2016 OSU TURF FIELD DAY

Lewis Brown Horticulture Farm
Corvallis, OR
33329 Peoria Rd.
Corvallis, OR 97333
Thursday – September 8, 2016

Speakers:
Alec Kowalewski, Turfgrass Specialist
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Conner Olsen, Graduate Assistant
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Field Day Agenda

Research PowerPoint Updates: 9:00 to 10:15
Opening Remarks. Speaker – A. Kowalewski
Fungicide Alternatives for the Control of Microdochium Patch. Speaker - C. Mattox (Page 3)
Cost Analysis of Synthetic and Natural Grass Athletic Fields. Speaker - B. Daviscourt (Page 4)
Optimizing Irrigation Rates and Frequencies for the Willamette Valley Speaker – C. Olsen (Page 5)
Low Maintenance Ground Covers of Oregon Schools. Speaker – G. Micah (Page 6)
Fungicides for Management of Microdochium Patch and Gray Snow Mold. Speaker – C. Mattox (Page 7 and 8)
Formal Field Tour: 10:15 to 11:00 am
Stop 1: Management of Anthracnose on Annual Bluegrass. Speaker – B. McDonald and A. Kowalewski (Pages 9)
Stop 2: National Turfgrass Evaluation Project Fine Fescue Trial. Speaker – B. Daviscourt, M. Gould and A. Kowalewski (Page 10 and 11)
Stop 3: Evaluating Perennial Ryegrass Cultivars for Greywater Irrigation Speaker – C. Olsen (Page 12)
Open House: 11:00 to 11:30 am
Featured Projects: • Anthracnose Control in the Pacific Northwest (Page 13-15) • Humates, Biostimulants and Synthetic Fertilizer on Perennial Ryegrass (Page 16) • Comparing Fertilizers (Organic/Synthetic) on Annual Bluegrass Greens (Page 17) • Biostimulant and Synthetic Fertilizer Combinations for Annual Bluegrass (Page 18)
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 Golf Course
Exhibitor List and Golf Outing Sponsors: Page 19
2014/2015 Research Supporters: Page 20
2015 Scholarships and Awards: Page 21

Formal Field Tour

Fungicide Alternatives for the Control of Microdochium Patch.
Clint Mattox
9:00 to 9:15 am

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INTRODUCTION:

Microdochium patch can be observed in cool, humid regions, and is damaging to annual bluegrass putting greens in the Pacific Northwest. Due to recent pesticide restrictions, it is the goal of current research to identify fungicide alternative control measures.

FERTILITY TRIALS:

A fertility trial that took place from 2013-2015 strongly suggested that 0.1 #N/M applied as urea every two weeks during the winter did not increase Microdochium patch severity and was beneficial to recuperation from golfer traffic. It was also shown that increasing rates of iron sulfate decreased Microdochium patch and that nearly complete control was observed when 2.0 # $FeSO_4$/M was applied every two weeks although turfgrass thinning was observed at this rate. The 2015-2016 fertility trials included an application timing trial (every 2, 4, 6 or 8 weeks) of 0.1 #N/M + 2.0 # $FeSO_4$/M in order to observe if this would have an effect on turfgrass thinning. Preliminary results suggest that only the 2-week application interval was sufficient for suppressing Microdochium patch. A different trial looked at different water carrier volumes (2.5, 5.0, 7.5, and 10 gal/M) in order to observe if this would have an effect on turfgrass thinning. Results suggest that water volumes of 7.5 and 10 gal/M appear to slightly reduce turf thinning, although turf quality was still determined to be unacceptable for putting greens.

ALTERNATIVE PRODUCTS TRIALS:

An alternative products trial that took place from 2013-2015 strongly suggested a significant reduction in Microdochium patch when Civitas One was applied in combination with sulfur or potassium phosphite. However, when rolling was included in combination with Civitas One, severe abiotic damage was observed. Also, it was observed that sulfur as well as phosphite applied alone were able to reduce Microdochium patch. When sulfur and phosphite were combined, an additive effect in disease control was observed. The 2015-2016 alternative products trials were implemented in order to see if different rates or frequencies of Civitas One used in combination with sulfur or phosphite could suppress Microdochium patch and not result in abiotic damage. In order to place the turf under stress, replicated golfer traffic was implemented throughout these trials.

One trial looked at different rates of Civitas One (4.25 or 8.5 oz./M) applied every two weeks in combination with different rates of sulfur (0.125 or 0.25 #S/M) or phosphite (0.038 or 0.075 # H_3PO_3 /M). The preliminary results showed that regardless of rates used, whenever Civitas One was applied in combination with sulfur, abiotic damage was observed in the winter months. The lowest rate of Civitas One (4.25 oz./M) used in combination with either rate of phosphite reduced disease although not to acceptable levels. Civitas One applied at 8.5 oz./M in combination with either rate of phosphite significantly reduced disease although still resulted in some abiotic damage during the winter period.

Another trial included applications of Civitas One every four weeks in combination with either sulfur or phosphite rotated with the combination of sulfur and phosphite. These rotations were compared to the combination of sulfur and phosphite applied every two weeks and a control plot. Preliminary results suggest that combinations of Civitas One and sulfur resulted in unacceptable abiotic damage in the winter months even when this combination was applied every four instead of every two weeks. Applications every two weeks of sulfur and phosphite resulted in good but not complete disease suppression compared to the control. Civitas One and phosphite applied in rotation with sulfur and phosphite resulted in good disease suppression with only minor abiotic damage.

Cost Analysis of Synthetic and Natural Grass Athletic Fields
Brian Daviscourt
9:15 to 9:30 am

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This case study assembles and compares the 20 year life-cycle costs of five natural turfgrass and five synthetic infill fields in the Willamette Valley, Oregon. Annual player-use data was collected on these fields to create and compare the cost efficiency of the 10 fields over their life-cycles. This was accomplished by calculating the cost of providing one hour of use for a single individual [20 year life-cycle cost/(annual hours of individual use*20 years)]. In order to represent a broader range of maintenance capabilities, fields were selected for this study to cover maintenance levels from K-12 schools to the NCAA level.

The average cost of the 20-year maintenance cycle for the 5 natural grass fields was $903,000. The average cost of the 20-year maintenance cycle for the 5 synthetic infill fields was $1,952,000. The calculated individual annual hours for the natural grass fields averaged 21,907 hrs. Expanded to the 20 year period the usage-hours were an average of 438,130 hrs. The synthetic fields averaged 70,093 hrs. Expanded to the twenty-year period the usage-hours were an average of 1,401,856 hrs. Comparatively the average usage-hours on the synthetic fields for the 20-year period was three times as much than as on natural grass fields. The average cost to provide an individual with an hour of use for the 5 natural grass fields was $2.18. The average cost per individual player hour for the 5 synthetic infill fields was $2.15. This figure emphasizes the importance of how necessary it is for synthetic fields to be adequately utilized. To be effectively utilized synthetic fields, with their life-cycle costs, need to be used for enough hours to be competitive with natural grass fields.

Maintenance cost, usage hours and dollar per usage hour for 5 natural grass and 5 synthetic infill fields in Oregon, data collected from 2014-2015.

Site	Field Type	20 year Maintenance Cost	20 Year Usage Hours	Dollar per Usage Hour
1	Natural Grass	$1,291,820.66	484,000	$2.67
2	Natural Grass	$362,833.31	120,000	$3.02
3	Natural Grass	$1,269,055.30	668,290	$1.90
4	Natural Grass	$1,247,925.10	685,360	$1.82
5	Natural Grass	$341,404.97	233,000	$1.47
6	Synthetic Infill	$2,114,904.77	1,386,400	$1.53
7	Synthetic Infill	$1,956,458.13	338,900	$5.77
8	Synthetic Infill	$1,742,801.74	1,278,130	$1.36
9	Synthetic Infill	$1,742,801.74	1,275,850	$1.37
10	Synthetic Infill	$1,952,031.39	2,730,000	$0.72
Average	**Natural Grass**	**$902,607.87**	**438,130**	**$2.18**
Average	**Synthetic Infill**	**$1,901,799.55**	**1,401,856**	**$2.15**

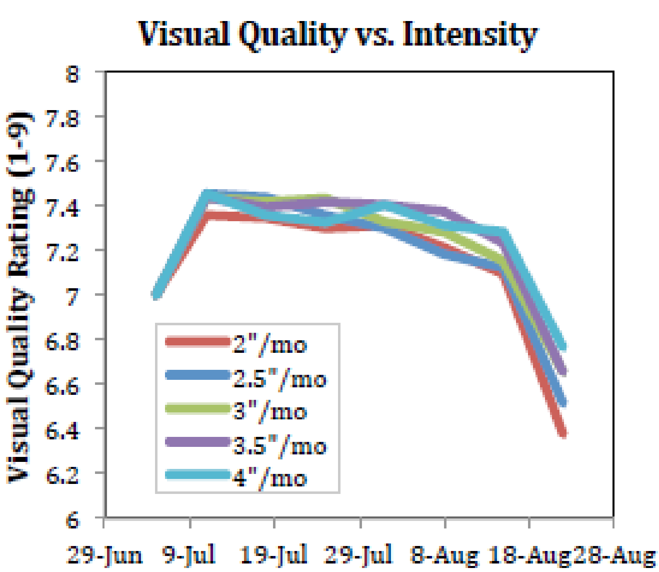
Formal Field Tour

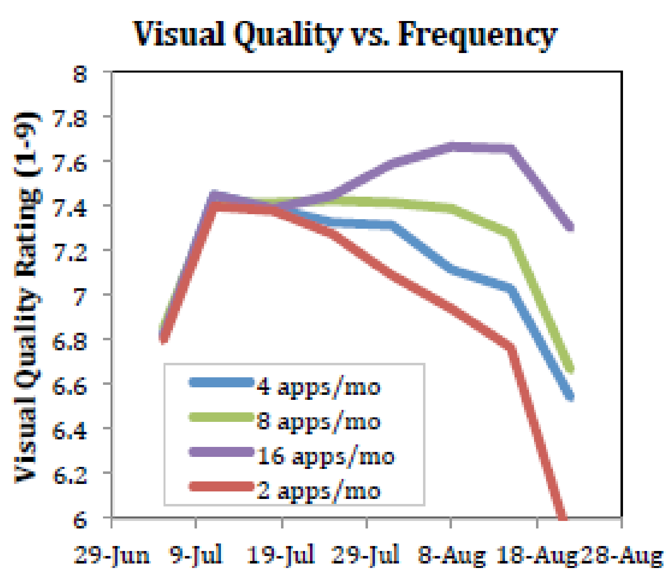
Optimizing Irrigation Rates and Frequencies for the Willamette Valley
Conner Olsen
9:30 to 9:45

Introduction: The OSU Master Gardener Program has been providing top-notch advice to amateur gardeners for many years; advice that is considered to be the most sustainable, best management practices (BMPs) known to date. One area of ambiguity, however, comes in their recommendation for turfgrass irrigation requirements, where they simply state that cool-season grasses in the cool-humid Pacific Northwest should be supplied with an inch of precipitation/irrigation per week. Unfortunately, this recommendation does nothing to answer the age-old question of whether turfgrasses should receive light-and-frequent or deep-and-infrequent irrigation applications. This experiment looks to solve that question through a factorial design that incorporates reduced irrigation rates applied at different frequencies.

Materials and Methods: A field experiment is being conducted at the Oak Creek Center for Urban Horticulture (OCCUH; OSU campus) to determine the optimal *set-it-and-forget-it* style of watering schedule for a typical lawn in the Willamette Valley. Perennial ryegrass (*Lolium perenne*) was established on a native (sandy clay loam) soil beginning in August 2015. Experimental design is a randomized block design with 4 replications. Factors include irrigation rates (2, 2.5, 3, 3.5, and 4 inches per month), and frequencies (2, 4, 8, and 16 applications per month).

Current Progress: Grass plots were established Fall 2015 – Spring 2016, and treatments began the first week of July 2016. After seven weeks of irrigation applications, many of the plots have declined to unacceptable quality. The most significant finding to this point is that increased frequency seems to be producing the highest quality turf.





Formal Field Tour

Low Maintenance Ground Covers of Oregon Schools.
Gould Micah
9:45 to 10:00

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The **OBJECTIVE** of this project is to evaluate the establishment rate, drought tolerance, weed suppression, mowing tolerance, and visual quality of various ground covers and grasses in a low and high maintenance situation. This data can potentially be used by school grounds employees to get an idea of fast establishing, low maintenance ground covers that require low input plants to be planted in their landscapes.

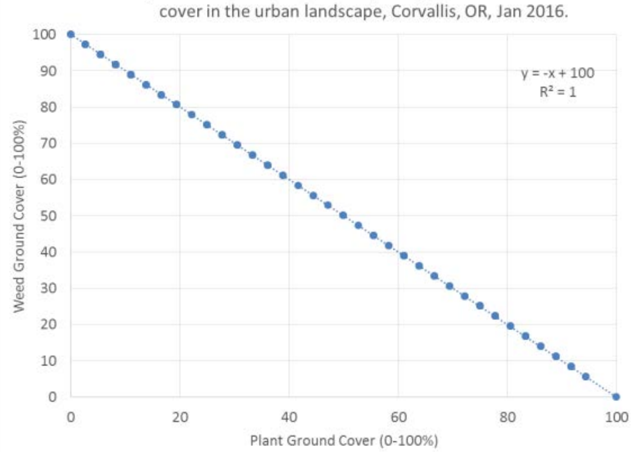
Methods and Materials: Research was initiated on 21 April 2015. Factors include location, plant type, mowing, and maintenance level. This field research is being conducted at two locations; Lewis-Brown Horticulture Research Farm and on OSU's main campus, south of Sackett Hall. During establishment, May to September 2015, irrigation was applied at an average rate of 1 inch per week. After September 2015, irrigation was discontinued and will remain off for the remainder of the experiment (May 2017). Response variables will include: percent coverage, visual quality ratings on a 1-5 scale, soil moisture content, and photosynthetic active radiation (PAR), which are taken monthly.

Current Findings:

Differences in percent plant coverage and weed cover have been observed. From May 2015 to January 2016, colonial bentgrass, chewings fescue, and strong red fescue had the highest percent of plant coverage among all ground covers (83%, 76% and 74%, respectively). The next closest ground cover was *Sedum spurium*, which provided 51.8% ground cover. From there, the plants drop off in plant coverage and increase in weed coverage. No differences were found among moisture content and PAR. There is a strong correlation between desired plants vs. weed cover as well.

Plant Species	Plant Cover (0-100%)
Colonial bentrass	83.3
Chewings fescue	76.4
Strong creeping red fescue	74.0
Sedum spurium	51.8
Ceonothus 'Point Reyes'	34.7
Herniaria glabra	32.3
Vinca minor	27.8
Juniperus horizontalis 'Blue Chip'	19.1
Cotoneaster dammeri	10.8
Euonymus fortunei 'Kewensis'	7.3

Figure 3: Correlations between plant ground cover and weed cover in the urban landscape, Corvallis, OR, Jan 2016.



Formal Field Tour

Fungicides for Management of Microdochium Patch in Western Oregon
Clint Mattox
10:00 to 10:15

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INTRODUCTION:

Microdochium patch caused by the turfgrass pathogen *Microdochium nivale* can be observed in cool, humid regions, and is damaging to annual bluegrass putting greens in the Pacific Northwest. Turfgrass managers often rely on chemical controls for managing this disease although the large choice of available fungicides labelled to control Microdochium patch can be daunting. In addition, with combination products on the market, it can be difficult to choose fungicides that provide excellent disease suppression without using the same chemical modes of action throughout the season.

FUNGICIDE TRIALS:

Oregon State University has performed fungicide trials on Microdochium patch for over 10 years and these experiments provide some insight into what works best to control this devastating pathogen on annual bluegrass putting greens in climates similar to Western Oregon. Using data from these past and ongoing trials, it is possible to summarize the fungicides that have provided the most consistent control of Microdochium patch and to recommend examples of fungicide rotations that should provide strong suppression of Microdochium patch and limit issues related to fungicide resistance.

EXAMPLE FUNGICIDE ROTATION FOR SUPPRESSING MICRODOCHIUM PATCH IN AREAS WITH EXTREME PRESSURE:

Date	Product	Rate (oz./M)	Active Ingredients	Group
Sep. 15	Headway	3.0	Propiconazole + Azoxystrobin	3,11
Oct. 15	Turfcide 400	8.0	PCNB	14
Nov. 15	Instrata	7.0	Chlorothalonil + Propiconazole + Fludioxonil	12,3,M
Dec. 15	Affirm + Secure	0.9 + 0.5	Polyoxin D + Fluazinam	19,29
Jan. 15	Turfcide 400	8.0	PCNB	14
Feb. 15	Instrata	7.0	Chlorothalonil + Propiconazole + Fludioxonil	12,3,M
Mar. 15	Interface	5.0	Iprodione + Trifloxystrobin	2,11
Apr. 15	Fore	8.0	Mancozeb	M3

Formal Field Tour

Fungicides for Management of Snow Mold in Central and Eastern Oregon
Clint Mattox
10:00 to 10:15

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INTRODUCTION:

Cool-season turfgrass exposed to prolonged snow cover can be severely damaged by the snow mold diseases Microdochium patch caused by the fungal pathogen *Microdochium nivale* as well as gray snow mold caused by the *Typhula* species: *T. ishikariensis* and *T. incarnata*. In Oregon, gray snow mold can be a particular concern in Central and Eastern Oregon where snow cover is common and can be persistent. Typically, turfgrass managers apply fungicides prior to snow cover to prevent damage from gray snow mold.

FUNGICIDE TRIALS:

Oregon State University has performed multiple field studies over the years in the Central Oregon area on golf course fairways in order to screen the performance of fungicides for controlling snow molds. The disease pressure last year (2015-2016) was particularly prevalent on a study initiated on October 30, 2015 on an annual bluegrass/perennial ryegrass/Kentucky bluegrass fairway on the Woodlands Golf Course in Sun River, Oregon. Treatments in this trial were applied on October 30, 2015 and 122 days of consistent snow cover occurred from November 24, 2015 to March 25, 2016. The following results were collected on March 31, 2016.

Treatments	**Rate (oz./M)**	**% Disease (0-100)**	
Untreated	na	50	c
Interface + Mirage	4.0 + 1.5	23.2	b
Interface + Mirage	4.0 + 2.0	22.8	b
Interface + Mirage + Proxy	4.0 + 1.5 + 5.0	12.0	ab
Interface + Mirage + Daconil Weatherstik	6.0 + 2.0 + 4.0	5.7	a
Interface + Mirage + Daconil Weatherstik	6.0 + 2.0 + 5.5	0.9	a
Interface + Mirage + Daconil Weatherstik + Tartan	3.0 + 2.0 + 5.5 + 1.0	3.3	a
Pervue + Mirage + Daconil Weatherstik	5.0 + 2.0 + 5.5	6.8	a
Pervue + Mirage + Daconil Weatherstik	6.0 + 2.0 + 5.5	5.4	a
Pervue + Mirage + Daconil Weatherstik	8.0 + 2.0 + 5.5	3.1	a
Instrata 11.0	11.0	2.9	a
Turfcide 400 + QualiPro Iprodione + Daconil Weatherstik	8.0 + 4.0 + 5.5	0.9	a
Turfcide 400	12.0	7.0	a
		LSD (0.05) = 13.6	

Stop 2: Management of Anthracnose on Annual Bluegrass
Brian McDonald and Alec Kowalewski
10:15 to 10:30

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Objective: Evaluate the effects of commercially available products applied alone and in rotation on anthracnose when infecting annual bluegrass putting greens.

	Product or Rotation	**Rate per 1,000 ft²**	**units**
1	Untreated	na	na
2	Anuew WDG PGR (27.5%)	2.0	grams
3	Anuew WDG PGR (27.5%)	4.0	grams
4	Oreon* + Harrell's PAR	4.0 + 0.37	fl oz
5	Oreon + Harrell's PAR	6.0 + 0.37	fl oz
6	Oreon + Harrell's PAR	8.0 + 0.37	fl oz
7	Autilus (PCNB 4 lbs ai/gal) + Harrell's PAR	6.0 + 0.37	fl oz
8	Mirage rotated with… Signature Xtra + Daconil Weatherstik	1.0 4.0 + 3.2	fl oz wt oz/fl oz
9	Mirage rotated with… Signature Xtra + Daconil Weatherstik	1.5 4.0 + 3.2	fl oz wt oz/fl oz
10	Daconil Action + Appear + Primo Maxx rotated with… Heritage Action + Appear + Primo	3.5 + 6.0 + 0.1 0.2 + 6.0 + 0.1	fl oz fl oz
11	Daconil Action + Appear + Primo Maxx	3.5 + 6.0 + 0.1	fl oz
12	Daconil Weather Stik + Signature Xtra	3.6 + 4.0	fl oz/Wt oz.
13	Daconil Action + Appear + Primo rotated with… Velista + Appear + Primo	3.5 + 6.0 + 0.1 0.5 + 6.0 + 0.1	fl oz fl oz
14	Daconil Action + Appear	3.5 + 6.0	fl oz
15	A19188 (experimental) + Primo rotated with… Medallion SC + Primo	1.0 + 0.1 1.0 + 0.1	fl oz fl oz

*Oreon (PCNB 4 lbs ai/gal + Tebuconazole 0.265 lbs ai/gal)

Treatments were applied as a tank mixture with a spray volume of 2 gallons per 1,000 sq ft. Treatments were initiated June 17, 2016 and applied every two weeks. Annual bluegrass was maintained at a 0.125" mowing height with clippings collected. Irrigation was applied as needed to prevent drought stress.

East →

Rep 1		**Rep 2**		**Rep 3**		**Rep 4**	
13	1	10	11	2	7	12	5
16	6	14	16	1	4	15	9
12	15	13	8	3	9	4	6
5	11	3	7	13	14	8	16
8	2	9	6	10	15	11	7
10	3	4	5	6	16	2	14
4	7	1	2	12	5	3	1
14	9	12	15	11	8	13	10

Stop 3: National Turfgrass Evaluation Project Fine Fescue Trial.
Brian Daviscourt, Brian McDonald and Alec Kowalewski
10:30 to 10:45

2014 NTEP Fine Fescue
Seeded 09/17/14; watered Friday 9/18
Plot Size 4' X 5'
Area = 36' X 70' = 2,520 sq ft

42 Entries
14 Entries per Row
3 Rows per Rep

Legend
Hard Fescue
Sheep Fescue
Chewings
Creeping Red

South-->

	4 '	Rep 3			Rep 2			Rep 1	
5'	31	28	4	42	15	14	25	35	17
	8	32	33	41	16	13	9	1	26
	37	25	5	40	17	12	23	39	24
	27	2	36	39	18	11	21	38	3
	23	11	6	38	19	10	4	33	29
	22	34	30	37	20	9	15	14	28
	18	1	26	36	21	8	2	27	41
	12	3	24	35	22	7	40	13	20
	42	13	17	34	23	6	30	10	12
	19	29	41	33	24	5	36	42	32
	20	38	14	32	25	4	22	19	16
	16	21	7	31	26	3	34	11	6
	35	39	15	30	27	2	5	7	31
	10	9	40	29	28	1	37	8	18

Formal Field Tour

Stop 3: National Turfgrass Evaluation Project Fine Fescue Trial Continued…

Number	Name	Species	Sponsor
1	Minimus	Hard Fescue	Landmark Turf & Native Seed
2	Marvel*	Strong Creeping Red	Landmark Turf & Native Seed
3	7C34	Strong Creeping Red	Brett Yound Seeds Ltd
4	DLFPS-FL/3066	Hard Fescue	DLF Pickseed USA
5	DLFPS-FRC/3060	Hard Fescue	DLF Pickseed USA
6	DLFPS-FL/3060	Hard Fescue	DLF Pickseed USA
7	DLFPS-FRR/3069	Strong Creeping Red	DLF Pickseed USA
8	MNHD-14	Hard Fescue	University of Minnesota
9	DLFPS-FRR/3068	Strong Creeping Red	DLF Pickseed USA
10	Quatro*	Sheep	Standard
11	Boreal*	Strong Creeping Red	Standard
12	Gladiator* TH456	Hard Fescue	Columbia River Seed
13	7H7	Hard Fescue	John Deere Landscapes
14	Sword*	Hard Fescue	Columbia River Seed
15	Seabreeze GT*	Slender Creeping Red	Standard
16	Radar*	Chewings	Standard
17	Beacon*	Hard Fescue	Standard
18	Navigator II*	Strong Creeping Red	Standard
19	PPG-FL 106	Hard Fescue	Mountain View Seeds
20	PPG-FRC 114	Chewings	The Scotts Company
21	PPG-FRT 101	Slender Creeping Red	Mountain View Seeds
22	PPG-FRR 111	Strong Creeping Red	Mountain View Seeds
23	PPG-FRC 113	Chewings	Mountain View Seeds
24	Kent*	Strong Creeping Red	Columbia Seeds
25	RAD-FC32	Chewings	Columbia Seeds
26	BAR FRT 5002	Slender Creeping Red	Barenbrug USA
27	BAR VV-VP3-CT	Chewings	Barenbrug USA
28	BAR 6FR 126	Chewings	Barenbrug USA
29	C14-OS3	Strong Creeping Red	The Scotts Company
30	RAD-FR33R	Strong Creeping Red	Brett Yound Seeds Ltd
31	RAD-FC44	Chewings	Bailey Seed Company
32	RAD-FR47	Creeping Red Fescue	Bailey Seed Company
33	PST-4DR4	Creeping Red Fescue	Pure Seed Testing Inc.
34	PST-4RUE	Creeping Red Fescue	Pure Seed Testing Inc.
35	PST-4BEN	Creeping Red Fescue	Pure Seed Testing Inc.
36	PST-4BND	Hard Fescue	Pure Seed Testing Inc.
37	PST-4ED4	Creeping Red Fescue	Pure Seed Testing Inc.
38	DLFPS-FRC/3057	Chewings	DLF Pickseed USA
39	Cascade*	Chewings	Standard
40	DLF-FRC 3338	Chewings	DLF Pickseed USA
41	DLF-FRR 6162	Creeping Red Fescue	DLF Pickseed USA
42	Beudin*	Hard Fescue	DLF Pickseed USA

Stop 4: Evaluating Perennial Ryegrass Cultivars for Greywater Irrigation
Conner Olsen
10:45 to 11:00
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Introduction: Researchers in arid regions, where fresh water is limited, have explored greywater as an alternative irrigation source. However, in arid environments, greywater has a tendency to increase soil nutrients (particularly salts) to toxic levels. In response to this, turfgrass breeders have been working to identify salt-tolerant turfgrasses to further improve their nutrient toxicity limits by developing resistant cultivars. In the cool-humid regions of North America (i.e. the Willamette Valley), seasonal rainfall could mitigate nutrient toxicity associated with greywater use. The use of salt-tolerant cultivars within these regions may altogether alleviate the symptoms associated with greywater irrigation.

Materials and Methods: A field experiment is being conducted at the Lewis-Brown Horticulture Farm to assess the viability of using greywater as a source of irrigation for rough-height perennial ryegrass, along with an assessment of salt-tolerant cultivars. Greywater irrigation is simulated using twice-weekly foliar applications of a concentrated solution of common agricultural and household products to mimic the sodium, chloride and boron loading of 1.5” overhead irrigation using reclaimed wastewater. Foliar applications are watered-in with 0.1” overhead irrigation (0.2” per week), and daily irrigation equates to 1.3” per week (total of 1.5” per week). The annual loading of sodium, chloride, and boron was determined using the concentrations found in effluent-quality wastewater used for irrigation of the Heritage Golf Course, Westminster, Colorado. Synthetic greywater will be applied to perennial ryegrass (*Lolium perenne*) established on a native clay-loam soil in the fall of 2016. Experimental design is a randomized block design with 4 replications. Factors include various rates and timings of greywater applications, along with cultivar assessments.

Current Progress: Grass plots were seeded in Fall 2015, established through Spring 2016, and treatments began the last week of June 2016. Some differences have been noted between treated and control plots, but the data has not been analyzed to determine statistical significance.

Open House: 11:00 to 11:30 am

Quick Guide to Anthracnose Control in the Pacific Northwest

Brian McDonald
Department of Horticulture, Oregon State University

Cultural Practices:

- Apply soluble nitrogen at .15 to .25 lbs. per 1,000 sq. ft. every 2 weeks, along with potassium at a 2:1 ratio of nitrogen to potassium.
- Keep mowing heights as high as possible to achieve your desired putting green speeds. Use rolling, Primo, and verticutting to attain your desired speeds.
- Apply consistent amounts of irrigation (avoid dry-down cycles if possible). Make monthly applications of wetting agents beginning in April or May before your greens dry out. There is some evidence that applying wetting agents weekly may reduce anthracnose.
- Apply a light sand topdressing every two weeks.
- Mow less: research at Oregon State University has shown that mowing Monday, Wednesday, Friday, and Saturday along with daily rolling achieves the same putting speeds as mowing and rolling every day.
- Core in the spring and fall. Use smaller tines (1/2") in the spring with closer spacing to create more holes for roots to grow.
- Use growth regulators: begin Proxy (5.0 fl. oz. per 1,000 sq. ft.) and Primo Maxx (0.125 fl. oz. per 1,000 sq. ft.) applications in early-to-mid March in Oregon. Make 3 applications on a 4-week interval. Make Primo only applications 2 weeks after the Proxy and Primo applications at 0.125 oz. per 1,000 sq. ft. Continue Primo applications every other week at 0.125 fl. oz. per 1,000 sq. ft. throughout the summer. **Do not apply Primo with DMI fungicides.**
- Keep your sulfur/sulfate levels below 2.0 lbs. per 1,000 ft^2 per year.

For more detailed information, see http://turf.rutgers.edu/research/GCM-BMP-Anthracnose.pdf

Quick Guide to Anthracnose Control in the Pacific Northwest (Cont.)

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Fungicide Rotation Programs: Don't be late with the first application!

Scenario Number 1: Goal of making the fewest applications as possible: – Must have low anthracnose pressure - (3 week spray interval)

a. No resistance issues with Strobilurins or thiophanate methyl

Date	Chemicals	Notes
3rd week of June	Banner, Mirage, Trinity, Torque (Avoid Bayleton & Tourney) mixed with Daconil Action (3.5 oz.)	Bayleton is weak. Tourney injures *Poa annua.*
2nd week of July	Heritage, Insignia, or Briskway mixed with Secure (3.5 oz.)	Briskway is Heritage + Difenaconazole
1st week of August	Thiophanate methyl (e.g. 3336, Fungo 50) mixed with Daconil Action (3.5 oz.)	This application will take you into September

b. With Strobilurin and thiophanate methyl resistance (**3 week spray interval**)

Date	Chemicals	Notes
3rd week of June	Banner, Mirage, Trinity, Torque (Avoid Bayleton & Tourney) mixed with Daconil Action (3.5 oz.)	Bayleton is weak. Tourney injures *Poa annua.*
2nd week of July	Medallion SC (1.0 oz.) mixed with Daconil Action (3.5 oz.)	Good on brown patch as well.
1st week of August	Signature (4.0 oz.) mixed with Daconil Action (3.5 oz.)	If hot temperatures occur earlier, switch the 2nd and 3rd applications

Note: As you move into September and *Microdochium* patch season starts, you can apply Banner Maxx again which is strong on *Microdochium* patch and will also control anthracnose.

Note: Mirage, Trinity, and Torque are all weak on *Microdochium* patch.

Open House: 11:00 to 11:30 am

Quick Guide to Anthracnose Control in the Pacific Northwest (Cont.)

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Scenario Number 2: Cadillac Program – apply every 2 weeks. Start earlier if local experience has shown symptoms appear earlier. Apply 3 weeks before you normally see symptoms.

Date	Chemicals	Notes
1st week of June	Banner, Mirage, Trinity, or Torque, (Avoid Bayleton & Tourney) mixed with Daconil Action (3.5 oz.)	Bayleton is weak. Tourney injures *Poa annua.*
3rd week of June	Briskway, Heritage, or Insignia, mixed with Secure (0.5 oz.)	Only use if resistance is not observed
1st week of July	Velista mixed with Signature (4.0 oz.) and Secure (0.5 oz.)	
3rd week of July	Medallion SC (1.0 oz.) mixed with Daconil Action (3.5 oz.)	Good on brown patch as well.
1st week of August	Thiophanate methyl (e.g. 3336, Fungo 50) mixed with Daconil Action (3.5 oz.)	Only use if resistance is not observed
3rd week of August	Affirm (0.9 oz.) mixed with Spectro 90 (3.6 oz.)	
1st week of September	Banner Maxx (2.0 fl. oz.) – will work as your first *Microdochium* patch application as well.	You could delay this application a couple of weeks if weather is still dry

Notes: Avoid repeated applications of Banner, Mirage, Triton, Trinity, and Torque. To avoid an excessive growth regulator effect (or brown tingeing) from these fungicides, wait at least 4 weeks to reapply. **DO NOT APPLY PRIMO WHEN USING DMI FUNGICIDES.**

New Products:

- Briskway – Difenoconazole + azoxystrobin. Difenoconazole does not appear to have the same growth regulator effects that other DMI's have.
- Secure – new contact. Early indications are that it is a good tank mix partner for both anthracnose and *Microdochium* patch.
- Velista – Has shown good activity on anthracnose when used in rotation programs.
- Mirage – new DMI from Bayer that mixes tebuconazole and the StressGard pigment. Provides excellent control of anthracnose.

Open House: 11:00 to 11:30 am

Humates, Biostimulants and Synthetic Fertilizer on Perennial Ryegrass

Brian McDonald and Alec Kowalewski
Department of Horticulture, Oregon State University

Objective: Evaluate the effects of granular fertilizer (30-0-10) applied alone and in combination with humate (Winfield 46 Black and experimental) and biostimulant (Winfield Secret and experimental) on perennial ryegrass maintained at rough height.

Treatments:		Rate per 1,000 sq ft
1	Control	na
2	Granular Fert (30-0-10)	0.75 lbs N
3	Granular Fert (30-0-10) + Winfield 46 Black	0.75 lbs N
4	Granular Fert (30-0-10) + Winfield Secret	0.75 lbs N
5	Granular Fert (30-0-10) + Winfield 46 Black + Winfield Secret	0.75 lbs N
6	Winfield Experimental Humate	4 fl oz
7	Winfield Experimental Biostimulant	1 lb N

South -->

Rep 4	**Rep 3**	**Rep 2**	**Rep 1**
5	**3**	**4**	**7**
6	**1**	**5**	**2**
3	**2**	**6**	**4**
4	**7**	**1**	**5**
2	**6**	**7**	**3**
7	**4**	**3**	**1**
1	**5**	**2**	**6**

Two treatments were made; May 13 and then Aug 16, 2016. Treatments were applied as a tank mixture with a spray volume of 2 gallons per 1,000 sq ft. Perennial ryegrass was maintained at a 2" mowing height with clippings returned to the respective treatments. Irrigation was applied as needed to prevent drought stress.

Effects of granular fertilizer, humate and biostimulant on perennial ryegrass clipping yield on July 20, 2016 at Lewis-Brown Farm, Corvallis, OR.

Treatment	**Clipping yield (grams/30 sq ft)**	
Granular Fertilizer (30-0-10) + Winfield Secret	40.7	a[±]
Granular Fertilizer (30-0-10)	32.5	ab
Granular Fertilizer (30-0-10) + Winfield 46 Black + Winfield Secret	31.7	b
Granular Fertilizer (30-0-10) + Winfield 46 Black	31.2	b
Winfield Experimental Biostimulant	16.2	c
Control	13.2	c
Winfield Experimental Humate	12.3	c

[±]lower case letters represent a significant difference at a 0.05 level of probability. Mean separations were obtained using Fisher's LSD.

Open House: 11:00 to 11:30 am

Comparing Fertilizers (Organic/Synthetic) on Annual Bluegrass Greens

Brian McDonald and Alec Kowalewski
Department of Horticulture, Oregon State University

Objective: Evaluate the effects of an organic/synthetic fertilizer blend with bio-activator (GenNext) to traditional synthetic fertilizer on an annual bluegrass putting green with and without plant growth regulator (Primo MAXX).

Treatments:

1. GenNext A (13-0-4) + GenNext B (13-0-2)
2. GenNext A + GenNext B + Primo MAXX
3. Wibur Ellis Link (12-0-12)
4. Wilbur Ellis Link + Primo MAXX
5. Anderson's (24-0-8 + 8-24-8) + Primo MAXX

All treatments are applied at 0.1 lbs N per 1,000 sq ft per application every two weeks. Primo MAXX is applied at a rate of 0.0625 fl oz per 1,000 sq ft. Treatments were made May 26, June 9, June 23, July 7, July 21, Aug 4, Aug 18, and Sept 1, 2016. All treatments were applied using a spray volume of 2 gallons per 1,000 sq ft. Annual bluegrass was maintained at a 0.125" mowing height with clippings collected. Irrigation was applied as needed to prevent drought stress.

North -->

2	1
5	3
3	2
1	4
4	5

3	5
4	2
5	1
1	4
2	3

For details on these products…

GenNext: http://gennextbiotech.com/product/complete-ab/
Wilbur-Ellis: http://ag.willburellis.com
Anderson's: http://www.andersonsinc.com/

Biostimulant and Synthetic Fertilizer Combinations for Annual Bluegrass

Brian McDonald and Alec Kowalewski
Department of Horticulture, Oregon State University

Objective: Evaluate the effects of an organic fertilizer supplement (WISErganic; 3-0-1) when applied with traditional synthetic fertilizer (28-5-18).

Treatments:

1. Anderson's 28-5-18 at 0.1 lbs N per 1,000 sq ft
2. Anderson's + WISErganic (3-0-1) at 6 fl oz per 1,000 sq ft
3. Anderson's + WISErganic at 12 fl oz per 1,000 sq ft
4. Anderson's + WISErganic at 24 fl oz per 1,000 sq ft

All treatments were applied every two weeks. Anderson's 28-5-18 was applied at 0.1 lbs N per 1,000 sq ft with and without WISErganic (3-0-1). WISErganic was applied as a tank mixture with the synthetic fertilizer at three different rates (6, 12 and 24 fl oz per 1,000 sq ft) every two weeks. Treatments were made on June 2, June 16, June 30, July 14, July 28, Aug 11, and 25. Treatments were applied as a tank mixture with a spray volume of 2 gallons per 1,000 sq ft. Annual bluegrass was maintained at a 0.125" mowing height with clippings collected. Irrigation was applied as needed to prevent drought stress.

South -->

X	3
2	1
X	X
4	2
1	X
3	4

X	3
1	4
4	X
3	2
X	X
2	1

For details on these products…

WISErganic: http://wiserg.com
Anderson's: http://www.andersonsinc.com/

Exhibitors

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Alexis Wenker	OTF and OGCSA	503-344-6535	ogcsa@ogcsa.org
Britton (Bo) Lacy	Barenbrug USA	509-628-6550	brittonlacy@gmail.com
David Phipps	Golf Course Superintendents Association	800-472-7878	dphipps@gcsaa.org
Ed Price	Andersons Inc.	509-981-9077	ed_price@andersonsinc.com
Elyssa Trejo	Dow Agro Sciences LLC	541-224-4632	eatrejo@dow.com
Frank Zamazal	GenNext	650-333-5637	frankz@gennextbiotech.com
Katie Fast, and Scott Dahlman	Oregonians for Food and Shelter	503-370-8092	
Mark Willcut	Rainbird Company	503-798-7203	mwillcut@rainbird.com
McKayla Fricker, and Nick Layton	Pure Seed, and Pure-Seed Testing	503-702-2414	nlayton@pureseed.com
Rennie Ku	AMVAC Environmental Products	360-921-8091	RennieK@amvac-chemical.com
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Tom DeArmond	Oregon Turf & Tree Farms	503-710-4030	tom@oregonturfandtree.com
Tony Lasher	Target Specialty Products	503-252-2732	tony.lasher@target-specialty.com

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Oregon Golf Association	WISErg Corporation

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Micah Gould	OGCSA - Martin
Evan McFadden	OGCSA Scholarship
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