2023 Winter Turf Field Day Proceedings

February 23, 2023

3 P.M. Education at Lewis-Brown Horticulture Farm, 33329 Peoria Rd, Corvallis, OR, 97333

5 P.M. Dinner at Trysting Tree Golf Club, 34028 NE Electric Rd, Corvallis, OR 97333

Contact Information: Alec.Kowalewski@oregonstate.edu

Stop 1: Cole Stover
The Effect of Nitrogen Source on *Microdochium* Patch Severity
Year 2 of 2 – Initiated Fall 2021

Year 1 Results

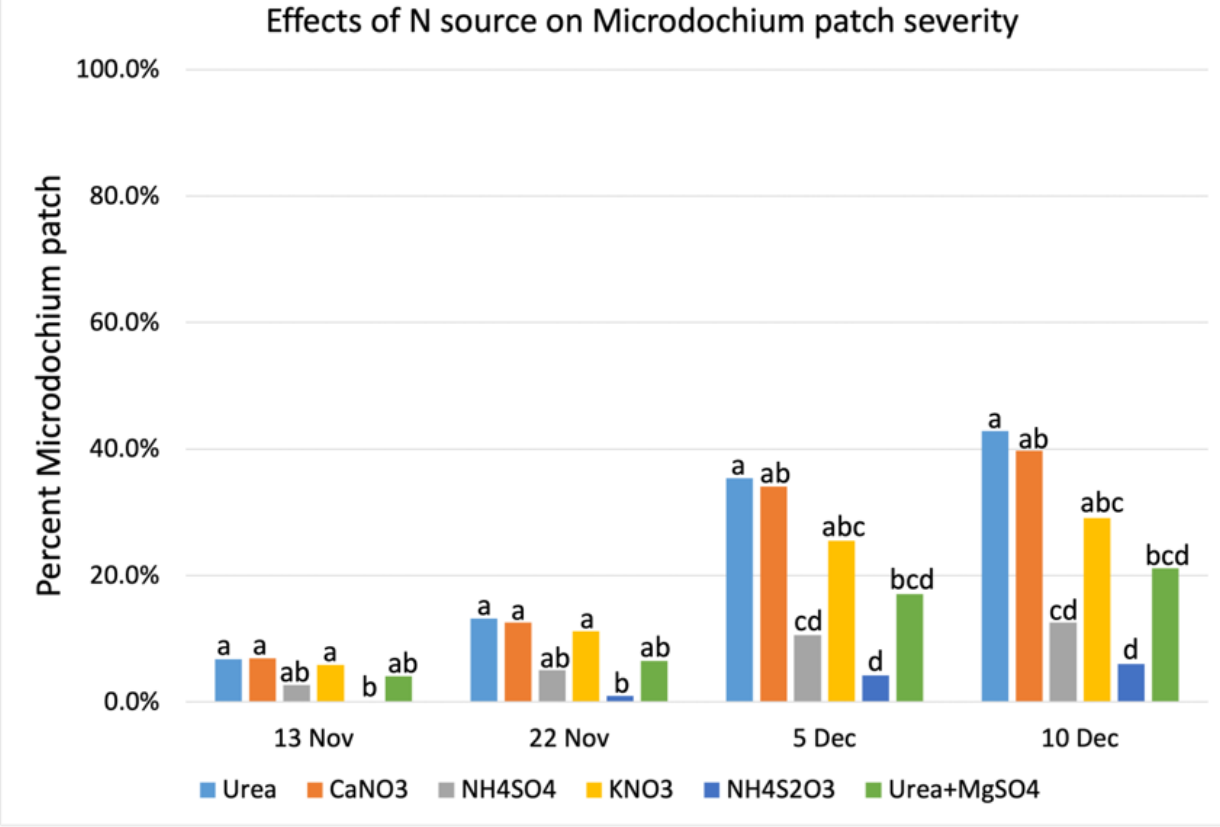


Table 1: Effects of treatments on Microdochium patch severity on an annual bluegrass putting green in Corvallis, OR. Means in the same column followed by the same letter are not statically significant according to Tukey's Honest Significant Difference at P ≤ 0.05.

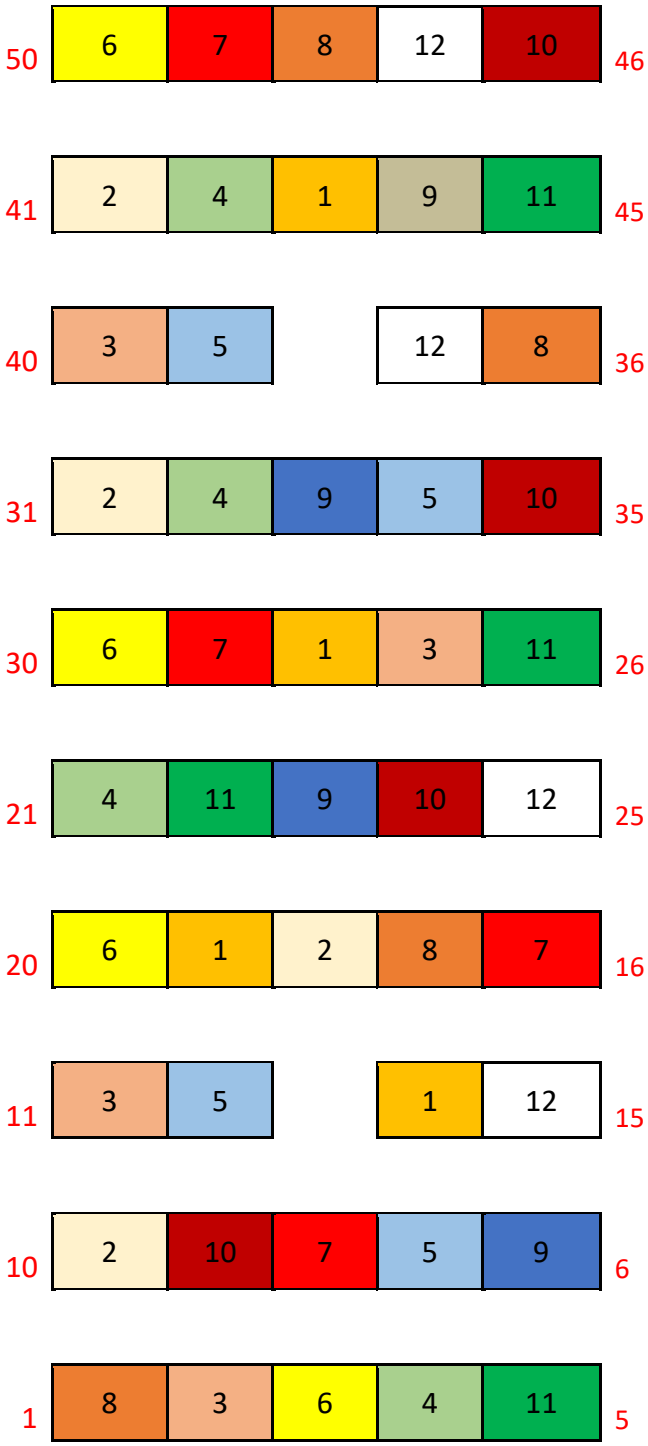
Year 2 Preliminary Observations

- Ammonium thiosulfate treatments have tip bleaching at both 0.1 #N / M and 0.2 # N / M
- Less disease pressure compared to winter 2021/2022. As of 1/31/23 differences in disease pressure were inconclusive. Increased disease pressure in February will hopefully lead to more defined differences between the treatments.

Year 2 Plot Map

East --- >

Treatment Number	Product	N rate Oct-Mar (Sep 0.25#N/M - two applications)
1	Urea	0.1#N/M
2	Urea	0.2#N/M
3	$CaNO_3$	0.1#N/M
4	$CaNO_3$	0.2#N/M
5	NH_4SO_4	0.1#N/M
6	NH_4SO_4	0.2#N/M
7	KNO_3	0.1#N/M
8	KNO_3	0.2#N/M
9	$NH_4S_2O_3$	0.1#N/M
10	$NH_4S_2O_3$	0.2#N/M
11	Urea $MgSO_4$	0.1#N/M $SO_4 = NH_4SO_4$
12	Urea $MgSO_4$	0.2#N/M $SO_4 = NH_4SO_4$



Stop 2: Brian McDonald

Using Alternative Products to Suppress Microdochium Patch
Oregon State University
Location: West side of South Poa
Initiated:10-07-22 N--->

4'

4'											
	11	8	9	2	4	3	10	5	7	6	1

6"

1	2	3	4	5	6	7	8	9	10	11
7	10	5	8	1	9	11	3	6	2	4
3	8	2	11	5	10	6	1	4	7	9

2022 E. Marker Ocean Organics M. Patch Trial
Oregon State University
Initiated:10-07-22

Trt #	Treatment	Rate fl. oz./M	Interval	Percent Disease	Number of Infection Cntrs
1	Untreated	na	na	5.3	15.0
2	Fungicide Rotation (see below)	See below	4 wks	0.0	0.5
3	TourTurf FDC (with 5% iron)	12.6	4 wks	4.1	13.3
4	TourTurf High PK (with phosphite)	3.1	4 wks	4.2	7.3
5	TourTurf FDC + TourTurf High PK	12.6 + 3.1	4 wks	1.5	4.3
6	TourTurf High PK (with phosphite) + STA (Sports Turf Acidifier)	3.1 + 12.6	4 wks	0.5	3.3
7	Duraphite 12	3.2	2 wks	0.0	0.3
8	Exp 1	-	-	0.0	0.5
9	Exp 2	-	-	0.1	0.3
10	Exp 3	-	-	0.1	0.3
11	Exp 4	-	-	0.0	0.3

1. Banner Max (2.0 fl. oz.), 2. Banner Max (2.0), 3. Banner Maxx (2.0), 4. Contend A (1.0) + Daconil W/S (3.6), 5. Affirm (0.9) + Secure (0.5)

Product Ingredients

TourTurf FDC	TourTurf High PK (with Phosphite)
Guaranteed content: Nitrogen (N)..... 5.0% - of which Ureic ..... 5.0% Iron (Fe) ..... 5.0% - of which iron sulphate.... 4.5% - of which EDTA chelated .. 0.5% Sulphur (SO_3)..... 7.0% Zinc (Zn)..... 0.1% Magnesium (Mg) ..... 0.1% Amino Acid (Glycine) ..... 0.5% pH: <2 Density: 1.25 Also contains Citronella oil, Tee Tree oil and Clove oil. Anti foam and surfactants.	**Guaranteed content:** Phosphorus (P_2O_5) ..... 18.0% Potassium (K_2O) ..... 12.0% Seaweed extract .....3.0% Humic acids.....3.0% With cedarwood oil. pH: 5.0 Density: 1.26

TourTurf Sports Turf Acidifier (STA)

Guaranteed content

TourTurf® STA 5-0-0 + 4% Fe is a liquid mineral N fertiliser with iron, sulphur and natural wetting agent (NWA).

Guaranteed Analysis (w/w)	
Nitrogen (N)	5.0%
Of which:	
– Ureic N	5.0%
Iron (Fe)	4.0%
Of which:	
– Ferris sulphate (Fe)	2.5%
– Ferrous sulphate (Fe)	1.5%
Sulphur (SO_3)	8.6%
Magnesium (MgO)	5.9%
Calcium (CaO)	3.5%
Saponin	30%
Fulvic acids	6.6%
Amino acids	21%

pH: 2

Relative density: 1.3

Stop 3: Chas Schmid

Long term Effects of Topdressing and Cultivation Practices on an Annual Bluegrass Putting Green

Materials and Methods:

Experimental design for the trial is a randomized complete block design with four replications. Treatments are arranged in a 2 x 2 x 3 factorial, with two sand topdressing rates (50 and 100 lbs/1000ft^2), two tine types (hollow and solid tine), and three cultivation timings (spring, fall, and both spring and fall). A non-treated control (no cultivation, no sand topdressing) and two non-cultivated plots that received either 50 or 100 lb/1,000 ft^2 sand topdressing were also included in the analysis. Spring cultivation treatments were applied on 1 June 2020, 28 May 2021, and 2 Jun 2022; and fall cultivation treatments were applied 29 Sept 2020, 7 Oct 2021, and 14 Oct 2022. Sand topdressing treatments were applied every 2-wks during the summer from 15 June through 21 Sep 2020, 9 June through 22 Sept 2021, and 20 June through 27 Sept 2022.

Preliminary Results:

Similar to the two previous years, few differences were observed between treatments with respect to turfgrass quality and NDVI during spring and mid-summer 2022. However, by August, TQ in the non-treated control plots reduced significantly due to Cyanobacteria (*Oscillatoria* sp.) outbreak, which was also observed in the previous season. On 25 Aug. 2022, the non-treated control plots were the only treatment with unacceptable TQ; all other combinations of cultivation and topdressing had acceptable quality. Subtle differences were also observed between the cultivation and topdressing treatments on this date. The main effect of topdressing rate indicated that topdressing at the high rate (100 lb/1,000 ft^2), resulted in higher turfgrass quality compared to the low rate (50 lb/1,000 ft^2). The main effect of cultivation timing also influenced TQ on this date, with fall cultivation resulting in higher TQ compared to spring cultivation.

Putting green surface firmness, measured with a Trufirm, was influenced by topdressing rate and cultivation timing during 2022. Sand topdressing at 100 lb/1,000 ft^2 resulted in a firmer surface compared to 50 lbs/1,000 ft^2 on 4 out of 5 ratings. Additionally, the combination of spring and fall cultivation resulted in a firmer putting green surface compared to spring or fall only cultivation on 4 and 3 out of the 5 ratings, respectively. On one rating in 2022, hollow tine cultivation produced a firmer surface compared to solid tine cultivation.

Statistical differences in soil infiltration rate were detected between treatments in 2022. The non-treated control and topdressing alone (both rates) resulted in significantly lower soil infiltration rates compared to all combinations of cultivation and topdressing. Visual observation of soil sample cores indicates a significant thatch layer has developed in non-treated control plots, which is likely reducing infiltration rate. Similarly, soil cores from topdressing only treatments showed thatch layering, which was likely reducing the infiltration rates in these treatments. The treatment that produced the greatest infiltration rate was the combination of hollow tine cultivation in spring and fall, and sand topdressing at 100 lb/1,000 ft^2, which was also the only treatment that maintained an average infiltration rate above 6 in/hr. Cultivation timing also influenced infiltration rate in 2022, with fall only cultivation resulting in lower infiltration rates compared to spring alone and the combination of spring and fall. Interestingly no statistical difference in infiltration rate was observed between hollow tine and solid tine treatments after almost three years. This result indicates that in the short-term, superintendents may implement solid tine cultivation to maintain infiltration rate, which reduces maintenance cost and recovery time compared to hollow tine cultivation.

Hollow tine spring 50 lbs/M	Hollow tine spring 100 lbs/M
Solid tine fall 100 lbs/M	Solid tine fall 50 lbs/M
Topderssing only 100 lbs/M	Topderssing only 50 lbs/M
Hollow tine spring & fall 50 lbs/M	Hollow tine spring & fall 100 lbs/M
Non-Treated Check	
Hollow tine fall 100 lbs/M	Hollow tine fall 50 lbs/M
Solid tine spring & fall 100 lbs/M	Solid tine spring & fall 50 lbs/M
Solid tine spring 50 lbs/M	Solid tine spring 100 lbs/M
Hollow tine spring 50 lbs/M	Hollow tine spring 100 lbs/M
Solid tine fall 100 lbs/M	Solid tine fall 50 lbs/M
Topderssing only 50 lbs/M	Topderssing only 100 lbs/M
Hollow tine spring & fall 50 lbs/M	Hollow tine spring & fall 100 lbs/M
Solid tine spring 50 lbs/M	Solid tine spring 100 lbs/M
Solid tine spring & fall 50 lbs/M	Solid tine spring & fall 100 lbs/M
Non-Treated Check	
Hollow tine fall 100 lbs/M	Hollow tine fall 50 lbs/M

Solid tine fall 50 lbs/M	Solid tine fall 100 lbs/M
Solid tine spring & fall 50 lbs/M	Solid tine spring & fall 100 lbs/M
Hollow tine spring 50 lbs/M	Hollow tine spring 100 lbs/M
Solid tine spring 100 lbs/M	Solid tine spring 50 lbs/M
Hollow tine fall 100 lbs/M	Hollow tine fall 50 lbs/M
Topderssing only 50 lbs/M	Topderssing only 100 lbs/M
Non-Treated Check	
Hollow tine spring & fall 100 lbs/M	Hollow tine spring & fall 50 lbs/M
Solid tine fall 50 lbs/M	Solid tine fall 100 lbs/M
Non-Treated Check	
Hollow tine fall 100 lbs/M	Hollow tine fall 50 lbs/M
Topderssing only 50 lbs/M	Topderssing only 100 lbs/M
Hollow tine spring & fall 100 lbs/M	Hollow tine spring & fall 50 lbs/M
Solid tine spring & fall 50 lbs/M	Solid tine spring & fall 100 lbs/M
Solid tine spring 50 lbs/M	Solid tine spring 100 lbs/M
Hollow tine spring 100 lbs/M	Hollow tine spring 50 lbs/M

Stop 4: Alec Kowalewski

Effects of Equipment Traffic on Turfgrass During Frost

Introduction:

Frost is a concern on northern and transition zone U.S. golf courses in the fall and spring, and in places with moderate winter conditions like the coastal Pacific northwest and southern U.S which allow for play in the winter months. The USGA currently suggests delays on mornings with frost because of fear that foot and cart traffic will cause damage. However, the cause and environmental conditions necessary for frost damage are not well understood and there is significant golfer speculation as to whether these delays are truly necessary. It is also poorly understood how turfgrass species, mowing height and source of traffic (foot traffic, cart traffic or maintenance equipment) affect injury during frost. Frost delays translate to significant reductions in revenue and valuable maintenance time which is often early in the morning prior to golfer arrival.

Objectives:

1. Evaluate the effects of daily winter morning cart traffic applied to a creeping bentgrass fairway.
2. Evaluate the effects of daily winter morning cart traffic applied to an annual bluegrass fairway.
3. Evaluate the effects of daily winter morning cart traffic applied to a perennial ryegrass fairway.
4. Evaluate the effects of daily winter morning rolling applied to an annual bluegrass putting green.

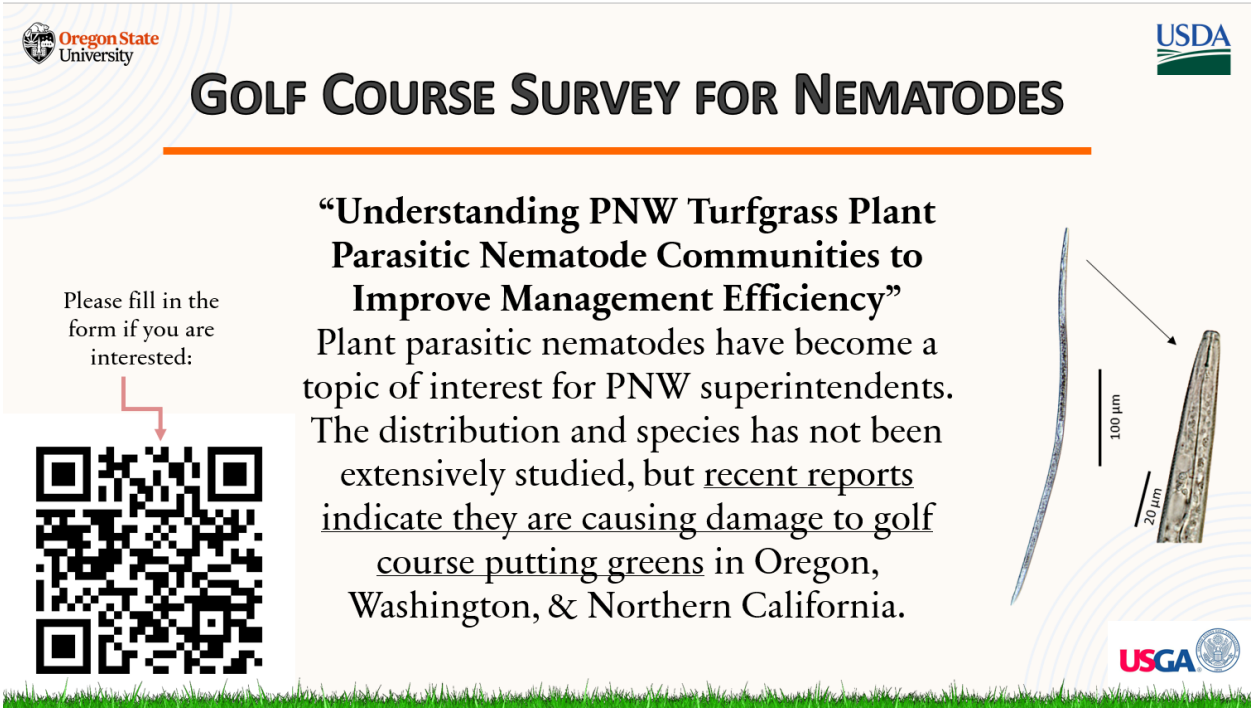
Materials and Methods:

Four experiments will be conducted from January 2 to February 28 in 2023, 2024 and 2025 at the OSU Horticulture Lewis-Brown Farm in Corvallis, OR. All these experiments will utilize a randomized complete block design with four replications. All experiments will evaluate the effects of daily winter traffic applied in the morning at 8:00 am and in the afternoon at 1 pm.

Plot Map: Effects of daily winter morning cart traffic applied to a creeping bentgrass fairway.

Treatments Mon - Fri Jan 2nd - Feb 28th 2023	
1	No traffic
2	8 am cart traffic
3	1 pm cart traffic

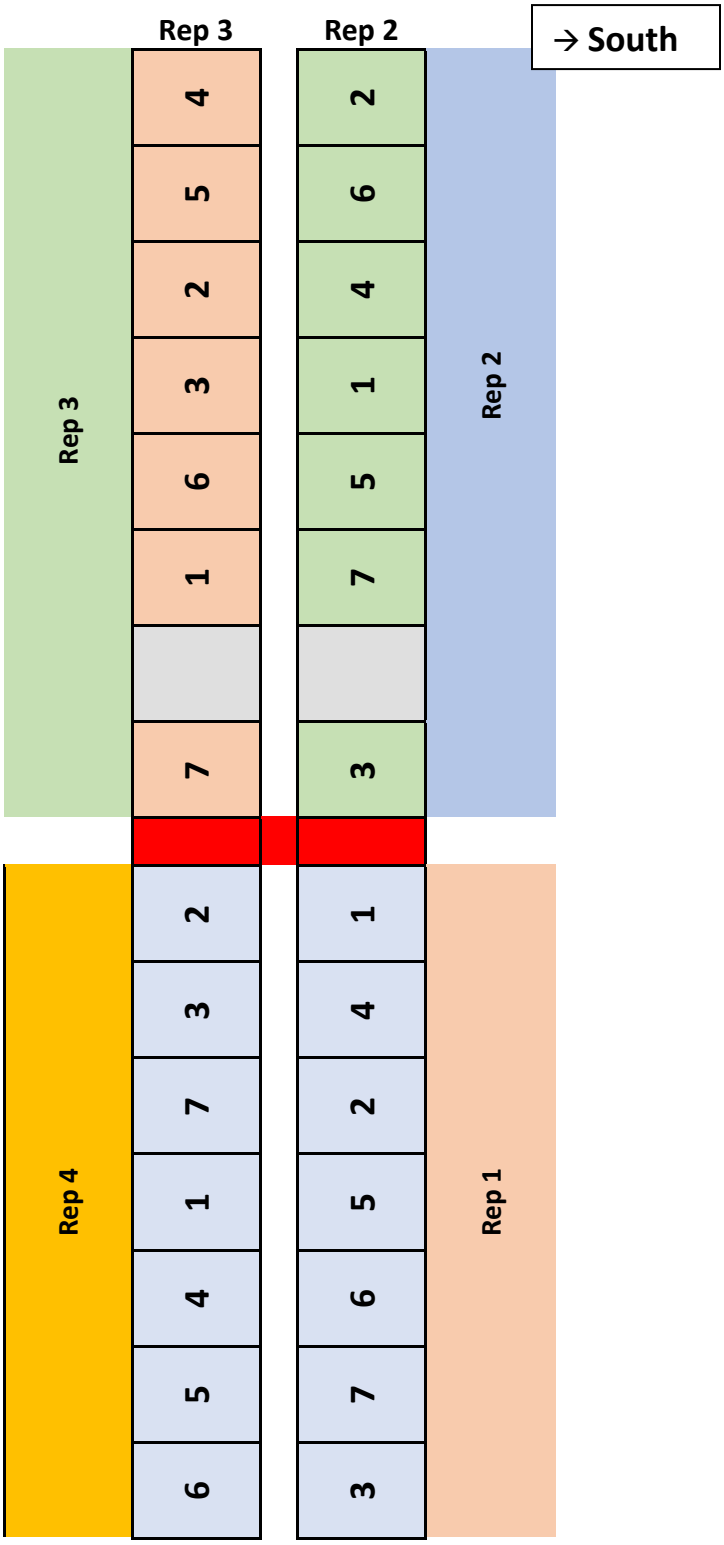
Stop 5: Emily Braithwaite and Brian McDonald



What we need from you:

- Six putting greens per course (15-20 ¾" soil cores per green).
- Sampled 4 times/year for the next 2-3 years.
- Initial sampling will be done with researchers assistance.
- Superintendents may be asked to conduct subsequent sampling, but will be given mail kits and detailed instructions.
- No prior history of nematodes required for participation!

2022-2023 Bayer Microdochium Patch Trial
Oregon State University
Initiated: 10/21/22



Rep 4 **Rep 1**

Treatment		Rate/1000ft^2	Interval
1	Non-treated Control	-	-
2	Interface	4.0 fl. oz.	21 day
3	Densicor	0.196 fl. oz.	21 day
4	Densicor + Fiata Stressgard	0.196 fl. oz. 5.0 fl. oz.	21 day
5	Signature Xtra	4.0 wt. oz.	21 day
6	Densicor *rotated with* Signature Xtra	0.196 fl. oz. 4.0 wt. oz.	21 day
7	2022-MP-OSU-01	See footnote[1]	21 day

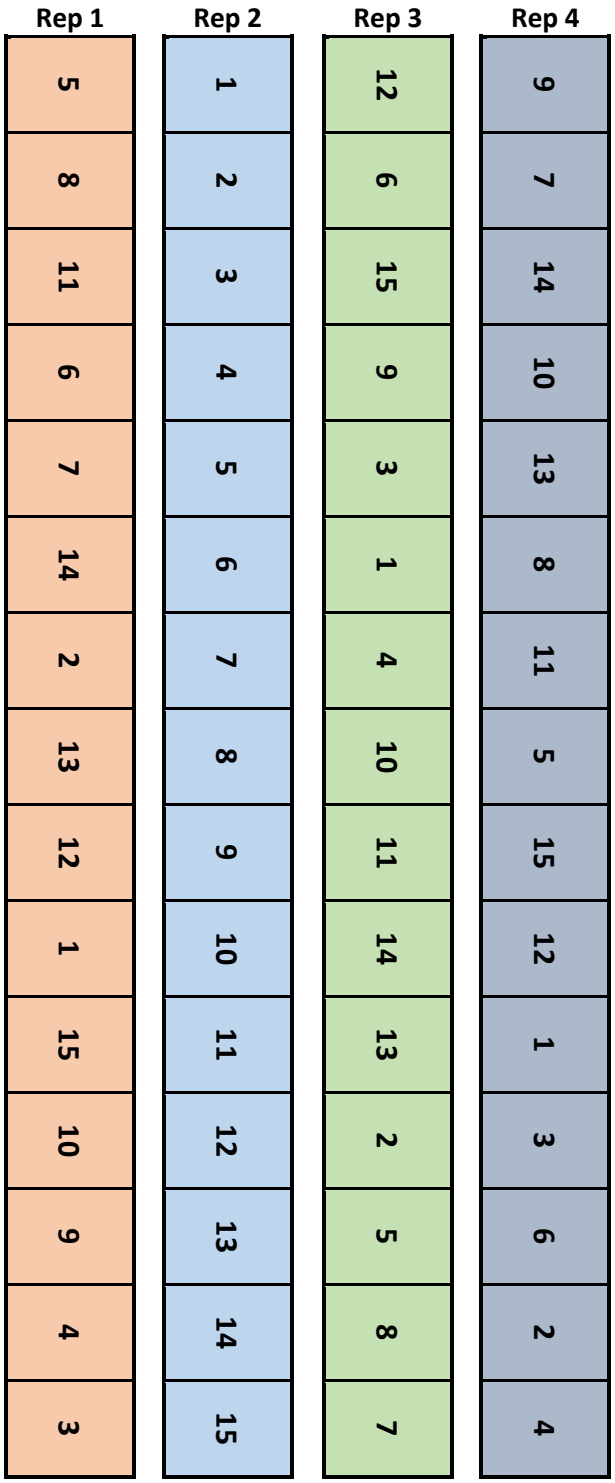
[1] Treatment 7 (2022-MP-OSU-01) consisted of a three-way rotation of Interface (4.0 fl. oz.) applied 21 Oct 2022 and 20 Dec 2022, Densicor (0.196 fl. oz.) applied 10 Nov 2022 and 13 Jan 2023, and Signature Xtra (4.0 wt. oz.) applied 1 Dec 2022 and 1 Feb 2023

2022-2023 Bayer Microdochium Patch Trial
Oregon State University
Initiated: 10/21/22

Treatment		Rate/1000ft^2	Interval	Average Infection Centers *10-Feb*		Average Percent Disease *10-Feb*		Average Turfgrass Quality *10-Feb*		Average Turfgrass Color *10-Feb*	
1	Non-treated Control	-	-	36.5	a	7.3	a	4.3	b	6.5	c
2	Interface	4.0 fl. oz.	21 day	2.0	b	0.4	b	7.3	a	7.3	ab
3	Densicor	0.196 fl. oz.	21 day	0.0	b	0.0	b	7.0	a	7	bc
4	Densicor + Fiata Stressgard	0.196 fl. oz. 5.0 fl. oz.	21 day	0.0	b	0.0	b	8.0	a	7.5	a
5	Signature Xtra	4.0 wt. oz.	21 day	1.3	b	0.3	b	7.0	a	7.5	a
6	Densicor *rotated with* Signature Xtra	0.196 fl. oz. 4.0 wt. oz.	21 day	0.5	b	0.5	b	7.0	a	7.0	abc
7	2022-MP-OSU-01	See footnote[1]	21 day	0.3	b	0.0	b	7.5	a	7.5	a
			LSD @ 0.05	24.3		3.1		1.4		0.7	

[1] Treatment 7 (2022-MP-OSU-01) consisted of a three-way rotation of Interface (4.0 fl. oz.) applied 21 Oct 2022 and 20 Dec 2022, Densicor (0.196 fl. oz.) applied 10 Nov 2022 and 13 Jan 2023, and Signature Xtra (4.0 wt. oz.) applied 1 Dec 2022 and 1 Feb 2023

2022-2023 AMVAC/FMC/Syngenta Microdochium Patch Trial
Oregon State University
Initiated: 10/20/22



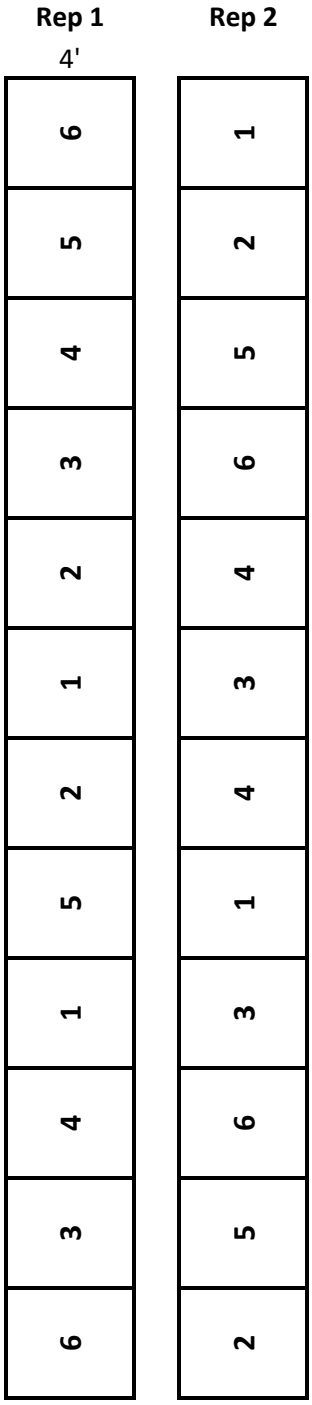
→ **North**

Treatment		Rate/1000ft^2	Interval
1	Non-treated Control	-	-
2	Turfcide 400	4.0 fl. oz.	28 day
3	Turfcide 400	8.0 fl. oz.	28 day
4	Premion	6.0 fl. oz.	28 day
5	Turfcide 400 + 26GT	4.0 fl. oz. 4.0 fl. oz.	28 day
6	Turfcide 400 + Instrata	4.0 fl. oz. 4.0 fl. oz.	28 day
7	Ascernity	1.0 fl. oz.	28 day
8	Ascernity + Posterity XT	1.0 fl. oz. 2.0 fl. oz.	28 day
9	Ascernity + Secure Action	1.0 fl. oz. 0.5 fl. oz.	28 day
10	Rayora + Fame	1.4 fl. oz. 0.5 fl. oz.	28 day
11	Rayora + Fame + Medallion	1.4 fl. oz. 0.5 fl. oz. 1.0 fl. oz.	28 day

2022-2023 AMVAC/FMC/Syngenta Microdochium Patch Trial
Oregon State University
Initiated: 10/20/22

Treatment		Rate/1000ft^2	Interval	Average Infection Centers *9-Feb*		Average Percent Disease *9-Feb*		Average Turfgrass Quality *9-Feb*		Average Turfgrass Color *9-Feb*	
1	Non-treated Control	-	-	32.8	a	9.1	a	4.0	c	6.8	cde
2	Turfcide 400	4.0 fl. oz.	28 day	0.3	c	0.0	c	7.5	a	6.3	ef
3	Turfcide 400	8.0 fl. oz.	28 day	0.0	c	0.0	c	7.3	a	5.3	g
4	Premion	6.0 fl. oz.	28 day	0.0	c	0.0	c	7.3	a	6.5	def
5	Turfcide 400 + 26GT	4.0 fl. oz. 4.0 fl. oz.	28 day	0.0	c	0.0	c	7.8	a	7.3	bc
6	Turfcide 400 + Instrata	4.0 fl. oz. 4.0 fl. oz.	28 day	0.0	c	0.0	c	7.3	a	6.0	f
7	Ascernity	1.0 fl. oz.	28 day	0.8	c	0.1	c	7.5	a	7.0	bcd
8	Ascernity + Posterity XT	3.0 fl. oz. 4.0 fl. oz.	28 day	0.0	c	0.0	c	8.0	a	8.0	a
9	Ascernity + Secure Action	2.0 fl. oz. 0.5 fl. oz.	28 day	0.0	c	0.0	c	8.0	a	7.5	ab
10	Rayora + Fame	1.4 fl. oz. 0.5 fl. oz.	28 day	12.0	b	2.7	b	5.5	b	7.5	ab
11	Rayora + Fame + Medallion	1.4 fl. oz. 0.5 fl. oz. 1.0 fl. oz.	28 day	0.5	c	0.1	c	7.5	a	7.3	bc
			LSD @ 0.05	8.2		1.3		0.8		0.7	

2022-2023 Microdochium Patch Model Trial
Oregon State University & University of Wisconsin at Madison
Initiated: 10/07/22



Treatment		Number of applications	Date of applications
1	Non-treated Control	0	-
2	Calendar Based Program	5	10/7/22, 11/3/22, 12/2/22, 12/30/22, 1/27/23
3	10% Action Threshold	2	12/7/22, 1/12/22
4	20% Action Threshold	2	12/14/22, 1/12/22
5	30% Action Threshold	1	12/14/22
6	40% Action Threshold	1	12/14/22
Fungicide program: Strobe Pro (3.0 fl. oz.), Turfcide 400 (8.0 fl. oz.), 26GT (4.0 fl. oz.) + Secure Action (0.5 fl. oz.), Contend A + Daconil Action (3.5 fl. oz.), Affirm (0.88 wt. oz.) + Secure Action (0.5 fl. oz.)			

Stop 7: Zach Hamilton
Tall Fescue Nitrogen Rates and Mowing Height

Research Objective:
Determine the optimum mowing height as well as timing and rates of nitrogen fertilizer to optimize tall fescue quality and mitigate winter diseases and weed encroachment in a cool, humid region.

Preliminary Findings:
Normalized difference vegetative index (NDVI) provides information on turfgrass health and color with larger values corresponding to healthier and greener turfgrass plants. After one year of data collection, the preliminary results indicate that a higher annual NDVI value is obtained on a tall fescue stand by mowing higher (mowing at three inches instead of two inches), including fall fertilizer applications, and increasing the nitrogen rate (Table 1).

Mowing Height	Annual NDVI
Two Inches	0.87 b
Three Inches	0.89 a
Timing	**Annual NDVI**
May, Jul, Sep, Nov, & Dec	0.88 b
May, Jul, Sep, Oct, & Nov	0.89 ab
May, Sep, Oct, Nov, & Dec	0.89 a
Apr, May, Jul, Aug, & Sep	0.87 c
Annual Nitrogen Rate	**Annual NDVI**
2 # N / M / YR	0.87 c
4 # N / M / YR	0.88 b
6 # N / M / YR	0.89 a

Table 1: Letter diagram of the effects of treatments on normalized difference vegetative index (NDVI) averaged over 12 months on tall fescue. Means following by the same letter are not significantly different according to Tukey's HSD test at alpha ≤ 0.05.

Photo A. shows the tall fescue winter fertility trial on June 15th, 2022. Photo B. shows the tall fescue winter fertility trial on January 20th, 2023.

Tall Fescue Winter Fertility Trial Plot Map

W--->

Rep 4	Rep 3	Rep 2	Rep 1
11	2	8	1
5	7	12	9
10	8	11	6
4	9	3	10
12	1	5	7
7	6	9	3
1	12	4	11
8	3	7	2
9	10	1	8
2	5	6	4
3	11	2	12
6	4	10	5

Trt #	Months Applied	N/app	Total lbs. of N
1	May, Jul, Sep, Nov, & Dec (Holiday)	0.4 lb.	2
2	May, Jul, Sep, Oct, & Nov	0.4 lb.	2
3	May, Sep, Oct, Nov, & Dec	0.4 lb.	2
4	Apr, May, July, Aug, & Sep	0.4 lb.	2
5	May, Jul, Sep, Nov, & Dec (Holiday)	0.8 lb.	4
6	May, Jul, Sep, Oct, & Nov	0.8 lb.	4
7	May, Sep, Oct, Nov, & Dec	0.8 lb.	4
8	Apr, May, July, Aug, & Sep	0.8 lb.	4
9	May, Jul, Sep, Nov, & Dec (Holiday)	1.2 lb.	6
10	May, Jul, Sep, Oct, & Nov	1.2 lb.	6
11	May, Sep, Oct, Nov, & Dec	1.2 lb.	6
12	Apr, May, July, Aug, & Sep	1.2 lb.	6