Hole Notes

The official publication of the MGCSA

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Vol. 48, No. 7 August 2014

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Badgerland Exposure
Lake Wissota Golf
Host Kris Woppert

October 7
Shoot Out
Minnesota Horse and Hunt Club
Host Mike Manthey

October 13
The Wee One
Brackett's Crossing Country Club
Host Tom Prosheck

November 19
Assistant's Professional Forum
Pinz Bowling Woodbury
Host Casey Andrus

December 3
Winter Mini Seminar
Medina Golf and Country Club
Host Erin McManus

January 15
Beer and Pretzel Social
Nirthern Green Expo
Hosts 27 Hole Challenge Affiliates

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DAVE KAZMIERCZAK, CGCS
DAVE@PRESTWICK.COMCASTBIZ.NET

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...Even More Content...

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 Roger Stewart, CGCS Superintendent at TPC Twin Cities

August is what I like to call "Hump Month". The way I look at it is if you can get through the season to August 15 without any major hiccups, chances are the course will make through the rest of the season in good shape as well. The days get shorter, the sun angle becomes less intense and the temperatures become even more comfortable with each passing day. I have been hearing the following phrase quite a bit this year: "It has been a very good year from a weather perspective and if you can't grow grass in a year like this, you shouldn't be in this business." While I'm sure that may ring true for some, others were hit with devastating flooding in June they still haven't fully recovered from. I can remember dealing with devastating winter kill on greens in 2011 and trying to recover in time for a Champions tour event at the end of July. The spring was cool, damp and perfect for the growth of Poa annua . Those who had it recovered well, those with bentgrass had a much longer road. We need to keep these things in mind and remember Mother Nature does not play favorites.

Speaking of August, the UM Field Day had a large attendance of over 175 people who turned out to see what is going on at what is quickly becoming recognized as a leading turf research facility in the country. If you missed it, you missed a lot. Dr. Brian Horgan and his staff are in the middle of some really interesting research that is on the cutting edge of what golf course management will look like in the future. Research on fine fescues for low input turf used for fairways is on-going at the U of M and while they are not there yet, it seems destined to be the up and coming cool season turf that will require much fewer inputs. Actually, the trials they have there now look pretty good to me, but will require some improvements along with a shift in expectations. Sam Bauer gave a great presentation on the MGCSA Member Driven Research projects, showing us some results from the wetting agent trial and the Primo GGD trials as well. Matt Cavanaugh

talked about his demonstration of common mistakes we make, or we deal with as superintendents and from the banter I heard around me, it might have been the most popular stop on the tour. Look for more of that from Matt in the future. Mark your calendars as soon as the next Field Day is scheduled and make sure you attend this must see event.

This issue of Hole Notes has a couple articles related to bees and the role we can play in improving their habitat and survivability. At the Field Day there was a demonstration project on what composes a good bee lawn and while I don't see this type of turf in playing areas any time soon, we all have plenty of areas that are out of play that could be maintained in this fashion to provide habitat for bees. Several MGCSA members in the metro area have provided room for some hives and worked to set aside some out of play areas for better bee habitat. It was great to see the interest in this initiative by several MGCSA members at the Field Day. There are many resources available for you to learn how you can participate in building bee habitat and you can get it through the U of M or by contacting Jack MacKenzie, who can point you in the right direction.

In closing, I want to remind all of our MGCSA members of a very important and worthwhile event coming up in October at Brackett's Crossing. The annual Wee One Foundation golf event and fund raiser is coming up and I hope you will have the opportunity to participate in this truly remarkable event. Wee One raises money to assist golf course management professionals and their families who have been or are currently facing life threatening illnesses by providing financial assistance to help with what can be devastating financial burdens.

Our own MGCSA members have been the recipients of assistance from Wee One and I hope you will all consider playing in the event so that others may be helped as well. I guarantee a feel good day for those who can make it to the Wee One!

Thanks for your support and I'll see you on the other side of the hump!

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and staff are welcome and encouraged to attend this event

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or call 651-324-8873

In Bounds

by Jack MacKenzie, CGCS

A friend of mine in the industry, one whom I have helped from time to time with ideas and thoughtful considerations, will often ask of me following a friendly salutation, "…this is all well and good, but more importantly, what have you done for me lately?"

Obviously this jest is made with humorous intent and is suggested to enhance our friendship as a jovial spar, but behind the thrust is a great question, what had I done for him recently? For that matter, what have I done for YOU recently?

Too be simple and to the point, I've been very busy on your behalf. Two and a half years ago I was hired from the ranks of golf course superintendents to manage your professional association to the best of my abilities utilizing the inherent needs I had accumulated after many seasons as a turf manager. At the time, I saw the career change as an opportunity to implement what I perceived as "industry demands" beyond communication and event management.

Together, let's face the truth of your industry. As much as you would like to volunteer, and as much as you want to be heard, you just don't have the time to work 50, 60 or even 70 hours a week from April through October and also give extra time to support the industry. And we must not forget the obligations you attempt to maintain on the home front. You have a real juggling act to successfully manage without external hands pulling you from your priorities.

From my point of view, I saw this administrative position as one of true representation of the well intended, yet over-worked,

professional golf course manager. From your viewpoint, I attempt to prioritize and follow through on a wide variety of topics and issues including educational material, legislative action, membership promotion, institutional support and public relations.

There is a lot going on in the industry and having a full time representative has proven quite effective in the enhancement of your profession. Through me, "we" are represented upon the USGA Green Section Committee, the MDA Pesticide Management Committee, the PMC Education and Promotion Team, the DNR Groundwater Management Planning Committee, the MDA Pollinator Strategic Planning Committee and of great importance, the MPCA, DNR, MDA and the Bureau of Water and Soil Resources Golf Course Environmental Stewardship Committee. "We" communicate regularly with the MGA, MN Section PGA, Midwest Golf Course Owners Association, Club Managers Association, the UMN, MNLA and the MTGF. "We" are always available for insight into the industry.

As your liaison with the GCSAA, "we" last year pursued and received a grant to enhance membership promotion. This lead to, and emphasized, our summer exposure and winter outreach, both of which are open to both member and non-member professionals. In 2014 "we" have applied for a $10,000 grant from the GCSAA to support the financial requirements necessary to further the Minnesota Golf Course BMP and Environmental Stewardship Program. As "we" continue to promote the program with our state agencies we have found some agency challenges will require funding to overcome. For example, funding necessary for the creation, implementation and tabulation of golf courses assessments, a requirement put forward by the

MDA.

"We," however, are not all about advocacy. Member networking is also important. Annually, the MGCSA plans and participates in over two dozen social and educational opportunities. From the Beer and Pretzel Bash at the NGE to the Assistant's Professional Forum in late November and the ten outstate Outreach/Exposure events; there are many chances for you to get a flavor of the social advantages associated with the MGCSA. That is roughly two events each month touching every membership level from Equipment Managers to our Affiliates.

Oh yes, "we" mustn't forget about communication…if you are not 'touched' by the MGCSA through electronic media, Twitter, The Stimpmeter, The Hole Notes, Facebook and e-blasts, at least twice per week, you must have 'accidently' added MGCSA to you "junk" mail! Indeed, I do pester you a bit through electronic networking, but that is because I had, as a superintendent, perceived the need for more current communication.

All this talk of autonomy doesn't mean I wouldn't like a call or two, an email or note of suggestion. In truth, I savor those too few comments as they keep me in touch with you, the professional turf manager base of the golf industry. Never do I want to take you for granted and I will always maintain an open mind and appreciation of your time-bound desires to be an active member.

What have I done for you recently I ask? Well, I'd like to think that this question doesn't cross your mind at all as I attempt to project myself into your shoes and anticipate and implement your demands. Thank you for the opportunity to serve as your professional administrator.

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Early Physiological Changes Associated in Cold Deacclimation of Annual bluegrass and Creeping bentgrass

Michele DaCosta, Lindsey Hoffman, and Xian Guan
University of Massachusetts

Turfgrass and Environmental Research Online
Volume 12, Number 1 | January 2013.

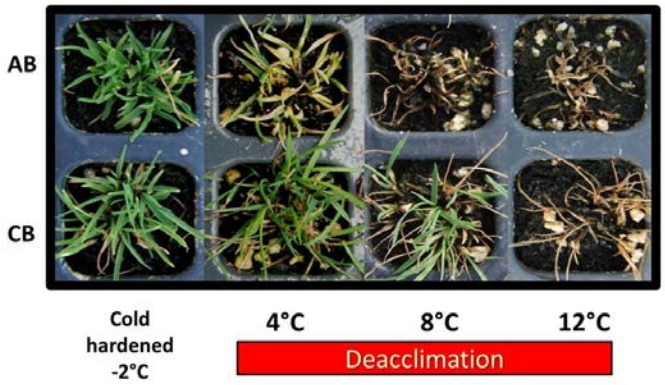
Objectives:

1. *Determine the effects of different above–freezing temperature and duration combinations that result in a loss in freezing tolerance of creeping bentgrass and annual bluegrass*
2. *Examine early physiological changes associated with deacclimation sensitivity of creeping bentgrass and annual bluegrass, with a focus on carbon and protein metabolism parameters*

Premature deacclimation associated with warming periods during winter and early spring can negatively impact turfgrass freezing tolerance and lead to winterkill. Some limited research suggests that annual bluegrass (Poa annua L.) (AB) and creeping bentgrass (Agrostis stolonifera L.) (CB) differ in their capacity to resist deacclimation, which can contribute to interspecific differences in winter injury potential. Therefore, research is necessary to understand the factors that trigger deacclimation in grasses and to identify plant traits that contribute to enhanced deacclimation resistance and freezing tolerance. The specific objectives of our research were to (i) determine the effects of different above–freezing temperature and duration combinations that result in deacclimation of CB and AB, and (ii) examine early physiological associated with deacclimation sensitivity of CB and AB, with a focus on carbon and protein metabolism parameters.

In Experiment 1, we compared one AB ecotype (previously shown to exhibit sensitivity to freezing temperatures) and one CB cultivar ('L–93'). Plants were exposed to a cold acclimation regime of 2°C for 2 weeks, followed by subzero acclimation –2°C for 2 weeks in controlled environment chambers. Following cold acclimation, plants were then exposed to one of six deacclimation treatments that consisted of the following temperature degree and duration combinations: 4°C for 1d or 5d, 8°C for 1d or 5d, and 12°C for 1d or 5d. Changes in freezing tolerance (lethal temperature at which 50% of plants were killed, LT50) for each species were monitored during cold acclimation and deacclimation. We found that CB achieved higher freezing tolerance at the end of the cold acclimation period (LT50 of –21.2°C) compared to that of AB (LT50 of –17.7°C). When plants were exposed to 4°C for 1 day, both species exhibited a small loss in freezing tolerance compared to that at –2°C. However, AB deacclimated to a greater extent compared to CB in response to most deacclimation treatments (Figure 1). As expected, the greatest deacclimation potential for both species was observed at higher temperatures (i.e., 12°C) and greater duration (i.e., 5 days).

Figure 1. Losses in freezing tolerance and resulting injury to annual bluegrass (AB) and creeping bentgrass (CB) following exposure to deacclimation temperatures of 4, 8 and 12° C for 5 days.



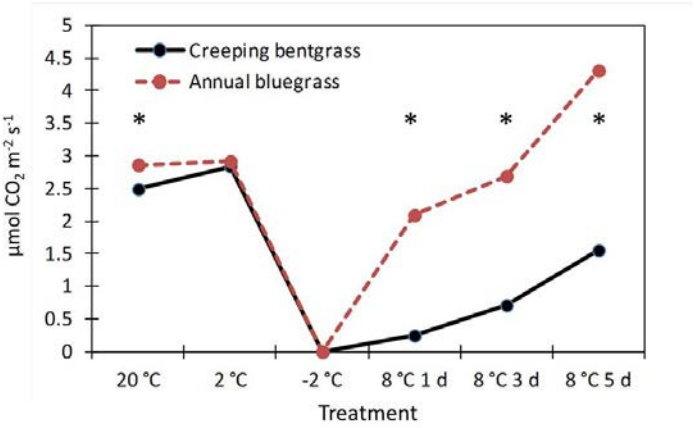
To better understand the underlying causes for differences in deacclimation resistance among the two species, we conducted a second experiment to examine early physiological changes of AB and CB in response to deacclimation, with a focus on carbon metabolism

TERO Vol. 12(1):13–14 | January 2013.
USGA ID#: 2011–01–411
TGIF Number: 217435

parameters. For Experiment 2, one AB ecotype (freezing sensitive) and one creeping bentgrass cultivar ('Penncross') were exposed to a cold acclimation regime as in Experiment 1. Plants were then exposed to a deacclimation treatment of 8°C for up to 5 days. During cold acclimation and deacclimation periods, we measured canopy photosynthesis and respiration rates, leaf chlorophyll fluorescence parameters, and leaf and crown carbohydrate contents. As found in Experiment 1, CB achieved higher freezing tolerance compared to AB in response to cold acclimation, and CB also maintained higher freezing tolerance following exposure to 8°C for 5 days. During deacclimation, AB restored carbon metabolism parameters more rapidly compared to CB, as exhibited by a greater increase in canopy photosynthesis and respiration rates and higher photochemical yield components (Figure 2). Although more rapid up–regulation of carbon metabolism may provide AB with a competitive advantage during spring recovery, these responses may also lead to greater susceptibility of AB to freezing injury in response to mid–winter warming events.

An additional experiment is currently underway to further evaluate early changes in the metabolism of important carbon and nitrogen metabolites involved in freezing tolerance, including carbohydrates, amino acids, and proteins, that may be responsible for differences in deacclimation resistance between AB and CB. In our preliminary work, we determined that CB maintained higher levels of fructans during deacclimation compared to AB. Furthermore, CB and AB exhibited distinct differences in their soluble protein profiles and presence of dehydrins proteins during deacclimation. The experiment is currently being repeated to confirm initial observations.

Figure 2. Changes in canopy photosynthesis of an–nual bluegrass (AB) and creeping bentgrass (CB) in response to different cold acclimation (20, 2 and –2°



Summary Points

- Annual bluegrass (AB) generally exhibited a greater loss in freezing tolerance at lower temperatures and shorter durations.
- In response to deacclimation, AB exhibited a more rapid capacity to restore carbon metabolism compared to CB, based on higher canopy photosynthesis, respiration, and photochemical yield components.
- Preliminary results from current experiments also suggest that differences in the metabolism of specific carbohydrate fractions and proteins, such as dehydrins, may also account for differences in deacclimation sensitivity among the two species.
- The more rapid shift in AB carbon and nitrogen metabolism may lead to greater susceptibility of this species to freezing injury in response to mid–winter warming events.

The MGCSA appreciates the opportunity to reproduce this report with full acknowledgment from the USGA. Their support of our industry through research and The Green Section Reports is valued greatly.

Thank you to the United States Golf Association

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The GreenJacket, A Humble Beginning in a Frigid Environment

Garry Sullivan, GreenJacket

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Back in 1996, Roger Kisch from SouthView CC called us to see if we had a material to fit a "need" to protect golf course turf during the winter. I told him about our NiceRink outdoor ice rink division and the type of white liners we produced to make the rinks work. I had explained to Roger how my grass came through each year after having 18" of ice on it for 3 months and told him "sure this particular product should work, but don't call me if your green dies, it's your idea!" So, we gave him the plastic to try, and Roger called me when he was pulling the cover the first spring of 1997, and said "You need to come up here to Minnesota right away to see how it worked.", I did, and thus began the GreenJacket®. As other area courses in the Twin Cities heard of what was going on with Roger's trials at SouthView CC, they too wanted to try the new covers.

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Honey Bees and Golf Courses, One Sweet Partnership Part 3

Rebecca Masterman, UMN Bee Squad Coordinator

When the University of Minnesota Bee Squad opened Somerset Golf Club's hives yesterday, they found, beneath thick coatings of healthy-looking bees, good stores of honey. They added supers to both last year's "parent" colony, and to this year's "divide," so the bees will have more room to take advantage of the mid-July nectar flow and continue making and storing honey. Like last year, the hives' sponsor Brian Smith will be doling out some of this bounty to members at the end of the summer. Of course, harvesting honey is a privilege only practiced when hives are doing well, and have more than enough food for the bees' own wintering.

Brian and golf course superintendent James Bade joined squad members on the roof the other day to see for themselves how well the hives were doing. Brian took photos, and James helped lift the heavy deep boxes to reverse their order. Reversals are done so that the queen always has room to move up in her hive, which encourages her to keep

laying eggs, as she has the perception she's never running out of space. She seems to prefers building her brood from the bottom up (don't we all?) so once the queen is laying eggs in the top deep (usually the third,) the Bee Squad will move that box to the bottom of the stack, and she'll re-start her upward ascent. Most importantly, a reversal allows workers to store honey in the new top deep (previously the bottom) which is where the colony will spend the winter eating and shivering together.

The bees have become a favorite topic of conversation amongst Somerset Golf Club members and guests, and that, says Brian, is the whole point of keeping them on the golf course property. The answer to the honey bee crisis is a very complex one involving multiple factors, from mites to management, but there are simple ways to work towards a solution: spreading interest and awareness about the importance of pollinators through gardens, hives, and conversations with neighbors, learning to keep bees, or sup-

porting research on honey bees and other at-risk pollinators.

Remember, planting food for bees and other pollinators on golf course properties can be as simple as selecting plants that provide good pollen and nectar sources throughout the growing season (Plants for Minnesota Bees). It's also imperative to care for all pollinators in ways that will ensure that their food is clean (http://www.pollinator.org/golfcourse.htm). For more information about the UMN Bee Squad, visit us at www.beesquad.umn.edu.

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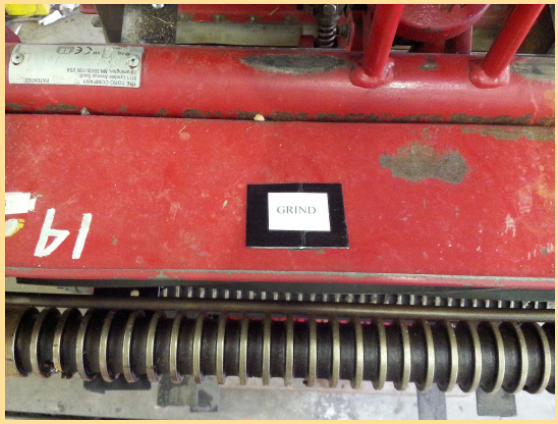
Equipment Manager's Insight

Justin Peuse, Equipment Manager at Wild Ridge/Mill Run Golf in Wisconsin, has a great way to keep track of any piece of steel equipment. Using a printed label and some old refrigerator magnets, he created easy to stick and remove tags for his equipment. In this case he uses "cutting" and "grind" to indicate which reels need work. Use your imagination and come up with your own magnetic ideas!



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2013-2014 Snow Mold Control Evaluation
Craguns Golf Resort – Brainerd, MN

Paul Koch, Ph.D.; P.J. Liesch; Sam Soper; and Bruce Schweiger
Department of Plant Pathology
University of Wisconsin-Madison

Andrew Hollman and Dr. Brian Horgan
Department of Horticultural Science, University of Minnesota

OBJECTIVES

To evaluate fungicides for the control of Typhula blight (caused by *Typhula ishikariensis* and *T. incarnata*) and Microdochium patch (caused by *Microdochium nivale*).

MATERIALS AND METHODS

This evaluation was conducted at The Legacy at Craguns GC in Brainerd, MN on a creeping bentgrass (*Agrostis stolonifera*) golf course fairway maintained at a height of 0.5 inch. Individual plots measured 3 ft x 10 ft (30 ft^2), and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i using a CO_2 pressurized boom sprayer equipped with two XR Teejet 8004 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1000 ft^2. All applications were made on October 24th, 2013. The experimental plot area was not inoculated. There was consistent snow cover on the experimental area from late November until mid-April, a total of over 120 days. Disease severity, turf quality, and color were recorded on May 7th, 2014. Disease severity was visually rated as percent area affected, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable, Normalized Difference Vegetative Index (turfgrass color) was rated using a GreenSeeker NDVI Turf Color Meter® from NTech Industries (Ukiah, CA). Treatment means were analyzed using the Waller Duncan method and are presented in Table 1.

RESULTS AND DISCUSSION

Disease pressure was high at Craguns in 2013-2014, with non-treated controls averaging 75% disease. Speckled snow mold (*T. ishikariensis*) was the primary disease observed in the experimental area, though minor amounts of snow scald (*Myriosclerotinia borealis*) were also observed. Despite this intense pressure, all 29 treatments suppressed snow mold relative to the non-treated control. Of these 29 treatments, 20 provided outstanding suppression (< 5.5% disease). Nearly all of these treatments contained at least three active ingredients, with some treatments containing four or even five active ingredients. Turf quality closely mirrored disease severity, with the same 20 treatments providing acceptable quality (6 or higher). No differences in turf color were observed using the NDVI meter amongst products providing adequate disease suppression.

Table 1: Mean snow mold severity, turf quality, and turf color assessed on May 7th, 2014 at The Legacy at Craguns GC in Brainerd, MN.

Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
1	Non-treated control			75.0a	2.8g	0.465h
2	Instrata	7.0 fl oz/1000 ft2	Late	8.8d-g	5.5cde	0.690c-f
3	Instrata	9.3 fl oz/1000 ft2	Late	5.5e-h	6.0bcd	0.692b-e
4	Compass	0.2 oz/1000 ft2	Late	62.5b	3.3g	0.550g
5	Interface Mirage	4.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	2.3fgh	6.8ab	0.710a-d
6	Interface Mirage	5.0 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	2.3fgh	6.8ab	0.717abc
7	Interface Mirage	5.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	2.8e-h	6.8ab	0.720abc
8	Mirage Compass	0.63 fl oz/1000 ft2 0.2 oz/1000 ft2	Late 1 HR PRE	5.0e-h	6.3abc	0.715abc
9	Mirage Compass	0.94 fl oz/1000 ft2 0.2 oz/1000 ft2	Late 1 HR PRE	4.8e-h	6.3abc	0.700a-e
10	Mirage Compass	1.57 fl oz/1000ft2 0.2 oz/1000 ft2	Late 1 HR PRE	4.3e-h	6.3abc	0.712abc
11	Mirage Compass	1.89 fl oz/1000ft2 0.2 oz/1000ft2	Late 1 HR PRE	2.5e-h	6.5ab	0.705a-e
12	SP28296 Mirage	5.0 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	2.0fgh	7.0a	0.730a
13	SP28296 Mirage	6.0 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	1.0h	7.0a	0.722abc
14	SP28296 Mirage	8.0 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	1.0h	7.0a	0.727ab
15	SP28297 Mirage	3.816 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	1.8fgh	6.8ab	0.715abc
16	SP28297 Mirage	4.77 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	0.0h	7.0a	0.727ab
17	SP28297 Mirage	5.724 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	1.3gh	6.8ab	0.722abc
18	Trilogy	3.14 fl oz/1000 ft2	Late	10.0de	6.0bcd	0.697a-e
19	Trilogy	5.56 fl oz/1000 ft2	Late	9.3def	5.5cde	0.687c-f
20	Interface Triton FLO Droplex	3.0 fl oz/1000 ft2 0.55 fl oz/1000 ft2 10.0 fl oz/a	Late Late Late	15.0d	5.0ef	0.672ef
21	Instrata Droplex	5.5 fl oz/1000 ft2 10.0 fl oz/a	Late Late	13.8d	5.3de	0.690c-f
22	Banner MAXX II Civitas Harmonizer Droplex	1.0 fl oz/1000 ft2 8.0 fl oz/1000 ft2 0.5 fl oz/1000 ft2 10.0 fl oz/a	Late Late Late Late	32.5c	4.3f	0.655f

[a]Fungicide treatments were applied on Oct. 24th, 2013.
[b]Mean percent diseased area assessed on May 7th, 2014.
[c]Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
[d]Color was assessed using a Greenseeker NDVI Turf Color Meter from NTech Industries®.

Table 1 (cont): Mean snow mold severity, turf quality, and turf color assessed on May 7th, 2013 at The Legacy at Craguns GC in Brainerd, MN.

Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
23	QP TM/C	6.0 oz/1000 ft2	Late	16.3d	5.3de	0.675def
	QP Iprodione	4.0 fl oz/1000 ft2	Late			
	QP Propiconazole	2.0 fl oz/1000 ft2	Late			
	Foursome	0.5 fl oz/1000 ft2	Late			
24	QP TM/C	6.0 oz/1000 ft2	Late	3.0e-h	6.5ab	0.697a-e
	QP Iprodione	4.0 fl oz/1000 ft2	Late			
	QP Tebuconazole	0.6 fl oz/1000 ft2	Late			
	Foursome	0.5 fl oz/1000 ft2	Late			
25	QP Iprodione	4.0 fl oz/1000 ft2	Late	0.5h	7.0a	0.727ab
	QP Tebuconazole	1.1 fl oz/1000 ft2	Late			
	Foursome	0.5 fl oz/1000 ft2	Late			
26	QP Enclave	8.0 fl oz/1000 ft2	Late	2.5e-h	6.5ab	0.710a-d
	Foursome	0.5 fl oz/1000 ft2	Late			
27	Torque	0.75 fl oz/1000 ft2	Late	5.5e-h	6.0bcd	0.687c-f
	26/36	4.0 fl oz/1000 ft2	Late			
28	Torque	0.75 fl oz/1000 ft2	Late	2.3fgh	6.8ab	0.727ab
	26/36	4.0 fl oz/1000 ft2	Late			
	Legend	5.0 fl oz/1000 ft2	Late			
29	Torque	0.6 fl oz/1000 ft2	Late	3.0e-h	6.5ab	0.715abc
	26/36	4.0 fl oz/1000 ft2	Late			
	Heritage TL	1.0 fl oz/1000 ft2	Late			
30	Chipco 26GT	4.0 fl oz/1000 ft2	Late	25.0c	4.8ef	0.687c-f
	Daconil Weatherstik	5.5 fl oz/1000 ft2	Late			

[a]Fungicide treatments were applied on Oct. 24th, 2013.
[b]Mean percent diseased area assessed on May 7th, 2014.
[c]Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
[d]Color was assessed using a Greenseeker NDVI Turf Color Meter from NTech Industries®.

Disease pressure was very high at Cragun's and provided some excellent results for northern mid-west golf courses.

2013-2014 Snow Mold Control Evaluation
Silver Bay CC – Silver Bay, MN

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OBJECTIVES

To evaluate fungicides for the control of Typhula blight (caused by *Typhula ishikariensis* and *T. incarnata*), Microdochium patch (caused by *Microdochium nivale*), and snow scald (*Myriosclerotinia borealis*).

MATERIALS AND METHODS

This evaluation was conducted at Silver Bay CC in Silver Bay, MN on a creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) golf course fairway maintained at a height of 0.5 inch. Individual plots measured 3 ft x 10 ft (30 ft^2), and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i using a CO_2 pressurized boom sprayer equipped with two XR Teejet 8004 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1000 ft^2. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1000 ft^2. All applications were made on October 25th, 2013. The experimental plot area was not inoculated. There was consistent snow cover on the experimental area from late November until mid-April, a total of over 120 days. Disease severity, turf quality, and color were recorded on May 6th, 2014. Disease severity was visually rated as percent area affected, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable, Normalized Difference Vegetative Index (turfgrass color) was rated using a GreenSeeker NDVI Turf Color Meter® from NTech Industries (Ukiah, CA). Treatment means were analyzed using the Waller Duncan method and are presented in Table 1.

RESULTS AND DISCUSSION

Disease pressure was moderate at Silver Bay CC in 2013-2014, with non-treated controls averaging 32.5% disease. Extremely cold temperatures throughout the winter likely resulted in less snow mold than is typically observed at this location. Both snow scald and speckled snow mold (*T. ishikariensis*) were observed in the experimental area. All treatments with the exception of treatment 24 provided suppression of snow mold relative to the non-treated control. The low disease pressure resulted in relatively little separation of products, with 21 of the 24 treatments providing excellent suppression (<6.3%). Most of the effective treatments contained at least three active ingredients, with some treatments containing four or even five active ingredients.

Table 1: Mean snow mold severity, turf quality, and turf color assessed on May 6th, 2014 at Silver Bay CC in Silver Bay, MN.

Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
1	Non-treated control			32.5a	4.3e	0.355c
2	Instrata	11.0 fl oz/1000 ft2	Late	0.0d	7.0bc	0.450abc
3	Interface Mirage	6.0 fl oz/1000 ft2 1.5 fl oz/1000 ft2	Late Late	0.0d	7.3abc	0.510ab
4	Interface Mirage	6.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.0d	7.5ab	0.527a
5	SP28296 Mirage	5.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.0d	7.0bc	0.457abc
6	SP28296 Mirage	6.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.0d	7.0bc	0.462ab
7	SP28296 Mirage	8.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.0d	7.3abc	0.435abc
8	SP28297 Mirage	3.816 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.5d	6.8bc	0.460ab
9	SP28297 Mirage	4.77 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.0d	7.3abc	0.467ab
10	SP28297 Mirage	5.724 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.0d	7.3abc	0.455abc
11	Tartan Mirage	2.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2	Late Late	0.0d	7.3abc	0.417bc
12	Tartan Mirage Chipco 26GT	1.0 fl oz/1000 ft2 1.0 fl oz/1000 ft2 3.0 fl oz/1000 ft2	Late Late Late	0.5d	7.0bc	0.490ab
13	Tartan Mirage Chipco 26GT	1.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2 3.0 fl oz/1000 ft2	Late Late Late	0.0d	7.3abc	0.517ab
14	Interface Triton FLO Droplex	3.0 fl oz/1000 ft2 0.55 fl oz/1000 ft2 10.0 fl oz/a	Late Late Late	6.3cd	6.5c	0.480ab
15	Instrata Droplex	5.5 fl oz/1000 ft2 10.0 fl oz/a	Late Late	1.3cd	6.5c	0.450abc
16	Banner MAXX II Civitas Harmonizer Droplex	1.0 fl oz/1000 ft2 8.0 fl oz/1000 ft2 0.5 fl oz/1000 ft2 10.0 fl oz/a	Late Late Late Late	13.8bc	5.0de	0.472ab
17	QP TM/C QP Iprodione QP Propiconazole Foursome	6.0 oz/1000 ft2 4.0 fl oz/1000 ft2 2.0 fl oz/1000 ft2 0.5 fl oz/1000 ft2	Late Late Late Late	2.5cd	7.3abc	0.512ab
18	QP TM/C QP Iprodione QP Tebuconazole Foursome	6.0 oz/1000 ft2 4.0 fl oz/1000 ft2 0.6 fl oz/1000 ft2 0.5 fl oz/1000 ft2	Late Late Late Late	0.0d	8.0a	0.502ab

[a]Fungicide treatments were applied on Oct. 25th, 2013.
[b]Mean percent diseased area assessed on May 6th, 2014.
[c]Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
[d]Color was assessed using a Greenseeker NDVI Turf Color Meter from NTech Industries®.

Table 1 (cont): Mean snow mold severity, turf quality, and turf color assessed on May 6th, 2014 at Silver Bay CC in Silver Bay, MN.

	Treatment	Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
19	QP Iprodione QP Tebuconazole Foursome	4.0 fl oz/1000 ft2 1.1 fl oz/1000 ft2 0.5 fl oz/1000 ft2	Late Late Late	0.0d	8.0a	0.487ab
20	QP Enclave Foursome	8.0 fl oz/1000 ft2 0.5 fl oz/1000 ft2	Late Late	0.0d	8.0a	0.517ab
21	Torque 26/36	0.75 fl oz/1000 ft2 4.0 fl oz/1000 ft2	Late Late	0.0d	7.0bc	0.495ab
22	Torque 26/36 Legend	0.75 fl oz/1000 ft2 4.0 fl oz/1000 ft2 5.0 fl oz/1000 ft2	Late Late Late	0.0d	7.0bc	0.477ab
23	Torque 26/36 Heritage TL	0.6 fl oz/1000 ft2 4.0 fl oz/1000 ft2 1.0 fl oz/1000 ft2	Late Late Late	0.0d	7.0bc	0.522a
24	Chipco 26GT Daconil Weatherstik	4.0 fl oz/1000 ft2 5.5 fl oz/1000 ft2	Late Late	20.0ab	5.3d	0.447abc

[a]Fungicide treatments were applied on Oct. 25th, 2013.
[b]Mean percent diseased area assessed on May 6th, 2014.
[c]Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
[d]Color was assessed using a Greenseeker NDVI Turf Color Meter from NTech Industries®.

Snow mold pressure at Silver Bay Country Club was moderate.

2013-2014 Auxiliary Snow Mold Control Evaluation

Tumbledown Trails Golf Course – Madison, WI
Wausau Country Club – Wausau, WI
Marquette Country Club – Marquette, MI

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OBJECTIVES

To evaluate fungicide treatments containing PCNB for the control of Microdochium patch (*Microdochium nivale*) and Typhula blight (*Typhula incarnata, T. ishikariensis*) on golf course turfgrass.

MATERIALS AND METHODS

This evaluation was conducted at three locations; Tumbledown Trails GC in Madison, WI, Wausau Country Club in Schofield, WI and Marquette GC in Marquette, MI. All plots were on a creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) fairway maintained at 0.5. Individual plots measured 3 ft x 10 ft (30 ft^2), and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i using a CO_2 pressurized boom sprayer equipped with two XR Teejet 8004 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1000 ft^2, except for 1786-G (2.5 gallons water). Applications were made on November 5th at Marquette GC, November 14th at Wausau CC, and November 21st at Tumbledown Trails. The experimental plot area was not inoculated. Disease severity and turf quality were recorded following snow melt in April of 2014 at all three courses. Disease severity was visually rated as percent area affected, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable, and Normalized Difference Vegetative Index (turfgrass color) was rated using a HCS 100 GreenSeeker® from Trimble Navigation Ltd (Sunnyvale, CA). Treatment means were analyzed using the Waller Duncan method and are presented in Tables 1, 2, and 3.

RESULTS AND DISCUSSION

Disease pressure absent at Madison and very high and both Wausau and Marquette with non-treated controls averaging 87.5% and 92.5% disease, respectively. The primary disease present in Wausau was pink snow mold and in Marquette was speckled snow mold. At both Wausau and Marquette all treatments except 1786-G reduced snow mold compared to the non-treated control. Interface and Turfcide 400 reduced snow mold significantly though not to the same degree as Instrata. It should be noted that Instrata includes three active ingredients while Interface contains two and the remaining contain only one.

Table 1: Mean snow mold severity, turf quality, and turf color assessed on April 2nd, 2014 at Tumbledown Trails GC in Madison, WI.

Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
1	Nontreated Control			0.0a	7.0a	0.478a
2	1786-G	12.0 fl oz/1000 ft2	Late	0.5a	7.5a	0.495a
3	Instrata	9.3 fl oz/1000 ft2	Late	0.0a	7.0a	0.545a
4	Interface	6.0 fl oz/1000 ft2	Late	0.0a	7.8a	0.525a
5	Turfcide 400	12.0 fl oz/1000 ft2	Late	0.0a	7.5a	0.535a

[a]Fungicide treatments were applied on November 21st, 2013.
[b]Mean percent diseased area assessed on April 2nd, 2014.
[c]Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
[d]Color was assessed using an HCS 100 NDVI GreenSeeker from Trimble Navigation Ltd®.

Table 2: Mean snow mold severity, turf quality, and turf color assessed on April 21st, 2014 at Wausau CC in Wausau, WI.

Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
1	Nontreated Control			87.5a	1.5c	0.277d
2	1786-G	12.0 fl oz/1000 ft2	Late	91.3a	1.3c	0.310d
3	Instrata	9.3 fl oz/1000 ft2	Late	2.5d	6.5a	0.687a
4	Interface	6.0 fl oz/1000 ft2	Late	35.0c	4.3b	0.607b
5	Turfcide 400	12.0 fl oz/1000 ft2	Late	55.0b	3.5b	0.527c

[a]Fungicide treatments were applied on Novemer 14th, 2013.
[b]Mean percent diseased area assessed on April 21st, 2014.
[c]Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
[d]Color was assessed using an HCS 100 NDVI GreenSeeker from Trimble Navigation Ltd®.

Table 3: Mean snow mold severity, turf quality, and turf color assessed on April 23rd, 2014 at Marquette GC in Marquette, MI.

Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
1	Nontreated Control			92.5a	1.5c	0.243b
2	1786-G	12.0 fl oz/1000 ft2	Late	98.3a	1.0c	0.243b
3	Instrata	9.3 fl oz/1000 ft2	Late	21.3c	4.8a	0.470a
4	Interface	6.0 fl oz/1000 ft2	Late	62.5b	3.0b	0.378a
5	Turfcide 400	12.0 fl oz/1000 ft2	Late	63.8b	2.8b	0.378a

[a]Fungicide treatments were applied on November 5th, 2013.
[b]Mean percent diseased area assessed on April 23rd, 2014.

2013-2014 Pink Snow Mold Control Evaluation
OJ Noer Center – Verona, WI

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OBJECTIVES

To evaluate fungicides for the control of Microdochium patch caused by the fungus *Microdochium nivale*.

MATERIALS AND METHODS

This evaluation was conducted at the OJ Noer Turfgrass Research and Educational Facility in Madison, WI on an 'Alpha' creeping bentgrass (*Agrostis stolonifera*) plot maintained at a height of 0.5 inches. Individual plots measured 3 ft x 10 ft and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i using a CO_2 pressurized boom sprayer equipped with two XR Teejet 8004 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1000 ft^2. Early applications were made on November 7th, 2013 and late applications were made on December 2nd, 2013. The experimental plot area was inoculated with *M. nivale*-infested rye grain and covered with a GreenJacket® cover on December 3rd. Snow cover was consistent from mid-December until late March, a period of approximately 100 days. Disease severity, turf quality, and turf color were recorded on April 1st, 2014. Disease severity was visually rated as percent area affected, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable, and Normalized Difference Vegetative Index (turfgrass color) was rated using a HCS 100 GreenSeeker® from Trimble Navigation Ltd (Sunnyvale, CA). Treatment means were analyzed using the Waller Duncan method and are presented in Table 1. In addition, surface temperature on the research plot was recorded using a Spectrum Watchdog® datalogger and is presented in Figure 1.

RESULTS AND DISCUSSION

Despite the prolonged snow cover in 2013-2014, Microdochium patch severity was very low on the experimental area with non-treated controls averaging just 3.8%. Disease was not observed on any other treatment with the exception of minor amounts on treatments 26 and 29. Other snow mold diseases such as gray (*Typhula incarnata*) and speckled (*T. ishikariensis*) were not observed. This decreased severity was likely due to the extremely cold temperatures observed in southern Wisconsin and a lack of snow depth required to properly insulate the turf surface, as evidenced by the cold surface temperatures observed in Figure 1. Differences in turf color were not observed using the NDVI meter, though products containing green pigments did appear slightly more green and resulted in a slight increase in turf quality.

Table 1: Mean snow mold severity, turf quality, and turf color assessed on April 1st, 2014 at the OJ Noer Turfgrass Research Facility in Madison, WI.

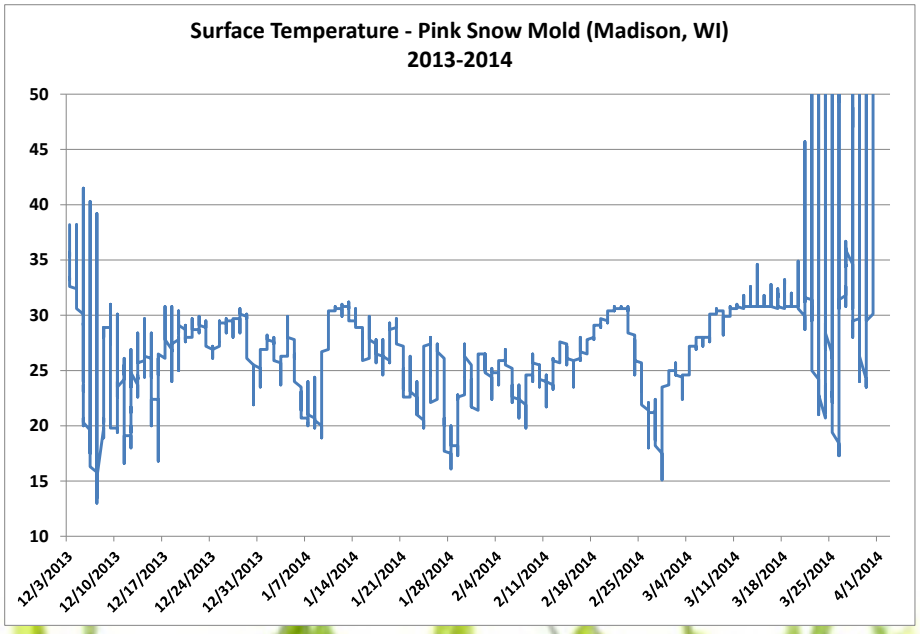
Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
1	Non-treated control			3.8a	7.0cd	0.555a
2	Chipco26GT	4.0 fl oz/1000 ft2	Late	0.0a	7.0cd	0.572a
3	Banner MAXX II	2.0 fl oz/1000 ft2	Late	0.0a	7.0cd	0.562a
4	Triton FLO	0.85 fl oz/1000 ft2	Late	0.0a	7.3c	0.582a
5	Heritage TL	2.0 fl oz/1000 ft2	Late	0.0a	7.3c	0.562a
6	1786-G	12.0 fl oz/1000 ft2	Early/Late	0.0a	8.8a	0.590a
7	Interface Triton FLO	6.0 fl oz/1000 ft2 0.85 fl oz/1000 ft2	Late Late	0.0a	7.8b	0.575a
8	Interface Triton FLO Droplex	3.0 fl oz/1000 ft2 0.55 fl oz/1000 ft2 10.0 fl oz/a	Late Late Late	0.0a	8.0b	0.580a
9	Instrata Droplex	5.5 fl oz/1000 ft2 10.0 fl oz/a	Late Late	0.0a	7.0cd	0.560a
10	Banner MAXX II Civitas Harmonizer Droplex	1.0 fl oz/1000 ft2 8.0 fl oz/1000 ft2 0.5 fl oz/1000 ft2 10.0 fl oz/a	Late Late Late Late	0.0a	8.0b	0.575a
11	A13705W	2.6 fl oz/1000 ft2	Late	0.0a	7.0cd	0.592a
12	Secure	0.5 fl oz/1000 ft2	Late	0.0a	7.3c	0.582a
13	Secure Daconil Weatherstik	0.5 fl oz/1000 ft2 5.5 fl oz/1000 ft2	Late Late	0.0a	7.0cd	0.580a
14	Concert II	8.5 fl oz/1000 ft2	Late	0.0a	7.0cd	0.582a
15	A13705W Daconil Weatherstik	2.6 fl oz/1000 ft2 5.5 fl oz/1000 ft2	Late Late	0.0a	7.0cd	0.555a
16	A15457 A17856 A7087 PAR	0.236 fl oz/1000 ft2 1.09 fl oz/1000 ft2 0.5 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late Late Late	0.0a	8.0b	0.575a
17	A15457 A17856 Heritage TL PAR	0.236 fl oz/1000 ft2 1.09 fl oz/1000 ft2 1.01 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late Late Late	0.0a	8.0b	0.587a
18	A15457 A17856 Banner MAXX II PAR	0.236 fl oz/1000 ft2 1.09 fl oz/1000 ft2 2.0 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late Late Late	0.0a	7.8b	0.567a
19	A19188 A17856 PAR	1.0 fl oz/1000 ft2 1.09 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late Late	0.0a	8.0b	0.590a
20	Instrata PAR	9.4 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late	0.0a	8.0b	0.565a

[a]Early fungicide treatments were applied on Nov. 7th, 2013 and late treatments applied on Dec. 2nd, 2013.
[b]Mean percent diseased area assessed on April 1st, 2014.

Table 1: Mean snow mold severity, turf quality, and turf color assessed on April 1st, 2014 at the OJ Noer Turfgrass Research Facility in Madison, WI.

Treatment		Rate	Application Timing[a]	Disease Severity[b]	Turf Quality[c]	Turf Color[d]
21	A20744 A17856 A7087 PAR	0.5 oz/1000 ft2 1.09 fl oz/1000 ft2 0.5 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late Late Late	0.0a	8.0b	0.600a
22	A20744 A17856 Heritage TL PAR	0.5 oz/1000 ft2 1.09 fl oz/1000 ft2 1.01 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late Late Late	0.0a	8.0b	0.597a
23	A20744 A17856 Banner MAXX II PAR	0.5 oz/1000 ft2 1.09 fl oz/1000 ft2 2.0 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late Late Late	0.0a	8.0b	0.582a
24	A20581 PAR	0.47 fl oz/1000 ft2 0.36 fl oz/1000 ft2	Late Late	0.0a	8.0b	0.577a
25	1786-A	12.0 fl oz/1000 ft2	Early/Late	0.0a	9.0a	0.587a
26	1786-B	12.0 fl oz/1000 ft2	Early/Late	1.3a	8.8a	0.595a
27	1786-C	12.0 fl oz/1000 ft2	Early/Late	0.0a	7.3c	0.590a
28	1786-D	12.0 fl oz/1000 ft2	Early/Late	0.0a	7.3c	0.570a
29	1786-E	12.0 fl oz/1000 ft2	Early/Late	1.3a	7.0cd	0.585a
30	1786-F	12.0 fl oz/1000 ft2	Early/Late	0.0a	6.8d	0.555a

[a]Early fungicide treatments were applied on Nov. 7th, 2013 and late treatments applied on Dec. 2nd, 2013.
[b]Mean percent diseased area assessed on April 1st, 2014.
[c]Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
[d]Color was assessed using an HCS 100 NDVI GreenSeeker from Trimble Navigation Ltd®.



Pink snow mold pressure was low at the Madison, Wisconsin test plots.

The Minnesota Golf Course Superintendents' Association acknowledges and gratefully appreciates the collaborative efforts between the Universities of Minnesota and Wisconsin. Thank you for your ongoing support of our industry. Without which, intense turf management would be much more difficult.

UMN/MTGF F

Miss it? You

Field Day 2014
Missed a lot!

Properly Store and Manage Small Packages of Pesticides and Fertilizers
August 2014 Bulletin 3 of 6
By Corinne du Preez, Agricultural Chemical Investigator

Storing, containing and managing pesticides-fertilizers

This bulletin by the Minnesota Department of Agriculture (MDA) will provide more explanation of requirements for handling, storing and managing small package pesticide and fertilizer, which ranges in liquid or dry amounts from 55-gallons or 99-pounds (or less). Proper storage of small packages, disposal of rinsates, and handling of containers can significantly reduce environmental contamination or exposure. These proper measures will also prevent inspection violations.

Statutory authority

To regulate these agricultural and urban lawn chemicals, the MDA is given statutory authority under Minnesota Statute 18B.07, Subd. 2. Prohibited pesticide use. (a) A person may not use, store, handle, distribute, or dispose of a pesticide, rinsate, pesticide container, or pesticide application equipment in a manner:
(1) that is inconsistent with a label or labeling as defined by FIFRA;
(2) that endangers humans, damages agricultural products, food, livestock, fish, or wildlife; or
(3) that will cause unreasonable adverse effects on the environment.

Minnesota Statute 18B.07, Subd. 4. Pesticide storage safeguards. A person may not allow a pesticide, rinsate, or unrinsed pesticide container to be stored, kept, or to remain in or on any site without safeguards adequate to prevent an incident. Pesticides may not be stored in an area with access to an open drain,

unless a safeguard is provided.

Minnesota Statute 18C.201, Subd. 1. Storage, handling, distribution, or disposal. A person may not store, handle, distribute, or dispose of a fertilizer, rinsate, fertilizer container, or fertilizer application equipment in a manner:
(1) that endangers humans, damages agricultural products, food, livestock, fish, or wildlife;
(2) that will cause unreasonable adverse effects on the environment;

Label language
When handling or storing small package pesticide products, it is important to read and follow the label. Labels provide specific product use, storage, handling, and disposal information. Improper handling of pesticides and fertilizers, or not following label directions, can result in enforceable action due to the potential risk and harm to people and the environment.

Below are some examples from pesticides commonly used on golf courses:
1. Trimec Classic herbicide (EPA Reg. # 2217-543, active ingredient 2, 4-D, MCPP, and Dicamba)
The label states in part:
PESTICIDE STORAGE: Store in original container in a locked storage area.
CONTAINER HANDLING: Non-refillable container. Do not reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

2. Merit 75 WSP insecticide (EPA Reg. # 432-1318, active ingredient Imidacloprid)
The label states in part:
PESTICIDE STORAGE: Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed.
CONTAINER DISPOSAL: Non-refillable container. Do not reuse or refill this container.

3. Honor Intrinsic fungicide (EPA Reg. 7969-255, active ingredient Pyraclostrobin and Boscalid)

The label states in part:
PESTICIDE STORAGE:
DO NOT contaminate water, food, or feed by storage or disposal.
DO NOT store near food or feed.
CONTAINER DISPOSAL:
Non-refillable Container. DO NOT reuse or refill this container.

Inspection questions and observations:
Are pesticides stored separately from food, feed, or seed?

The MDA recommends a separation of at least one pallet width, or at least three feet, to separate pesticides from food, feed, and seed. Unless specified as prohibited on the label, products can be stored within the same room but in a manner to prevent cross contamination or co-mingling.

Violation: Pesticide was stored on top of grass seed bags; therefore, stored too
close to or not separate from food, feed, or seed.

ORDER/Statement of Completion:
Store pesticides separately from food, feed, and seed.

Correction: The facility corrected the violation by moving the seed to a different building.

Right: Unacceptable storage of chemicals, fertilizers and seed.

Is the pesticide storage area free of open drains?

Pesticides must be stored in a manner to prevent their release in the event of an incident. An open drain potentially allows pesticide to escape into the environment and may cause unreasonable adverse effects.

Violation: Open drain in the pesticide storage area.

ORDER: Cease and desist use of storage area until drain is plugged or removed.

Statement of Completion: Provide a means of shutoff for drain in pesticide storage area, move pesticide into an adequate containment area, move the pesticide to another area, or plug the drain(s).

Above: Unacceptable storage in a pesticide room with an open drain.

Above: Acceptable storage with drain plugged to protect the environment

Are small package pesticides safeguarded as required by the label?

Store small package pesticides in a secure area that prevents people, pets, and wildlife from unauthorized access. Some labels require specific storage requirements. For example, many fumigants must be stored under lock and key, away from areas occupied by people, and may have storage placard requirements.

Violation: Improper storage.

ORDER/ Statement of completion: Store pesticides according to label directions.

Left and Bottom:
Unacceptable storage.

Both photos above show fumigant stored in violation of the label (in a building with people present and without proper placarding).

Store small package pesticides in a secure area that prevents people, pets, and wildlife from unauthorized access.

Above: An example of a great storage facility

Are wells safeguarded from pesticides in storage?

Individual pesticide containers with a capacity of 25 gallons, or 100 pounds or more must be stored at least 150 feet from a well, unless additional safeguards are provided. Information on additional safeguards which may reduce this set-back can be obtained from:

Greg Harding, MDA Facility Management Unit
Greg.Harding@state.mn.us.
651-201-6274
Pesticide storage areas with a total combined product volume of 56 gallons, or 100 pounds or more must be located at least fifty (50) feet from a well.

Are wells safeguarded from pesticide mixing and loading sites?
If the total or cumulative volume of small package pesticide containers located at the pesticide mix/load site is greater than 25 gallons, the pesticide containers must be located at least 150 feet from a well unless additional safeguards are provided. See above question/answer for more information.

Violation: Required setback between pesticide and well is less than required.

ORDER/Statement of completion: Setback of 150 feet or additional containment must be established.

Is pesticide disposal, rinsate use, and container disposal consistent with label directions?

Triple rinse all pesticide containers. Place the rinse water back into your application equipment and apply as directed by the label. DO NOT reuse pesticide containers. Dispose of triple rinsed containers according to label directions. To dispose of fertilizer bags properly, shake the bag vigorously and inspect it to be sure there is no residue left. Once the entire product has been removed, the fertilizer bag can be disposed of in the trash.

Violation: Improper disposal and/or rinsate.

ORDER to comply: Dispose of pesticides in a manner consistent with label directions.

ORDER to comply: Dispose of pesticide rinsate in a manner consistent with label directions.

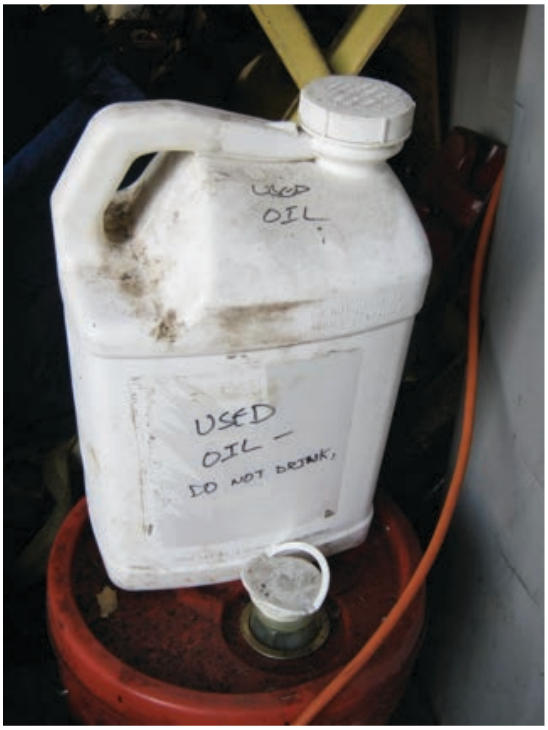
ORDER to comply: Dispose of pesticide containers in a manner consistent with label directions.

Right: Acceptable container disposal. Properly rinsed containers stored prior to disposal.

Are empty containers used only for their intended purposes?
According to the label, pesticide containers cannot be used for other purposes. The potential for harm to food, feed, seed, and many other substances can be prevented by properly handling containers.

Violation: Reuse of pesticide container.

ORDER: Cease and desist using pesticide containers in manner inconsistent with label directions.



According to the label, pesticide containers cannot be used for other purposes.

Above and right: Unacceptable re-use of pesticide containers.

Additional requirements must be met to store or use mini-bulk containers (greater than 55 gallons).
For more details: http://www.mda.state.mn.us/Global/MDADocs/licensing/chemicals/minibulk.aspx

Enforcement
Due to the potential health and environmental risks associated with the lack of proper storage, disposal, and container management, please be advised that documented non-compliance may result in additional enforcement, including financial penalties. Also, be advised that the violations shown above are commonly documented during routine inspections at golf courses.

For additional information and/or examples of small package storage requirements, refer to MDA's fact sheet, Pesticide and Fertilizer Storage: Small Package Requirements at:
http://www.mda.state.mn.us/chemicals/~/media/Files/chemicals/pesticides/smlpkg.pdf

Thank You,

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Pesticide and Fertilizer Management Division
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Are you in compliance?

The MGCSA acknowledges and thanks the Minnesota Department of Agriculture for their help in providing educational materials specific to the golf industry. This private/public partnership benefits everyone involved. Professional turf managers keep up to date upon regulatory measures and our state agencies have assurances that the golf industry strives to meet public expectations.

Within the Leather

by David Kazmierczak, CGCS

The sign saying "Golf Course" with a simple arrow pointing the way off Highway 385 was in sight. It was another glorious morning in the Black Hills of South Dakota on a slow Tuesday morning. The entire family was packed into our minivan, and it was last day of our short vacation to visit my parents who reside in this wonderful part of the world.

As we turned into the parking lot I could make out a small machine on the first fairway at Tomahawk Country Club. Now, Tomahawk Country Club is the local course for Deadwood, South Dakota. It is quaint little nine-hole course open to the public all the time. The only thing "country club" about it is it's out in the country, and it's a golf club. Nothing else. It is the course my grandparents took me to play when we visited as a kid, and I guess it really was the course I grew up on, if there was one, so today was going to be kind of special as I hadn't played the course in quite some time.

After parking, the small machine suddenly looked quite lager as it made its way to the first tee. Indeed it was a turf vehicle with a core sweeper attached. They had aerified the first and ninth fairways, visible from the clubhouse.

"Crap," I thought as I mentioned it out loud to the minivan's passengers. I related to all that we could go play somewhere else if desired but, as always, the decision fell upon my narrow shoulders on whether or not to still play at Tomahawk. Not wanting to be the guy I have become to detest, you know, the guy who always whines at you when you aerify at your course, I decided we could tough it out, no big deal, that's what I always tell our pro shop.

"Really, it's just cores, all they have to do is shoo then out of the stance and roll the ball, no big deal," is always my pat answer.

We loaded everybody up, paid our green fees and off we went. After teeing off and looking at the area swept up already two observations popped into my head. The first was that in two weeks, I would be doing the exact same thing and the other was that it was far too early in the day for these guys to be using that sweeper! The fairway had turned to a mud bowl. If the guy was sweeping anything, it was an upset. Most of the cores were simply being smeared all over the fairway. I think he figured

it out pretty quickly as he was still sweeping after we were done playing 18 at a much better success rate but initially what we had was a family half covered with mud and questioning my judgment on the second tee. I quickly told all concerned to chill out, scrape their shoes, and it was going to be a fine, fun filled day. Or I would drive back to the pro shop, get our money back and go home. Not my folks place- home!

Idle threats had always worked for my dad- and I guess I learned from the best as everybody did chill out, and we did have a good day. As we came around to the ninth, another worker had a Cushman and a core harvester slowly trying to clean the fairway. The word harvest in bold bright letters reminded me of something very important. That no matter what scale of golf course maintenance you are in charge of- high end multi-course facility or small country nine-hole or executive tract- we are all really simple farmers in the end. Our crop is grass, and while we may grow it differently than our agricultural brethren, we still have the basic programs and worries as they do. We are at the mercy of Mother Nature always, and have good crop years and bad.

Which leads me to the ultimate point I want to make. How many farmers do you know- other than our group of grass farmers? I know a couple very well. My father in law was a farmer, my brother in law is a farmer. I have met many of their peers, many of whom are relatives. I have meet plenty of other farmers throughout my years on this orbiting rock to know that everyone I have ever met has one undeniable trait: they are humble people. Time has taught these folks from generation to generation that in order to succeed long term one must be humble in ones abilities, for you are only as good as your last crop and a lot of your success or failure is out of your hands.

This has been an outstanding agronomic year in our region for "grass farmers." I, and our crew, have been gathering bouquets most of the summer from members and non-members alike. It is easy to let the atta-boys go to your head and start thinking you are God's gift to turf and golf. Forget it mister (and missus). You are a lowly grass farmer. Nothing more, nothing less. (Ok- maybe a little more, but you get my point.)

With the dog days of August over and all of us shifting into aerification mode and easing into fall and the ugliness that follows, this is a gentle reminder to keep diligent, keep humble, and keep farming the best crop a guy or gal can have the privilege of farming: precision golf turf. Happy growing!