


MICHIGAN STATE UNIVERSITY

Turf 101


Dr. Trey Rogers
Michigan State University

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- Artificial Turf
- Sand-based athletic fields

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There are relatively few new ideas, only technology to carry the original ones forward.


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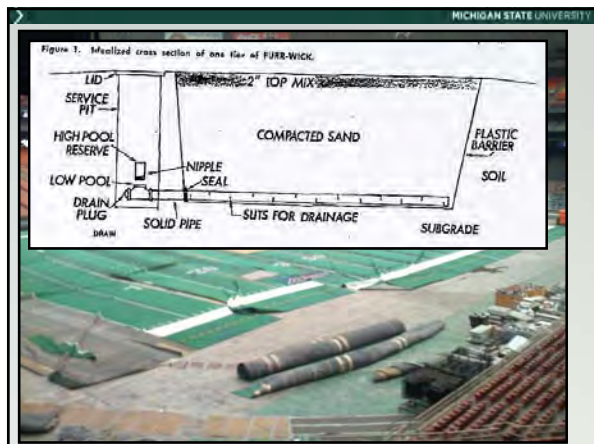


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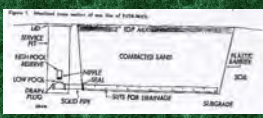


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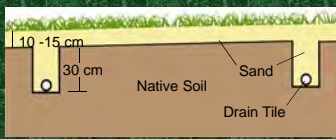
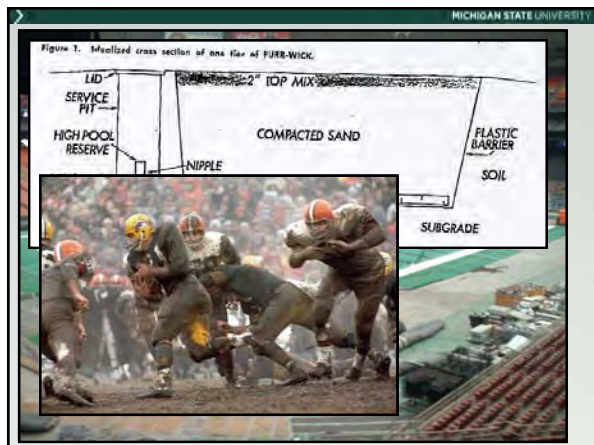




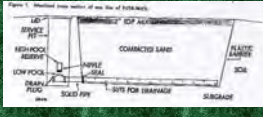
Sports Turf Field Construction




1. PAT System
2. USGA
3. Sand Cap
4. Sand Cap build up
5. ASTM Specs

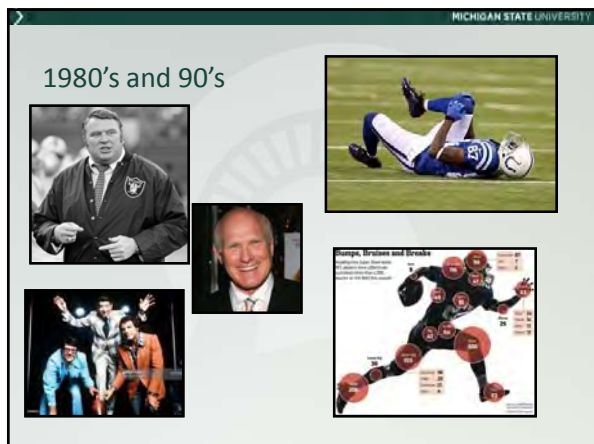
Sports Turf Field Construction



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Designation: F 2396 - 04
An American National Standard

Standard Guide for Construction of High Performance Sand-Based Rootzones for Sports Fields¹

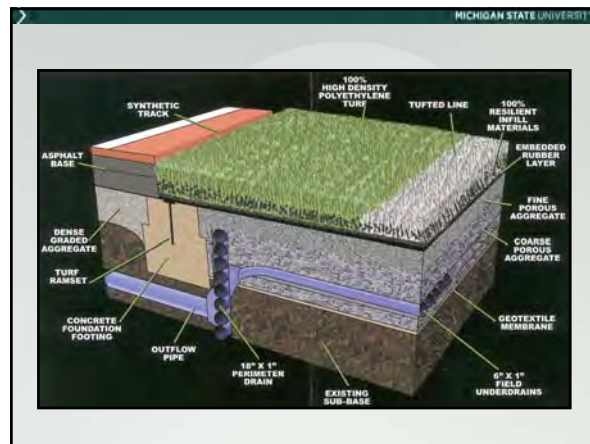


Sports Turf Research at Michigan State University - 1988-2009

- Crumb Rubber
- *Poa supina* Management
- Summer Weed Management
- Athletic Field Systems
- Root Zone Engineering
- Quantification of Cultural Practices
- Establishment Studies
- PGR
- Sand Cap Field Construction
- Organic Matter Accumulation Studies
- Sand Cap built-up systems

Sports Turf Research at Michigan State University - 1988-2009

- Summer Weed Management
- Athletic Field Systems
- Engineering of Cultural Practices
- Studies
- Construction
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Increased Complexity

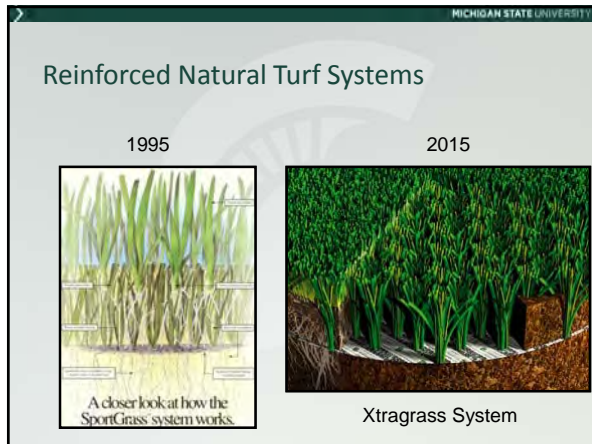
Circa 2000 – In-fill systems

What's in Field Turf?

An artificial turf field like FieldTurf is made up of plastic grass fibers held in place by up to 21 layers of different-sized cryogenic rubber particles and sand.

Source: Tarkett Co. GAZETTE

There are relatively few new ideas, only technology to carry the original ones forward.



Turf Management Cultural Practices

1. Mowing
2. Fertilizing
3. Irrigation
4. Soil Cultivation
5. Pest Management

The first three items of the list are circled in red.

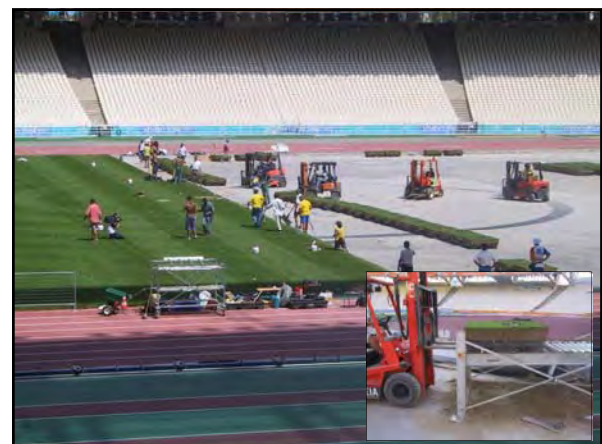
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Turf Management Cultural Practices

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All about Turf




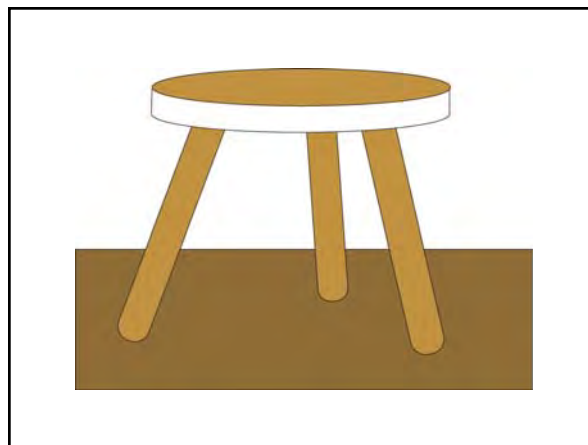
How to get through to these guys?



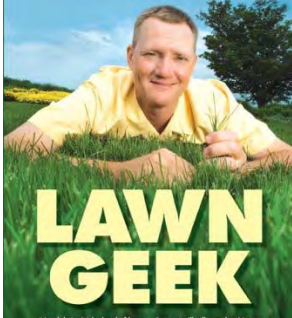
All about Turf



Briggs and Stratton's "The Yard Doctor"



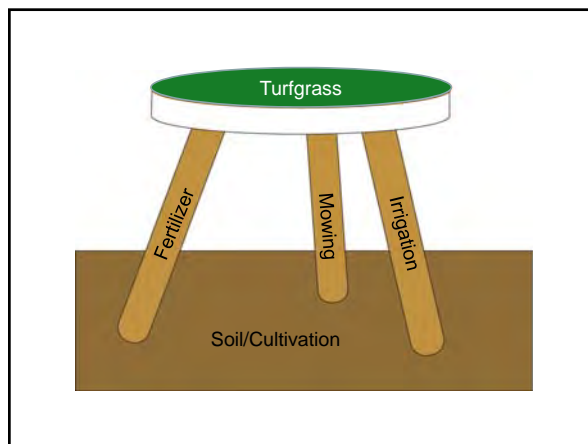
Tips and Tricks for the Ultimate Turf
from the Guru of Grass

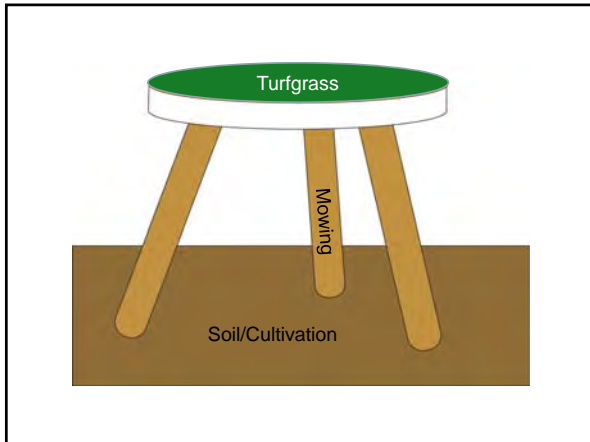



LAWN GEEK

"A celebrity in the land of lawns... Rogers will tell you that it's not that hard to have a beautiful lawn. Really." —USA Today

TREY ROGERS



Top Ten Yard Tips

1. Never cut more than one-third of the grass blade during any one mowing.
2. Alternate your mowing pattern.
3. Leave grass clippings on the lawn.
4. Control weeds while they're young.
5. Give your mower a checkup.
6. Look for a high-quality engine when buying a lawn mower.
7. Water early in the day.
8. Buy high-quality grass seed.
9. Avoid a fertilizer overdose.
10. Protect the environment while saving your lawn.




MOWING






Top Ten Turf Tips

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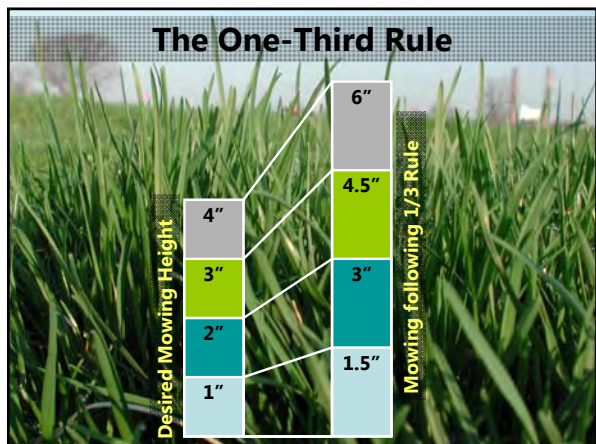
Mowing

70% of all problems in the lawn are directly or indirectly related to mowing practices

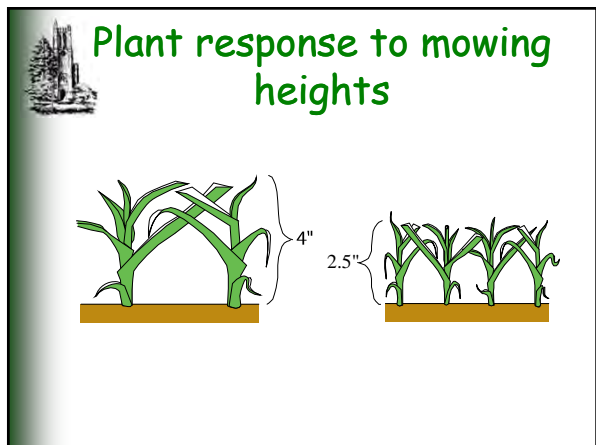


Mowing Tips

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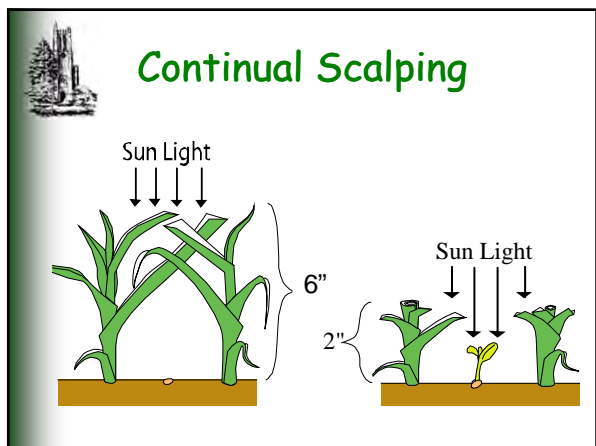


- ### Sports Turf Research at Michigan State University - 1988-2006
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Quantification of the Effect of Cultural Practices on Wear Tolerance of an Athletic Field

Lisa M. Lundberg, Graduate Assistant
Department of Crop and Soil Sciences
Michigan State University



- ### Materials and Methods
- Factor 1 = Mowing Frequency**
(Zero turn rotary; push mower)
- Level 1: Mow 1x/week at 3.8 cm (Low)
 - Level 2: Mow 2x/week at 3.8 cm (High)
- Factor 2 = Fertilization Rate and Frequency**
(Scott's 18-5-18)
- Level 1: 5 g N m⁻² @ 5 apps./yr. (Low Infrequent)
 - Level 2: 2.5 g N m⁻² @ 8 apps./yr. (Low Frequent)*
 - Level 3: 5 g N m⁻² @ 7 apps./yr. (High)

Traffic Simulation

Brinkman traffic simulator



Cady traffic simulator





50 passes made from 24 August through 15 Nov. 2000






50 passes made from 27 August through 16 Nov. 2001

Robotic Mowing??

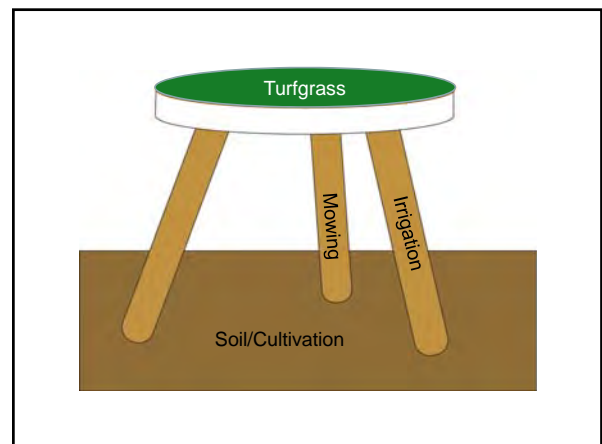
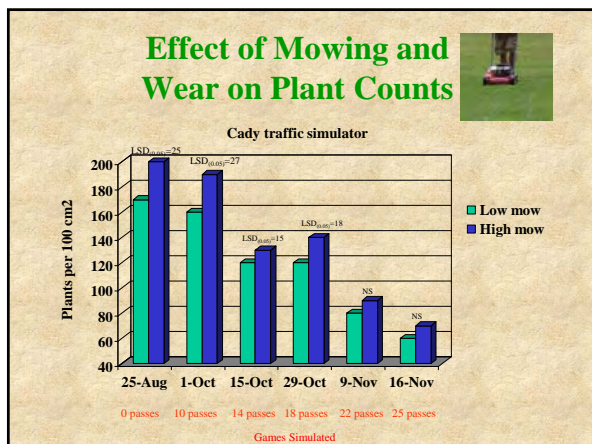



Cady Traffic Simulator

Forward ↑

Backward →



Top Ten Turf Tips

6. Look for a high-quality engine when buying a lawn mower.
7. **Water early in the day.**
8. Buy high-quality grass seed.
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10. Protect the environment while saving your lawn.



Irrigation

- **Timing**
- **Rates**
- **Coverage**
- **Efficiency**



Top Ten Yard Tips

6. Look for a high-quality engine when buying a lawn mower.
7. **Water early in the day.**
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Irrigation Rates

Water to equal 1.0 inch/week

- Lower at beginning and end of season
- All moisture counts in total



Irrigation Timing

Water early in the day

- Wind is minimal
- Sun will dry off leaves
- Greatest efficiency



Irrigation Rates

- There are far more negative consequences from over-irrigated turf compared to under irrigated turf.

Consequences of **over irrigated** turf

- Increase nuisance pests (**mosquitoes**)
- Leaching of nutrients & pesticides
- Moss
- Mushrooms
- Scald
- Scalping

Irrigation

- Check your coverage
 - 0.1 inch
 - 0.05 inch
 - 0.03 inch or less

Consequences of **over irrigated** turf

- Wet wilt
- Waste of money
- Waste of water
- Wear on heads (**nozzles**) and pumps
 - Labor cost

Irrigation


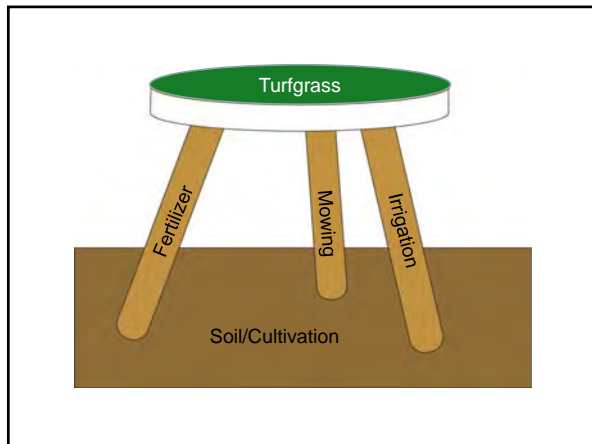
- Check your coverage

Irrigation Rates

There are far more negative consequences from over-irrigated turf compared to under irrigated turf.

Given this fact the only way anyone would over irrigate is by mistake.

Irrigation does not lie!



Fertility

- Fertilizer does not lie.




September 2007


- Fertilize



Fertilization

- Fertilizer does not lie, but people do.






Fertility

- Twice as much is rarely, if ever, twice as good.
- You can always add more, but can't take it back.

Food Pyramid


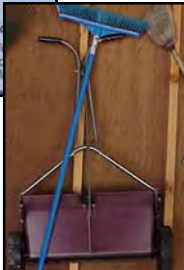


Rotary vs Drop

Scotts EasyGreen® Rotary	24-26
Scotts Drop	5-6
Precision (Red Devil) Broadcast	4-6
Precision (Red Devil) Drop	4-7
Earthway Broadcast	14-17

Applicable Pattern

Apply at half rate in two directions.

Turf Food Pyramid

Micronutrients


Macronutrients



Applicable Pattern

Apply at half rate in two directions.





Fertility

- Follow the Directions, on the back of the bag, this is science in action.
- Be wary if there are no directions on the back of the bag.



Weeds are an effect of poor quality turf, not the cause.

Materials and Methods

Factor 1 = Mowing Frequency
(Zero turn rotary; push mower)

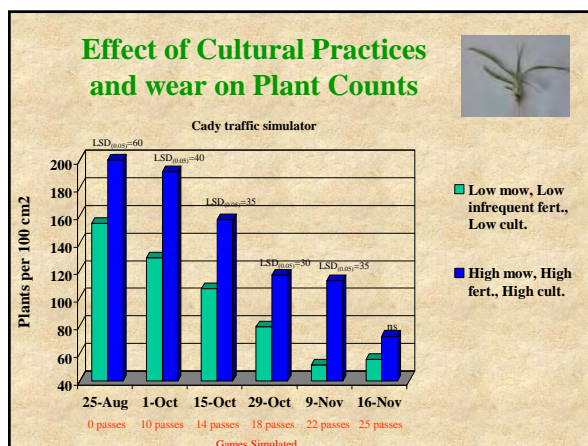
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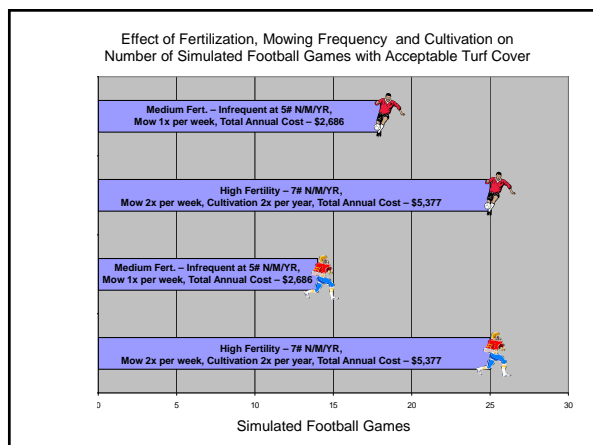
Optimizing Cultural Practices to Improve Athletic Field Performance

R. Calhoun, L. Lundberg, J. Rogers, and J. Crum
Michigan State University Extension

Bulletin E 18TURF

December 2002

You have 70 days to get a field ready during the summer time, what do you do while minimizing cost?



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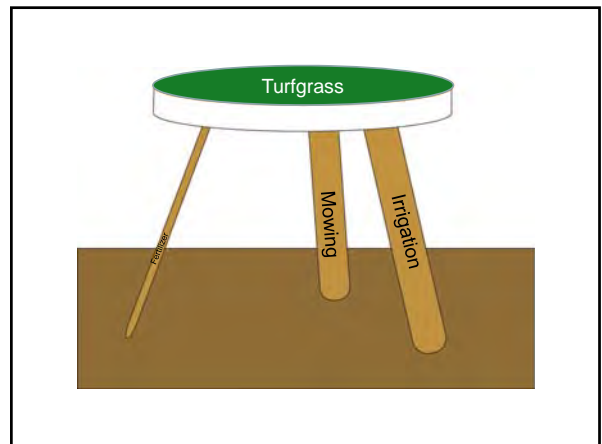
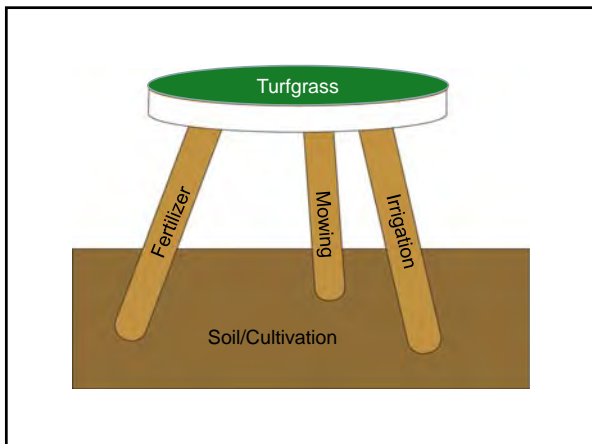
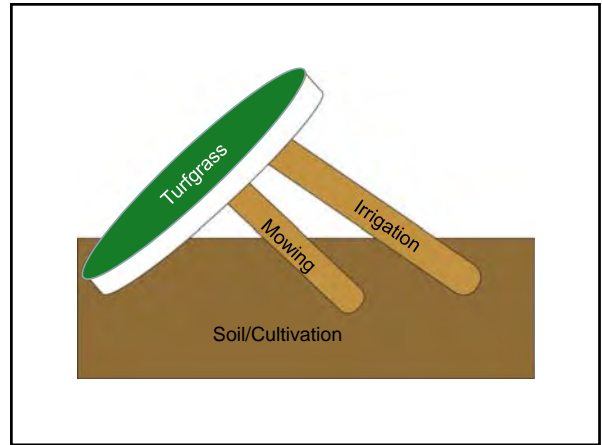
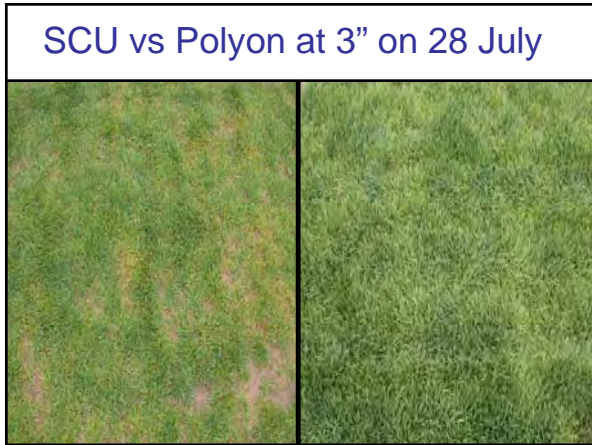
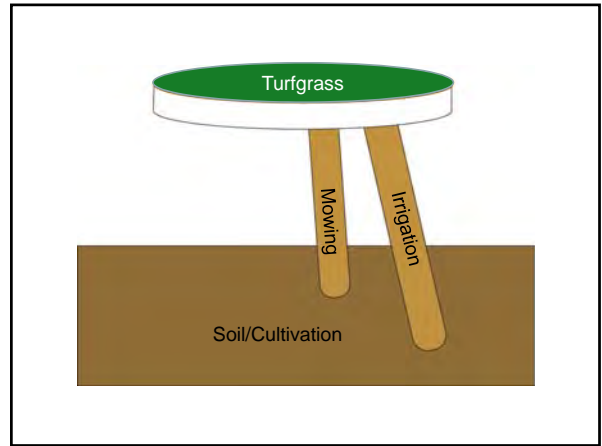
Fertility Treatments applied on May 31

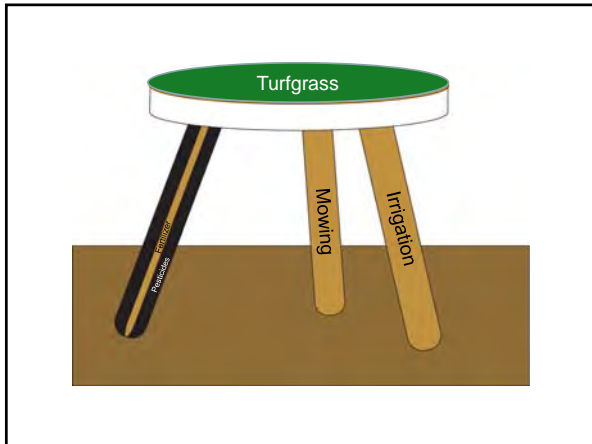
Factor B - Fertilizer -

- 1) 46-0-0 - July 1 @ 1# N/M - **Urea**
- 2) 46-0-0 - 0.33# N/M every 2 weeks - **Urea 2w**
- 3) 39-0-0 - SCU @ 3# N/M - **SCU**
- 4) 43-0-0 - Polyon @ 2# N/M - **Poly 2**
- 5) 43-0-0 - Polyon @ 3# N/M - **Poly 3**
- 6) 44-0-0 - Polyon @ 4# N/M - **Poly Thin**

13-25-12 starter fertilizer @ 1.0# N/M was also applied with the treatments

All other nutrients were applied uniformly across the treatments as needed

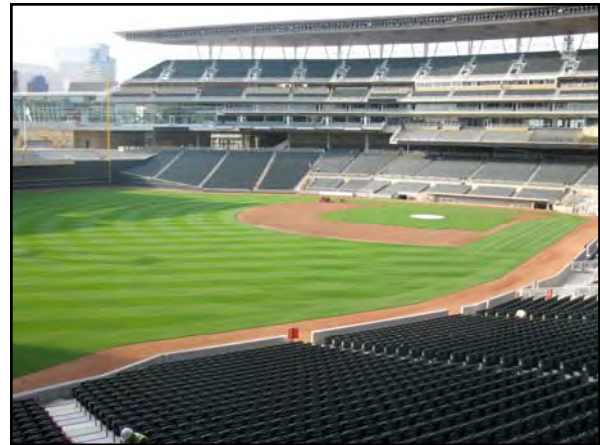
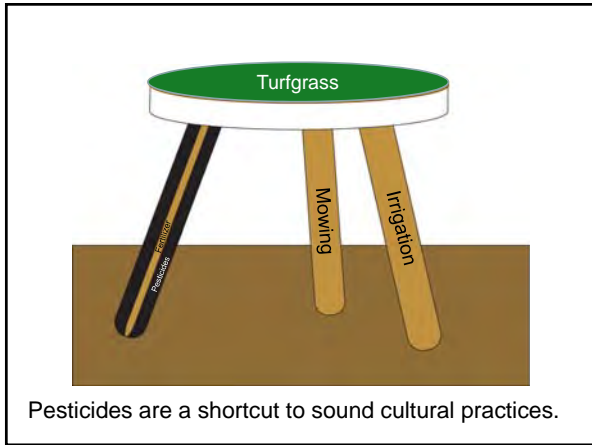




Healthy Turf - Healthy Body?

- Adequate Fluids
- Proper nutrition
- Consistent Exercise
- Watering correctly
- Proper fertilizing
- Consistent mowing/cultivation

Medicine = Pesticides



Healthy Turf - Healthy Body?

- Adequate Fluids
- Proper nutrition
- Consistent Exercise
- Watering correctly
- Proper fertilizing
- Consistent mowing/cultivation





Teams shouldn't tear up grass fields just yet. ESPN.com

- More thought needs to be put into saving grass fields. Maybe that means paying big money to the right person to nurture the field. That should be a position that's not taken lightly.

John Clayton, 15 Nov. 2002



Four Rules of Life

- Show up.
- Pay attention.
- Tell the Truth.
- Don't be attached to the outcome.



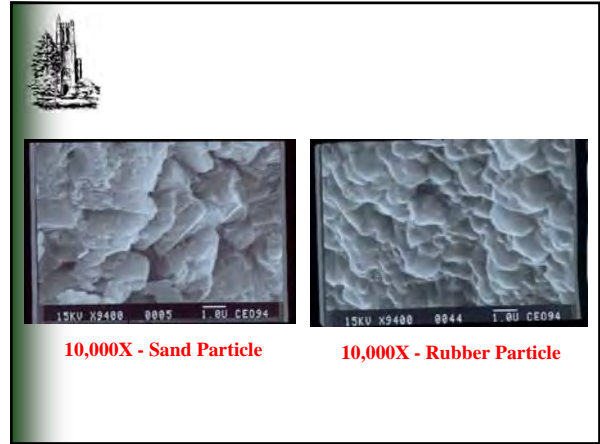

A collage featuring the Michigan State University Turfgrass Science logo, which shows a hand holding a grass seedling. Surrounding the logo are four circular images: a close-up of grass, a person working on a field, a stadium at night, and a field with a goal.



Crumb Rubber

Rubber depth, mm	% Cover Oct. 94	%Cover Dec. 94
0.0	53	42
3.8	62	51
7.6	72	63
9.5	73	66
19.1	89	88
LSD	11	14





**United States Patent:
No. 5,622,022**

“Method for reducing abrasion of turfgrass on activity fields.”

J.N. Rogers, J.T. Vanini, April 1997



Its never so bad...



...it can't get worse!