





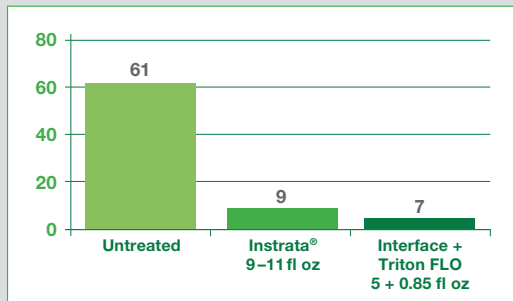
Product	Iprodione (Dicarboximide)	Triadimefon (DMI)	Triticonazole (DMI)	Trifloxystrobin (QoI)	
			X		X
		X		X	X
	X			X	X

Snow Mold Control Recommendations

Greens & Tees/Fairways

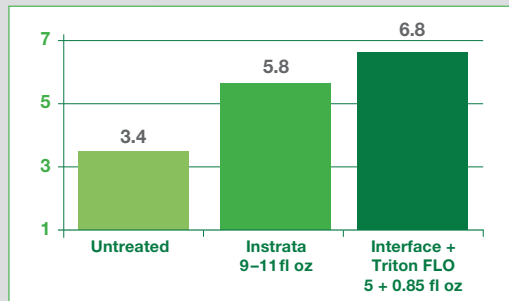
	Less than 60 days (Pink)	60 to 149 days (Pink + Gray)	150 days or more (Gray)
Greens & Tees	Interface 6 fl oz -OR- Tartan 2 fl oz	Interface 5-6 fl oz + Triton FLO 0.85 fl oz -OR- Interface 5 fl oz + Reserve™ 4.5 fl oz	Interface 6 fl oz + Triton FLO 0.85 fl oz -OR- Interface 6 fl oz + Reserve 5.4 fl oz
Fairways	Less than 80 days (mainly Pink)		80 days or more (mainly Gray)
	Interface 4 fl oz + Tartan 2 fl oz		Interface 4 fl oz + Triton FLO 0.55 fl oz

% Snow Mold



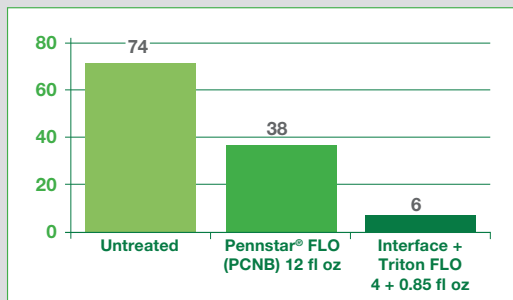
2008-2012 Summary of University Trials
25 Trial Comparisons

Turf Quality



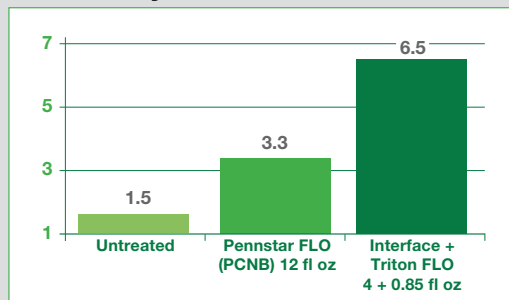
2008-2012 Summary of University Trials
31 Trial Comparisons

% Snow Mold



Oregon State University, Golembiewski & McDonald

Turf Quality



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Kevin Norby is the owner and principal of Herfort Norby Golf Course Architects in Chaska. Kevin attended the University of Idaho at Moscow and South Dakota State University at Brookings where he received a bachelor's degree in landscape architecture. He is a member of the American Society of Golf Course Architects (ASGCA) and is an active member of numerous golf course industry associations including the Golf Course Superintendents Association of America (GCSAA) and the Midwest Public Golf Managers Association (MPGMA). In 1991, Norby formed Herfort Norby Golf Course Architects and worked with his partner and mentor Don Herfort until 2003. Today, Herfort Norby specializes exclusively in the design and renovation of golf courses. Norby has been involved with nearly 100 golf course projects throughout the United States, Canada and the Caribbean and is a frequent speaker and contributing writer on issues related to golf course design and master planning. His services cover all aspects of golf course development from site selection and market/feasibility studies, to renovations and new course design.

1 Golf Course Master Planning

Whether a private country club or a public daily-fee golf course, a long-range master plan can be a valuable tool for identifying and prioritizing capital improvements. Norby will discuss the benefits of preparing a master plan and will describe steps which you, as a superintendent, can take to encourage your course to complete a long-range plan to reduce maintenance and unnecessary repairs and to improve course conditioning and playability.

2 Panel Discussion on Golf Course Master Planning

This panel discussion will bring together superintendents who have completed a long-range master plan for their golf course including Mike Handrich, Superintendent at Racine Country Club in Racine, Wisc.; Kurt Knox, Superintendent at Island View Golf Club in Waconia, Minn.; Chris Bradford, Superintendent at Coal Creek Golf Course in Louisville, Colo. and Troy Malo, General Manager at Pebble Creek Golf Course in Becker, Minn. They will discuss the challenges they faced in convincing their club to pursue a master plan and the benefits which they have experienced since completing the process. They will discuss some of their specific changes and will describe what impact their master plan has had on their course and their budget.

Join the conversation on Twitter. #GreenExpo13



Bob Vavrek has been part of the USGA Green Section staff for 22 years. His current responsibilities include making turf advisory service visits and USGA Championship preparation in Nebraska, Iowa, Northern Illinois, Wisconsin, and Minnesota. The goal of the USGA Turf Advisory Service is to help provide golfers the best possible playing conditions within the budgetary limitations of a particular golf facility. Other duties include writing articles for various publications and making numerous educational presentations at turf conferences across the United States and abroad. A native of northeast Ohio, Vavrek holds a B.S. in biology from Marietta College. A Masters degree in turfgrass entomology from The Ohio

State University explains his interest in helping golf course superintendents make a rapid, accurate diagnosis of turf related problems as well as presenting sustainable, environmentally friendly options to address these issues. He resides in Waukesha, Wisconsin.



Golf Course: The 2012 Year In Review

A mild winter and early warm weather during spring started the 2012 golf season off on the right foot. However, record heat and extended periods of drought across the upper Midwest caused plenty of stress to golf courses during June and July. This presentation discusses ways golf course managers addressed issues of intense heat and inconsistent rainfall this summer.

Plus many more great seminars and speakers! To view the entire preliminary schedule-at-a-glance, visit www.NorthernGreenExpo.org.

The Future Starts Today

TROE Center, Headquarters for Minnesota Turfgrass Professionals

By Jack MacKenzie, CGCS, North Oaks Golf Club and
Dr. Brian Horgan, University of Minnesota Turfgrass Extension Specialist

So what the heck does TROE really mean? No, it isn't a fancy Scottish term for a chili dip wedge. Nor is it Minnesota speak for advancing a ball. But rather, TROE stands for Turfgrass Research, Outreach and Education. And TROE Center stands for the basis of an up and coming University of Minnesota program focused on the future of turf management.

Research will concentrate upon the environmental impacts of general turf management. This will include the evaluation of alternative materials for use as low input turf. These materials will be monitored to develop management strategies that will include mowing frequency, nutrient and water use efficiency and the cultural practices necessary to promote healthy turf.

A second objective of research is to completely understand the impacts of fertilizer and pesticide applications on general turf. This may include fertilizer and pesticide runoff and leaching potentials as effected by common cultural practices used by homeowners and turf managers. And the research may evaluate the impacts of natural and organic products and how they affect the management of a low input turf.

There are also numerous other environmental quality issues that need to be addressed for the professional turf manager. Research at the TROE Center may include the effect of sand-based root zones and the movement of nutrients and pesticides, pesticide resistance issues and genetically modified grasses. The effects of modern technology and its application to the use of nutrients and pesticides may be evaluated. And the advances in GIS and GPS mapping may be presented in a comprehensible format to better understand its application to golf course pest management.

The TROE Center will be the industries "new" research facility, one that is flexible, comprehensible and progressive. In addition to the evaluation of breeding materials developed at the University of Minnesota, National Turf Evaluation Program (NTEP) trials will be conducted at the research facility.

The NTEP trials are collaborative efforts that incorporate cultural aspects and pest (disease, insect etc...) management. The information generated from these studies serve

as groundwork for the generation of information to be distributed by extension programs.

Outreach efforts focused through the TROE Center will target specific audiences as well as be multifaceted in their educational design. That is, information and educational activities such as field days, research tours, workshops and field-based classes will be targeted to professional turf managers such as those associated with the MGCSA and the MTGF.

The TROE Center will serve as a convenient gathering place for educational programs conducted for legislature and other public decision-makers. This will allow them to become acquainted with the diversity of turf, turf management and the importance of research and continuing education.

Education of current and future industry leaders is of great importance at the TROE Center. The Center will provide an outdoor laboratory for undergraduate students studying turf and turf-related issues. This laboratory will enable faculty, graduate students and staff from across the University and within industry the opportunity to apply experiences related to design, construction and maintenance.

Students who attend the University of Minnesota Turfgrass Program will gain the skills needed to be exceptional professionals. Some will go on to the graduate program to further their education and opportunities. Graduate students will have the opportunity to conduct research to increase knowledge of production practices, cultural systems and the environmental impact of turf grasses and landscape management.

The breadth and depth of research and education needs related to professional turfgrass management, as well as those

related to general turf, continues to grow and expand. TROE Center will meet and surpass these demands by creating an environment for research, outreach and education that will benefit the industry for many generations of turf professionals.

No, TROE Center isn't a catchy turf term, but odds are that it will become a name that defines the advancement of turf management at the University of Minnesota.

"TROE Center isn't a catchy turf term, but odds are that it will become a name that defines the advancement of turf management at the University of Minnesota."



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TROE CENTER UPDATE

By Dr. Brian Horgan
University of Minnesota

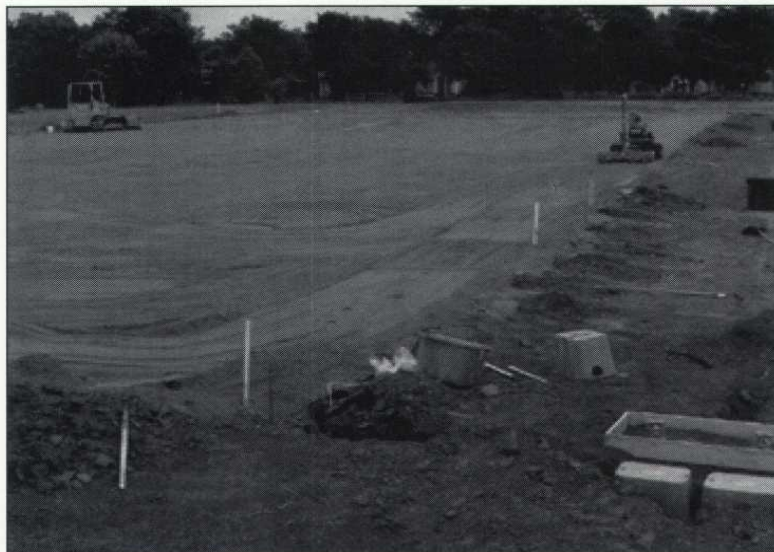
We didn't waste any time following the groundbreaking ceremony for the new Turfgrass Research, Outreach and Education Center on the St. Paul Campus.

EXCAVATION: On July 25, the College of Agriculture Food and Environmental Sciences had a formal ground breaking ceremony for the TROE Center held in conjunction with the most successful Turf Field Day to date. Immediately following the ceremony, the Hartman Company began excavating the soil for the USGA specification green designed by Jeff McDowell of Bonestroo and Associates. By August 1, 2002, the Hartman Company had installed the drainage tile, donated by Prinsco, and filled in the cavity with 4 inches of pea-gravel donated by Plaisted Companies.

IRRIGATION: Irrigation design and all irrigation parts for the green were provided by MTI and The Toro Company. From August 7 through August 13, the irrigation was installed by Premier Irrigation and staff from the University of Minnesota Turf Program. The irrigation design, as seen in the photo, may seem as a bit of overkill. However, the focal point of the irrigation system is individual control of 10 by 10 foot areas in a 2500 square foot portion of the green. These micro-irrigation plots will enable researchers at the U to use water rates as a treatment in the experimental design. In addition, scientists from the United States Department of Agriculture donated 8 lysimeters that were installed in the green within the micro-irrigation plots. In short, the combination of the micro-irrigation plots and the lysimeters will be used to measure the amount of water necessary to leach nutrients and pesticides through the USGA green.

TOP-MIX: Following the installation of the irrigation system, on August 15 and 16, the top-mix, which was donated by the Plaisted Companies, was delivered. Again, the Hartman Company moved the top-mix and leveled the surface to a specified 1.5% slope. Seeding as to be completed by August 31 with seed and fertilizer donated by Simplot Partners.

THANK YOU FROM THE UNIVERSITY OF MINNESOTA: All of companies mentioned in this brief update on



the TROE Center and the dozens of others that made this possible deserve a sincere thank you. For all of you that participated in the "Drive for the U" program, thank you. For all of the members of the MGCSA research committee that donated their time and energy in helping make the green a reality, thank you. The University of Minnesota appreciates all of your support and efforts and I personally look forward working with you in the future. **STAY TUNED.....**

TROE Center Green Construction Vendor Participants

DRAIN TILE
Prinsco Pipe

SITE DESIGN
Jeff McDowell, Bonestroo Assoc.

EXCAVATION & DRAINAGE
Hartman Co.

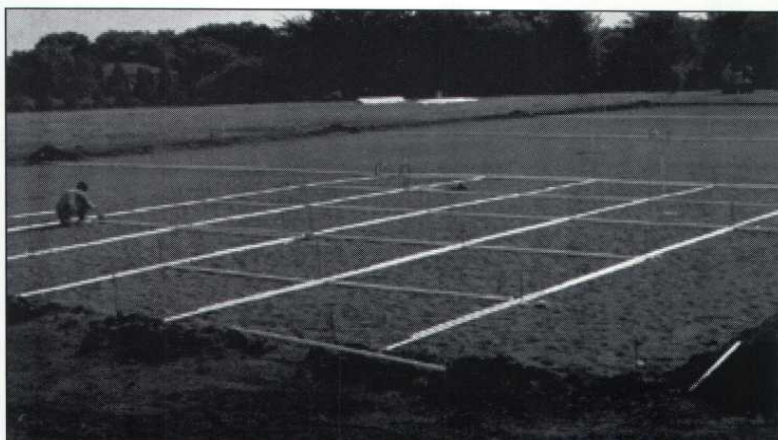
IRRIGATION SUPPLIES
MTI Distributing, Inc. & The Toro Company

IRRIGATION INSTALLATION
Premier Irrigation

DRAINAGE ROCKS & TOP MIX
Plaisted Companies

SEED FERTILIZATION
Simplot Partners

LYSIMETERS
USDA



The Wee One Foundation, Smoothing out a Rough Road by Dave Kazmeirczak CGCS



The road to recovery from cancer can be a long and lonely one, but on October 8, 2012 Dale Ledstrom, owner of Tim's Tree Service, got a little help from his industry brothers. Ledstrom is this year's Wee One recipient.

Ledstrom related in an acceptance speech at the Wee One Foundation event at North Oaks Country Club that while his road to recovery has already been trod upon, there are many more steps to take.

Ledstrom has owned and operated Tim's tree service for the last seven years and has serviced close to a dozen golf courses in the greater Twin Cities area. He started experiencing neck and shoulder pain earlier in the year and tried chiropractic care and physical therapy to correct the pain he was experiencing. When that did not help, he decided to seek another opinion. On June 6, 2012 he was diagnosed with Acute Lymphoblastic Leukemia.

The devastating news was a blow not only to Ledstrom, but to his wife, Denise,

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their daughter, Annika and the rest of his family as well. Tim's tree service would also take a major hit, as Ledstrom was owner and operator, and his dawn to dusk schedule would be reduced to next to nothing. Clearly Ledstrom and his family needed some help, and that is what they got in a variety of ways.

In order to keep the business afloat, Denise has stepped in to run the business side while the former owner, Tim Hagen, returned to help with the tree service

end of the business. Ledstrom also did landscaping and demolition work, but that part of the business has been halted until Ledstrom recovers. While this plan has kept the business alive, it has not kept the business profitable, and some equipment has had to be sold in order to sustain the operation. Also, Denise has not been able to return to a regular job in order to concentrate on the business matters, further burdening the home budget.

Having heard of Ledstrom's illness, Mike Manthey, superintendent Midland Hills and Jeff Ische, superintendent Golden Valley Country Club wondered if the Wee One Foundation would be able to help Ledstrom. Some investigation



Dale and Denise Ledstrom, cancer in remission, share a good moment with Kerry Anderson, Wee One beneficiary four years ago.

from Ische confirmed that Ledstrom was eligible to receive help from the foundation. Now all Ledstrom had to do was accept that help, which was not easy.

When Ische first approached Ledstrom about the Wee One

donation he was hesitant. Ledstrom had always been the giver, the one who went above and beyond the normal service and provided his customers what they needed. Now he was the one in need. After about four weeks, Ische was contacted by Denise, and the application was quickly submitted and approved. All proceeds from the October 8 event, plus \$2,500 more from the Wee One Foundation would go to Ledstrom and his family.

Perhaps the greatest gift of all, however, will come from his older brother.

When Ledstrom was first diagnosed, he started four cycles of in-patient chemotherapy at the University of Minnesota Fairview hospital. An MRI in last September showed that the cancer was in remission, which allows Ledstrom to proceed in the next step to recovery- a bone marrow transplant that will be donated from his older brother. After the surgery, Ledstrom will spend 30 days in an isolated situation due to a lack of immune system, and then another couple months at Hope Lodge, a short-

term recovery facility.

Ledstrom expressed gratitude to the Wee One and the MGCSA for supporting him, and thanked Ische for his support in getting it accomplished. His road to recovery will take time to travel, but he is looking forward to getting around this detour, and providing the strong service his customers have come to appreciate from him in the spring of 2013.

If you are interested in helping support the Wee One Foundation visit WeeOne.Org for more information. Your contributions make a difference and are greatly appreciated by many including Dale Ledstrom, Mike Smith, Tom Fuller and Kerry Anderson.

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Effect of Clipping Management on Nutrient Runoff from Kentucky Bluegrass Turf

By Brian Horgan, Troy Carson, and Pam Rice
University of Minnesota

Introduction

Recently, the State of Minnesota passed a law restricting the use of phosphorus fertilizers applied to turfgrass throughout the state (SF 1555). Exceptions to this legislation include applying P at time of seeding or establishment, need of P based on soil testing, and/or if you are a golf course personnel that has completed a training session. As an extension turfgrass specialist, I would not recommend the use of P unless during establishment or if a soil deficiency is present. Therefore, this new legislation makes sense to me except I'm not sure that the expected results will be obtained.

The debate about restricting P use to turf centered on the actual fertilizer applied to turf. Although a scenario can be created in which the actual fertilizer prill may runoff, sound agronomic practices will minimize or even eliminate this potential. One such scenario could be: apply fertilizer to a sparse turf population grown on a highly compacted soil that is saturated which receives a large rainfall event immediately following fertilization. Many of us can think of areas on our properties where this could occur. However, experience has shown that professional turfgrass managers who subscribe to sound agronomic practices would not risk losing product from a runoff event. Your scenario would probably be: obtain a soil test, aerify twice a year, apply fertilizer to maintain good density, and coordinate your fertilizer application so that it can be watered in with irrigation, not a large rainfall event.

Because data does not exist to prove the movement of fertilizers applied to dense turf sward, other nutrient sources must be examined. Mowing is a primary cultural practice that we can not do without. Often times, we recommend recycling clippings as a future source of nutrients. Looking back at the previously described scenario that could lead to runoff of fertilizer, could clippings also move off that site into surface water? On sloped surfaces that directly feed to surface water bodies, should clippings be recycled or removed to possibly prevent nutrient runoff and surface water contamination?

The objective of this research will be to evaluate the effect of clipping management on nutrient runoff from Kentucky bluegrass turf. The following experimental design and treatment list will be evaluated:

Materials and Methods

Proposed area for runoff plot construction is at the TROE Center on the St. Paul campus. This area will be irrigated and is currently space that has been allocated for turfgrass research.

- Construct 24 runoff plots (8 ft by 24 ft), separated by dividers to ensure that runoff is from a known area, with a uniform 6%

slope, at both locations.

- To simulate homelawn conditions, the topsoil will be removed, the subsoil compacted and the areas will be sodded with a Kentucky bluegrass blend.

- This will allow 8 treatments to be imposed with three replications. The proposed treatment list includes:

- 1) Control - no fertilizer applied, clippings removed
- 2) Only nitrogen fertilizer applied, clippings removed
- 3) Full-rate phosphorus and nitrogen, clippings removed
- 4) Double-rate phosphorus and nitrogen, clippings removed
- 5) Control- no fertilizer applied, clippings returned with recycling mower
- 6) Only nitrogen fertilizer applied, clippings returned with recycling mower
- 7) Full-rate phosphorus and nitrogen, clippings returned with recycling mower
- 8) Double-rate phosphorus and nitrogen, clippings returned with recycling mower

*potassium will be applied to those fertilized plots according to soil test results

- A rainfall simulator/irrigation system will be designed and installed to simulate rainfall events.

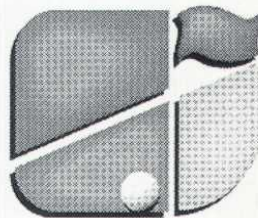
- A sampling mechanism will be installed at the base of each plot to measure volume of water running off each plot and collect a subsample for analysis.

- Hand held TDR probe will be used to measure volumetric water content within each plot.

Results and Discussion

This research will begin in September 2003 and conclude in December 2006. Plots will be constructed this summer and available to tour at Field Day on July 24, 2003.

(Editor's Note: Brian Horgan is an Assistant Professor and Troy Carson is an Assistant Scientist in the Department of Horticultural Sciences at the University of Minnesota and Pam Rice is a USDA/ARS Soil Scientists located in St. Paul, Minnesota.)



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