

Ant Bait (AI (active ingredient), indoxacarb, Syngenta, available in MN) and Maxforce Professional Insect Control Fine Granule Insect Bait (AI, hydramethylnon, Clorox Co.) which in Minnesota is registered as Maxforce Complete Brand Granular Insect Bait. Note that a similarly named product, Advance Granular Ant Bait, was not as effective. Neither bait is specifically marketed to the golf industry, but their labeling does allow use on golf courses. Spot-treating with bait allows selective control, while preserving beneficial ants in fairways and roughs.

For now, controlling ants with fipronil (class phenyl pyrazoles), which is used for termites, is only available to southern turf managers. The manufacturer is seeking to broaden the fipronil label, so that granular products for nuisance ant control on northern golf courses may be available soon. TopChoice, containing fipronil, is presently labeled for use only in the 13 states: Alabama, Arkansas, California, Florida, Georgia, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennes-

see and Texas, where imported fire ants occur. Fipronil is slow-acting so foraging workers that contact or feed on the material do not die right away. This allows them to return to the underground nest where body grooming and exchange of food among nest-mates transfers the insecticide throughout the colony, including the queen and her brood. Granular fipronil often provides 95 percent control of existing ants within four to six weeks.

Spot treatments of greens may permit ant suppression, while maintaining ant colonies in roughs and fairways may allow the ants to feed on pest insects, thereby lowering your insecticide use and expenses.

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Photo on page 28: Ant can collect honeydew from a scale (this picture), as well as aphids.

Bugwood, University of Georgia,

DNR rolls out new online water permit application

A newly designed web-based system that simplifies the steps to getting water permits and paying for them online is being rolled out by the Minnesota Department of Natural Resources. The new MNDNR Permitting and Reporting System (MPARS) is part of Gov. Mark Dayton's initiative to streamline state government services.

The new application at www.mndnr.gov/mpars will save an anticipated \$255,000 annually and allows DNR employees to devote more time to technical assistance and field work.

"DNR employees will have 5,000 more hours every year to protect and improve our environment, thanks to this 'Unsession' reform," Dayton said. "I thank Commissioner Tom Landwehr and his staff for making these commonsense changes that will dramatically reduce the time to process more than 10,000 water permit applications each year."

The old paper application process was time consuming and inefficient with department staff spending hours hand-sorting applications and on manual data entry.

"We've tried to make it as easy and as

pain-free as possible for water users while giving us a way to more precisely manage and conserve a precious natural resource," said Landwehr. "We'll be able to better track our water use, identify permit violations and increase compliance."

The department processes more than 10,000 permit applications and transactions each year, including reports on annual water use. Cities, farmers, businesses and landowners that use 1 million gallons of water each year, or more than 10,000 gallons a day, or work in public waters are required to get a water use permit or permit to work in public waters.

Applicants now have access to maps and can track the progress of their applications online. They are also automatically alerted if they don't need a DNR water permit.

Under the new electronic system, customers find out if their application is complete within 15 days of applying. Final decisions are made within five months. On average, permits are issued or denied a month faster than under the manually-intensive, former way of doing business. The system also improves inter-agency coop-

eration on permitting. When applicants enter their information into the MPARS system a report is generated and can be easily forwarded to other permitting agencies.

Inga Foster, environmental project manager for St. Louis County in Duluth, is using the system to apply for permits to work in public waters for culvert and bridge replacement projects. The dashboard view gives her a quick way to check on the status for many different permits. “I like how transparent it is,” she said. Now when project managers come to her and ask where their permit is in the process,

she can quickly tell them.

She’s received 30 permits through MPARS so far and has 30 applications in the works. “It’s difficult when you have 60 different balls in the air to capture what is happening with all those applications at any one moment,” Foster said. “MPARS does that for me.”

The mapping tool enables staff to quickly view 60 different data layers, for trout streams, endangered species and infested waters, to name a few, to determine if a project location is near sensitive natural resources.



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Member Driven Research Update

*Dr. Brian Horgan, Professor Turfgrass Management, Matt Cavanaugh,
Research Scientist and Sam Bauer, Extension Educator
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Currently, it's raining very hard. In fact about an additional two inches today on the St. Paul campus. Although I love watching water move, I do not like being delayed by weather. However, a day like today does allow us to take some time to update the Member Driven Research. The initiative started last year by looking at a growing degree day (GDD) model for trinexapac-ethyl (Primo Maxx) on creeping bentgrass greens, a GDD model with paclobutrazol (Trimmit 2SC) on Kentucky bluegrass fairways, a wetting agent study looking at surface firmness and winter turfgrass health and also a fun one to watch: melting ice on putting greens study. This year will focus on many of the same topics, but with some changes as well.

2014 projects:

Trinexapac-ethyl Growing Degree Day Model for Creeping Bentgrass Putting Greens: Data collected in 2014 will validate the work that was done in 2013. This study will offer a better recommendation of when to apply trinexapac-ethyl based on its metabolism in the plant and not based the calendar. This will help prevent the rebound effect and maintain a more consistent playing surface. We know that as the temperatures

rise, the growth regulation provided by trinexapac-ethyl reduces and thus reapplication is needed sooner than the calendar will allow us. As you may recall, trinexapac-ethyl was applied at or below label rates monthly and every 200 GDD (Table 1). Initial GDD studies conducted at the University of Wisconsin-Madison with trinexapac-ethyl indicated little difference observed with rates even twice as high as label recommendations. By choosing lower rates for the MGCSA study, we were able to observe the rate effect on growth suppression. We are finding that as trinexapac-ethyl rate decreases, so does the level of growth suppression, but duration of suppression stays the same. Although one year of data is not enough to provide solid recommendations, data suggests that 200 GDD with trinexapac-ethyl may be conservative. 2014 will provide additional data to back up the quality data from 2013.

Table 1. Trinexapac-ethyl treatments and rates.

Treatment	Rate
Monthly	0.125 fl oz/M
Monthly	0.094 fl oz/M
Monthly	0.063 fl oz/M
Monthly	0.031 fl oz/M
Every 200 GDD	0.125 fl oz/M

Wetting Agents and Their Effect on Surface Firmness and Winter Health of Bentgrass Putting Greens: This is the second year of the wetting agent trial (addition of new products for 2014). This study is focusing on wetting agent's influence on surface firmness and winter health of putting greens. Table 2 shows the products that are being used this year and also the category of each product. There is much discussion about the surface firmness and winter health benefits that wetting agents may provide, but to date nothing has been published on the topic. With this member driven project, we hope to answer these questions. With that said, 2013 data showed very little difference in surface firmness between the products and absolutely no benefit or negative effects on winter health; we observed complete health following winter at the study location. With the increase in products during 2014, we hope to see some differences and we will also be putting these products to the test during the summer by reducing the irrigation to look at performance.



Table 2: Wetting agent rates, type and manufacturer used in surface firmness & winter injury of bentgrass putting greens.

Treatment	Rate (oz/M)	Type	Manufacturer
AquiFlo	4	Infiltration	WinField
AquiCare	3	Retention	WinField
Cascade Plus	4	Infiltration & Retention	Precision Laboratories
Duplex	1	Infiltration	Precision Laboratories
Cascade Plus/Duplex	4/1	Infiltration & Retention	Precision Laboratories
Fleet	8	Infiltration	Harrell's
Revolution	6	Retention	Aquatrols
Tournament Ready	4	Infiltration	Kalo, Inc.
Dispatch Sprayable	4	Infiltration	Aquatrols
Primer Select	4	Retention	Aquatrols
Sixteen 90/Dispatch Sprayable	4/1	Retention & Infiltration	Aquatrols
Sixteen 90	4	Retention	Aquatrols
TriCure AD	2	Retention	Mitchell Products

Flurprimidol & Paclobutrazol Growing Degree Day Model for Creeping Bentgrass Fairways: This trial is being taken to a new level. During 2013, we looked at finding a paclobutrazol growing degree day model for Kentucky bluegrass fairways. The data suggested that at an 8 or 16 fl oz/A rate, a good model is 400 growing degree days (remember that we use a base temperature of 0C, so we just add up degrees Celsius). At 16 to 24 fl oz/A rate, a good model is 800 growing degree days. Keep in mind that more than 100% growth reduction was achieved with the higher rates. We are in the process of analyzing data from Tartan Park and the University of Wisconsin-Madison from 2013 and expect a detailed up-

date soon. For 2014, we have added flurprimidol (Cutless 50w) and we have moved the study to a creeping bentgrass fairway at Medina Golf and Country Club. We are also doing this in collaboration with the University of Illinois providing additional data. The study is designed to find the most accurate model by incorporating multiple growing degree days on both the low and high side (Table 3).

Table 3: Flurprimidol & Paclobutrazol Growing Degree Day Model Study on Creeping Bentgrass Fairways.

Treatment	Rate (oz/A)	Application Interval (GDD in Celsius)
Cutless 50 W	10	200
Cutless 50 W	20	200
Trimmit 2 SC	10	200
Trimmit 2 SC	20	200
Cutless 50 W	10	350
Cutless 50 W	20	350
Trimmit 2 SC	10	350
Trimmit 2 SC	20	350
Cutless 50 W	10	500
Cutless 50 W	20	500
Trimmit 2 SC	10	500
Trimmit 2 SC	20	500





Growth regulator plot at Medina G&CC

Melting Ice on Putting Greens: This study was conducted here at the University of Minnesota and at Michigan State University. There was a very nice article in the January/February addition of Hole Notes discussing the study. A quick highlight, as you can imagine the solar absorption products increased surface temperatures the most, and the most visible ice melt was from some of the fertilizer applications and also black sand. The standard salts and safer ice melt treatments produced very little visible ice melt.

Currently, the wetting agent and the flurprimidol & paclobutrazol GDD study have been initiated. The trinexapac-ethyl GDD study will be initiated the first week of June. The projects put forth by the Member Driven Research are looking to answer some very common questions we have in our industry. We are excited for the support the MGCSA has given to the University of Minnesota. Please contact us with any questions, comments or suggestion on future projects. We look forward to showing you all the progress at the Minnesota Turf and Grounds Foundation Field Day on August 7th.

A photograph of a sunset over a body of water. The sun is low on the horizon, creating a bright orange glow and a reflection on the water. The sky is filled with wispy, white clouds. In the foreground, there are silhouettes of trees and a bridge in the distance.

Using Clouds to Predict the Weather
by Marci Goodwin, Home School Scientist