## Doing More with What You Have (Or Less) for Sports Field Management

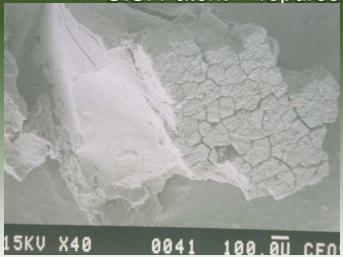
J. Tim Vanini, PhD
New Dimensions Turf (NDT)
Optimum Turf Performance (OTP)
Buffalo, NY

#### 

- Bachelor of Science –School of Agriculture
- Four-Year Varsity Letterman– Ice Hockey

#### Michigan State University

- Masters of Science 1995
  - 4 1994 World Cup
  - U.S. Patent Topdressing



## Background





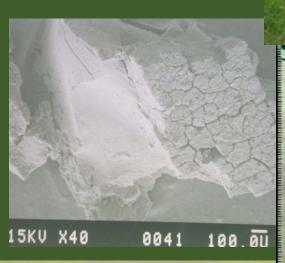




#### Research Projects

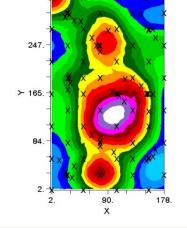
- Crumb Rubber
  - Agron. J. 90:215-221.
  - ASTM Safety in American Football - 1997 - p. 132-144.
- New Traffic Machine
   Crop Sci 47(2):780-784.
   Agron. J. 97:1153-1157.
- Scotts Roundup Ready Creeping Bentgrass
- Graden Machine
- Mowing & Fertility StudyATS-RS-07-0101
- Variety Trial Study for Sports Field Grasses
- System Study
- Geostatistics Precision

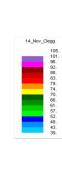
Turfgrass Management (PTM)











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Please welcome our new President for 2011



**Pete Cheswick** 

**Upcoming Events** >>>>>>>> 2 TURF RODEOS

Scenes form the November 2, 2010 meeting at Great Gardens Chief Equipment Seminar



Skaneateles High School December 30, 2010 Skaneateles, New York

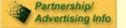
7:00 Registration, Refreshments and Early Bird Trade Show

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>>>>>>>>





### Overview

- The Fundamentals
- Cost Benefit Analysis
- Numbers used in this workshop are there for talking points – Need to do your own research - Verify
- Let's interact and share ideas

CULTURAL PRACTICES Mowing & Fertility

RESEARCH What's the latest?

Sports Field Management Philosophy

DATA
Evaluation of wear
patterns on soccer
fields, Inventory

ADMINISTRATION Who's on-board?

# Each sports field has its own "finger print" Ideally... Realistically?



### Maintenance Levels

Low (LM)

Mowing, Fertility, Seeding, Cultivation? → \$

Medium (MM)

Irrigation, Cultivation, Pest Mgt? → \$\$

High (HM)

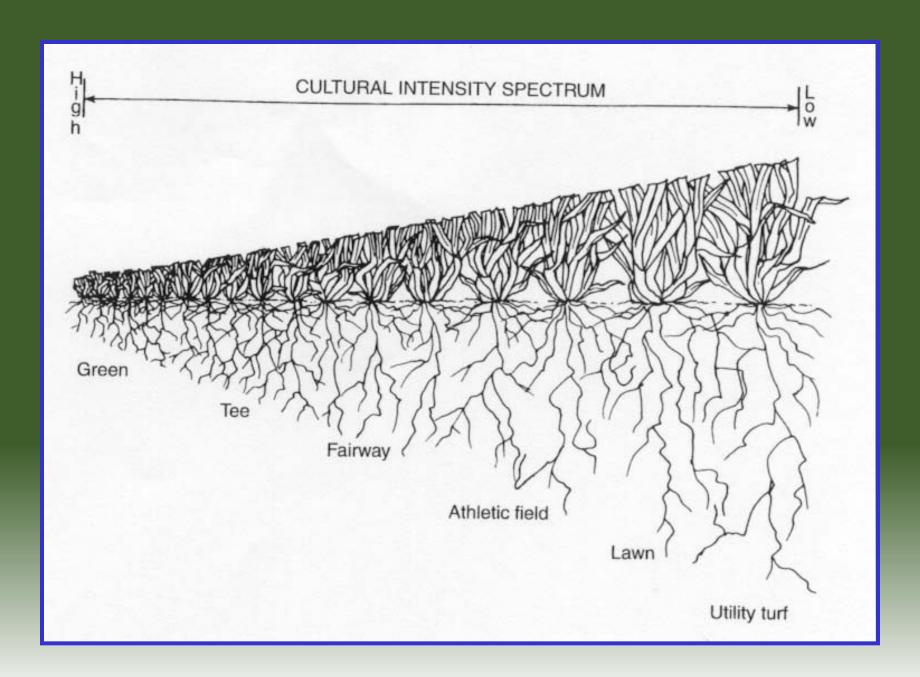
Sand Systems, Pest Mgt, Spraying → \$\$\$

### The Fundamentals

Mowing Fertility

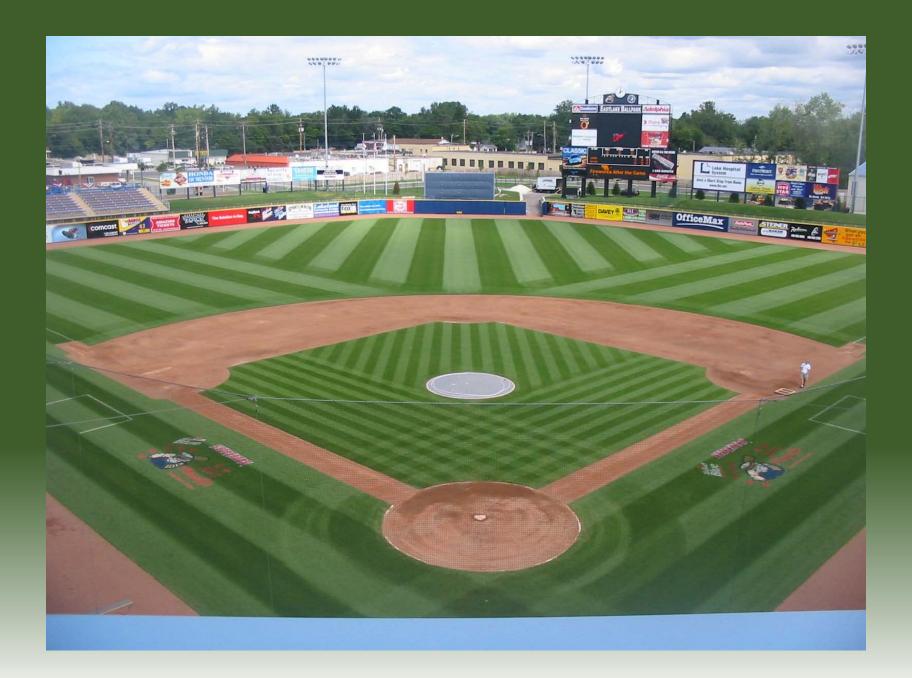
Overseeding - LM Irrigation? - MM

## Mowing

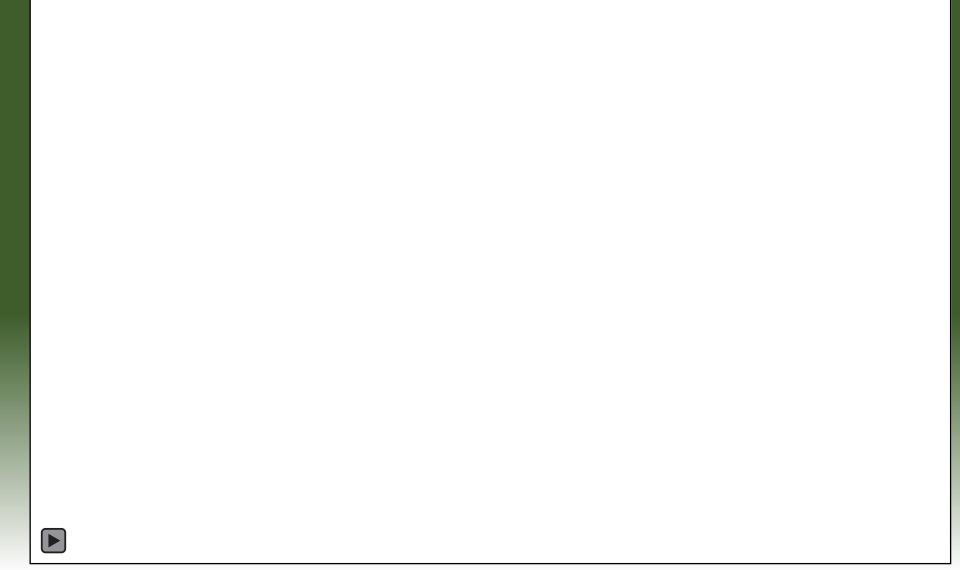


## Mowing Height

Mowing Frequency



## Mowing at The Masters...Hmm



## Mowing vs Primo

	Employee 3	20.5						
	Employee 4	16.59						
	Employee 5	23.07						
	Employee 6	9.07						
	Average	14.57						
	Not including Benefits							
	April 08 - Jun 08	550						
	2008 - 09							
	July 1 - Dec 14	Mainten.	Rink	Custodian	Total Hours	Wage/Hr	Total	%
1	Cutting Grass	423	193	259	875	14.57	12748.75	44.1
2	Weed-whipping	191	20	100	311	14.57	4531.27	15.7
3	Raking Leaves	166	14.25	17	197.25	14.57	2873.93	9.9
4	Flowers/Weeding	149	14	17	180	14.57	2622.60	9.1
5	Marking Fields	112		17	129	14.57	1879.53	6.5
6	Trees/bushes	90			90	14.57	1311.30	4.5
7	Fertilizing/Seedling	84			84	14.57	1223.88	4.2
8	Watering	39		17	56	14.57	815.92	2.8
9	1180 Amherst	38			38	14.57	553.66	1.9
10	Baseball/Softball (June)	25			25	14.57	364.25	1.3
		1317	241.25	427	1985.25			100.00
	Hourly wage	14.57	14.57	14.57	14.57			

Sports Fields	219252	Rink & Potter	Fields			
Mowing season	April 15	- Nov 15	28 weeks		Mow	2x/week
	Hrs	Times/wk				
Potter Field (\$15/mowing)	1	2	28	56		
Rink Field (\$30/mowing)	2	2	28	112	Labor/hr	Total
, , , , , , , , , , , , , , , , , , , ,				168	14.57	2447.76
Whole Campus (M+W)				1736	14.57	25293.52
, , ,				2075	14.57	30232.75
Number mowings/month	Regular	Primo				
Potter Field	8	4				
Rink Field	8	4				
Primo (\$369)			Total (oz)	\$2.88/oz	# apps.	Total
Sports Fields	0.75	220	165	475.2	7	3326.4
Whole Campus	0.75	503	377.25	1086.48	7	7605.36
Labor to apply	Hrs	Per Hour	Total	Application	Cost	
Sports Fields	4	14.57	58.28	7	407.96	
Whole Campus	15	14.57	218.55	7	1529.85	
Mowing	Hr	Mow/Week	# of weeks	Total (hrs)		
Potter	1	1	28	28		
Rink	2	1	28	56		
			Total	84	14.57	1223.88
Whole Campus				868	14.57	12646.76
	1186+550	1.75*1186			1186+550	1.75*1186
Whole Campus (w/o Primo)	25293	30240		Difference	3512	8459
	Primo	Labor	Mow	Total		
Whole Campus (w/ Primo)	7605	1529	12647	21781		

Sports Fields				
w/o	2447.76			
	Primo	Labor	Mow	Total
w Primo	3326	407.96	1223.88	4957.84

## Mowing Summary

- The importance of mowing Height vs Frequency
- Stripping Do you necessarily have to do this? Maybe more efficient by cutting in a circle.
- The budget and costs
- Primo small vs large areas or labor intensive areas

## **Fertility**

## **Essential elements** for plant growth

#### **Macro-essentials Micro-essentials**

Air / H2O	S	oil	S	Soil		
C	N	Ca	Fe	Cu		
Н	P	Mg	Mn	Zn		
0	K	S	В	CI		
			Mo	Co		

## Nitrogen



- Controlling element for turfgrass growth!
  - Chlorophyll, a. acids, proteins, nucleic acids, chlorophyll gun

  - Balanced N fertility in plant important

## All grasses are <u>NOT</u> the same when it comes to Nitrogen

Yearly N Needs **Species** Bermuda 6-12 lbs. Zoysia 2-6 lbs. Ryegrass 3-6 lbs. Bluegrass 4-6 lbs. Tall Fescue 4-6 lbs.

# How do you know if your fertility is adequate??

- Appearance of the turf
- Performance
- Soil or Tissue Test
   (conduct a soil test yearly to assess P, K, and pH)

## Tissue Testing

Submitted By:

**New Dimensions Turf** 9 Colvin Avenue Buffalo, NY 14216

Submitted For:

NEW DIMENSION TURF

Plant Information Sheet No.

028165

Laboratory Sample No.

AD29799

Date Reported: 23\_Nov\_10

Laboratory Turnaround:

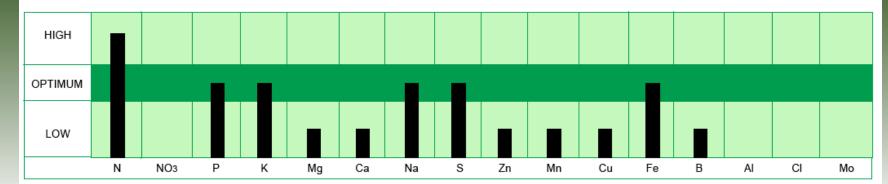
Samples Will Be Stored Until:

7-Dec-10

Date Reported.	23-1404-10	Laboratory Turnaround.	1 Day	Samples will be Stored Onlin.	1-Dec-10
Sample Marked:	EAST	Crop: TURF		Plant Part:	LEAF

	Results of Laboratory Analysis															
Laboratory	4.52		0.49	2.66	0.17	0.43	0.01	0.37	39.23	29.2	11.7	131.0	4.5	43.6		
Analysis	% Nitrogen	ppm Nitrate	% Phosphorus	% Potassium	% Magnesium	% Calcium	% Sodium	% Sulfur	ppm Zinc	ppm Manganese	ppm Copper	ppm Iron	ppm Boron	ppm Aluminum	% Chloride	ppm Molybdenum

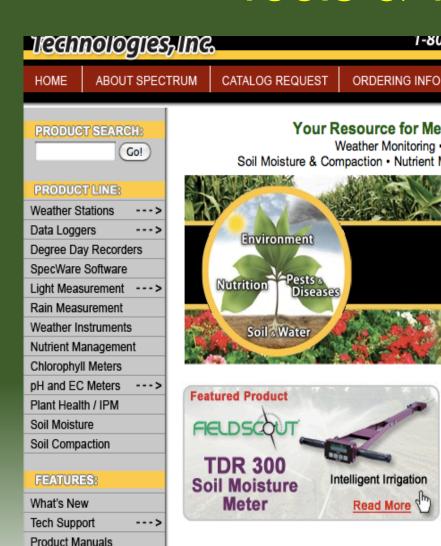
	Graphic Rating of Results Compared to Normal Ranges															
Normal	3.9		0.29	2.49	0.24	0.49	0	0.25	40	41	15	125	20	N/A		
Ranges	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to
	4.5		0.5	3.5	0.5	0.75	0.16	0.4	60	80	20	175	40	N/A		



### **Tools & Technology**

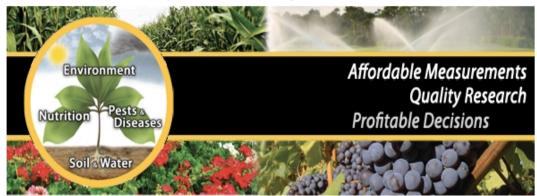
1-800-248-88/3

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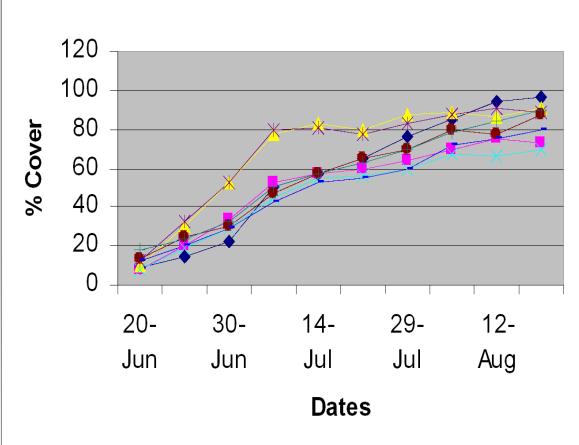


Summary of effects of mowing regimes and fertility treatments on a trafficked and non-trafficked perennial ryegrass/Kentucky bluegrass stand at the HTRC, 2003.

	6-7	Aug			3-Sep	
Treatments	Cover	Root Pull N	Cover	Shear Nm	SH/CL Nm	Pl. Counts plants/100cm <sup>2</sup>
Mowing						
3.8 cm Low	77	324	40	8	49	172
7.6 - 3.8 cm Grad.	81	368	41	8	53	166
7.6 cm Chop	73	357	37	7	51	157
LSD (0.05)	6	NS	NS	NS	NS	NS
Fertility						
	<b>7</b> 6	330	27	5	38	139
	74	383	34	7	47	163
SCU	68	305	32	7	48	172
RCU2	81	405	49	11	61	167
RCU3	92	397	66	12	70	203
RCUThin	69	278	28	4	39	145
LSD (0.05)	8	89	11	3	11	35
Games Simulated	0	0	34	34	34	34

## Establishment Study 03 Cover Ratings





– Urea - e2w - 0.5#N/M Nitroform - 4# N/M IBDU - 3# N/M SCU - 3# N/M  $\longrightarrow$  Polyon - 3# N/M Nutrismart 400 Nutrismart 600 High Nutrismart 600 Low

## Assumptions About Calculations

- Keep it simple
- Urea vs. PCU...no secondary and micronutrients.
- Re-establishment time and money is the same for both applications "Spot treating" small areas.
- Walking spreaders being used.
- Full Time Laborer making \$15/hr.

### Calculations

#### **Labor**

Product	A Labor (\$/hr)	B No. of Apps.	C Time (hr)	(A*B*C) Total
Urea	15	5	1	75
46-0-0 PCU 43-0-0	15	1	1	15

5X

#### **Product Coverage**

Product	A Rate (N/M)	B LBS/M	C No. of Apps.	Total (B*C) (#)	Coverage per 50# Bag
Urea	0.5	1.1	5	5.5	9100
46-0-0 PCU 43-0-0	3	7	1	7	7100

### Calculations

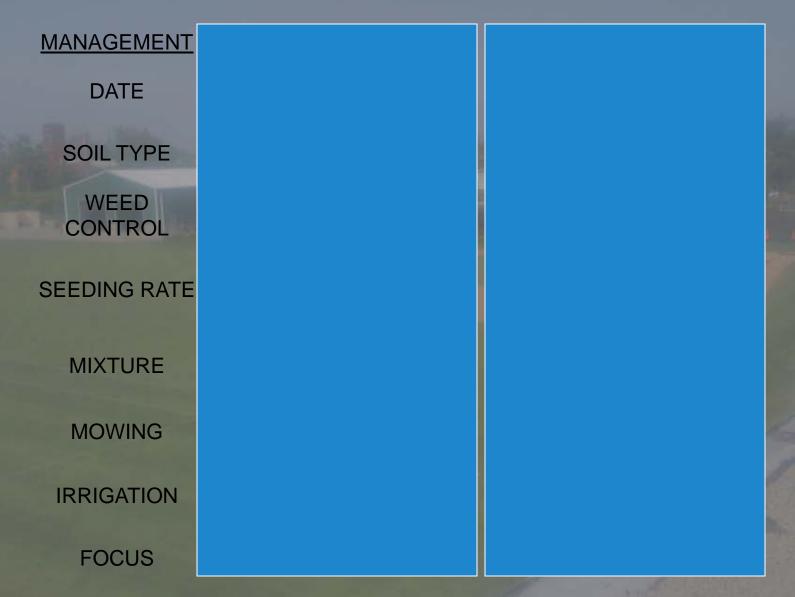
		Α	В	С	D	A+D
Area (Sq.Ft)	Product	Labor (\$)	Bags	Cost/Bag (\$)	Total (B*C) (\$)	Cost (\$)
10000	Urea	75	2	10	20	95
	46-0-0					
	PCU	15	2	30	60	75
	43-0-0					
20000	Urea	115.5	3	10	30	145.5
	46-0-0					
	PCU	22.5	3	30	90	115.5
	43-0-0					
30000	Urea	150	4	10	40	190
	46-0-0					
	PCU	30	5	30	150	180
	43-0-0					
60000	Urea	187.5	7	10	70	257.5
	46-0-0					
	PCU	37.5	9	30	270	307.5
	43-0-0					
76000	Urea	225	9	10	90	315
	46-0-0					
	PCU	45	11	30	330	375
	43-0-0					

## 3" Mowing Height on 28 July



## Gradual (@1.5")on 28 July





The common denominator was FERTILITY

## Fertility Summary

- Balance of Nitrogen the key...
- ...but the delivery system quick release vs slow release, What is the balance?
- Tissue testing can be a more "exact tool" turn around time is fairly quick.

## Effect of Fertilization and Mowing Frequency on Number of Simulated Soccer Games with Acceptable Turf Cover

High Fertility 7# N/M/YR \$705

Medium Fert. Frequent 5# N/M/YR \$535

Medium Fert. Infrequent 5# N/M/YR \$505

5



# Overseeding



### Why overseed?

#### Biomass

Grasses to consider – Annual Rye, Perennial Rye...

### Supina bluegrass

- Damp/moist, heavy, fertile soils
- Sun to shade
- \*Athletic fields; Europe also: Tees/(greens), lawns
- Medium-High
- Mowing ht: 0.5-1.5"
- Irrigation-necessary during drought
- Fungicides-prob. minimal req'ts
- Diseases: Pink snow mold, (summer patch, \$ spot)









# Maintenance Levels Other comments

#### Low (LM)

Mowing, Fertility, Seeding, Cultivation? → \$

#### Medium (MM)

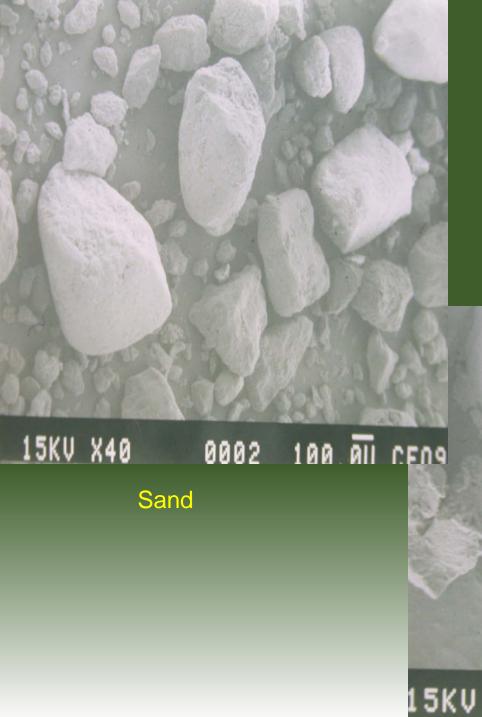
Irrigation, Cultivation, Pest Mgt? → \$\$

#### High (HM)

Sand Systems, Pest Mgt, Spraying → \$\$\$

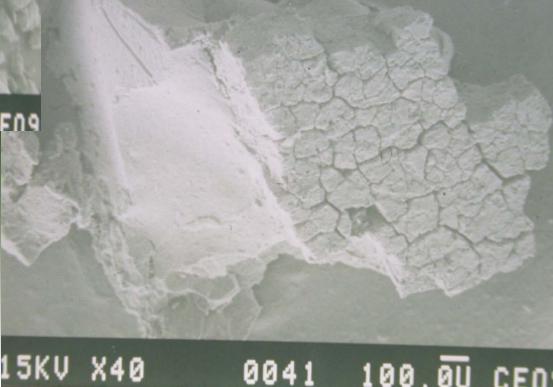
# What could be used as a "stabilizing" tool?





#### Magnification at 40x

Crumb Rubber





# Crumb Rubber

Rubber	% Cover	%Cover
depth	Oct.	Dec.
0	53	42
0.125"	62	51
0.25"	72	63
0.5	73	66
0.75	89	88
LSD		



-Vanini et al Mich St.

# Sports Turfs Species and Crumb Rubber Comparison



### Turfgrass comparison

#### Bermudagrass



**Hybrid Bluegrass** 



- Enters dormancy in early fall
- Lacks the ability to fill worn areas
- Optimal growth is spring and fall.
- Maintains growth during use.



# Sports Turfs Species and Crumb Rubber Comparison Results

Crumb rubber significantly increased wear for all species.

Tifway and Rivera Bermudagrass had the best cover early in the season.

Bluegrass caught up to dormant Tifway and Rivera at the end of the season.

Quickstand had the least wear tolerance of all species.



#### System Study – Coming in July 04

- ® Re-est. started on approx. 20 May 2003
- Seeded on 2 June
- 6 Factors
  - Grass 50:50 mixtures KB/PR or Sup/CB.
  - Fertility 2.5# N/yr vs 5# N/yr

  - Solumb rubber None vs 0.5" Rubber down by 3rd wk in July
  - Reseeding None vs 50% of seeding rate
- Traffic began 11 Aug 112 passes with BTS at end of season

### Effects of different management systems on shear resistance using repeated measures analysis at the HTRC.

-		2003	2004			
System	11-Aug	11-Nov	29-Mar	2-Jun	9-Aug	11-Nov
			Nm			
Cool/Cool 1	18.3 a	19.3 a	17.0	19.7 b	17.5 ab	0 c
Cool/Cool 2	9.0 b	17.3 a	14.7	15.0 c	12.3 c	12.3 ab
Cool/Cool 3	20.3 a	18.0 a	15.3	22.7 a	21.7 a	13.7 ab
Cool/Warm 1	21.7 a	19.3 a	18.3	16.3 c	18.7 ab	0 c
Cool/Warm 2	12.3 b	13.0 b	13.7	14.7 c	12.0 c	8.3 b
Cool/Warm 3	13.0 b	13.0 b	14.0	18.7 b	17.3 b	17.3 a
Days	1	93	232	297	365	469
No. of Passes	0	112	0	80	0	146
Accum. Passes	0	112	112	192	192	338

### Effects of different management systems on shear resistance using repeated measures analysis at the HTRC.

	2003		2004			
System	11-Aug	11-Nov	29-Mar	2-Jun	9-Aug	11-Nov
			Nm			
Cool/Cool 1	A 18.3 a	A 19.3 a	A 17.0	A 19.7 b	A 17.5 ab	D 0 c
Cool/Cool 2	D 9.0 b	A 17.3 a	ABC 14.7	AB 15.0 c	BCD 12.3 c	BCD 12.3 ab
Cool/Cool 3	ABC 20.3 a	BC 18.0 a	D 15.3	A 22.7 a	AB 21.7 a	DE 13.7 ab
Cool/Warm 1	A 21.7 a	AB 19.3 a	AB 18.3	B 16.3 c	AB 18.7 ab	E 0 c
Cool/Warm 2	AB 12.3 b	AB 13.0 b	AB 13.7	A 14.7 c	ABC 12.0 c	CDE 8.3 b
Cool/Warm 3	CDE 13.0 b	CDE 13.0 b	BC 14.0	A 18.7 b	ABC 17.3 b	ABC 17.3 a
Days	1	93	232	297	365	469
No. of Passes	0	112	0	80	0	146
Accum. Passes	0	112	112	192	192	338

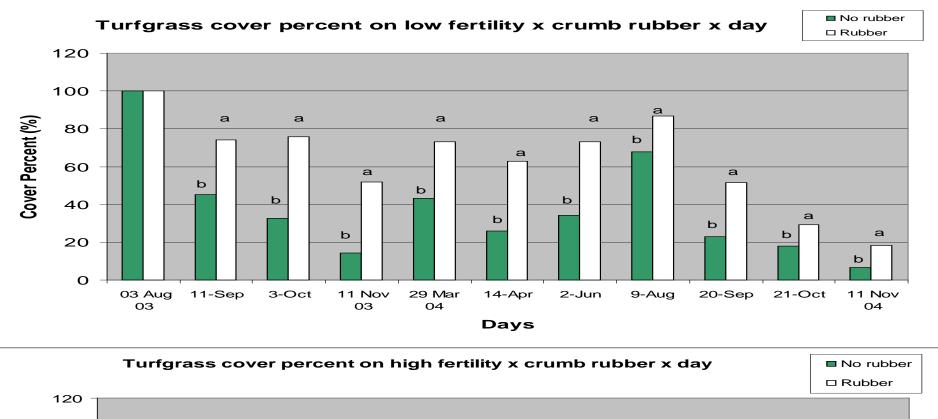
#### Effects of different management systems on shear resistanceusing repeated measures analysis at the HTRC.

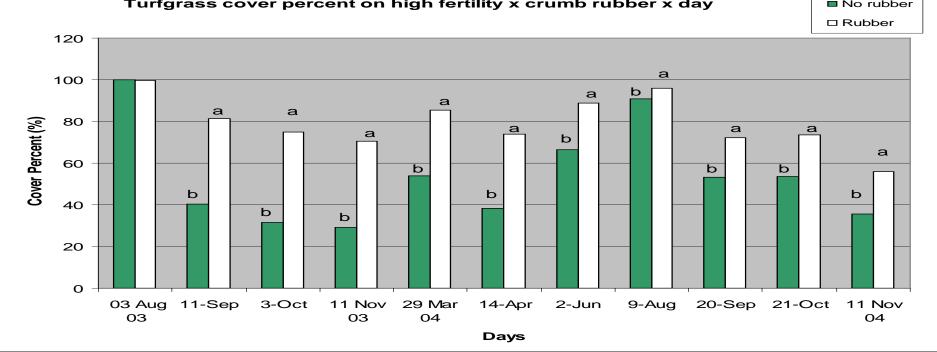
		2003				
System	11-Aug	11-Nov	29-Mar	2-Jun	9-Aug	11-Nov
			Nm			
Cool/Cool 1	A 18.3	A 19.3	A 17.0	A 19.7	A 17.5	D 0
Cool/Cool 2	D 9.0	A 17.3	ABC 14.7	AB 15.0	BCD 12.3	BCD 12.3
Cool/Cool 3	ABC 20.3	BC 18.0	D 15.3	A 22.7	AB 21.7	DE 13.7
Cool/Warm 1	A 21.7	AB 19.3	AB 18.3	B 16.3	AB 18.7	E 0
Cool/Warm 2	AB 12.3	AB 13.0	AB 13.7	A 14.7	ABC 12	CDE 8.3
Cool/Warm 3	CDE 13.0	CDE 13.0	BC 14.0	A 18.7	ABC 17.3	ABC 17.3
Days	1	93	232	297	365	469
No. of Passes	0	112	0	80	0	146
Accum. Passes	0	112	112	192	192	338

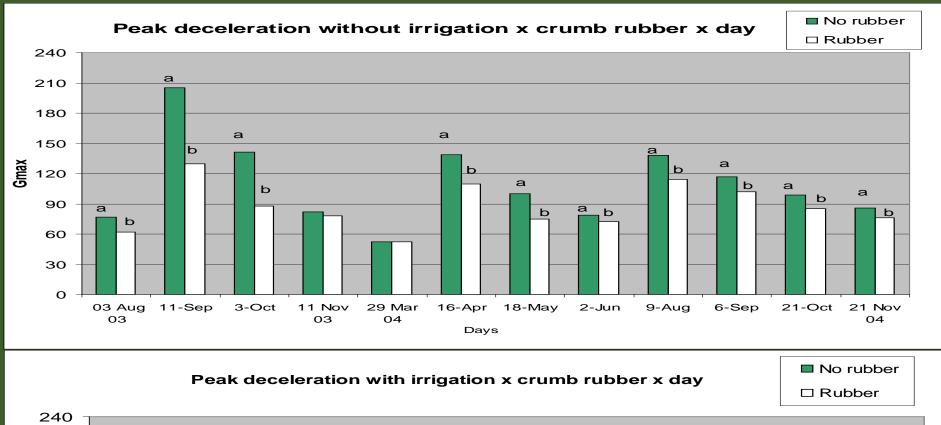
#### Effects of different management systems on plant counts using repeated measures analysis at the HTRC.

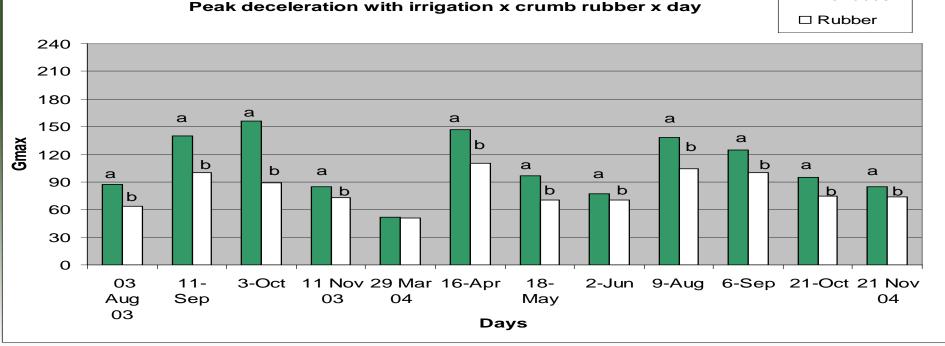
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	U	U	4

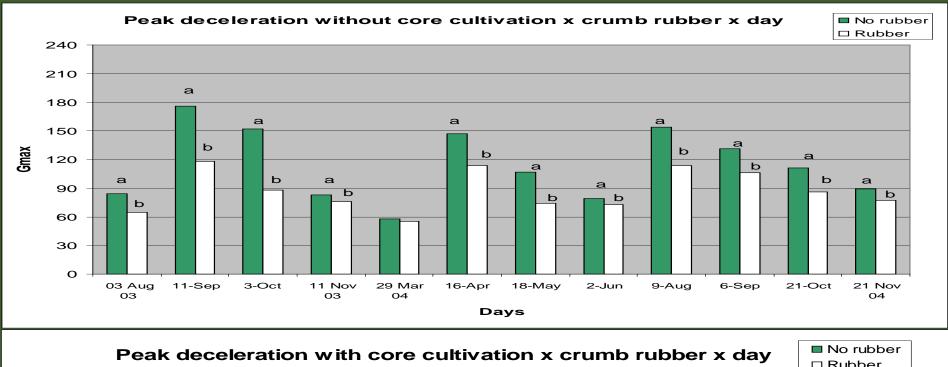
System	29-Mar	16-Apr	2-Jun	4-Aug	12-Nov
			olants * 100 (	cm <sup>2</sup>	
Cool/Cool 1	A 156 ab	B 54 bc	A 130 a	A 156 abc	B 45 de
Cool/Cool 2	A 181 a	B 83 abc	A 139 a	A 177 ab	B 83 bc
Cool/Cool 3	A 223 a	C 109 ab	B 160 a	A 215 a	C 109 ab
Cool/Warm 1	A 83 b	В 33 с	A 76 b	A 114 bcd	B 25 e
Cool/Warm 2	A 210 a	C 76 abc	B 134 a	BC 89 d	C 63 cd
Cool/Warm 3	168 a	121 a	130 a	130 bcd	139 a
Days	232	250	297	360	460
No. of Passes	0	24	80	0	146
Accum. Passes	112	136	192	192	338

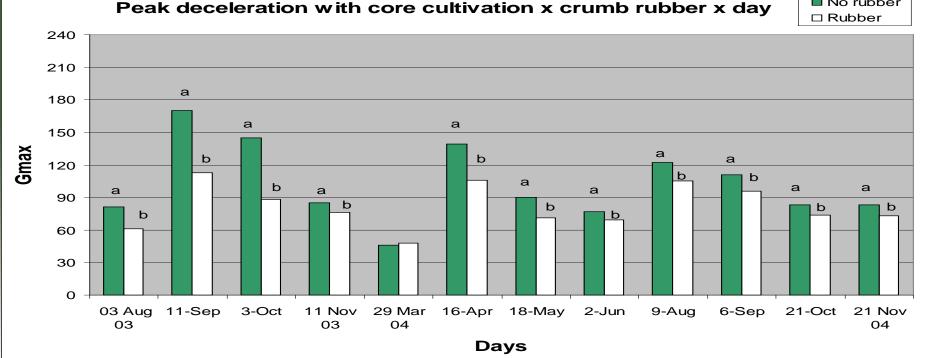








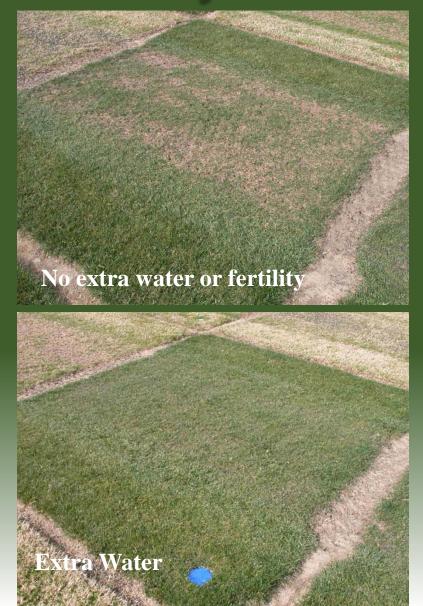








# System Study Plots





#### Effects of different management systems on turfgrass percent cover using repeated measures analysis at the HTRC.

	20	003	2004			
System	11-Aug	11-Nov	29-Mar	2-Jun	9-Aug	11-Nov
				%		
Cool/Cool 1	A 100	D 26 c	B 57 b	C 40 c	B 60 d	F 10 cd
Cool/Cool 2	A 100	D 60 a	B 87 a	BC 78 ab	B 91 ab	F 17 c
Cool/Cool 3	A 100	EF 42 b	C 67 b	CD 62 b	B 87 b	F 37 b
Cool/Warm 1	A 100	E 6 d	D 28 c	D 30 c	B 72 c	E 7 d
Cool/Warm 2	A 100	E 39 b	D 57 b	C 63 b	B 82 bc	F 18 c
Cool/Warm 3	A 100	D 45 b	BC 82 a	AB 87 a	A 99 a	D 53 a
Days	1	93	232	297	365	459
No. of Passes	0	112	0	80	0	146
Accum. Passes	0	112	112	196	192	338

#### Effects of different management systems on turfgrass percent cover using repeated measures analysis at the HTRC.

	20	003	2004			
System	11-Aug	11-Nov	29-Mar	2-Jun	9-Aug	11-Nov
				%		
Cool/Cool 1	100	26 c	57 b	40 c	60 d	10 cd
Cool/Cool 2	100	60 a	87 a	78 ab	91 ab	17 c
Cool/Cool 3	100	42 b	67 b	62 b	87 b	37 b
Cool/Warm 1	100	6 d	28 c	30 c	72 c	7 d
Cool/Warm 2	100	39 b	57 b	63 b	82 bc	18 c
Cool/Warm 3	100	45 b	82 a	87 a	99 a	53 a
Days	1	93	232	297	365	459
No. of Passes	0	112	0	80	0	146
Accum. Passes	0	112	112	196	192	338

Means preceded by the same uppercase letter (within rows) and means followed by

the same lowercase letters (within columns) are not significantly different at p > 0.05

#### Effects of different management systems on turfgrass percent cover using repeated measures analysis at the HTRC.

	20	003	2004			
System	11-Aug	11-Nov	29-Mar	2-Jun	9-Aug	11-Nov
				0/		
Cool/Cool 1	A 100	D 26	 В 57	C 40	 В 60	F 10
Cool/Cool 2	A 100	D 60	B 87	BC 78	B 91	F 17
Cool/Cool 3	A 100	EF 42	C 67	CD 62	B 87	F 37
Cool/Warm 1	A 100	E 6	D 28	D 30	B 72	E 7
Cool/Warm 2	A 100	E 39	D 57	C 63	B 82	F 18
Cool/Warm 3	A 100	D 45	BC 82	AB 87	A 99	D 53
Days	1	93	232	297	365	459
No. of Passes	0	112	0	80	0	146
Accum. Passes	0	112	112	196	192	338

#### Costs for each system based on 80,000 ft<sup>2</sup>

Year 1	Systems					
Factors	Cool/Cool 1	Cool/Cool 2	Cool/Cool 3	Cool/Warm 1	Cool/Warm 2	Cool/Warm 3
Grass Mixture	490	490	490	3210	3210	3210
Fertility	350	350	700	350	350	700
Irrigation	0	184	184	0	0	184
Reseeding	250	0	250	1610	0	0
Core Cultiv.	0	360	360	0	360	360
Crumb Rubber	0	30000	0	0	30000	30000
Total	1090	31384	1984	5570	33920	34454

#### Costs for each system based on 80,000 ft<sup>2</sup>

Year 2 - 5	Systems						
Factors	Cool/Cool 1	Cool/Cool 2	Cool/Cool 3	Cool/Warm 1	Cool/Warm 2	Cool/Warm 3	
Grass Mixture	0	0	0	0	0	0	
Fertility	350	350	700	350	350	700	
Irrigation	0	184	184	0	0	184	
Reseeding	500	0	500	1610	0	0	
Core Cultiv.	0	360	360	0	360	360	
Crumb Rubber	0	0	0	0	0	0	
Total	850	894	1744	1960	710	1244	
Year 2-5 Year 1 5 Year Plan	3400 1090 4490	3576 31384 34960	6976 1984 8960	7840 5570 13410	2840 33920 36760	4976 34454 39430	

Costs reflect purchase of product and do not include labor except for core cultivation.

Irrigation reflects costs based on 2002 Michigan Rotational Survey

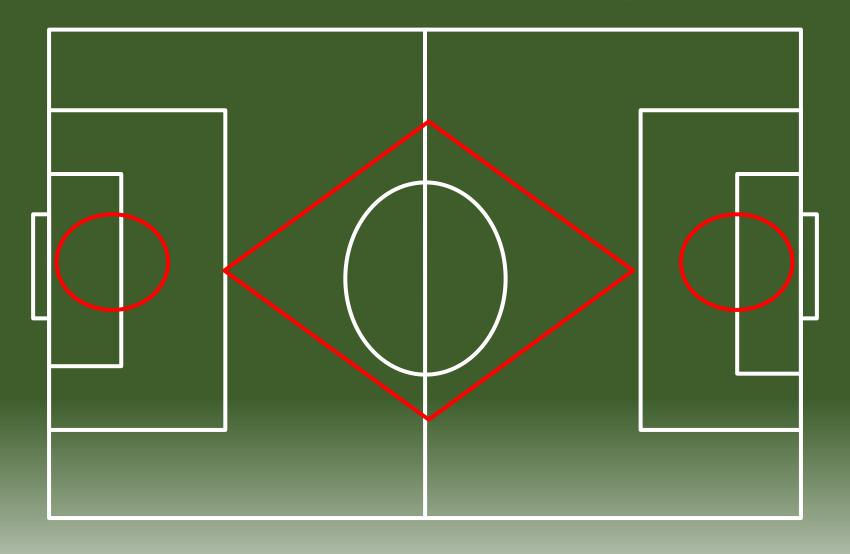
Core cultivation based on estimates from Lundberg, 2002.

#### Summary of Crumb Rubber

- Crumb rubber stabilizes the surface
- Less inputs
- Improves agronomical factors
- Safer surface
- The less the money in the budget, the more important crumb rubber is as a tool. Consider it a capital improvement or ask for a gift from the boosters.

#### Other Factors To Consider

### Think about Site Specific Management



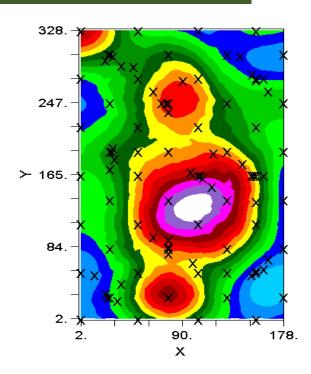
"Fingerprint"

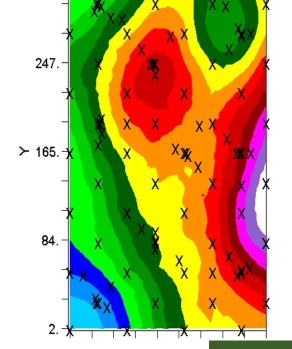


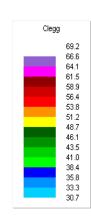
Two Local Lansing Soccer Fields

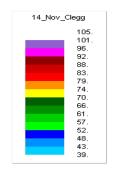
Clegg Data taken in Nov '03

Native Soils (sandy loam to loam)









	_			_		
Date	Company	Item	Units	Cost	Shipping	Total
7-Jul	Lakeside Sod	Seed (100 PR)	20	54		1080
7-Jul	Lakeside Sod	Andersons (25-5-15)	17	25.75		437.75
7-Jul	Lakeside Sod	Spreaders	2	425		850
27-Jul	Sherwin Williams	White Paint	75	5.81		435.75
27-Jul	Sherwin Williams	Yellow Paint	50	5.81		290.5
28-Jul	Harrells Fertilizer	Polyon 20-3-18	60	22		1320
1-Aug	Oasis Irrigation	Control Valve	1	233		233
4-Aug	Lakeside Sod	Supina	20	25.5		510
4-Aug	Lakeside Sod	Seed (100 PR)	20	54	40	1120
23-Aug	Atlantic Irrigation	Sprinkler Head	1	35.44		35.44
4-Aug	Sherwin Williams	Orange Spray Paint	6	3.95		23.7
11-Aug	Sherwin Williams	Orange Spray Paint	36	3.95		142.2
18-Aug	Sherwin Williams	Flex Paint Gun	1	140		140
18-Aug	Sherwin Williams	Flex Paint Gun	1	44.95		44.95
25-Aug	Grainger	Premium Reinforced Hose	2	35.3		70.6
25-Aug	Grainger	Measuring Tape	2	62.06		124.12
25-Aug	Grainger	Farm Hose	6	29.85		179.1
25-Aug	Grainger	Splitters	3	3.1		9.3
25-Aug	Grainger	Large Pistol 5 Nozzle	1	13.05		13.05
25-Aug	Grainger	Sprinklers	6	27.95		167.7
25-Aug	Gernatt Sand	Sand - 25 Tons	25	15.95	3.17	401.92
25-Aug	Sherwin Williams	White Paint	75	5.81		435.75
29-Aug	Grainger	Hose (100' x 5/8")	3	26.25	2P099	78.75
29-Aug	Grainger	Sprinklers	2	20.42	1WG46	40.84

Nichols School				
	Turfgrass	Shrub Beds	Total	Acres
Potter/Rink Fields (A)	219252	0	219252	5.03
Parking Lot (B)	18425	6645	25070	0.58
Center '63 (C)	0	0	0	0.00
Middle School (D)	35900	5475	41375	0.95
Mitchell/FPAC (E)	48300	13370	61670	1.42
Moot/Albright (F)	12000	2650	14650	0.34
Rink (G)	23763	4375	28138	0.65
Strauss/Truscott/Peek (H)	102363	4970	107333	2.46
1180 Amherst (I)	43362	3645	47007	1.08
		44400		
Total	503365	41130	544495	
Acres	11.56	0.94	12.50	
Trees				
Tunna				
<u>Trees</u> Arborvitae	109			
Arborvitae	109			
Maple	43			
Crimson King: 14				
Sugar: 13				
Nonnative: 6				
Silver: 6				
Norway: 2				
Japanese: 2				
Crabapple	33			
<u>Pine</u>	19			
Austrian - 17				
White - 2				
Spruce	14			

11-Jul	Mow		1	Tim			
13-Jul	Mow		1	Tim			
15-Jul	Seed, Fert		2	Tim			
18-Jul	Mow		1	Tim			
20-Jul	Water (2)		1	Tim			
22-Jul	Water (2), Mow		2	Tim			
27-Jul	Watered (2), spread seed (30:70)	Wet down the middle	2	Tim			
28-Jul	Mowed, Fert (18-24-12 1 #P)	Wet at north end of field	2	Tim			
1-Aug	Mowed, Fert (20-3-18 1# N)		2	Tim		Gene's Hours	
2-Aug	Water (2)		1	Gene	11.62	1	
3-Aug	Mow		1	Gene	11.62	1	
4-Aug	Mow		1	Gene	11.62	1	
5-Aug	Water(2)		1	Gene	11.62	1	
8-Aug	Mow, Water (1)		2	Gene	11.62	2	
10-Aug	Water (2)		1	Gene	11.62	1	
11-Aug	Mow		1	Gene	11.62	1	
12-Aug	Water (1)		1	Gene	11.62	1	
15-Aug	Mow		1	Gene	11.62	1	
16-Aug	Water (2)		1	Gene	11.62	1	
17-Aug	Mow, Fill in		3	Gene	11.62	3	
19-Aug	Mow, Water (1)		2	Gene	11.62	2	
22-Aug	Mow/Water (2)		2	Gene	11.62	2	
23-Aug	Fill in spots		2	Gene	11.62	2	
24-Aug	Mowed/Fill in spots	Watered (1)	3	Gene	11.62	3	
26-Aug	Mowed/Fill in spots	, ,	4	Gene	11.62	4	
29-Aug	Spread 30:60:10		0.5	Tim			
31-Aug	2.5" rain						
2-Sep	Mowed (3")		1	Gene	11.62	1	
5-Sep	Mowed/moved nets	starting to see rust on the field	1	Gene	11.62	1	
7-Sen	Put up nets	-	1.5	Gene	11.62	1.5	

	•	5 5: 11				
Peek Field	Comments	Potter Field	Comments		Football Field	Comments
6	B & G V-JV soccer	3	V & JV FH	_	0	
6	B & G V-JV soccer	3	V & JV FH	_	0	
6	B & G V-JV soccer	3 3	V & JV FH	_	0	
6	B & G V-JV soccer	3	V & JV FH		0	
6	B & G V-JV soccer	3	V & JV FH		0	
3	G V-soccer	3	V & JV FH		2	Frosh Football
Rest		Rest			Rest	
6	B & G V-JV soccer	3	V & JV FH		0	
6	B & G V-JV soccer	3	V & JV FH		0	
Rest	2.5" of Rain	Rest	2.5" of Rain		0	
Rest	Drainage	Rest	Drainage		0	
3	B - V Soccer	4	V-Tourney		2	V Football Pract
Rest		4	V- Tourney		3.5	Game Day
Rest		Rest			Rest	
2	G V-soccer	Rest			Rest	
Rest		2	V & JV FH		2	V & Frosh
3	B & G V-Soccer	3	V & JV(Game) FH		3	PE & V & F Football
3	G JV Soccer	Rest			1	Frosh Football
2.5	JV Soccer game	Rest			2.25	PE & V Foot Pract
2.5	JV Soccer game	Rest			3.5	Game Day
Rest		Rest			Rest	
					2	V & Frosh
		2	JV FH		2	V & Frosh
2	G V Soccer				2	V & Frosh
3	B V Soccer	2			2	V & Frosh
2.5	G JV Soccer	2	FH practice		1	V Football Pract

	Light	Water	Food	Color	Bare Scil	Woods	Mowing	Feel of Ground	Torrain	Intensity	Expected Quality	
	% Shade	Irrigated or Not	Fert. Apps/Yr.	Nutrient or Pest Issue	% Exposed Soil	% Non-Turfgrass	Mow Hi. (inches)	Surface Firmness	Surface Drainage	Events per day	How close to perfect?	
	1= Full Sun	1= Yes	1= 2 or more	1≡ Green	1=0-25	1=0-25	1=2 to 4.5	1=Firm	1=Adequate	1≡ 2 or less	1= No concern	
	2≡ Part shade	2≡No	2= 1	2= Evenly yellow	2= 25-50	2= 25-50	2= 1.5 to 2	3≡ Spongy	3=Some Puddling	3=2 to 4	3=Somewhat	
	3≡ Deep Shade		3≡ none	3≡ Patchy Yellow	3= >50	3=>50	3= >4.5"	5≡ Hard	5≡ Large Pools	5≡ More than 4	5≡ Ferfect	
Location					5≡ No Turf	5≡ No Turf	5=<1.5°					Total
Rose Bowl	1	1	1	1	1	1	2	1	1	1	5	16
Trumansburg Soccer?												0
												0
												0
												0
												0
												0
												0

### Now What?

11 to 20 continue current management, except if color rating 8 or bare soil rating >2

21 to 85 Reassess management program, unless quality expected is <8

## Number one challenge to managing athletic fields is CO\$T!

Costs of Managing a Bermudagrass Football Field in Tennessee

Charles R. Hall, Professor, Agricultural Economics; and John C. Sorochan, Assistant Professor; Tom Samples Professor; J. Scott McElroy, Assistant Professor; and Darren K Robinson, Associate Professor, Plant Sciences

his publication is intended to provide sports turf managers and coaches an estimate of the costs of managing an existing bermudagrass football field in Tennessee. Managing a healthy, wear-resistant football field requires routine moving and fertilization. Bermudagrass football fields are most often maintained with a reel mower set at cutting heights from 3/4 to 2 inches. Sports turfs often require more nitrogen (N), phosphorus (P) and potassium (K) than the soil can supply. Magnesium and iron applications can improve plant color. Applying calcium, a component of plant cell walls, may result in added plant strength. Sulfur, found in several proteins, may also be limiting. Fertilizing usually increases the amount of acids in soil and lowers the soil pH. Liming neutralizes these acids and increases the soil pH. Irrigation is necessary to supplement rainfall and prevent the soil from becoming too dry. Core aerifying several times during the bermudagrass growing season helps combat soil compaction. Matting (dragging) immediately after core aerifying mixes soil from acration cores with thatch. Topdressing

with sand (e.g., 1/4-inch layer) after core aerifying helps smooth the soil surface and fills aeration channels. Applying sand topdressing at least once each year may eventually improve the compaction resistance of a soil high in clay. In September, bermudagrass can be overseeded with perennial ryegrass to provide student athletes a green, actively growing turf during winter dormancy Insecticides are used, as needed, to control armyworms, cutworms, white grubs and other insects that commonly injure turf. The timely application of pre-emergence and post emergence herbicides will control troublesome broadleaf weeds and weed grasses. Although several diseases including dollar spot (Sclerotinia homoeocarpa, now known as Lanzia and Mollerodiscus spp.), leaf spot (e.g., Helminthosporium spp., now known as Bipolaris, Drechslera and Exserohilum spp.) and brown patch (Rhizoctonia spp.) can injure turf, fungicides are seldom applied to football fields. When necessary, treatments are most often made on a curative, rather than preventative basis.

**U** Extension

The Field — The football field used as an example to develop this budget is five years old and has a 12-inch crown side-to-side. The texture of the original soil base is silt loam. 'Thiway' (Tifton 419) bermudagrass was established by sprigging immediately after the automatic sprinkler irrigation system was installed. Although the turf has been core aerified and topdressed with ½-inch of sand once each year since establishment, the soil is very compacted due to extra heavy play. Bermudagrass has thinned from hashmark to hashmark. Although the thatch layer is nearly ½-inch thick along the sidelines there is very little thatch in the center of the field. Soil test results indicate a pH of 6.0, a phosphorus level of 45 pounds per acre (medium) and a potassium level of 190 pounds per acre (high). Crabgrass, goosegrass and dallisgrass are commonly observed weed grasses. Chickweed, clover, henbit and wild garlic are also becoming a problem. Last year, green June beetle larvae (white grubs) caused severe damage from the 30-yard line to the goal line on the north end of the field. Bermudagrass has been overseeded with perennial regranss for the past two years.

THE UNIVERSITY of TENNESSEE

# Costs of Managing a Bermudagrass Football Field in Tennessee

http://www.turf.tennessee.edu

http://www.turf.tennessee.edu/Bermudagrass\_mgmt.pdf

High-intensity maintenance on a 1.33 acre bermudagrass football field in Tennessee, 2005. Labor Materials Equipment Number Number Cost Cost Cost Cost per Cost Rate Cost per Maintenance activity performed of of entire entire per per per per per hour<sup>b</sup> entire hourd field field hours unit hours\* area field Late February \$44.78 gallon a. Apply post-emergent herbicide (to control chickweed, henbit & \$12.50 0.99 19.73 \$19.56 0.33 1.98 \$24.78 \$14.69 white clover) - three-way herbicide - 2,4-D (30.56%) + MCPP (8.17%) + Dicamba (2.77%) Late March 0.69 19.76 8.00 a. Apply fertilizer and pre-emergent herbicide (to control 1.38 \$12.50 \$17.21 \$13.60 \$36.52 50-lb. bag \$292.16 crabgrass & goosegrass) - 15-3-15 with Ronstar (0.63% oxadiazon) + 50% sulfur-coated urea and 1.16% ammoniacal nitrogen + 13.84% urea nitrogen Mid-May 4.00 a. Apply fertilizer and pre-emergent herbicide (to control 1.38 \$12.50 \$17.21 0.69 19.76 \$13.60 \$33.05 50-lb. bag \$132.20 crabgrass & goosegrass) - 19-3-7 with PRE-M + 30% polymer-coated, sulfer-coated urea Early June a. Remove perennial ryegrass with Revolver herbicide (2.34% 19.73 \$19.56 1.98 \$12.50 \$24.78 0.99 \$191.17 quart 0.53 \$101.56 foramsuluron) \$33.24 b. Core aerify using rotary-motion aerifier with ¾-inch \$10.00 \$34.32 1.72 19.37 3.43 diameter coring tines - 3 passes c. Topdress with medium-coarse textured sand 7.58 \$10.00 \$75.79 3.79 19.61 \$74.31 \$18.50 ton 65.00 \$1,202.50 1.25 19.37 \$24.29 d. Drag-mat to mix soil from aeration cores with thatch and 2.51 \$10.00 \$25.08 to work sand into aeration channels - 2 passes e. Apply fertilizer - 21-0-0 ammonium sulfate with 21% 1.38 \$12.50 \$17.21 0.69 19.76 \$13.60 \$13.60 50-lb. bag 4.00 \$54.40 ammoniacal nitrogen + 20% combined sulfur Late June a. Apply fertilizer - 5-10-31 with 10% iron and 3.9% \$12.50 \$17.21 0.69 \$13.60 \$23.55 50-lb. bac \$122.46 1.38 19.76 5.20 ammoniacal nitrogen + 1.1% urea nitrogen Mid-July a. Core aerify using rotary-motion aerifier with ¾-inch 1.72 19.37 \$33.24 3.43 \$10.00 \$34.32 --diameter coring tines - 3 passes b. Drag-mat to mix soil from aeration cores with thatch and \$25.08 \$24.29 2.51 \$10.00 1.25 19.37 --to work sand into aeration channels - 2 passes \$17.21 0.69 19.76 \$13.60 Apply fertilizer - 46-0-0 urea with 46% urea nitrogen 1.38 **\$**12.50 \$27.40 50-lb. bag 2.60 \$71.24 d. Apply gypsum - pelletized 20% calcium + 16% combined sulfur 1.38 \$12.50 \$17.21 0.69 19.76 \$13.60 \$15.40 50-lb. bag 6.50 \$100.10 e. Apply post-emergent herbicide (to control crabgrass & \$82.65 2.5 gallon 1.98 \$12.50 \$24.78 0.99 19.73 \$19.56 0.18 **\$**14.72 goosegrass) - MSMA 6.6 Target - 51% monosodium acid methanearsonate Late July \$24.78 \$82.65 2.5 gallon a. Apply post-emergent herbicide (to control crabgrass & goose-1.98 \$12.50 0.99 19.73 \$19.56 0.18 \$14.72 grass) - MSMA 6.6 Target - 51% monosodium acid methanearsonate \$72.72 Apply insecticide (to control green June beetle larvae, cutworms, 1.98 \$12.50 \$24.78 0.99 19.73 \$19.56 \$136.70 2.5 gallon 0.53 and armyworms) - Seven Brand SL (43% carbaryl)cutworms, and armyworms) - Sevin Brand SL (43% carbaryl)

## Summary of "Other Things"

- Collect Data number of activities (practice vs game field), pictures from the same spot, plant counts
- Work with your administrators
- Maybe you just have to "do less"
- ♦ Plan out 2 3 years at high school areas.
- Slowly introduce these items
- Have a game plan A formal proposal or Contract it out ie) OTP 2 cents/ft
- Be persistent
- Online resources

CULTURAL
PRACTICES
Mowing & Fertility

Summary

RESEARCH What's the latest?

Sports Field Management Philosophy

DATA
Evaluation of wear patterns on soccer fields, Inventory

ADMINISTRATION Who's on-board?

## Thank You

J. Tim Vanini, PhD
New Dimensions Turf (NDT)
Optimum Turf Performance (OTP)
Buffalo, NY

716 - 319 - 7495

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