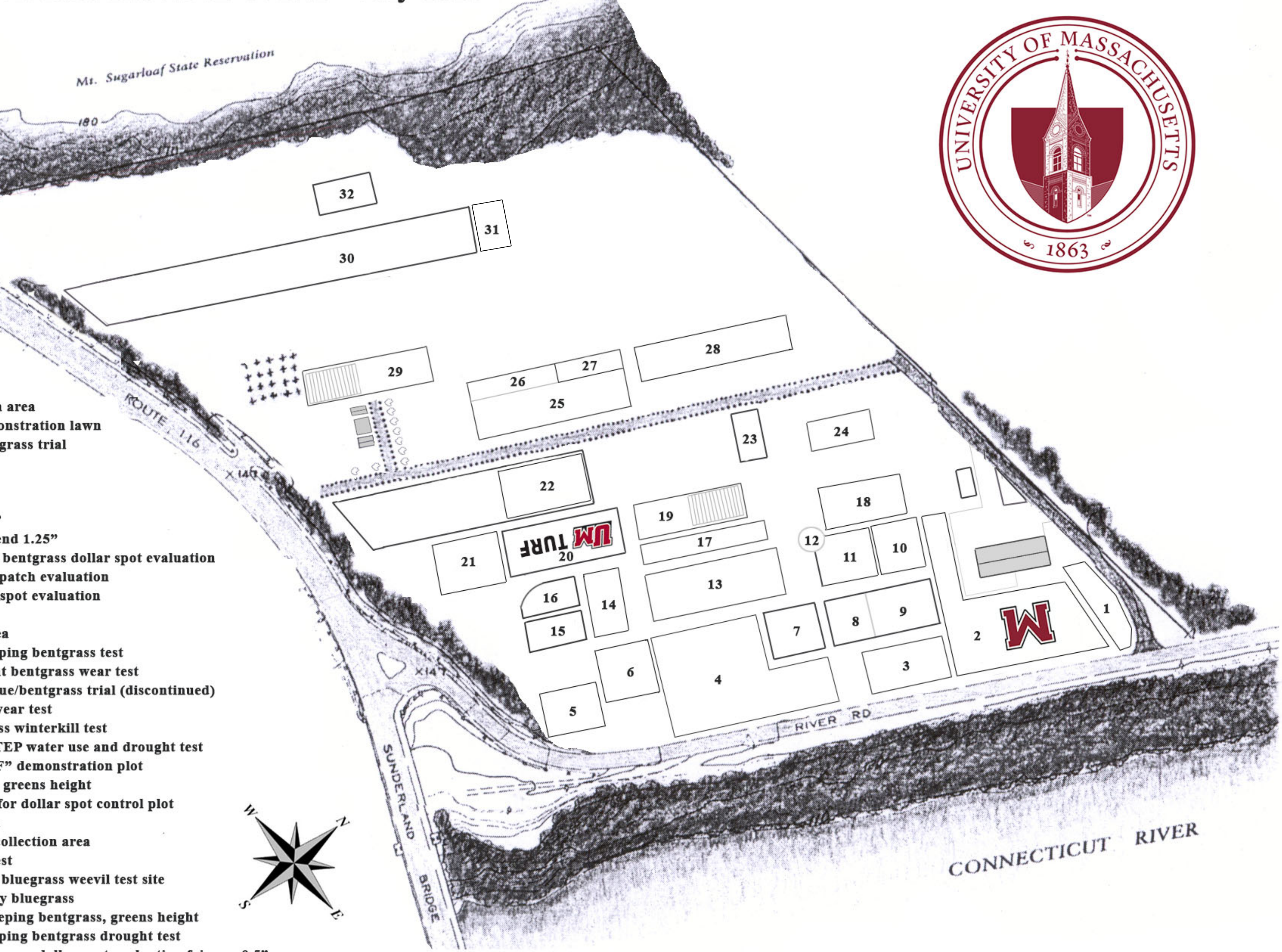
UMass Joseph Troll Turf Research Center - July 2023



1 – Pollinator habitat demonstration area
2 – Tall fescue three-way blend demonstration lawn
3 – Ebdon 2022 NTEP perennial ryegrass trial
4 – Ebdon et al. grass tennis courts
5 – Native soil *Poa annua* green
6 – Kostromytska white grub trial
7 – Ebdon 'Padre 2' tall fescue 1.25"
8 – Perennial ryegrass three-way blend 1.25"
9 – Jung et al. 'Mackenzie' creeping bentgrass dollar spot evaluation
10 – Jung colonial bentgrass brown patch evaluation
11 – Jung creeping bentgrass dollar spot evaluation
12 – Weather station
13 – Kostromytska billbug study area
14 – 2021 NTEP fairway height creeping bentgrass test
15 – Ebdon 2020 NTEP greens height bentgrass wear test
16 – DaCosta "ScanGreen" fine fescue/bentgrass trial (discontinued)
17 – Ebdon 2020 NTEP fine fescue wear test
18 – DaCosta 2022 perennial ryegrass winterkill test
19 – DaCosta/Ebdon 2022 USGA/NTEP water use and drought test
20 – Kentucky bluegrass "*UM* TURF" demonstration plot
21 – 'Memorial' creeping bentgrass, greens height
22 – Jung et al. combined practices for dollar spot control plot
23 – Constructed wetland wash area
24 – Kostromytska bent/*Poa* insect collection area
25 – Ebdon 2018 NTEP tall fescue test
26 – Kostromytska bent/*Poa* annual bluegrass weevil test site
27 – Kostromytska 'Rubix' Kentucky bluegrass
28 – DaCosta/Jung 'Pure Select' creeping bentgrass, greens height
29 – 2021 NTEP fairway height creeping bentgrass drought test
30 – Jung 'Penncross' creeping bentgrass dollar spot evaluation fairway 0.5"
31 – Prostak weed control demonstration plot
32 – Former Clark et al. vegetative filter strips research

Turf Program

SPECIAL THANKS TO OUR 2023 TURF RESEARCH FIELD DAY SPONSORS!

Elite Level

Premier Level

Standard Level

THE 2023 UMASS TURF RESEARCH FIELD DAY

Welcome to the 2023 UMass Turf Research Field Day… thanks for joining us!

Here is today's program:

6:15-8:15 Exhibitor Check-In & Set-Up

8:15-9:30 Attendee Check-In – Continental Breakfast – Trade Show & Networking – Equipment Demos

9:30 Welcoming Remarks

9:45 Featured Research Presentation Tour *– 2 pesticide contact hours –*

- **Glufosinate as a Glyphosate Alternative for Turf Renovation** - *Randall Prostak, M.S, Extension Specialist, Weed Management*
- **Effect of Urea on the Reduction of Dollar Spot Inoculum** - *Dr. Geunhwa Jung, Professor, Turf Pathology*
- **Pesky Pythium: Biology and Management** - *Dr. Angela Madeiras, Educator and Diagnostician, UMass Extension Plant Diagnostic Lab*
- **Selecting Bentgrasses for Fairway Water Conservation** - *Dr. Michelle DaCosta, Professor, Turf Physiology*
- **Winter in July: Turfgrass Selection for Better Winter Survival** - *Dr. Masoud Arghavani, Visiting Scientist, DaCosta Lab*
- **Synergistic Effects of Fungicide Combinations for Dollar Spot Control** - *Xiaojing Shi and Soonhong Min, Graduate Students, Jung Lab*
- **Turfgrass Selection the Easy Way: A New Tool for Using NTEP Data** – *Dr. Scott Ebdon, Professor Emeritus, Turf Agronomy*
- **The Billbug Complex in New England: Management & Phenology** - *Dr. Olga Kostromytska, Extension Assistant Professor, Turf Entomology*
- **Pairing Pollinator Habitats and Turf Areas: Can They Co-Exist?** - *Jason Lanier, M.S, Extension Specialist and Team Leader, Turf Management*
- **Use of Chemical Activators and Plant Health Products to Improve Turfgrass Stress Tolerance** – *Jefferson Lu, Graduate Student, DaCosta Lab*

12:15 Educational Program Wrap-Up – Pesticide and Professional Credits Awarded

12:30 Festive Cookout Lunch – Trade Show & Networking

FIELD DAY STOP #2

Glufosinate as a Glyphosate Alternative for Turf Renovation

Randy Prostak[1] and James Poro[2]

[1]UMass Extension Weed Specialist and [2]Superintendent, Turf Research Center Joseph Troll Turf Research Center

In recent years, turf and landscape professional have occasionally moved away from the use of glyphosate. This shift away from the non-selective herbicide glyphosate is largely a result of perceived health risks associated with this molecule. The non-selective herbicide glufosinate is suggested as a one-to-one replacement. This field stop will discuss the similarities and differences between glyphosate by way of a turf renovation demonstration.

Turf seed

Green Wave New Century Rye Blend, with Bio-Surge,

Supplier: Atlantic Golf and Turf, LLC

Grand Slam GLD	34.81%
Man O' War	34.61%
Overdrive 5G	29.79%

Herbicides

Product	Active ingredient	Formulation	Manufacturer	Justification of rate
Ranger Pro EPA:524-517 Supplied by Valley Green	glyphosate	4 lbs ai/gallon	Bayer	turf renovation rate in quarts per acre based on target species: creeping bentgrass - 1.5 qts; Kentucky bluegrass - 2; white clover- 3 to 5; dandelion - 3-5; tall fescue - 1 to 3; quackgrass - 2 to 3; orchardgrass - 2.
Cheetah Pro EPA: 72182-82-2 Supplied by Atlantic Golf and Turf	glufosinate-ammonia	2.34 lbs ai/gallon	Nufarm	highest broadcast label rate

Demonstration plot map

GLUFOSINATE Cheetah Pro - 82 fl. oz./A 1.5 lbs. ai/A outlined in YELLOW.		**GLYPHOSATE** Ranger Pro - 3 qts./A 3 lbs. of glyphosate/A outlined in RED.		**UNTREATED** outlined in WHITE.	
Glufosinate-killed turf removed with sod cutter and seeded following hollow-tine aeration.	Overseeded into glufosinate-killed turf.	Glyphosate-killed turf removed with sod cutter and seeded following hollow-tine aeration.	Overseeded into glyphosate-killed turf.	Untreated turf removed with sod cutter and seeded following hollow-tine aeration.	Overseeded into untreated turf.

Comparison of the characteristics of glyphosate and glufosinate

Herbicide	WSSA Group	Translocation	Soil active	Mobility & leaching potential	Mechanism of-action
Glyphosate	9	Strongly translocated in the symplast with accumulation in underground tissue, immature leaves, and meristems.	No, strong adsorption with no phytotoxicity with soil applications. Crops can be seeded or transplanted immediately into treated areas.	Low mobility due to strong adsorption to soil.	See 1 below.
glufosinate	10	Translocation in xylem and phloem is limited.	No, Crops can be seeded or transplanted immediately into treated areas	Highly mobile in soil. Despite high leaching potential never been found below 15 cm, presumably due to rapid microbial degradation.	See 2 below.

1. Glyphosate mechanism of action: inhibit 5-enolpyruvylshikimate-3-phosphate (EPSP) synthase which produces EPSP from shikimate-3-phosphate and phosphoenolpyruvate in the shikimic acid pathway. EPSP inhibition leads to depletion of the aromatic amino acids tryptophan, tyrosine, and phenylalanine, all needed for protein synthesis or for biosynthetic pathways leading to growth.

2. Glufosinate mechanism of action: inhibit activity of glutamine synthetase, the enzyme that converts glutamate and ammonia to glutamine. Accumulation of ammonia in the plant destroys cells and directly inhibits photosystem I and photosystem II reactions. Ammonia reduces the pH gradient across the membrane which can uncouple photophosphorylation.