft^2 and six pounds of potassium (K_2O) per 1,000 ft^2 should be applied. The above rates must be applied to a non-turf area or placed in holes drilled or punched into the soil under the tree to prevent injury to the turf or a cover crop. Established trees in the landscape require less fertilizer wherein one to three pounds of actual nitrogen will be sufficient. The recommended rate for application over

turf is one lb N/1000 ft^2 at one time. Any rate greater than two pounds of nitrogen per 1,000 ft^2 in one application will result in injury to turf. Table 1 in Chapter 26 of the Manual indicates some common fertilizer analyses and rates of each formulation that will give the recommended rates for application.



Whenever possible, use a slow release or partially slow release fertilizer such as 18-18-8 or 25-3-7 to reduce the amount of fertilizer immediately available and to extend its feeding duration. Products that combine fertilizers and herbicides such as "Weed and Feed" should not be used on or around trees and shrubs. Such products will injure or kill trees, shrubs and perennials in the same way that they kill weeds.

How to Apply

Apply a complete fertilizer (N, P, and K) at the time of planting. Care must be taken to ensure that it is thoroughly mixed with the backfill and it is best to use a slow release or partially slow release product. Do not apply fertilizer of any type directly to the roots.

Fertilization should occur at planting time in the nursery and in the landscape. If the proper amount of fertilizer is thoroughly mixed with the backfill soil, no root injury will occur. The fertilization should be based on results of a soil test to avoid under or over fertilizing any tree or shrub. After planting, the easiest and most convenient method of applying nitrogen fertilizers in the landscape is to spread the fertilizer on the soil under the tree canopy with a standard lawn spreader. Although two pounds of nitrogen per 1,000 ft^2 is the maximum rate that can be applied to turf in this manner, it is better to apply one pound of nitrogen per application and make more applications. Higher rates must be incorporated (drilled) into the soil in a landscape setting. To promote good, healthy, vigorous, rapid growth in a nursery production situation, three to four pounds per 1,000 ft^2 of actual nitrogen can be applied in a band in the nursery row or to individual trees. Surface applications will not readily supply phosphate and potash because these two nutrients do

not readily move down to the tree's root zone. In the landscape, determine the area under the tree to be fertilized by marking off a square that encompasses the spread of the tree several feet past the dripline. Multiply the length by the width to determine the area in square feet. The spreader should be calibrated to deliver the recommended amount of fertilizer per 1,000 square feet. For example, if the area under the tree is 40 feet by 40 feet or 1,600 square feet, 3.2 pounds of nitrogen is needed to provide two pounds of actual nitrogen per 1,000 square feet. Six pounds of ammonium nitrate will supply two pounds of nitrogen (See Table 1 in Chapter 26 of the Manual). Therefore six pounds of ammonium nitrate (2 pounds of nitrogen) should be spread over that 1,600 square foot area. This can be repeated again in three weeks to obtain the four lbs/1,000 ft^2 rate for faster growth rates on younger trees. This surface application should be done when the grass blades are dry and then followed with a deep watering. Note that much of the fertilizer applied to the surface will benefit the grass rather than the tree. If chips or gravel cover the entire area to be treated, the total four pounds can be applied in a single application. For mature landscape trees, the one to two pounds of actual nitrogen may be sufficient.

If higher rates of nitrogen, or if phosphate and potash are to be added, it is best to place the fertilizer in holes drilled or punched in the soil. Drill holes are two feet apart with a soil auger in a series of parallel lines under the spread of the tree and extending two feet past the dripline, or four to six feet if the tree has an upright or columnar form. The holes should be two inches in diameter and 12 to 18 inches deep. No hole should be within three feet of the trunk to prevent damage to the root collar. Avoid damaging major roots when drilling. Too much nitrogen close to the surface of the soil will cause spotty turf growth.

Place the recommended amount of fertilizer (See Table 1 in Chapter 26 of the Manual) in each hole, water it in, and fill the holes with sand, compost, or peat; in heavy soils, leave the holes open to improve soil aeration. In addition to getting phosphorus and potassium down into the root zone, this method has an added advantage because the holes help decrease soil compaction and increase air and water penetration, both of which are essential for nutrient uptake by the tree. Holes may also be made with a punch bar, crowbar, or pipe. However, removing the core of soil with an auger is most beneficial.

Liquid injection root feeders are also acceptable provided that recommended application rates are maintained. This treatment effect may

be less persistent than that of a dry fertilizer and, costs increase with the use of specialized equipment and fertilizers.

Large, slow-release pellets or spikes of fertilizer are available. They do provide nutrients to the tree, but the nutrient distribution may be somewhat limited compared to soil incorporation unless an

abundance of spikes are used. Fertilizer release from spikes is very slow.

Fertilizers may be injected directly into the trunk of the tree either as a liquid or a slow release capsule. This method is commonly used to apply micronutrients. Repeating the injections over many years will cause some damage to the tree trunk.

Micronutrients also may be applied to the soil or foliage using a dilute rate of 200-400 ppm soluble solution or by using a "chelate" formulation. A chelate is a chemical that combines with a nutrient element to make it available to the plant under a wider pH range. Various chelates are available at most landscape supply or fertilizer dealers. Follow label instructions for proper application. Foliar applications of iron chelates are effective, but repeated applications are necessary. Foliar applications of all nutrients are effective for a short term only, and usually have to be repeated several times during the season. Incorporation of iron sulfate, sulfur and/or acid peat into the soil to lower the pH before planting may alleviate most micronutrient problems on high pH soils. The best way to avoid micronutrient deficiency problems is to avoid planting sensitive tree species in high pH soils.

Nursery and landscape plants are easily stressed from fertility deficiencies or excesses. Apply appropriate amounts of the right nutrient at the right time to provide for optimum plant growth and vigor.

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Late Fall Soil Surfactant Appl
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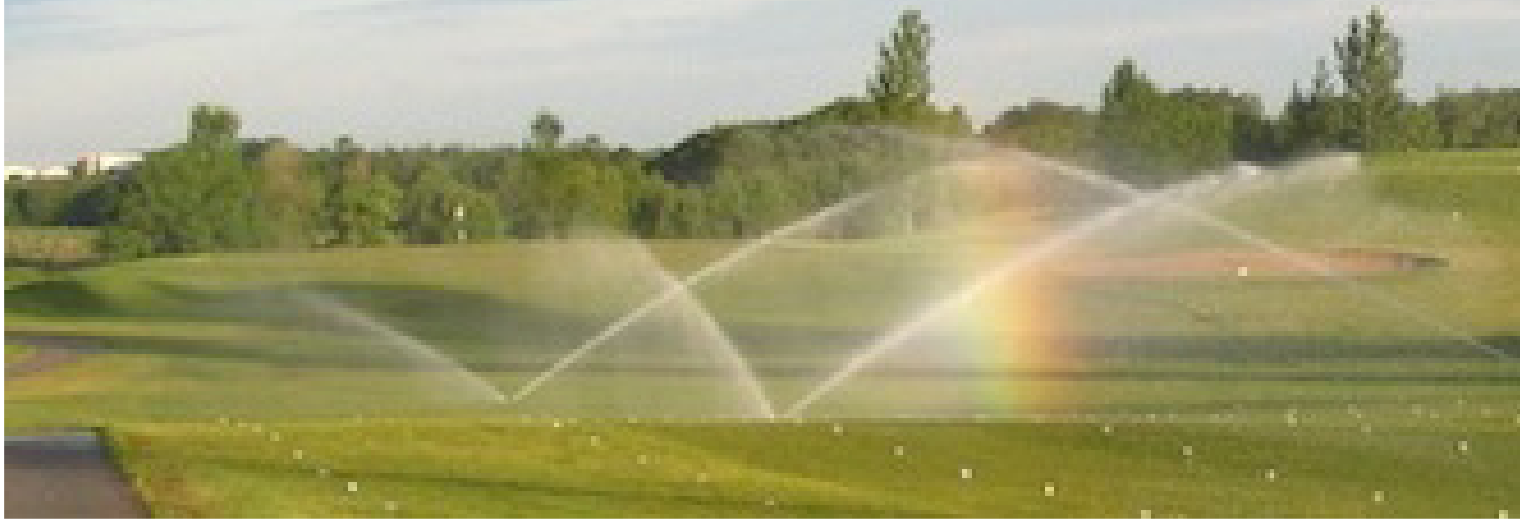
By Larry Lennert -Territory Manager- Ac



Not That Long Ago ….

Do you remember March 2012? It seems like a long time ago already, but I still remember it well because that month my phone was ringing a whole lot more than it normally rings in March. Spring came early in 2012. Very early. Record early. It went from the "winter that wasn't" to summer in less than a week. The Upper Midwest and Great Lakes regions experienced daytime temperatures in 70, 80 and 90 degree range for almost two weeks straight in the middle of March, and then much above average temperatures until mid April. Since there were almost no irrigation systems up and running yet, many golf course superintendents were trucking water out to their greens and that is why my phone was ringing. These superintendents were seeing the water they were putting on their parched greens puddle up on the surface, and run down slope in ribbons and sheets like it was the middle of a dry spell in July. But this was March, and they wanted to know if I had any recommendations to help them with this problem.

This is not the first time I have seen putting greens act this way in the spring. As a young assistant golf course superintendent in the 1980s, I spent

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quatrols

Photo by Troy Carson

a lot of time hand watering greens. I remember a few other early springs back then, and seeing water puddle up on the surface and run back down slope at my feet just like in March 2012. I really didn't understand what was causing that to occur back then, but I think I do now.

What Causes Water To Run Off Sloped Turfgrass Areas?

There are several reasons why water runs off of sloped turfgrass areas. Sometimes it is just soil physics. If the precipitation rate (from rainfall, irrigations heads, or applied by a hose) exceeds the infiltration rate of the soil the turf is growing in, water will begin to accumulate on the turfgrass canopy and run downhill. Low soil infiltration rates can be the result of soil compaction, or sometimes they are just a normal characteristic of very fine-textured soils (clays) that have low infiltration rates to begin with. However, it is not uncommon for water to puddle up on the surface of low-mowed turfgrass stands and run downhill, even when water is being applied at a rate that is lower than the normal infiltration rate of the soil. In areas of the country with high sodium levels in irrigation water, sodium can sometimes cause deflocculation of clay soils and a loss of soil structure. This

can reduce infiltration rates as well, and this is sometimes called "chemical compaction". Loss of soil structure from excessive sodium in irrigation water can create the same effect as physical soil compaction, increasing the amount of small, capillary pores that hold water and reducing the amount of larger, non-capillary pores that are needed for soil drainage. Fortunately for us, high sodium levels in water used to irrigate turfgrass in the Upper Midwest and Great Lakes regions is rare. However, there are a few aquifers that contain elevated levels of sodium, and use of effluent or "recycled" water is becoming more common in our part of the country as well. So it is still a good idea to have the quality of your irrigation water tested for sodium hazard, and excessive salinity and boron levels from time to time, just to be sure none of these potential water quality issues are at high enough levels in your irrigation water to cause a problem in your soil.

There have also been anecdotal reports from turfgrass managers that irrigating with water containing high levels of bicarbonate during extended periods of very dry weather, or true drought conditions, can cause a reduction of soil infiltration rates. The theory is bicarbonate anions and calcium cations in the irrigation water can precipitate out in the soil as water-insoluble calcium carbonate deposits. These deposits may partially plug soil pores and cause the reduction in infiltration rates observed. However, a current university research project investigating this topic has not been able to produce calcium carbonate deposits in a sand rootzone mix after irrigating turfgrass with very high bicarbonate water for an extended period of time. The researcher has not observed any reduction in infiltration rates in the sand rootzone he is testing either. It is not currently known under what exact conditions irrigating with water containing high levels of bicarbonate may or may not cause a reduction of infiltration rates in turfgrass soils, and more research work in this area is needed.

Soil Water Repellency Is A Likely Suspect

If you can rule out simple soil physics or an irrigation quality issue as the reason for reduced soil infiltration rates and an associated increase of water runoff on sloped turfgrass areas, then soil water repellency is a likely suspect. Water repellency is most commonly caused by the simple decomposition of organic matter. When microorganisms decompose organic matter in the thatch/mat layer of a turfgrass stand and in the soil, some of the by-products of this decomposition are organic acids, like humic acid and fulvic acid. These organic acids begin to partially coat the

surfaces of lignin fibers in the thatch/mat layer and soil particles, including sand particles topdressed into the thatch/mat layer. As these organic acid coatings go through repeated wet to dry cycles, they become more and more non-polar and water repellent. This explains why most of the water repellency in turfgrass systems develops in the thatch/mat layer and top inch of soil. These two areas have more of the two factors needed to produce water repellency than areas deeper down in the rootzone; (1) higher organic matter content that when decomposed by soil microbes produces organic acid coatings, and (2) more frequent wet to dry cycles that cause these organic acid coating to become more and more water repellent over time.

Reduced water infiltration rate and water pudding on the surface of a research putting green due to soil water repellency. On flat turfgrass areas, water puddles, on sloped turfgrass areas water runs down slope in sheets and ribbons.

Soil Water Repellency Is Like "Rain-X" On Your Windshield

The non-polar, water repellent, organic acid coatings mostly responsible for soil water repellency in a turfgrass system act very similarly to the phenomenon you observe if you put the product "Rain-X" on the glass windshield of your vehicle. Glass is a polar, water receptive, substance. Water is also a

polar substance, and individual water molecules are attracted to glass and any other polar surface. When you drive in the rain, polar water molecules attach to your polar glass windshield by a process called adhesion. Since polar water molecules are also attracted to one another, once the first layer of water molecules is laid down on the glass surface, other water molecules begin to attach to that initial layer of water molecules by another process called cohesion.

As more and more water molecules start to attach to one another, a film of water begins to form on the glass surface of your windshield that makes it difficult for you to see through the windshield when you are driving in the rain. That is usually the time you turn on your windshield wipers, which are really just small rubber squeegees that physically wipe that thin film of water molecules off of the glass windshield so you can see where you are going. But if you have ever used Rain-X on your windshield, you have a totally different experience when you drive in the rain. Rain-X is a clear liquid that you can apply to the glass on your windshield. Once it dries, you can buff off the haze and it is completely transparent. It is also a very non-polar, water repellent substance.

If you drive fast enough in the rain with Rain-X on your windshield, you don't even have to use your windshield wipers. Why? Because Rain-X, being a very non-polar substance, turns your normally polar, water receptive glass windshield into a non-polar, water repellent surface. Since water molecules are repelled by, and can't attach to non-polar surfaces, rain can't form a film of water on your Rain-X treated windshield. Water will just bead up run down the slope of your windshield in ribbons and sheets, if your vehicle is driving slow or parked. If you drive fast enough, the wind will blow the water off your windshield, and windshield wiper use becomes optional.

Soil Surfactants Are Like Rain-X, In Reverse

Think of the thatch/mat layer and soil particles in the turfgrass / soil system as the glass windshield of a vehicle. They are normally polar, water receptive surfaces. Imagine that the non-polar, water repellent organic acid coatings on the lignin fibers in the thatch/mat layer and on the surfaces of soil particles are like Rain-X. They turn normally polar, water receptive surfaces into non-polar, water repellent surfaces. Water repellency on your glass windshield is good, but water repellency in the thatch/mat layer and soil is bad.

When you apply a soil surfactant (wetting agent) product and water it in, the surfactant molecules attach to the surfaces of the non-polar, water

repellent, organic acid coatings in the thatch/mat layer and soil, and put a polar, water receptive surface back over the top of these surfaces. This is like Rain-X in reverse, turning non-polar, water repellent surfaces back into polar, water receptive surfaces like they were before the soil water repellency developed. Soil surfactant use increases infiltration rates, reduces runoff on sloped areas, enhances uniformity of moisture in the soil, prevents or cures localized dry spots, improves playability and contributes to better overall plant health. All these benefits explain why the use of soil surfactant products by golf course superintendents and other turf managers continue to grow each year.

Organic acid coatings responsible for water repellency on a sand particle. Photo Dr. Keith Karnok, University of Georgia DR.

When Are Soil Surfactants Used And Why?

Traditionally, the first applications of soil surfactant products in the Upper Midwest and Great Lakes regions are made to turfgrass in late spring or early summer. They are commonly used through the summer months of June, July, and August. Sometimes they are used in September, if there are warm and dry conditions in the early fall. This use period is very understandable. Summertime is when temperatures are the highest and water loss from evapotranspiration (ET) on turfgrass stands is the greatest, commonly exceeding ET losses of 0.25” per day. This is also the time of year when it can be very dry, so more wet to dry cycles

occur in the soil, which increases the development of soil water repellency.

Add to this the fact that many cool-season turfgrass species on golf courses can lose a significant amount of root mass and depth in the heat of summer (can anyone say Poa annua?). As roots get shallower, there is less soil volume for the roots that remain to access water from. Soil closer the surface also dries out quicker than soil deeper in the rootzone and it is also much more water repellent than soil deeper in the rootzone, so it may not wet properly and any moisture that is present may not be very uniformly distributed either.

All of these factors lead to perfect storm conditions for the development of the ultimate symptom of soil water repellency, localized dry spot (LDS). No wonder many different soil surfactant products are applied in late spring and summer on a regular, preventative basis to help minimize the development of LDS symptoms, or they are at least applied on a curative basis to treat LDS symptoms when they occur.

Localized dry spot (LDS) on a golf course in Ohio.

Soil surfactant products are also used on turfgrass during this same period of time to prevent or treat more subtle symptoms of soil water repellency besides LDS, such as reduced soil infiltration rates, increased runoff on sloped turfgrass areas and non-uniform wetting of the soil, all which can lead to reduced playability and lower overall plant health.

When fall arrives,

temperatures begin to drop, ET rates decline rapidly and turfgrasses begin to grow back root mass and length they lost during the heat of summer. LDS symptoms are a lot less common, and soil surfactant use dwindles. This too is understandable. However, the non-polar, water repellency, organic acid coatings that cause soil water repellency problems like LDS and runoff on sloped areas have not gone away, and are still present in the soil, waiting to cause problems the next time it gets dry.

The Case For Late Fall Soil Surfactant Applications

Return to March 2012 and the record early spring. Golf course superintendents were trucking water out to their greens because their irrigation systems were not up and running yet and soils were getting very dry. It was common to see the water they were applying to greens puddle up and run down slope. I think the reason this occurred (in most cases) was because of untreated soil water repellency, and the soil water repellency was untreated because almost all golf course superintendents stop applying soil surfactant products in August and September.

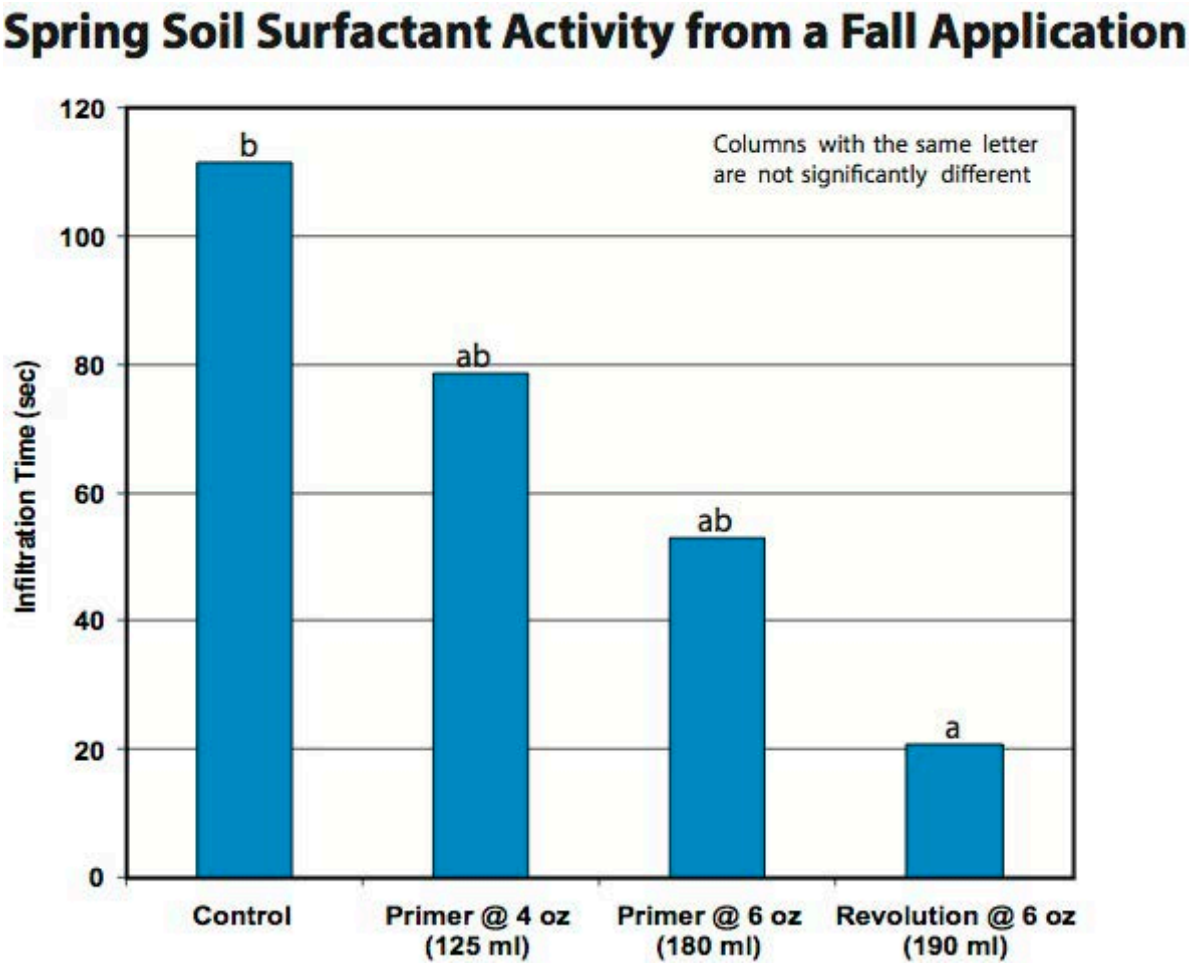
Soil surfactant molecules, like many other commonly used turf chemical molecules, contain a lot of carbon atoms. Carbon is a food source for soil microorganisms, so as soon as a soil surfactant application is made to a turfgrass stand and is watered in, microorganisms in the thatch/mat layer and in the soil begin to break those soil surfactant molecules down to get the carbon atoms they contain. This is why soil surfactant products (and many other turf chemicals) only last for a limited period of time in the soil, and why they need to be reapplied on a regular basis when used in the late spring, summer, or early fall, when soil temperatures are warm and soil microbial activity is high. So if golf course superintendents stop using soil surfactant products in August or early September, there is not going to be many soil surfactant molecules left in the soil to treat water repellency in late fall, winter, and coming out of winter the following spring.

All of these facts, and my prior experience as a young assistant golf course superintendent observing water running down slope at my feet while hand watering greens during an earlier than normal spring, lead to an idea. What if a soil surfactant application was made late in the fall, when soil temperatures and microbial activity were much lower than they are during late spring, summer or early fall? Theoretically, these soil surfactant molecules should persist in the soil to treat soil water repellency for a much longer period of time than they do when they are traditionally used, since the

microbes that degrade them are not very active in cold soils. Could a late fall soil surfactant application even last until soil temperatures warmed up the following spring?

There has not been much research done yet to investigate this hypothesis. However, when the Aquatrols product Revolution® was still being developed prior to its introduction into the turf industry, a study in Kansas showed that an application of Revolution made even in early September 2002 resulted in better infiltration rates in early March of 2003 compared to an untreated control or the leading soil surfactant product at that time (Table 1). This suggests there was still statistically significant control of soil water repellency from a Revolution application made six months previously heading into fall and winter.

Based on this Kansas data and some other unique performance characteristics of Revolution verified by university research (and my own experience seeing this chemistry work in the field

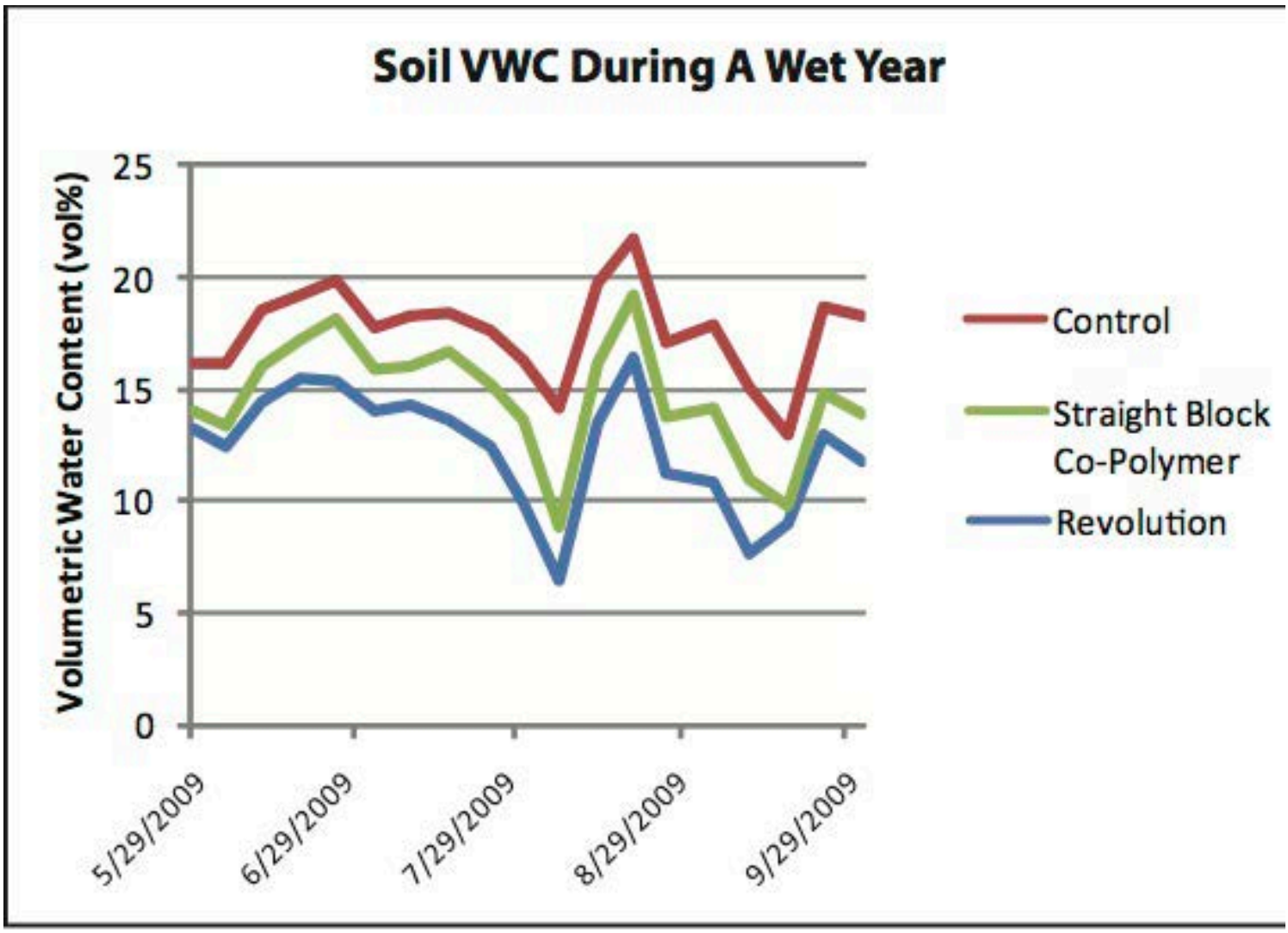


Graph 1

Infiltration rates on March 3rd, 2003 on a putting green in Kansas. Primer Select and Revolution applications were made on September 1st, 2002, six months prior to data collection. Agronomy Solutions, Dodge City, KS.

for many years), I began to recommend a late fall application of Revolution on putting greens to golf course superintendents about five year ago. I recommend making this application as late was possible in the fall to let soil temperatures get as cold as possible, but while you still have irrigation water on to water Revolution in properly. So apply it a day or two prior to blowing out your irrigation system for the winter.

The feedback I have received from golf course superintendents who now make this late fall application has been very interesting and very positive. If it gets dry after they blow out their irrigation systems in the late fall, they say they see improved infiltration of any rainfall or snow melts that occurs, which helps improve soil moisture levels before the ground freezes. More favorable soil moisture levels in late fall should



(Graph 2 Caption)

Differences in volumetric water content (VWC) in a research putting green at the O.J Noer Turfgrass Center from late May until late September 2009, in response to different soil surfactant chemistries. Dr. Doug Soldat, University of Wisconsin – Madison.

help reduce moisture stress on turfgrass going into the winter, and help maximize photosynthesis and root growth until the ground freezes. If they have had very wet conditions prior to the ground freezing, they have seen the excess water drain out of their rootzones more rapidly prior to the soil freezing so greens don't go into winter as excessively wet.

Some golf course superintendents have also experienced a mid-winter thaw. If some of the soil thaws out too, and there is somewhere for the melting ice and snow to go, they believe standing water has drained off the turf surfaces faster than they have experienced in the past when they did not make a late fall application of Revolution. If standing water does get off the turf surface faster during winter thaws and less crown hydration occurs because of this, potentially there could be less crown hydration damage after a hard freeze.

In the early spring, golf course superintendents have seen better infiltration of any precipitation that occurs or snow that melts after the soil thaws. Better infiltration reduces runoff, improves soil moisture levels, and maximizes photosynthesis and root growth coming out of winter. This can be especially important if it gets warm and dry before you can get your irrigation system up and running in the spring. Superintendents who made a late fall application of Revolution in 2011 did not see any water puddling and running down slope when they had to truck water out to their greens in March 2012. The water they applied went right in.

This same principle of a late fall soil surfactant application on putting greens can apply to any other turfgrass areas that has a history of soil water repellency and receives soil surfactant applications during the summer. Many golf course superintendents are now making a late fall application of Revolution to tees, and Dispatch® Sprayable fairways, and I have heard favorable results about these applications as well.

Several universities are currently conducting research trials involving soil surfactants (wetting agents), including the University of Minnesota. I am hopeful that research can be done to verify some of the benefits of a late fall Revolution application that superintendents have reported from using Revolution. It would also be good to investigate if other soil surfactant chemistries besides Revolution can also provide positive benefits when applied in the late fall. Research may ultimately help to develop recommendations to make these applications even more effective as well.

If you have not made a late fall soil surfactant application before, perhaps this is something you might want to consider this year as you put your golf course to bed for the winter. Fall is here.

Benefits of Membership in the MGCSA

MGCSA.org: The MGCSA provides its membership an electronic destination. The site offers a broad range of services including latest news, meeting information, important links, local association contacts and meeting schedules, as well as a market place for used equipment or student internships. Links are provided to the Affiliate Members who advertise on the web site.

Education: The MGCSA provides a range of high quality discounted professional education with more than 100 hours of relevant classes at the Northern Green Expo in January each year, supplemented by an extensive program at the Mega Seminar, as well as the annual MGA Spring Turf Forum.

Research: The MGCSA coordinates with researchers at the University of Minnesota's TROE Center to make sure you get the information you need. The association also directs Turfgrass Research Benefit Week, the annual sale of donated tee-times, to raise money for golf turfgrass research. And the association also contributes to The Turf Endowment fund to ensure a continuing program at the University of Minnesota.

Government Relations: The MGCSA provides access to the State Capitol through a continued relationship with the Minnesota Golf Association and other Green Industry Allies. This service keeps your association aware of issues likely to affect golf as they emerge rather than after the fact. This proactive presence also helps us educate legislators and regulators by providing solid information and research findings as they strive to make sound decisions for the good of the whole community. The MGCSA has representation at the Minnesota Nursery and Landscape's 'Day on the Hill' event.

Hole Notes Magazine: The MGCSA provides an award winning professional golf course superintendent association journal. Published ten times each year in a digital format, Hole Notes strives to provide relevant, interesting information that reflects the personality and professionalism of the membership. Links are provided to the Affiliate members who advertise in the magazine.

Membership Directory: At the Member's Only section the MGCSA provides an annually updated listing of names and contact details for every member of the association. This electronic directory puts each within fingertip reach of around 700 allied professionals across the region.

Employment Referral Service: The MGCSA provides a link between the people with jobs and those who want them. The employment referral service is available on-line at MGCSA.org as well as electronically delivered weekly through 'e-updates'.

Email Alerts: The MGCSA uses the internet to provide updates and alerts on urgent matters as they arise so we remain current with issues that may effect you, the industry and the Association.

Scholarships: The MGCSA extends its support to the next generation through an annual scholarship program to assist children and grandchildren of superintendents who have achieved academic excellence.

Wee One Support: The MGCSA annually hosts a Wee One fund raising golf outing with the proceeds going to support this outstanding program that serves those in the goof course turf management industry.

Within the Leather

by David Kazmierczak, CGCS

"They grow up so fast"

I can still hear the voice of the nurse as I was holding my son a few hours after he entered this world on the final day of Major League Baseball in the strike year of 1994. He entered, and the boys of summer exited, all in about an 18 hour span. Maybe that's why my son Kyle gravitated to football.

At any rate, in the subsequent months and years that followed, that phrase- they grow up so fast- was repeated to me by a plethora of well meaning individuals. From Grandparents, to friends, to Pastors, to co-workers and even complete strangers, they grow up so fast was uttered as a catch-all phrase to remind you that your children won't be children very long and you had better make the most of it.

If I had a dollar for every time I heard it, I would have enough for a grand time in Vegas with a few bucks to come home with more than likely.

So I am going to be the first person to go ahead and say that indeed kids don't grow up so fast. In fact, for the average person, they don't reach maturity until somewhere in their 40's. Heck, I know seventy year olds that act like six year olds. Every golf course has a couple of infants in saggy skin and bad plaid shorts. We've all seen them chunking greens with their putters and throwing clubs in a temper tantrum from time to time.

It takes the average child 18 years to get through infancy, kindergarten and twelve years of schooling before he or she leaves the nest to college or joins the ranks of the permanently employed. Eighteen years is a long time. A lot of things have happened since 1995. Nobody had a cell phone, much less an I pad. Dial-up was the sole means of getting on the Interweb, as Homer Simpson called it. Bill Clinton hadn't met Monica Lewinski. Tiger Woods was still in college. The Vikings hadn't won the Super Bowl. Oh wait, that still hasn't happened and I don't think ever will.

The point being from day one you have a long, long time to be with your children and watch them mature. The real question is how well is the time spent? Have you created memories for them and you that will last a lifetime? Have you been there when they really needed you?

Those are tough questions to answer, and sometimes harder to have the answer be "yes".

The job of golf course superintendent can be very family unfriendly. It demands long hours at times. It can be very stressful at times. Summer vacations that the Smiths and Johnsons down the street take are a rumor in Joe Turf's home. Odds are the spouse is building the snowman because the turf manager has to plow the clubhouse. But despite these demands, there is adequate time to spend with them if one makes the commitment. And really, how can you not?

My son Kyle is now a sophomore at UW Madison. He spent this past summer at home and worked his fourth summer on the crew at Prestwick. I am so very lucky to have that, not many parents have their kids work with them. While we don't see each other very much during the day, it's comforting knowing he is around, and he's turned into a pretty good

worker to boot.

Now that he is back in school, all I have is memories and a cell phone.

We'll talk every few days, mostly about football. Neither one of us are big phone talkers so the conversations are brief. Despite that, I don't think he realizes how much I miss having him around, and how much I enjoyed the quality times we did spend together.

There was the one-day trip to New York. We caught a flight at 7 am into La Guardia Airport and hit the Subway to Yankee Stadium in its' final year of existence for a day game. Back on the Subway to Times Square and back to the airport, home by Midnight. Back to work (for both of us) the next day.

There was the trip last winter to the Rose Bowl and the Fiesta Bowl. He saw his now beloved Badgers lose their Bowl game, and I saw my Kansas State Wildcats lose theirs. At least we were losers together. Or the trip to the Boundary Waters last August with a group of his friends and dads- something way out of my comfort zone, but right up his ally. We had a blast.

But fond memories don't have to come from grand trips. Simple things like helping him with his Eagle Scout project, building a few pinewood derby cars, coaching him in a few different sports. All quality time spent together.

The latest and possibly the most unique project we did together was a beer pong table. He masterminded the 3 foot by 8 foot piece of plywood consisting of 3,172 beer bottle caps entombed by $150 worth of epoxy that dried to a pristine clear surface. I helped and gave pointers. While frivolous and not exactly a monumental contribution to society, it was fun to do and we will both look back on the process with pride and sense of accomplishing something together. More priceless memories created.

I would be remiss not to mention my twin daughters, 16, and juniors in high school. Allison and Susan both have their interests and while much more family centric, we still enjoy one on one times that I will cherish all my life, and hopefully theirs as well. Soon they will be leaving the nest, their 18 years of time at home up, and begin to experience all life has to offer.

The children did not grow up too fast. They grew up, and continue to grow up, under my wife's and my watchful eye, and with slow, steady progression. As they grow, we continue to maximize the time we do have to spend with them and make that time meaningful and worthwhile. Don't just make the time or take the time to be a part of your children's lives, maximize the time you have with them and that feeling of "they grow up so fast" will never overtake you.