2022 OSU TURF FIELD DAY

Lewis Brown Horticulture Farm
Corvallis, OR
33329 Peoria Rd.
Corvallis, OR 97333
Thursday – September 1, 2022

Speakers:

Alec Kowalewski, PhD, Turfgrass Specialist
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Brian McDonald, Senior Faculty Research Assistant
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Ruying "Wrennie" Wang, PhD, Research Associate
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Chas Schmid, PhD, Research Associate
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Cole Stover, Graduate Assistant
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Zach Hamilton, Graduate Assistant
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Field Day Map – Page 3
Research PowerPoint Presentations: 9:00 to 10:00
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Presentation 2: Remote Sensing of Winter Turfgrass Injury in Central Oregon Speaker - Cole Stover (10 minutes) page 6
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Formal Field Tour: 10:00 to 11:00 am
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Stop 2: Long-term Effects of Topdressing and Cultivation Practices on Annual Bluegrass Speaker - Chas Schmid, PhD (10 minutes) page 12 and 13
Stop 3: Evaluating AMVAC Fungicides and Rotations for Control of Anthracnose Speaker – Brian McDonald (10 minutes) page 14
Stop 4: Manuscript for Control of Tall and Fine Fescue Speaker – Brian McDonald (10 minutes) page 15
Stop 5: Fungicides for Anthracnose (NuFarm, FMC, Bayer, Syngenta and Quali-Pro) Speaker – Emily Braithwaite (10 minutes) page 16 and 17
Open House: 11:00 to 11:30 am
Featured Projects: • Using Gamin and Relzar to Control False Dandelion, Brian McDonald, Page 18 and 19 • Effects of Nitrogen and Potassium Rates and Timings on M. Patch on Fairways, Cole Stover, Page 20 and 21 • Tall Fescue Irrigation Rates and Frequency, Alec Kowalewski, Page 22 and 23 • Effects of Nitrogen Rates, Timings, and Mowing Height on Tall Fescue, Zach Hamilton, Page 24 and 25 • National Turfgrass Evaluation Program Tall Fescue Trial, Chas Schmid, Page 26 and 27
Lunch: 11:30 to 12:30 pm at Lewis Brown Farm
Jason Oliver Memorial Golf Tournament and Dinner 1:00 to 6:00 pm at Trysting Tree
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N →
Open house 1
False Dandelion
Control
Field Tour
Stop 1
Field Tour
Stop 2
Field Tour
Stop 3
Open house 2
Poa Fairway
Fertility Trial
Open house 4
Tall Fescue
Fertility Trial
Open house 3
Tall Fescue
Irrigation
Field Tour
Stop 5
Field Tour
Stop 4
Open house 5
Tall Fescue
NTEP Varieties

Presentation 1: Effects of non-selective herbicides on a mixed lawn in western Oregon (page 1 of 2)

Clint Mattox[1,3], Tim Stock[1], Leslie Beck[2], Bernd Leinauer[2], and Alec Kowalewski[1]
[1]Oregon State University, Horticulture Department, Corvallis, OR
[2]New Mexico State University, College of Ag, Consumer, and Environmental Sciences, Las Cruces, NM
[3]Currently: USDA-Agriculture Research Service Forage Seed and Cereal Research Unit, Corvallis, OR

Introduction:

Pesticide restrictions in urban areas are encouraging stakeholders to seek herbicide alternatives; therefore, a field experiment took place over 8 weeks in western Oregon comparing 11 non-selective herbicides for the suppression of vegetation in a mixed stand of turfgrass and broadleaf weeds.

Methods and Materials:

Applications began on April 15th, 2022 and were made every two weeks for a total of four applications (glyphosate was only applied on the first application date). Spray carrier volume was two gallons per 1,000 ft^2 and pressure at the boom was 35 psi. Light box images were collected three times a week and digital images were analyzed for percent green color. Treatments included:

- 1% clove oil applied at a 33% volume / volume (v/v) solution
- 44% caprylic acid + 36% capric acid applied at 6% v/v
- 40% Ammonium nonanoate applied at 13% v/v
- 70% d-limonene applied at 25% v/v
- 7.5% sodium chloride applied at 100% v/v
- 22% ammoniated soap of fatty acids + 3% maleic hydrazide applied at 17% v/v
- 45% cinnamon oil + 45% clove oil applied at 5% v/v
- 5% mint oil, 5% sodium lauryl sulfate, 5% potassium sorbate applied at 6% v/v
- 20% acetic acid applied at 100% v/v
- 57% pelargonic acid applied at 10% v/v
- 48.7% glyphosate applied once at a rate of 2.42 oz. per 1,000 ft^2
- Water Control

Results:

On every rating date occurring two weeks post application, glyphosate had a lower percent green color percentage compared to all other treatments. On these same rating dates, every treatment had a lower percent green color than the water control with the exception of mint oil + sodium lauryl sulfate + potassium sorbate on all four dates and clove oil on the June 10th rating date (Table 1 and Figure 1).

	Apr 29	May 13	May 27	Jun 10
Clove oil	68% b[1]	72% b	79% b	86% a
Caprylic + Capric acid	59% bc	53% c	58% cd	58% bc
Ammonium nonanoate	49% cd	47% cd	55% de	60% bc
D-limonene	53% bcd	54% c	55% de	64% b
Sodium chloride	50% cd	50% c	52% def	53% cd
Ammoniated soap of fatty acids + Maleic hydrazide	54% bcd	37% d	45% ef	47% d
Cinnamon oil + Clove Oil	64% bc	65% b	67% c	68% b
Mint oil + Sodium lauryl sulfate + Potassium sorbate	84% a	86% a	89% ab	88% a
Acetic acid	39% d	37% d	44% ef	51% cd
Pelargonic acid	50% cd	37% d	43% f	54% cd
Glyphosate	13% e	1% e	1% g	4% e
Water	89% a	90% a	92% a	90% a

Table 1: The effects of non-selective herbicide treatments on percent green cover of a mixed stand of grasses and broadleaves in Corvallis, OR. Treatments began 15 Apr 2022 and were applied every 2 weeks. Ratings listed represent percent green cover 2 weeks after each application. [1]Means in the same column followed by the same letter are not statistically significant according to Tukey's Test at $P \leq 0.05$

Presentation 1: Effects of non-selective herbicides on a mixed lawn in western Oregon

(page 2 of 2)

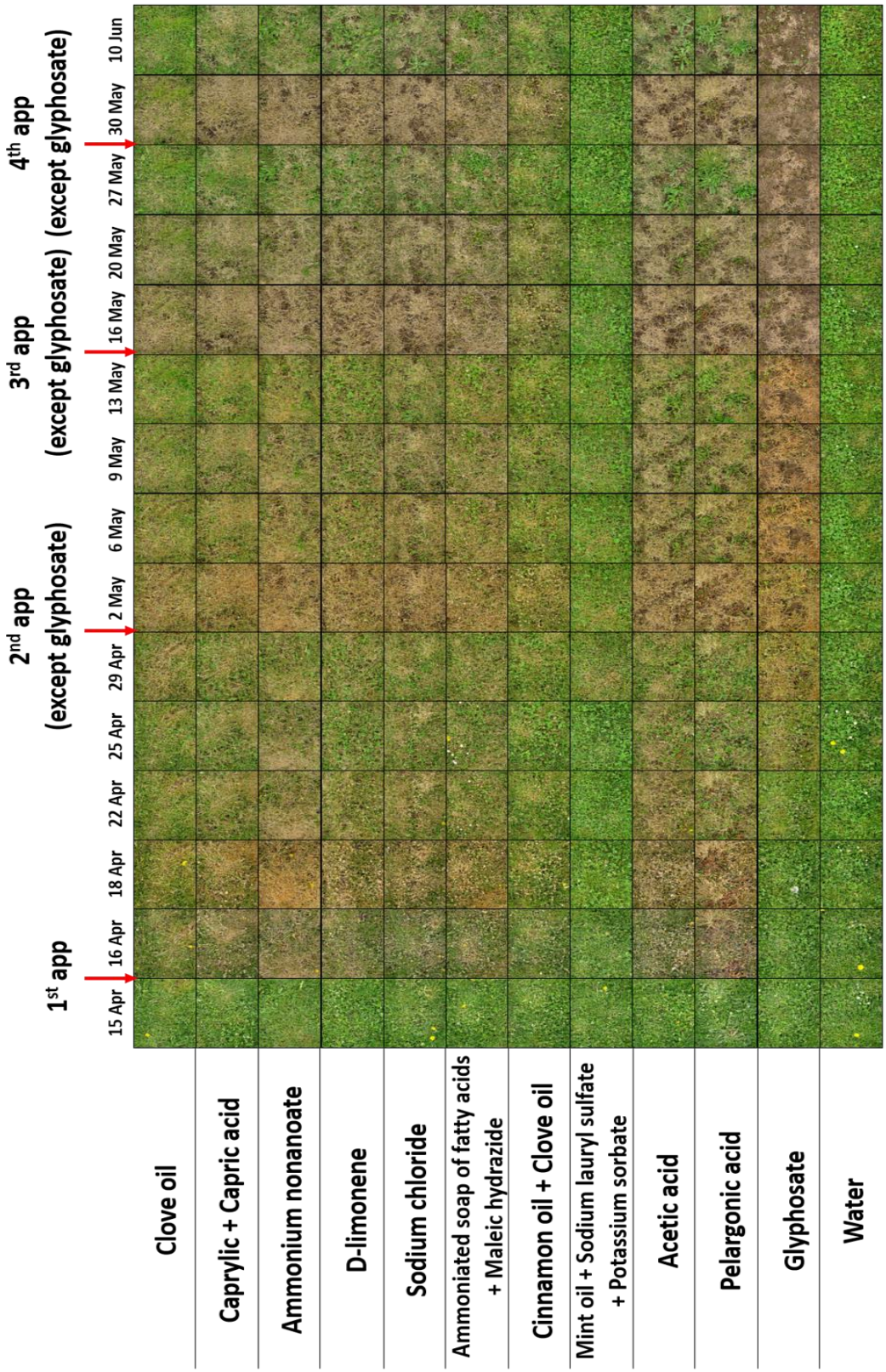
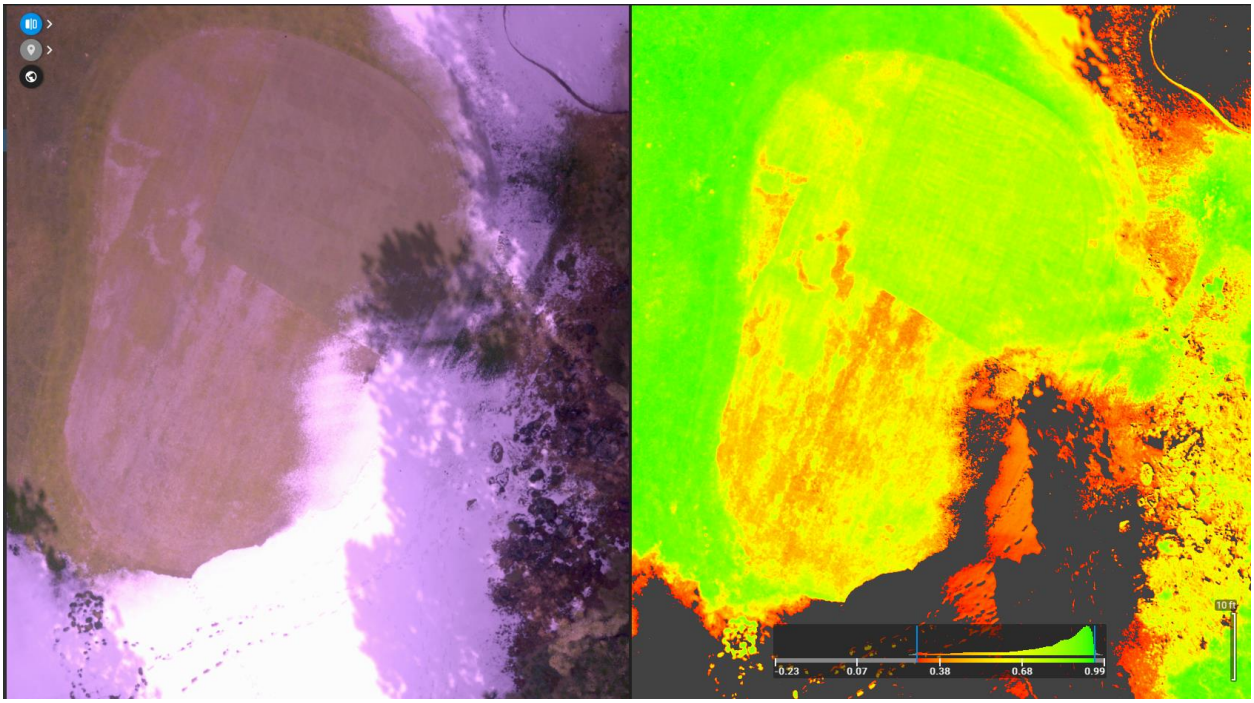


Figure 1: Light box images of plots representative of non-selective herbicide treatment effects over time on a mixed stand of grasses and broadleaves in Corvallis, OR. Treatments began 15 Apr 2022 and were applied every 2 weeks (with the exception of glyphosate, which was only applied on 15 Apr 2022).

Presentation 2: Remote Sensing of Winter Turfgrass Injury in Central Oregon

Cole Stover, Alec Kowalewski, Eric Watkins, Ce Yang

Cool season turfgrass species are well adapted to cool weather but can be damaged during winter months by a variety of different winter conditions. Currently there is no reliable method for predicting when different environmental conditions will cause damage. In Central Oregon several golf courses experience substantial localized winter kill suggesting small variation is climate can result in this problem. This project aims to identify the various micro-environmental conditions that cause localized winterkill. This trial was initiated in November 2021 and will conclude in December 2023. For this study data is collected from Black Butte Ranch in Sisters, OR, Widgi Creek Golf Club and Broken Top Golf Club in Bend, OR, and the Woodlands Golf Course in Sunriver, OR, where localized winterkill has historically occurred. Environmental conditions, CO2 and O2 flux at a 1.27 cm soil depth, as well as soil temperature (C) and soil volumetric water content at 15.24 cm, 7.62 cm, and 1.27 cm soil depths, and photosynthetically active radiation at the surface, are measured every 15 minutes. Monthly DJI Inspire II drone flights equipped with a Sentera 6x multispectral sensor with thermal are being used to assess red (670-30 nm), green (550 to 20 nm), near infrared (840-20 nm), red edge (715-10 nm), RGB (20 MP) as well as surface temperature (C). Grass genus and species population dynamics are being assessed in the spring, summer, and fall in areas that experience damage, and undamaged areas at each location. Preliminary results show increases in turf loss in areas that are shaded, and where the predominant grass is *Poa annua* at greens height. Exposure to extreme temperature swings as the result of no snow cover also resulted in turf loss at several sites.



Above: Hole 13 at Black Butte Ranch April 2022. Left shows standard RGB picture, right shows NDVI.

Presentation 3: Effects of Plant Growth Regulators on Putting Green Aerification Recovery

Speaker - Chas Schmid, PhD

Materials and Methods:

A field study was initiated in March 2021 on a 1-yr old annual bluegrass putting green with the objectives to 1) determine the effect of trinexapac-ethyl application timing on core cultivation recovery, 2) determine if ethephon treatments applied in the spring for annual bluegrass seedhead control influence cultivation recovery time, 3) evaluate the effect of gibberellic acid (GA_3) on core cultivation recovery. Treatments were arranged as a 3 x 2 factorial with four replications. Gibberellic acid (RyzUp) applied at 1.4 and 2.8 g GA3 ha^{-1} and a non-treated control were included for comparison. Trial area was cored in the spring and fall with 0.5" inside diameter hollow tines in a 5.1 x 5.1 cm spacing. Following core cultivation, digital images were collected daily using a lightbox to determine percent cover over time.

Treatment Summary:

1. Untreated control
2. TE applied 400 GDD~~Y~~ prior to cultivation
3. TE applied 400 GDD prior to cultivation + ethephon
4. TE applied 400 and 200 GDD prior to cultivation
5. TE applied 400 and 200 GDD prior to cultivation + ethephon
6. TE applied 400, 200 and 10 GDD prior to cultivation
7. TE applied 400, 200 and 10 GDD prior to cultivation+ ethephon
8. GA3 applied 10 GDD prior to cultivation at 0.05 oz RyzUp /Acre
9. GA3 applied 10 GDD prior to cultivation at 0.1 oz RyzUp/Acre

Preliminary Findings:

Results from the spring of 2021 indicate that the main effect of ethephon treatments had the greatest effect on cultivation recovery time, with plots receiving ethephon recovering quicker than plots that received no ethephon. The main effect of TE timing was only significant on one date in the spring of 2021, where the treatment receiving TE applied 400 GDD prior to cultivation had greater percent recovery 5-d after cultivation compared to the treatment that received TE 400, 200 and 10 GDD prior to cultivation. Results from the fall cultivation event also indicated that the main effect of ethephon treatment had the greatest effect on cultivation recovery time; however, during the fall plots receiving ethephon were slower to recover than plots that received no ethephon. Trinexapac-ethyl timing had no effect on cultivation recovery time in the fall of 2021.

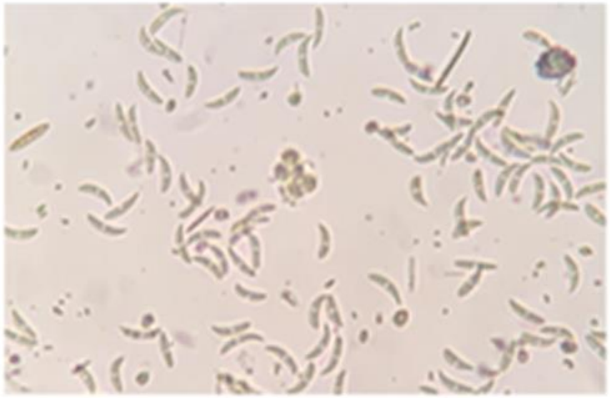
Interestingly, plots treated with GA at 0.05 or 0.1 oz/A initially had increased turfgrass growth and rapid recovery from core cultivation 3-5 days after cultivation. However, scalping from excessive turfgrass growth slowed recovery time overall. A higher rate of nitrogen (0.5 lbs N/ 1000 ft^2) in Fall compared to 0.3 lbs N/ 1000 ft^2 in spring) applied prior to the fall cultivation event seem to reduce the negative effect of the GA treatments long-term. It may be possible to limit the negative effect of excessive turfgrass growth by mowing more frequently and/or applying higher rates nitrogen prior to GA applications. Further research is needed to better understand how PGR applications influence cultivation recovery.

Presentation 4: Oregon State University Disease Diagnosis Laboratory Updates

Emily Braithwaite

Oregon State University

Turfgrass Diagnostic Lab



Located at Lewis-Brown Farm, the OSU Turfgrass Diagnostic Lab provides quick and accurate diagnostic information and management recommendations for turfgrass problems.

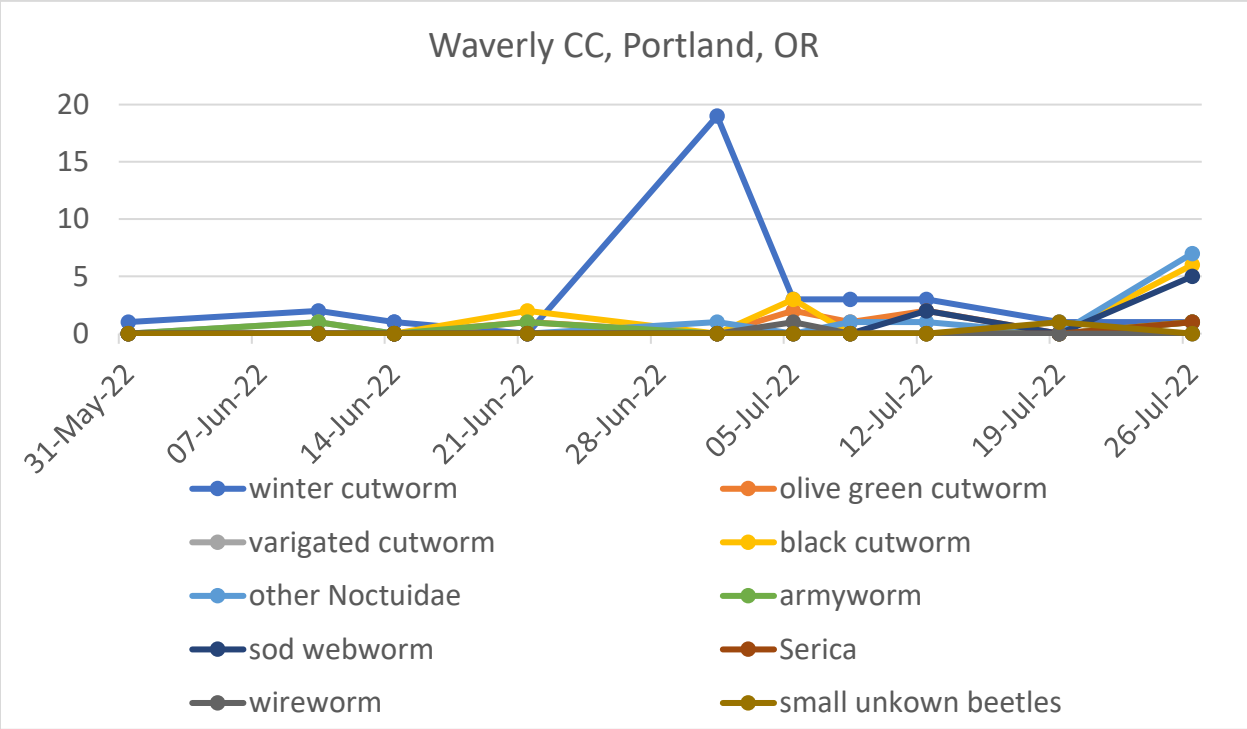
Visit our website below or follow QR code for details on submission costs, sampling and shipping methods, or email us for more information.

Lewis-Brown Farm:
33329 Peoria Rd, Corvallis, OR 97333
https://horticulture.oregonstate.edu/beaverturf/diagnostic-lab

Presentation 5: European Chafer in the Pacific Northwest of the United States

Zach Hamilton

The European chafer, *Rhizotrogus majalis***,** is an invasive species that causes serious damage to the roots of turfgrass. European chafer was first observed in the eastern U.S.A. in 1940 and migration across the midwestern U.S.A since has been well documented. In more recent years (2015), European chafer presence in the coastal Pacific Northwest has been documented. Currently turfgrass managers in the coastal Pacific Northwest are using cultural practices and insecticide timings developed in the eastern and midwestern U.S.A. However, the coastal Pacific Northwest has very moderate summer and winter conditions suggesting that the European chafer life cycle may differ drastically in this climate. For instance, preliminary research conducted in 2021 determined that adult European chafer start to emerge from the ground in the Seattle area as early as May 2, and peak between June 23 and July. Considering this, the objectives of this research are to assess the adult flight duration, early instar period, and distribution of European chafer in Western Washington and Oregon. For this project data will be collected at golf courses in Everett, Seattle, Tacoma, Olympia, Vancouver, WA, and Portland, OR from spring of 2022 to the fall of 2022. Blacklight traps at each location are being used to collect adult European chafer and soil samples are being collected to identify the early instar period of this insect in this niche environment. In 2021 adult European chafers were observed in Seattle as early as May 2. The adult population peaked between June 23 and July 9, 2021. In 2022, European chafer were observed in Seattle between June 12 and 22. European chafer were not found in any other city or state. High populations of Noctuidae (cutworm moth) were observed throughout the summer months at multiple locations in Washington and Oregon.



The graph above shows the insects found with a black light trap at Waverly Golf Course during the summer of 2022.

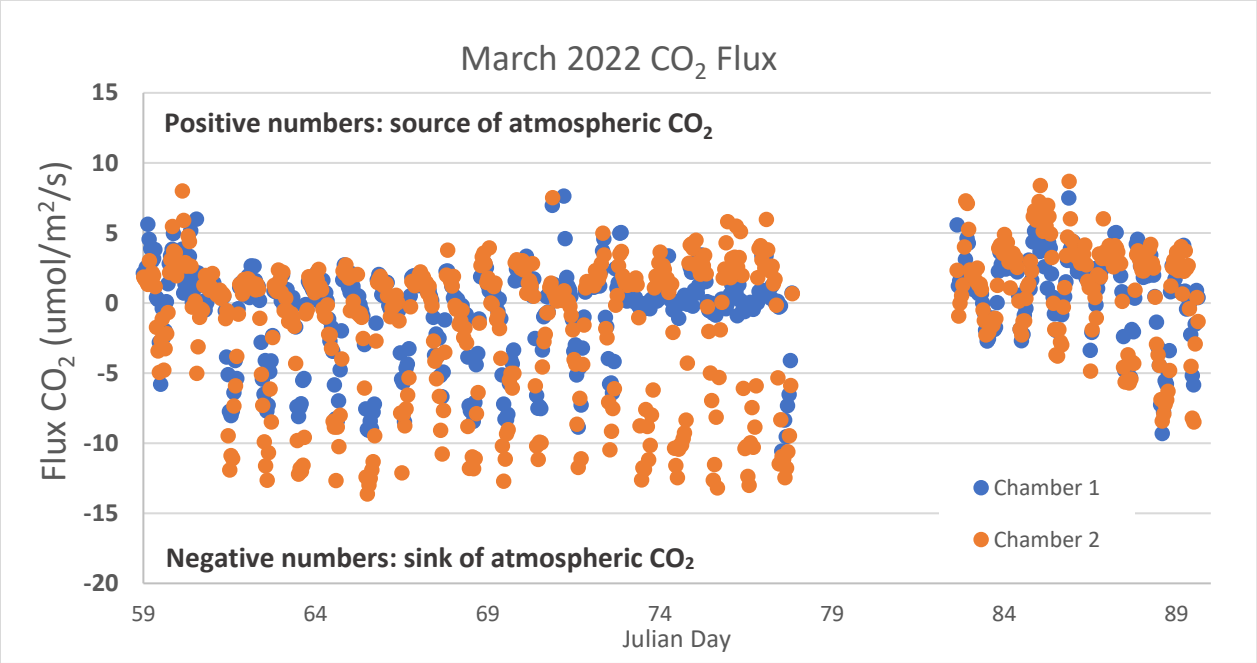
Formal Field Tour: 10:00 to 11:00 am

Stop 1: Enhancing Turfgrass Carbon Sequestration (page 1 of 2)

Ruying Wang[1], Clint Mattox[1,2], Emily Braithwaite[1], Claire Phillips[2], Zach Hamilton[1], and Alec Kowalewski[1]

[1]Horticulture, Oregon State University, Corvallis, OR; [2]USDA-ARS

Stop 1, Part 1: Monitoring CO_2 Flux in a Perennial Ryegrass Lawn



Here, we present the raw data from two automatic chambers which measure CO_2 concentrations and calculate CO_2 flux.

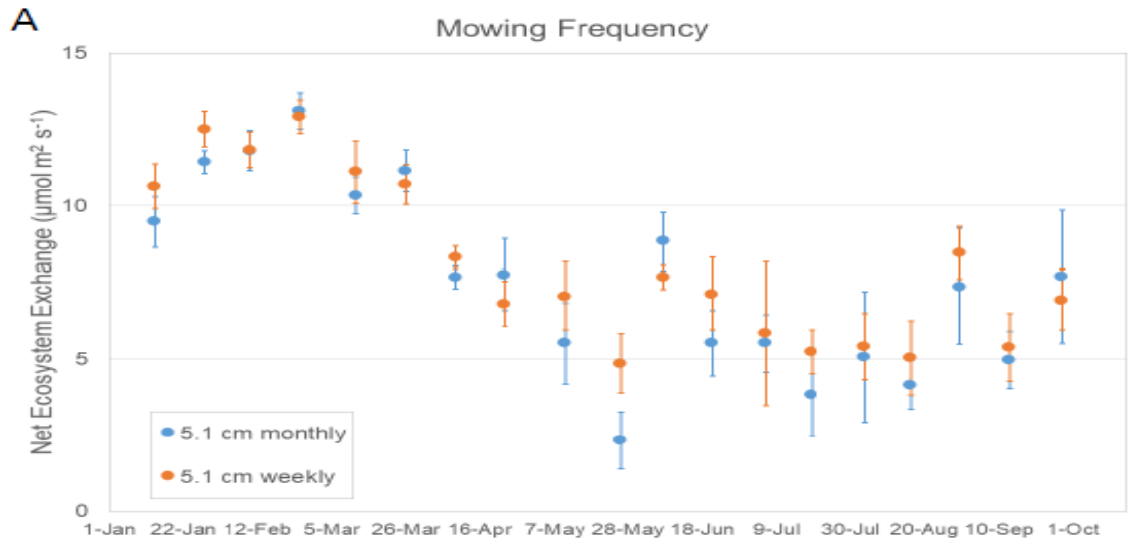
The data indicated that turfgrass were actively assimilating CO_2 at high rates during the day. And the system respiration rates were low at night in March.

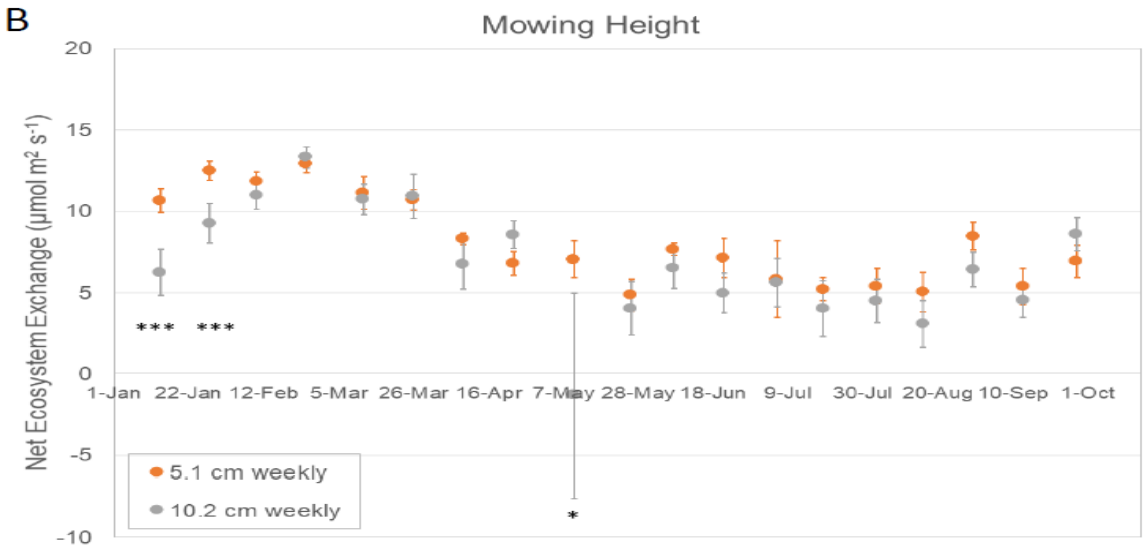
The annual net CO_2 gain or loss in this turfgrass system still needs to be calculated but from this graph the mean CO_2 value for March is -0.6 umol/m^2/s (a carbon sink). Perennial ryegrass is a cool-season grass which is well-adapted to the cooler months in our area (Willamette valley). Even though in those months the daylight could be limited, the photosynthetic rate and CO_2 assimilation rate of turfgrass are still high. However, we also expect the flux rates would be different in summer months in which turfgrass could be CO_2 neutral or a source.

Stop 1, Part 2: Mowing Affects the Ability of Cool-Season Turfgrass System to Assimilate Carbon Dioxide (page 2 of 2)

Criticisms of the environmental impacts of lawns, including a high climate footprint, pose challenges to the market acceptance of natural turfgrass. There are limited assessments of how to enhance turfgrass carbon accumulation in order to more efficiently offset maintenance emissions in the northwest U.S. The goal of this study is to evaluate how turfgrass maintenance can be modified to enhance carbon accumulation, and to characterize trade-offs between carbon sequestration, aesthetic characteristics, and maintenance intensity. A portable clear chamber with a CO_2 gas analyzer is used to measure CO_2 exchange on a subset of treatments with mixed species of cool-season turfgrasses at year 4 post-establishment. From the mowing trial, we are examining mowing heights of 5 cm weekly and monthly and 10 cm weekly. Data are taken every two weeks to compare those management practices.

In the following graphs, negative net ecosystem exchange values indicate carbon source and postive values indicate carbon sink.





Formal Field Tour: 10:00 to 11:00 am

Stop 2: Long term Effects of Topdressing and Cultivation Practices on Annual Bluegrass

Speaker – Chas Schmid, PhD (page 1 of 2)

Introduction:

Hollow tine aerification and sand topdressing have been used on golf course putting greens for decades to manage organic matter accumulation, improve infiltration, and maintain firm playing conditions. In more recent years, superintendents and researchers have been exploring solid tine aerification and topdressing without aerification. Despite recent trends, aerification and topdressing research on annual bluegrass putting greens in the Pacific Northwest, where 12 months of growth can be expected, is minimal.

Materials and Methods:

A 5-year field trial was initiated in May 2020 at the OSU Lewis-Brown Horticulture Farm in Corvallis, OR. Experimental design for the trial is a randomized complete block design with four replications. Treatments are arranged in a 2 x 7 factorial, with two sand topdressing rates (50 and 100 lbs 1000 ft^{-2}) and 7 cultivation treatments [hollow tine (HT) spring, fall, and both spring and fall; solid tine (ST) spring, fall, and both spring and fall; and a non-cultivated plot that received sand topdressing]. A non-treated control (no cultivation, no sand topdressing) was also included in the analysis.

Preliminary Results:

The main effect of cultivation treatment influenced turf quality (TQ) in Aug, Sept, Oct, and Nov of 2020, with spring cultivation treatments (HT spring, HT spring & fall, ST spring, ST spring & fall) generally resulting in greater TQ rating than fall cultivation treatments and topdressing only plot. Orthogonal contrast between spring cultivation treatments and all other treatments indicate spring cultivation had greater infiltration than plots that didn't receive spring cultivation. Neither main effect of topdressing rate or cultivation treatment had an effect on yellow patch severity in the fall of 2020; however, all combinations of topdressing rate and cultivation treatments reduced yellow patch severity compared to the non-treated control.

During 2021, differences in TQ between treatments became more apparent. Topdressing rate had a significant effect on TQ on 4 of the 5 rating dates in 2021, with topdressing applied at 100 lbs 1000ft^{-2} increasing turf quality compared to a rate of 50 lbs 1000ft^{-2}. Cultivation treatment influenced TQ on 2 July 2021, with the fall hollow tine cultivation treatment having a greater TQ than any other cultivation treatment or topdressing alone. The non-treated control plot had the lowest TQ rating of all treatments, on all rating dates in 2021. This response was particularly evident late summer when a cyanobacteria (Oscillatoria sp.) infestation reduced TQ in the non-treated control plots. No statistical difference in soil infiltration rate or surface firmness characteristics (Trufirm) were detected between either cultivation treatments, sand topdressing rates, or the interaction between the two factors during 2021.

Stop 2: Long term Effects of Topdressing and Cultivation Practices on an Annual Bluegrass Continued (page 2 of 2).

N

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

Formal Field Tour: 10:00 to 11:00 am

Stop 3: Evaluating AMVAC Fungicides and Rotations for Control of Anthracnose

Brian McDonald

2022 AMVAC Anthracnose Trial
Oregon State University
Location: Middle North Poa Green - west end
Initiated: 6/16/22
Last Application 8/25/22

N---> Rates

Rate/M
Premion
4
6
8

4'

4'	2	10	3	1	7	6	8	12	5	11
4"	14	15	16	18	13	17	19	9	20	4
	13	4	12	8	9	11	5	15	1	20
	17	2	6	14	18	3	16	7	19	10
	16	8	5	19	12	4	2	20	14	3
	1	9	13	6	11	15	7	10	17	18
	11	19	17	10	3	1	13	12	16	9
	20	7	4	5	2	8	18	14	15	6

Rep 4
Rep 3
Rep 2
Rep 1

Road

	Tebuconazole	PCNB	
lbs/gal	0.265	4.0	
	0.36	5.4	lbs. ai/A
	0.54	8.2	lbs. ai/A
	0.72	10.9	lbs. ai/A

Trt #	*Treatment*	*Rate/M*	Interval
1	Untreated	NA	na
11	Premion + Par	4.0 + 0.37	14 day
12	Premion + Par	6.0 + 0.37	14 day
13	Premion + Par	8.0 + 0.37	14 day
14	Turfcide 400 + Par	6.0 + 0.37	14 day
15	Rotation 1	See below	14 day
16	Rotation 2	See below	14 day

Rotation 1		
Premion + Par	6.0 + 0.37	A
Turfcide 400 + Par	6.0 + 0.37	B

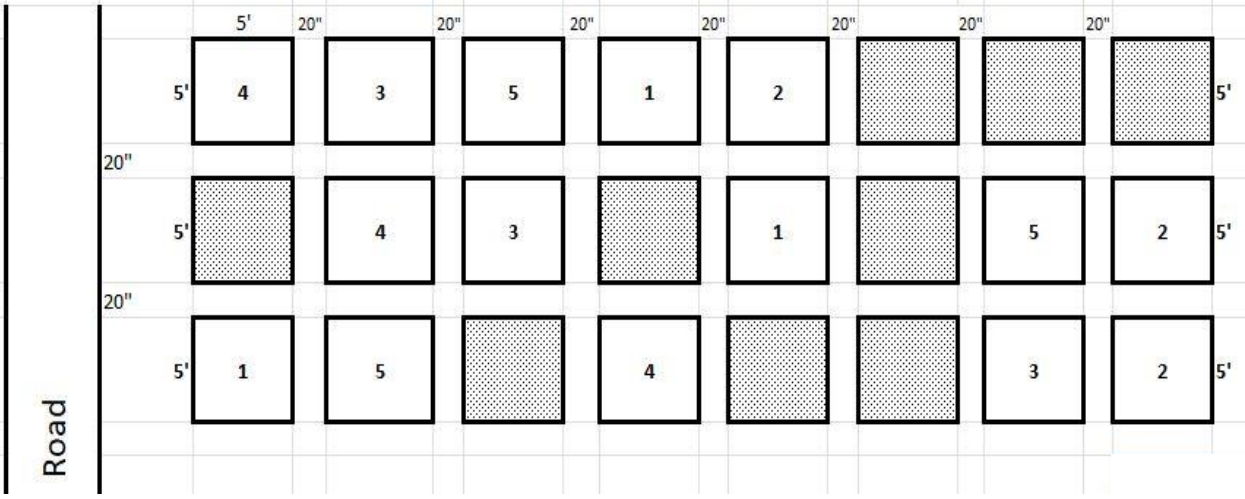
Rotation 2		
Premion + Par	8.0 + 0.37	A
Signature Xtra + Previa	4.0 + 3.6	B
Velista + Affirm	0.30 + 0.88	C
Oximus + Medallion SC	1.0 + 1.5	D
Signature Xtra + Previa	4.0 + 3.6	E
Velista + Affirm	0.30 + 0.88	F

Formal Field Tour: 10:00 to 11:00 am

Stop 4: Manuscript for Control of Tall Fescue Growing in Fine Fescue

Brian McDonald

2022 Manuscript for Control of Tall Fescue Growing in Fine Fescue
Oregon State University
Initiated: 6/1/2022 **E-->**
Second application: 6/24/22

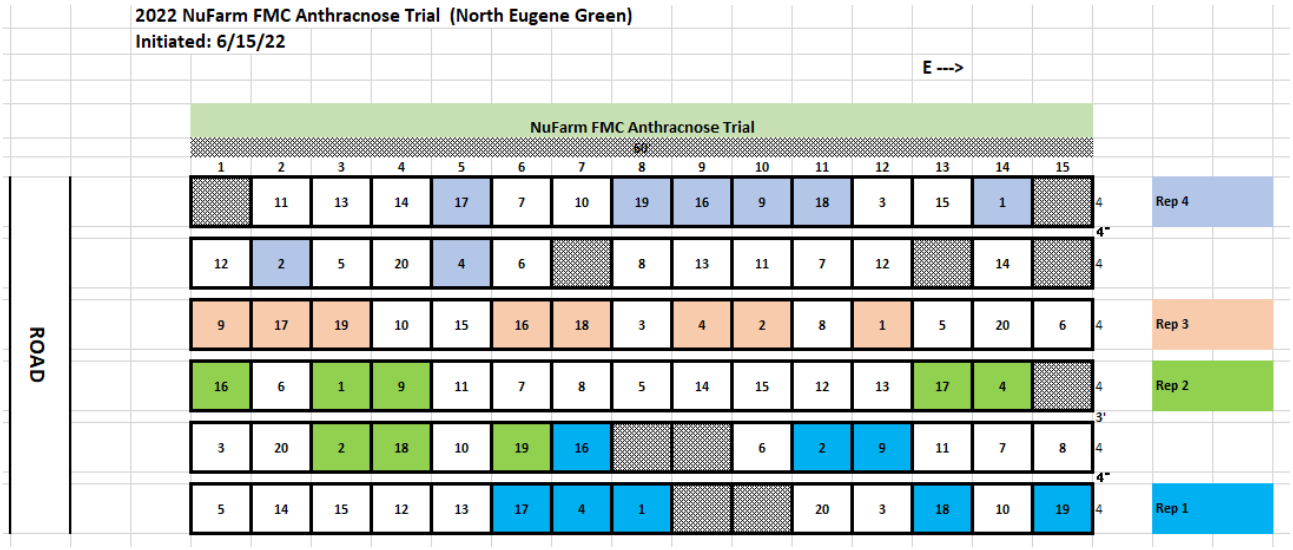


Trt #	Treatment	Rate/Acre fl. oz.	Adigor Surfactant	Apps	Interval	7/21/2022 Percent Control
1	Untreated	na	na	na	na	0.0
2	Fusillade II + Adigor	16.0	0.50% v/v	2	21 days	31.0
3	Manuscript + Adigor	19.2	0.50% v/v	2	21 days	99.3
4	Manuscript + Adigor	38.4	0.50% v/v	2	21 days	99.0
5	Manuscript + Adigor	57.6	0.50% v/v	2	21 days	100.0

Formal Field Tour: 10:00 to 11:00 am

Stop 5: Fungicides for Anthracnose – Part 1 of 2 - NuFarm and FMC

Speaker Emily Braithwaite



Treatment		Rate (oz/1000ft^2)	Interval	Avg % Dis 8/25/22	Avg Quality 8/25/22
1	Non-treated Control	-	-	13.8	4.0
2	Tourney 50WG	0.28 wt. oz.	14 day	1.8	5.5
4	Torque 3.6SC	0.6 fl. oz.	14 day	0.4	6.8
9	Affirm 11.3WG	0.88 wt. oz.	14 day	0.9	6.8
16	Kalida 4SC	0.33 fl. oz.	14 day	0.2	6.8
17	Kalida 4SC	0.4 fl. oz.	14 day	0.1	6.3
18	Velista 50WG	0.7 wt. oz.	14 day	0.9	7.0
19	Navicon 3.34SC	0.85 fl. oz.	14 day	0.3	7.5

Formal Field Tour: 10:00 to 11:00 am

Stop 5: Fungicides for Anthracnose – Part 2 of 2 - Bayer, Syngenta and Quali-Pro

2022 Bayer Syngenta QP Anthracnose Trial (South Eugene Green)
Oregon State University
Initiated: 6-14-22

E--->

ROAD

60'

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
15	14	2	1	3	4	13	11	9	7	10	5	8	12	6	4
															4"
5	4	8	13	7	2	14	12	10	1	11	6	3	15	9	4
3	11	12	6	14	10	9	8	7	2	13	15	5	1	4	4
8	10	15	7	5	13	1	6	14	4	12	3	9	2	11	4

Treatment		Rate (oz/1000ft^2)	Interval	Avg % Dis 8/23/22	Avg Quality 8/23/22
1	Non-treated Control	-	-	6.3	4.8
6	Densicor	0.196 fl. oz.	14 day curative	1.7	6.0
7	Maxtima	0.4 fl. oz.	14 day	0.3	6.8
8	Maxtima	0.4 fl. oz.	21 day	0.7	6.8
9	Signature Xtra + Densicor *rotated with* Signature Xtra + Daconil Ultrex	4.0 wt. oz. 0.196 fl. oz. 4.0 wt. oz. 3.2 wt. oz.	14 day	0.3	7.8
10	Signature Xtra + Densicor *rotated with* Signature Xtra + Daconil Ultrex	4.0 wt. oz. 0.196 fl. oz. 4.0 wt. oz. 3.2 wt. oz.	14 day curative	0.3	7.5
11	Daconil Action + Appear II + Primo Maxx	3.5 fl. oz. 6.0 fl. oz. 0.1 fl. oz.	14 day	0.4	7.8
12	Ascernity + Appear II + Primo Maxx	1.0 fl. oz. 6.0 fl. oz. 0.1 fl. oz.	14 day	0.0	7.8
13	Briskway + Primo Maxx	0.9 fl. oz. 0.1 fl. oz.	14 day	0.4	7.0
14	Syngenta Rotation[1]	See footnote	14 day	0.2	7.3
15	Quali-Pro Rotation[2]	See footnote	14 day	0.0	7.3

Open House: 11:00 to 11:30 am

Featured Projects: Using GameOn and Relzar to Control False Dandelion (6 weeks after 1 application) page 1 of 2

Brian McDonald

Objective: To evaluate GameOn and Relzar for control of false dandelion (*Hypochaeris radicata*). Trimec classic was added as a standard for comparison.

Site: Trial area had been unirrigated and unfertilized for the past 10 years. The turfgrass stand had converted to a mix of mostly bentgrass with smaller amounts of Rat-tailed fescue (*Vulpia myuros*, an annual that dies in the summer). Site was irrigated before the trial started.

Important Considerations: False dandelion can be a difficult weed to kill for a couple of reasons. First, it is genetically diverse. It is common for some plants to be killed easily while others seem to be less effected by herbicides. Second, false dandelion has a large, fleshy crown. It is common for herbicides to "burn down" the plant to the crown appearing to kill it. However, oftentimes it will recover. To get good control of false dandelion, it is critical to make 2 applications. Fall applications will likely improve control.

Note: Subterranean clover, a summer annual, germinated after the applications were made.

Open House: 11:00 to 11:30 am

Featured Projects: Using GameOn and Relzar to Control False Dandelion (6 weeks after 1 application) page 2 of 2

2022 Corteva False Dandelion Trial
Oregon State Unversity
Initiated: 07/23/22

Treatment Numbers in Red

N --->

Percent Weed Cover at Start of Trial

	Rep 4 (8')	Rep 3	Rep 2	Rep 1
4'	75 (4)	60 (2)	65 (5)	60 (3)
1'	75 (2)	80 (5)	75 (1)	60 (2)
4'	70 (3)	75 (4)	75 (3)	75 (1)
4'	75 (1)	60 (3)	75 (4)	75 (5)
4'	80 (5)	80 (1)	75 (2)	70 (4)

Road

Trt #	Trts	Herbicide Rate	units
1	Untreated	na	na
2	GameOn	3.0	pts/A
3	GameOn	3.5	Pts/A
4	Relzar + COC 0.	0.72	oz/A
5	Trimec Classic	4.00	Pts/A

Open House: 11:00 to 11:30 am

Featured Projects: Effects of Nitrogen and Potassium Rates and Timings on Microdochium Patch on Fairways (Project 1 of 2)

Cole Stover

Objective: To identify whether the rates and timing of our fertilizer applications can be used to reduce disease pressure in fairways and tees.

Experiment 1: Looking at the effect that the timing of the last applications of urea and potassium sulfate of the season has on Microdochium patch.

Trt		15-May	15-Jun	15-Jul	15-Aug	15-Sep	15-Oct	15-Nov
		lbs of N or K2O per 1,000 sq ft						
1	Control	-	-	-	-	-	-	-
2	Last N Sept	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	1 N, and 0 K20	-	-
3	Last N Oct	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	-	1 N, and 0 K20	-
4	Last N Nov	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	0.5 N, and 0.5 K20	-	-	1 N, and 0 K20
5	Last K20 Sept	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	0 N, and 1 K20	-	-
6	Last K20 Oct	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	-	0 N, and 1 K20	-
7	Last K20 Nov	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	0.75 N, and 0.25 K20	-	-	0 N, and 1 K20

East

4'x4' plot

Timing

	Rep 1		Rep 2		Rep 3		Rep 4
1	5	14	4	15	7	28	7
2	1	13	6	16	3	27	5
3	7	12	5	17	1	26	4
4	6	11	7	18	2	25	3
5	4	10	2	19	6	24	1
6	3	9	1	20	5	23	6
7	2	8	3	21	4	22	2

South

Open House: 11:00 to 11:30 am

Featured Projects: Effects of Nitrogen and Potassium Rates and Timings on Microdochium Patch on Fairways (Project 2 of 2)

Treatment					
		15-May	15-Jun	15-July	15-Aug
1 and 14	Control (0 N, 0 K)	lbs of N or K2O per 1,000 sq ft			
2	1 lbs N, 0 K20	.25# N, 0 K20	.25# N, 0 K20	.25# N, 0 K20	.25# N, 0 K20
3	2 lbs N, 0 K20	.5# N, 0 K20	.5# N, 0 K20	.5# N, 0 K20	.5# N, 0 K20
4	4 lbs N, 0 K20	1# N, 0 K20	1# N, 0 K20	1# N, 0 K20	1# N, 0 K20
5	1 lbs N, 1 K20	.25# N, .25# K20	.25# N, .25# K20	.25# N, .25# K20	.25# N, .25# K20
6	2 lbs N, 1 K20	.5# N, .25# K20	.5# N, .25# K20	.5# N, .25# K20	.5# N, .25# K20
7	4 lbs N, 1 K20	1# N, .25# K20	1# N, .25# K20	1# N, .25# K20	1# N, .25# K20
8	1 lbs N, 2 K20	.25# N, .5# K20	.25# N, .5# K20	.25# N, .5# K20	.25# N, .5# K20
9	2 lbs N, 2 K20	.5# N, .5# K20	.5# N, .5# K20	.5# N, .5# K20	.5# N, .5# K20
10	4 lbs N, 2 K20	1# N, .5# K20	1# N, .5# K20	1# N, .5# K20	1# N, .5# K20
11	1 lbs N, 4 K20	.25# N, 1# K20	.25# N, 1# K20	.25# N, 1# K20	.25# N, 1# K20
12	2 lbs N, 4 K20	.5# N, 1# K20	.5# N, 1# K20	.5# N, 1# K20	.5# N, 1# K20
13	4 lbs N, 4 K20	1# N, 1# K20	1# N, 1# K20	1# N, 1# K20	1# N, 1# K20

East

Rep 1

4	13	8	21
12	11	9	20
14	6	10	19
10	3	11	18
5	9	12	17
8	2	13	16
1	7	14	15

Rep 2

3	8	22	35
13	2	23	34
5	7	24	33
6	1	25	32
14	12	26	31
4	11	27	30
10	9	28	29

Rep 3

1	2	36	49
7	6	37	48
9	4	38	47
13	11	39	46
5	14	40	45
10	3	41	44
8	12	42	43

Rep 4

3	14	50	
5	11	51	
8	1	52	
12	10	53	
6	4	54	
9	2	55	
13	7	56	

Featured Projects: Tall Fescue Irrigation Rates and Frequency (page 1 of 2)

Alec Kowalewski

Objective: The goal of this project was to determine the optimal irrigation regime for suppressing weeds while sustaining tall fescue in western Oregon.

Findings: Irrigation frequency (once a weed or 4 times per week) produced no differences on weed population. Irrigation rate produced significant difference on weed population and normalized difference vegetation index, a measure of turfgrass health. The lower irrigation frequency (45% Evapotranspiration Replacement) resulted in less weeds, but also reduce tall fescue health (Table1). The control, which did not receive irrigation, had less weeds, but also the lowest NDVI values when compared to the other treatments (Table 2).

Table 1: Main effects of evapotranspiration (ET) replacement rate, and irrigation event frequency on weed population and NDVI in Corvallis, OR 2021 and 2022.

Rate (weekly ET replacement)	Weeds (0-100%)		Normalized difference vegetation index (NDVI)	
45%	36.9	b	86.5	B
80%	44.5	a	88.9	A
Frequency (irrigation events per week)				
1 time per week	41.1	a	87.4	A
4 times per week	40.3	a	87.9	A

Table 2: Contrasts comparing the percent weeds and NDVI in the control treatment, no irrigation, to the weekly evaporation (ET) replacement rates and irrigation event frequencies in Corvallis, OR, 2021, and 2022.

	Percent weeds (0-100%)		Normalized difference vegetation index (NDVI)	
control	12.1		75.5	
Rate (weekly ET replacement)				
45%	36.9	***	86.5	***
80%	44.5	***	88.9	***
Frequency (irrigation events per week)				
1 time per week	40.3	***	87.4	***
4 times per week	41.1	***	87.9	***

Featured Projects: Tall Fescue Irrigation Rates and Frequency (page 2 of 2)

Irrigation Treatments Initiated: July 1, 2021 and July 1, 2022

	S ----->				
	trt				
block 1	3	2	4	1	C
block 2	C	1	3	4	2
block 3	1	C	2	3	4
block 4	2	4	1	C	3

Trt 1 = 45% 1x/week
Trt 2 = 80% 1x week
Trt 3 = 45% 4 x week
Trt 4 = 80% x 4 week
C = control, no irrigation

Evapotranspiration rates for Corvallis, OR

	20 year average			
	Monthly ET	Weekly ET	45% ET	80% ET
	inches			
July	8.7	2.2	1.0	1.7
Aug	7.6	1.9	0.9	1.5
Sept	5.2	1.3	0.6	1.0

Open House: 11:00 to 11:30 am

Featured Projects: Effects of Nitrogen Rates, Timings, and Mowing Height on Tall Fescue

(page 1 or 2)

Zach Hamilton

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.

Featured Projects: Effects of Nitrogen Rates, Timings, and Mowing Height on Tall Fescue (page 2 or 2)

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

Open House: 11:00 to 11:30 am

Featured Projects: National Turfgrass Evaluation Program Tall Fescue Trial (Entry and Sponsor List) Page 1 of 2 Speaker – Chas Schmid

Entry	Name	Sponsor	Entry	Name	Sponsor	Entry	Name	Sponsor
1*	Naturally Green	Carlton Seed Co.	45	PST-5MINK	Pure Seed Testing	89*	Spyder 2LS	Mountain View Seeds
2*	Paramount	Standard	46*	Moondance GLX	Integrated Seed Growers	90	PPG-TF-231	Peak Plant Genetics LLC
3	DLFPS-321/3693	DLF Pickseed USA	47*	Monument	Site One Land. Supply	91*	Rover	Landmark Turf & Native Seed
4	DLFPS-321/3694	DLF Pickseed USA	48	PST-5DZM	Pure Seed Testing	92	PPG-TF-318	Peak Plant Genetics LLC
5	DLFPS-321/3695	DLF Pickseed USA	49	PST-5GLBS	Pure Seed Testing	93*	Bullseye	Standard
6*	SR 8700	DLF Pickseed USA	50*	GLX ACED	Pure Seed (Rose Agri)	94*	Firehawk SLT	Burlingham Seeds
7	ATF2116	Pennington Seed	51	PST-5DC24	Pure Seed (Rose Agri)	95*	Hemi	Standard
8	NT-3	Pennington Seed	52*	Tango	Site One Land. Supply	96*	Bullseye LTZ	Burlingham Seeds
9	RS1	DLF Pickseed USA	53*	Endgame	Site One Land. Supply	97*	Turbo SS	Burlingham Seeds
10	5LSS	Pure Seed Testing	54*	Bandit	Site One Land. Supply	98*	Dragster	Burlingham Seeds
11	BGR-TF3	Berger International	55*	Copious TF	Site One Land. Supply	99	GO-RH20	Grassland Oregon Seed
12	ATF 1768	Pennington Seed	56*	Padre 2	Site One Land. Supply	100*	Birmingham	Grassland Oregon Seed
13*	Gallardo	DLF Pickseed USA	57*	Bravo 2	Site One Land. Supply	101	GO-AOMK	Grassland Oregon Seed
14*	Essential 2	DLF Pickseed USA	58	NAI-FQZ-17	Lakeside Ag. Ventures	102*	Talladega II	The Scotts Company
15	DLFPS-TF/3553	DLF Pickseed USA	59*	Capitan	DLF Pickseed USA	103	NAI-ROS4	Landmark Turf & Native Seed
16*	Bentley	DLF Pickseed USA	60	DLFPS-321/3706	DLF Pickseed USA	104*	Tough	The Scotts Company
17	LBF	Tualatin Valley Seeds	61	DLFPS-321/3707	DLF Pickseed USA	105	NAI-ST5	Landmark Turf & Native Seed
18	TD2	Pennington Seed	62	DLFPS-321/3708	DLF Pickseed USA	106*	Gro-Pro	Smith Seed Services, LLC
19*	Raceway	DLF Pickseed USA	63*	Zion	Barenbrug USA	107	SE5STAR	Smith Seed Services, LLC
20*	Rowdier	DLF Pickseed USA	64	BAR-FA8230	Barenbrug USA	108*	Galactic	Smith Seed Services, LLC
21*	Grande 3	DLF Pickseed USA	65	AH1	Landmark Turf & Native Seed	109*	Fairfield	Smith Seed Services, LLC
22*	Fayette	Standard	66	PPG-TF-249	Landmark Turf & Native Seed	110	SETFM2	Smith Seed Services, LLC
23	JT-517	Barenbrug USA	67	PPG-TF-262	Landmark Turf & Native Seed	111	SETFM3	Smith Seed Services, LLC
24*	Bonfire	Barenbrug USA	68	PPG-TF-267	Landmark Turf & Native Seed	112	3B2	ProSeeds Marketing
25	RDC	Oregro	69*	Daybreak	Brett Young Seeds	113	RAD-TF105	Radix Research
26	BAR 9FE MAS	Barenbrug USA	70	K18-RS6	The Scotts Company	114	RAD-TF131	Radix Research
27	BAR FA 8228	Barenbrug USA	71	K18-WB1	The Scotts Company	115	RHL2	Semillas Fito
28	COL-TF-148	The Scotts Company	72	RH1	ProSeeds Marketing Inc.	116*	Raptor III	Standard
29*	O'Keefe	Lebanon Seaboard Corp.	73	RH3	ProSeeds Marketing Inc.	117	RHF	Semillas Dalmau
30*	Degas	Lebanon Seaboard Corp.	74	JT 233	Vista Seed Partners	118*	Teacher	The Scotts Company
31*	Kizzle	The Scotts Company	75*	Xanadu	Barenbrug USA	119*	Serenade	Integra Turf, Inc.
32	K18-NSE	The Scotts Company	76*	Firenza II	Integra Turf, Inc.	120*	Triad	The Scotts Company
33*	Fastlane	Brett Young	77*	Symphony	Integra Turf, Inc.	121*	Tank	The Scotts Company
34*	Bladerunner 3	DLF Pickseed USA	78	PPG-TF 316	Lewis Seed Co.	122*	Estrena	Semillas Fito
35*	Houndog Nine	DLF Pickseed USA	79	RC4	Semillas Fito	123	AST8118LM	Allied Seed LLC
36	DLFPS-321/3703	DLF Pickseed USA	80	PPG-TF-257	Vista Seed Partners	124	AST8218LM	Allied Seed LLC
37	PST-5TRN	Pure Seed Testing	81*	Stealth	Mountain View Seeds	125	A-TF31	Allied Seed LLC
38	PST-5GQ	Pure Seed Testing	82*	Dynamite G-LS	Mountain View Seeds	126*	Palomar	Oregro Seed
39	PST-5MCMO	Pure Seed Testing	83*	Avenger III	Mountain View Seeds	127*	Escalade	Oregro Seed
40*	Pro Gold	Integrated Seed Growers	84*	Titanium G-LS	Mountain View Seeds	128*	OG-WALK	Oregro Seed
41	PST-5E6	Pure Seed Testing	85	PPG-TF-312	Mountain View Seeds	129*	Titan GLX	Smith Seed Services
42	PST-5THM	Pure Seed Testing	86*	Firecracker G-LS	Mountain View Seeds	130*	Titan Max	Smith Seed Services
43	PST-5BYOB	Brett Young	87*	Raptor LS	Mountain View Seeds	131*	Grand Prix	Criadero El Concerro SA
44*	Lifeguard	Pure Seed (Rose Agri)	88	PPG-TF-337	Mountain View Seeds	132*	Kentucky-31	Standard

* COMMERCIALLY AVAILABLE IN THE US OR ANY OTHER COUNTRY 2022

Open House: 11:00 to 11:30 am

Featured Projects: National Turfgrass Evaluation Program Tall Fescue Trial (Plot Map)

Page 2 of 2

N

61	51	128	58	117	57	30	22	124	12	87	130	68	44	6	54	125
13	15	26		19	11	129	66	78	25		20	46	84	40	72	106
85	121	41	109	23	2	70	105	47	107	76	8	64	45	29	67	56
94	114	100	80	126	3	93	120	50	38	59	82	17	101	71	99	113
116	90	86	73	33	49	131	31	81	62	43	10	119	110	102	122	16
96	53	55	111	34	79	112	52	97	4	42	123	1	9	132	35	74
77	69	63	75	28	108	7	115	48	27	83	88	103	118	60	127	92
32	89	95		104	24	18	5	21	91		39	36	98	37	65	14
		132	131	130	129	128	127	126	125	124	123	122	121	120	119	118
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117
100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84
67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50
35	36	37		38	39	40	41	42	43	44		45	46	47	48	49
34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		3	44	109	131	48	50	122	49	77	106	70	72	115	75	104
110	117	95	7	71	25	69	111	119	78	103	61	26	43	18	85	64
84	12	114	116	24	5	8	34	65	14	101	68	132	62	74	4	92
45	125	90		38	58	11	126	53	56	96		10	88	86	63	55
39	99	15	66	80	23	31	6	1	102	27	107	16	81	105	59	129
57	32	37	21	83	98	82	73	112	30	108	52	127	9	113	13	94
121	51	91	28	76	54	35	67	93	17	2	19	60	100	89	36	124
33	20	87	41	46	118	40	128	97	79	42	29	22	47	120	130	123

Rep 3

Rep 2

Rep 1

2021 and 2022 Research Supporters (page 1 of 2)

Advanced Ag	Ocean Organics
Agricultural Research Foundation	Ontario Turfgrass Research Foundation
A-List	Oregon Department of Agriculture
Allied Nutrient	Oregon Golf Course Superintendents Association
AMVAC Environmental Products	Oregon Seed Association
Aquatrols	Oregon Tall Fescue Commission
ARCO-Swallow Fellowship	Oregon Turf Foundation
Awbrey Glen Golf Club	OSU Ecampus
Bandon Dunes Golf Resort	OSU Foundation
Barenbrug USA	Oswego Lake Country Club
BASF	Pacific Golf and Turf
Bayer Crop Science	Pacific Sports Turf
Belchim Crop Protection	PBI Gordon
Bio Ag	Petro Canada Lubricants Inc.
Black Butte Ranch	Planet Turf
Brandt	Plant Peak Genetics
Broken Top Golf Club	Pleasant Hill School District
Burlingham Trust	Portland Parks and Recreation
Chambers Bay Golf Course	Pronghorn Resort
City of Bend	Pumpkin Ridge Golf Club
Columbia Seeds	Quebec Turfgrass Research Foundation
Control Solutions Inc.	Rainbird
Corteva Agriscience	RhizoSolutions
DLF Pick seed	Royal Oak Country Club
DPH	Salmon Run Golf
E. Marker	Scott Larsen
Emerald Valley	SePro Corporation
EnviroLogic Resources, Inc.	Simplot
Eugene Country Club	Smith Seed
Everett Golf and Country Club	Stewart Meadows Golf Course
Evergreen Golf Course	Sunriver Resort, Woodlands
Exacto Inc.	Syngenta Crop Protection, Inc.
FMC Corporation	TeeJet
Giustina Family, Trysting Tree Foundation Board	The Andersons Plant Nutrient Group
Glen Acres Golf and Country Club	The Lawn Institute
Golf Course Superintendents Association	Tigard and Tualatin School District
Grain Millers	TLC Products
Great Lakes Marketing	Tokatee Golf Club
Gwen Stahnke	Tom Cook
Harrell's LLC	Trysting Tree Golf Course
HollyFrontier Lubricants & Specialties	Tumwater Valley Country Club

2021 and 2022 Research Supporters (page 2 of 2)

Hunter Industries	Turf Star Western and the Toro Company
Koch Agronomic Services LLC	Turfgrass Water Conservation Alliance
Land O Lakes	TurfMend, LLC
Langdon Farms Golf Club	United States Department of Agriculture – Specialty Crop Research Initiative
Linn and Benton Country Master Gardener Program	United States Golf Association
Lisi Global	USDA-SCRI
Marion AG Services	Valent, Mycorrhizal Applications
Melgreen/Olmix NA, Inc.	Washington State Pesticide Resitration
Middlefield Golf Course	Waverly Country Club
Milliken & Company	Westcoast BioGreen
Milroy Golf Systems	Western Canada Turf Association
National Turfgrass Evaluation Program	Widgi Creek Golf Club
Northern California Superintendents Association	Wilbur-Ellis Company, Advanced Ag
Northwest Turfgrass Assocaition	Winfield United
NuFarm Americas Inc.	Yakima Elks Club

2022 Scholarships and Awards

2022	Friends and Alumni Award	Sean Arey, and Pat Doran
2022	Jason Oliver Memorial Scholarship	Cole Stover
2022	Bruce Faddis Scholarship	Nora Graham
2022	Tom Cook Legacy Scholarship	Naia Evans

2021 Jason Oliver Golf Tournament Champions

Kurt Wright, Corey Beelke, Mike Turley and Richard Rosenberry