long and how many plants have been affected? Are nearby plants of different species affected in a similar way? What types of pesticides and fertilizers have been used recently? All of this information will be considered by the diagnostician and will contribute to the accuracy of the final diagnosis.

For more complete information on available tests, how to submit samples, and the most current rates for service, please visit our website at pdc.umn.edu or feel free to contact us by phone or email. Thank you for your time and we look forward to helping you with your plant health problems!

PDC Contact Information
Brett Arenz, Assistant Professor and PDC Director
Jennifer Flynn, PDC Diagnostician
Phone: 612-625-1275
Email: pdc@umn.edu
Website: pdc.umn.edu

Mailing Address
Plant Disease Clinic
495 Borlaug Hall
1991 Upper Buford Circle
St. Paul, MN 55108

Hand Delivery Address
105 Stakman Hall
1519 Gortner Ave

Turfgrass Disease Diagnostics at the UMN Plant Disease Clinic; The Price is Right

How do you diagnose your plant? A recent survey says that over 54 % of MGCSA members diagnose their own turf diseases. I know that superintendents are incredibly well educated and can often do this. However, there may be a time when you come across some diseased turf that has ambiguous symptoms, disease symptoms that look similar between two or more diseases, or diseased turf that just won't recover despite your best efforts. That is where we can help.

Beginning this spring, my laboratory will be teaming up with the Plant Disease Clinic (PDC) to provide you with timely turfgrass disease diagnoses and management recommendations. At the PDC, we have the equipment and expertise to perform microbiological and DNA based tests to provide you with accurate diagnosis of your diseased turfgrass samples.

We will also be reaching out to you with recommendations for your turf disease management. While I will strive to help you manage diseases using primarily cultural techniques, I will also work with you to select the appropriate chemical treatments.

Several members have requested services such as site visits and subscription based services, and that is what we are now able to offer you! We will be offering a subscription fee that will allow unlimited sample submission as well as a site visit and will include molecular diagnostics. Another subscription service will allow for submission of up to five samples and will include molecular diagnostics. The new services and fees are as follows:

Professional Turf Disease Diagnosis Fees:

Diagnosis with a phone consultation - $100 per sample

Diagnosis with a written report and phone consultation - $150 per sample

Diagnosis with site visit and written report - $250 per sample

Subscription 1 – 5 samples including written reports, phone consultations - $500

Subscription2 – unlimited samples, written reports, phone consultations, and one site visit - $1000

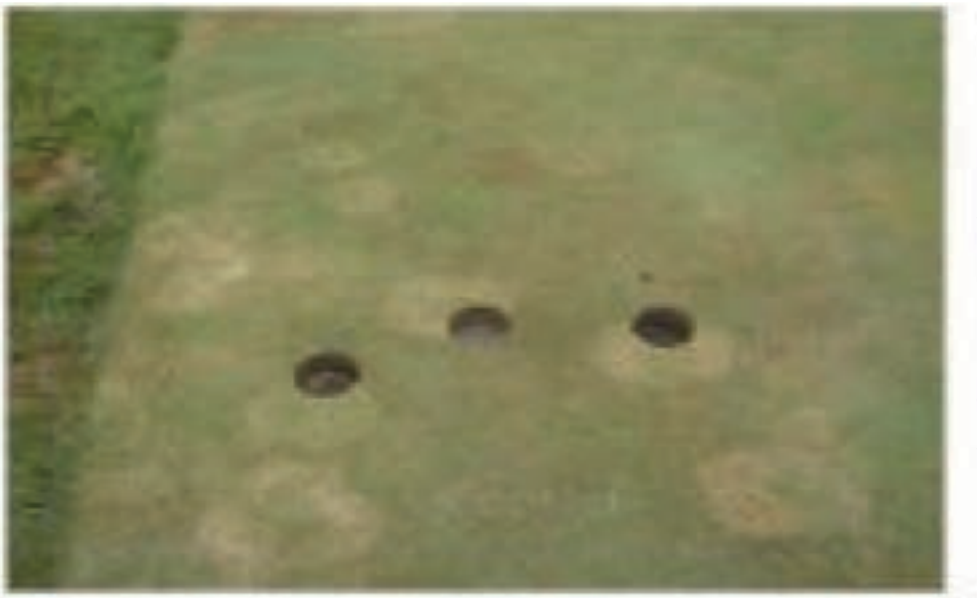
All samples and payments will be handled by the PDC. You can find out more about the PDC at the following website: pdc.umn.edu.

How do you submit a sample? This is an important step. Proper sample submission can have a huge influence on our ability to quickly and accurately identify the pathogen.

1. Take an appropriately sized sample. Samples taken with a cup cutter are perfect! However, if you are using a shovel or spade on longer landscaping grasses, it is still important to take a sample that is at least 6" in diameter (or width x length for square samples). Take samples that are at least 2 to 3 inches deep to ensure adequate roots and soil.

2. If there are several diseased spots, it can be helpful to take several samples (Figure 1, above). If there are different stages of disease present, it can be helpful to submit samples that are at different stages of disease. Taking several samples of both healthy and diseased turf can help us with

difficult samples.



3. When taking the sample, take them from the edge of the diseased area so that both healthy and diseased turf is present. (Figure 2, above). Label the samples to denote the location where they were taken. Pictures of the disease – such as this one – can be very helpful for us to make diagnoses.

4. Fill in the disease submission form in as much detail as possible. Make a note of any conditions (sun, shade, humidity, drainage, temperature) treatments (growth regulators, fertilizers, pesticides) and cultural practices (cutting, aeration, top dressing, rolling). Place this submission form into a plastic bag to prevent it from becoming wet. If you have printed pictures, these can also go into the plastic bag. Alternatively, you can email a picture of your diseased areas to pdc@umn.edu – be sure to make sure that we can connect this email to your submission by providing your name, date, and mailing date.

5. Package your sample by wrapping the soil portion in foil to prevent soil from getting onto the grass. Package the samples tightly in newspaper and add newspaper to the box to ensure that they do not bounce around inside of the box (Figure 3, oppisite page). Do not put any samples into plastic bags as the humidity will encourage sample degradation very rapidly.

6. Sample submission. You can submit samples to the PDC in person (first floor Stakman Hall) or mail them to:
495 Borlaug Hall
1991 Upper Buford Circle

Saint Paul, Minnesota, 55108.

7. Please mail samples with overnight or one day delivery at the start of the week. If samples are mailed on a Friday, they could degrade as they sit in the courier mailbox over the weekend.

All pictures were provided courtesy of Joe Rimmelspach at The Ohio State University (http://turfdisease.osu.edu).

University of Minnesota

Plant Disease Clinic

Turf Disease Sample Submission Form

Date: _____ Name:_____ Organization: _____

Street Address: _____ City: _____ State: _____

Zipcode: _____ Phone: _____ Email: _____ Fax: _____

Does submission include pictures? Y / N Best method for contact: phone ☐ email ☐

Describe Turf Species/Cultivars: _____Age of stand: _____

Describe Turf Type (greens, fairway, lawn…): _____ Height of cut:_____

Describe the Damage (Patches, streaks, circles, spots…): _____

Approximate size of individual damaged areas: _____

Soil type: _____ When did you first notice the problem:_____

Is this a recurring problem for you? Y / N Since when?:_____

What pesticides have you applied to this turf recently (date, rate) ?:_____

_____

Describe cultural practices (aeration, topdressing):_____

Describe environmental conditions of affected turf (temperature , irrigation, rain, drainage, fertilization…): _____

_____

_____

Use this space to provide more details if required: _____

_____

You will be contacted within 24 h for samples arriving Monday to Thursday. You will be contacted the following Monday for samples arriving on Friday.

Take samples from the edge of diseased area and deep enough to include roots. Package samples with the root zone (not leaves) wrapped in foil and firmly pack the sample into a box with newspaper. Do not package samples in plastic bags.

Ship disease samples overnight or early in the week to avoid sample degradation.
Accompanying pictures (with contact information) can help with diagnosis and can be emailed to: pdc@umn.edu

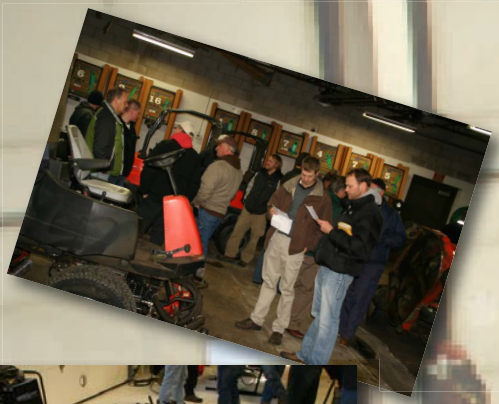
Send samples to:
Plant Disease Clinic, 495 Borlaug Hall1991 Upper Buford Circle, University of Minnesota, St. Paul, MN, 55108

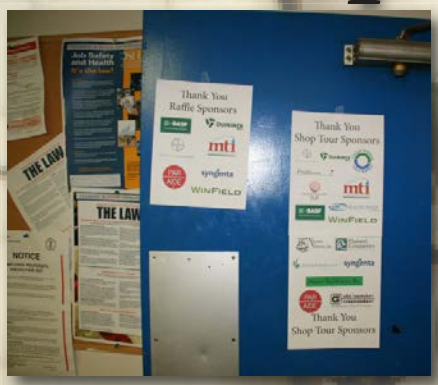
Call 612-625-1275 for questions regarding submissions / samples, subscription services, or payment.

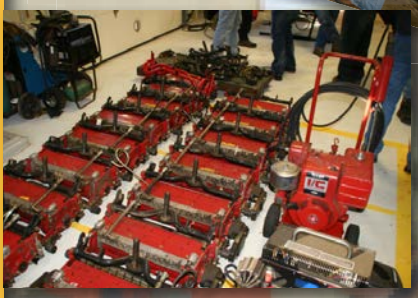
Person Receiving Sample: _____ Date and time received: _____

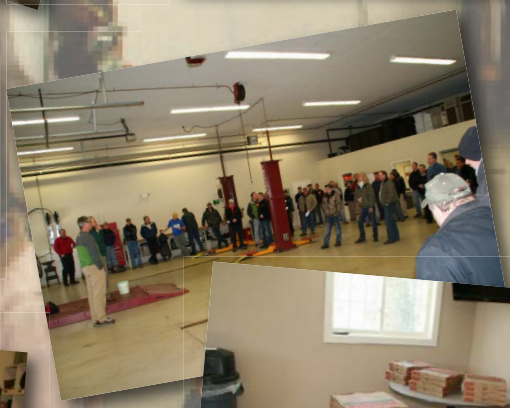
Response by: _____ Response Date: _____ Response Method: _____

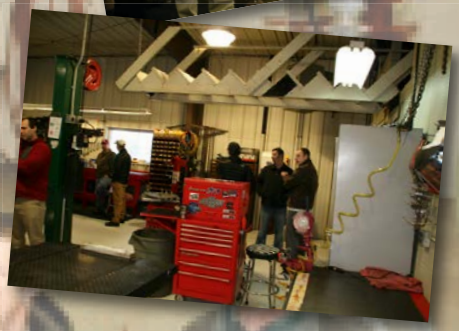
MGCSA Shop Tours

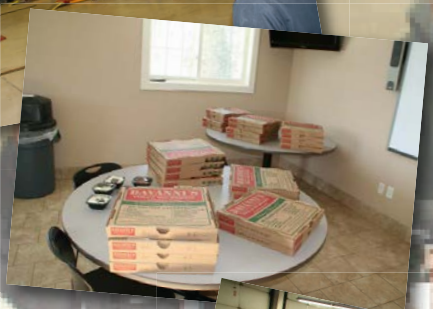


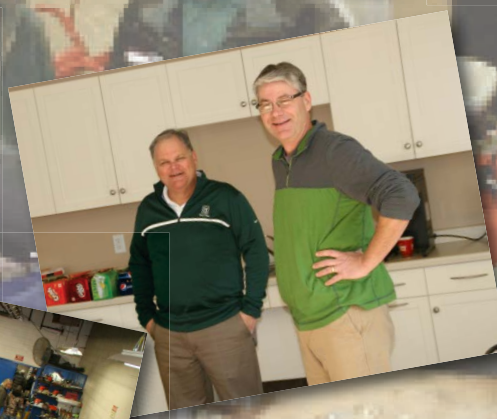


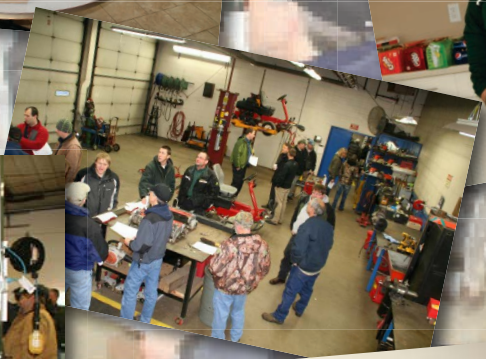


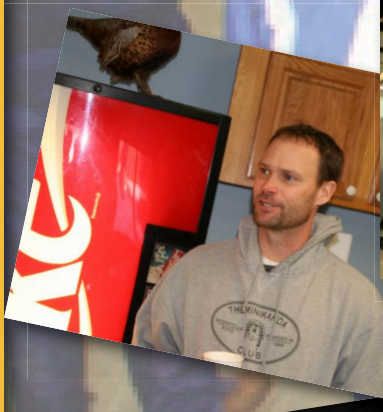


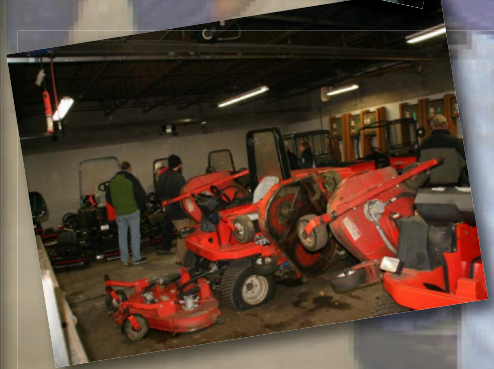


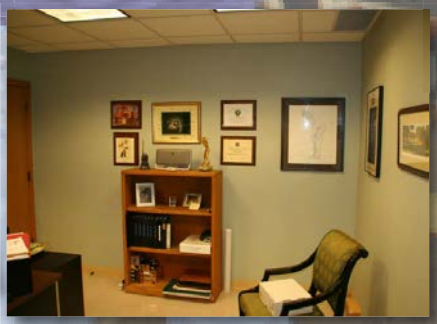


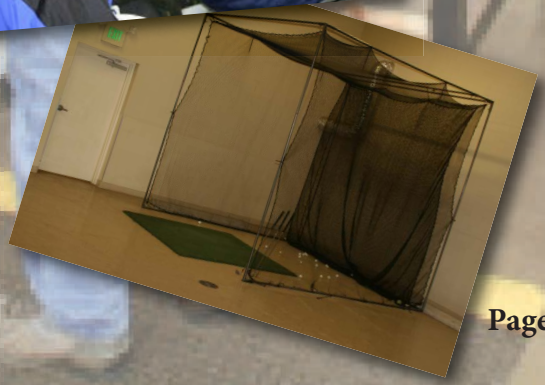




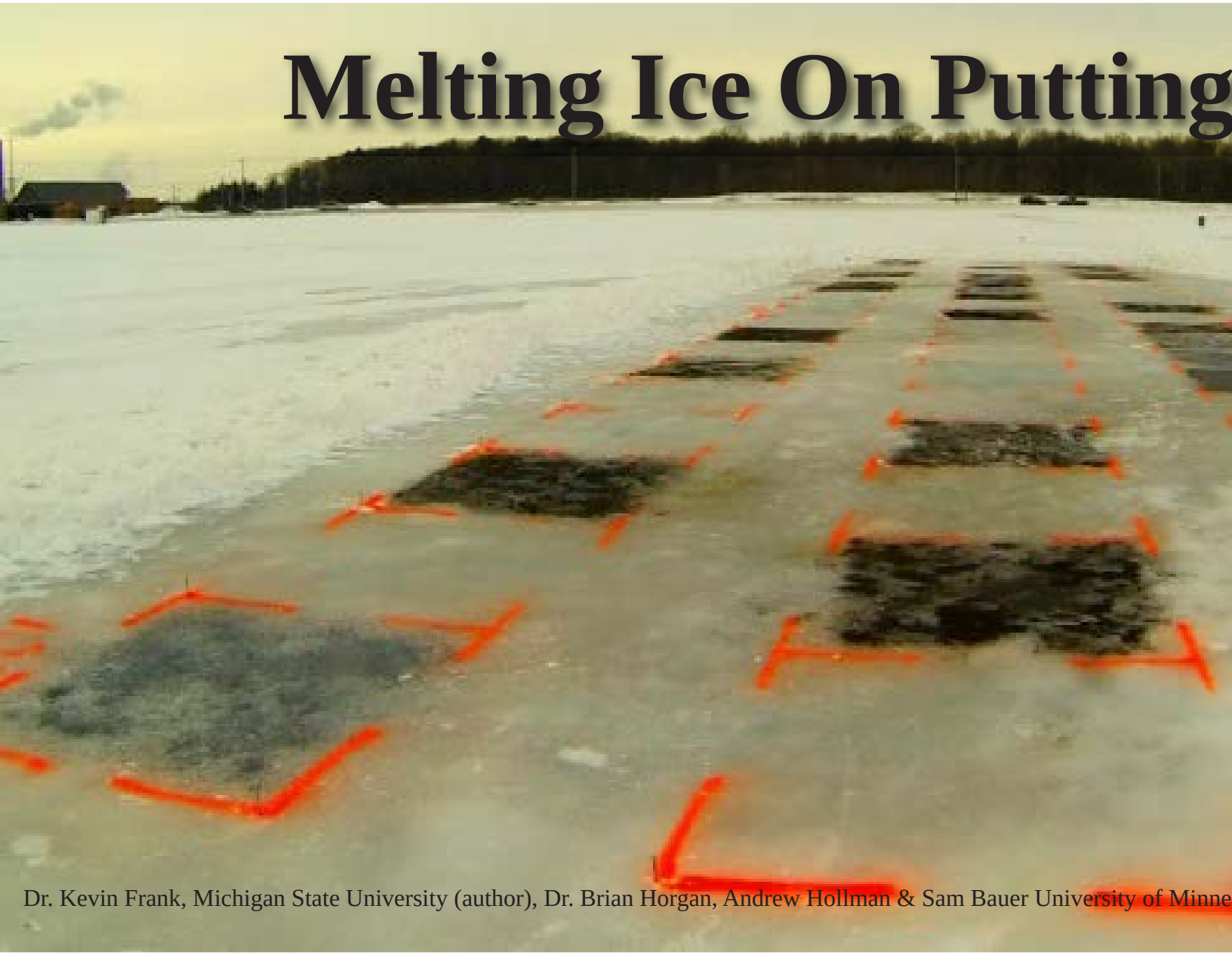








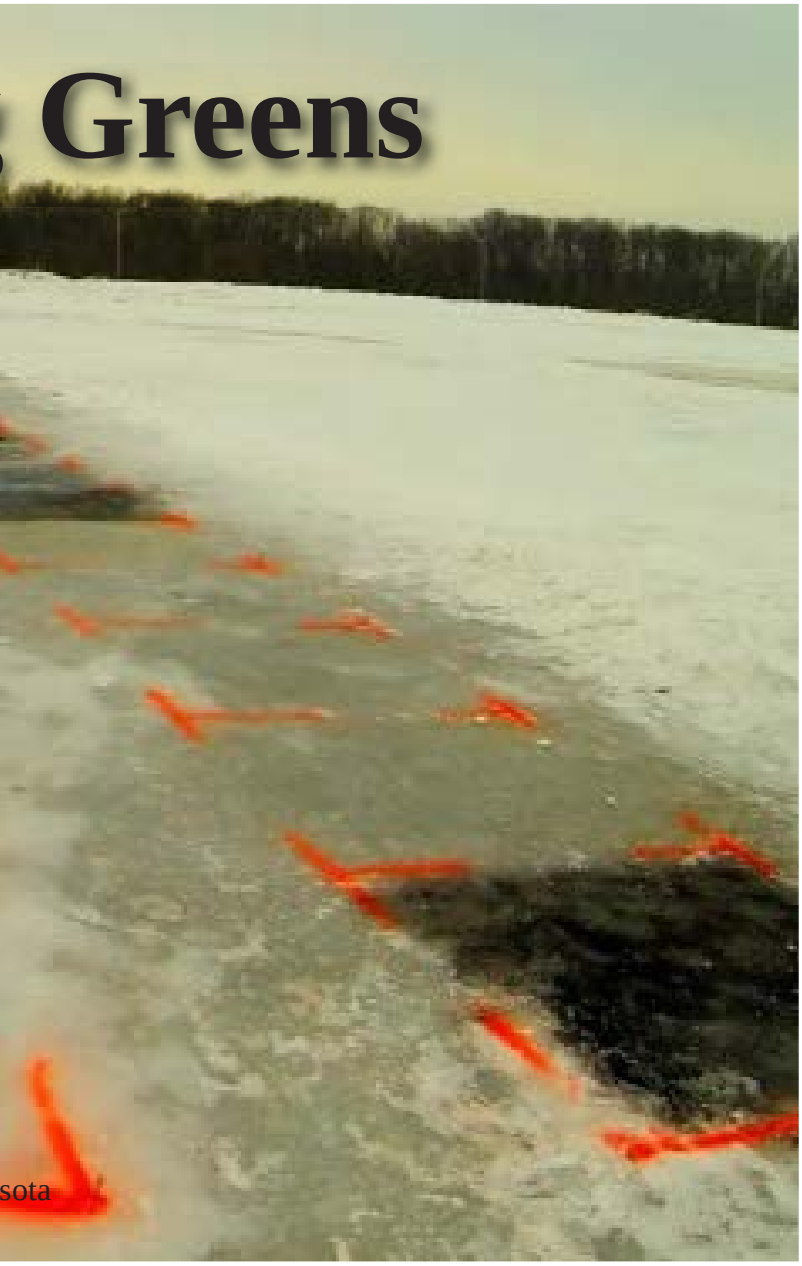
Melting Ice On Putting



Dr. Kevin Frank, Michigan State University (author), Dr. Brian Horgan, Andrew Hollman & Sam Bauer University of Minne

When given lemons make lemonade. When given an ice sheet, conduct an ice melt study. On January 31 at the Hancock Turfgrass Research Center (HTRC) at MSU we conducted an ice melting study in cooperation with Dr. Brian Horgan, Andrew Hollman, and Sam Bauer from the University of Minnesota. We tested 20 products for their ability to melt ice. Conditions during our treatment window which began at approximately 11 am and concluded at 5:30 pm had temperatures hovering around 25 °F and constant cloud cover. The treatments can be broken down into three general categories:

g Greens



Standard Chemicals/Salts (all application rates 28 lbs./1000 ft.^{2})

1. Calcium chloride
2. Sodium chloride
3. Potassium chloride
4. Magnesium chloride

'Safer' ice melt products (all application rates 28 lbs./1000 ft.^{2})

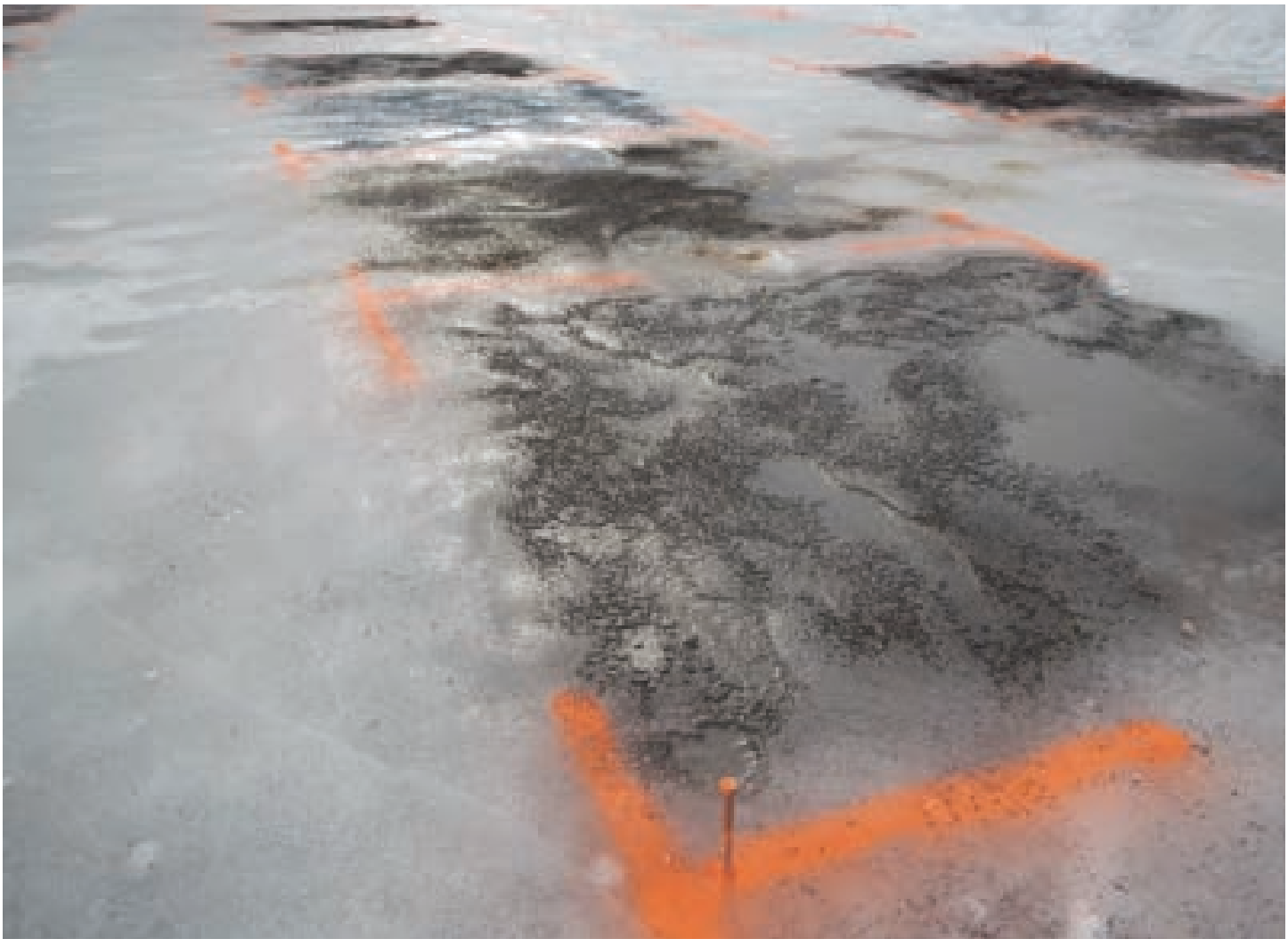
5. Calcium magnesium acetate (CMA)
6. Sodium acetate (NAAC)
7. Enviro Melt (carbonyl diamide/ urea)
8. Safe Paws (modified amide/ glycol admixture)
9. Paw Thaw (CMA and fertilizer)
10. Tenderfoot Ice Melter (urea and DeFrost)
11. Ammonium sulfate

Solar Absorption Products (dark colored)

12. Milorganite greens grade (56 lbs./1000 ft.^{2})
13. Sustane greens grade (40 lbs./1000 ft.^{2})
14. Top Cut biosolids SGN 90 (53 lbs./1000 ft.^{2})
15. Top Cut SGN 200 (53 lbs./1000 ft.$^{2)}$
16. Top Cut + DeFrost SGN 200 (53 lbs./1000 ft.^{2})
17. BioDac + DeFrost SGN 200 (47 lbs./1000 ft.^{2})
18. BioDac + DeFrost + Colorant SGN200 (47 lbs./1000 ft.^{2})
19. Eon 75 humic acid (47 lbs./1000 ft.^{2})
20. Black sand (100 lbs./1000 ft.^{2})

We recorded surface ice temperatures prior to treatment application and at intervals following applications using an infrared temperature sensor. We rated ice melt based on observation of standing water on the plots on a scale from 1-5 with 1 = no visible melt, and 5 = visible standing water.

Surface temperatures prior to treatment application were very similar to air temperatures 25-26 °F. One hour after treatment application the treatments were separated into two groups, the standard salts and safer ice melt products vs. the solar absorption products. The solar absorption products with their dark coloration had surface ice temperatures of 35-37 °F whereas the salts and safer treatments had surface ice temperatures of 27-31 °F. Treatments were still significantly different at 4.5 hours after treatment application although



Solar absorbing products had the greatest melting