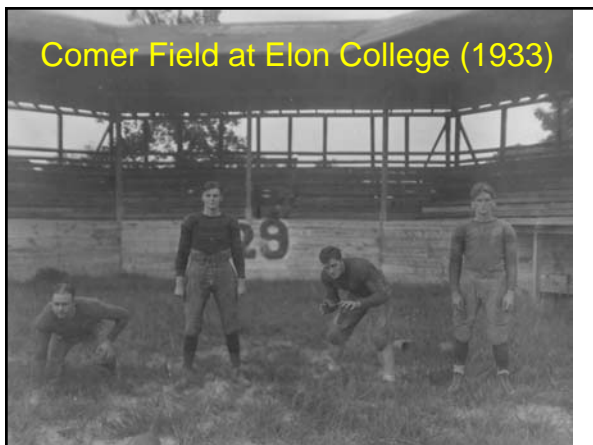


We do not want to go backwards

- ### Characteristics of Transition Zone
1. Short season for warm-season grasses
 2. Cool winters for warm-season grasses (#7)
 3. Hot summers for cool-season grasses
 4. High humidity for cool-season grasses
 5. Often use overseeded c.s. grasses on base w.s.
 6. More use of colorants for green color
 7. Dependence on bermudagrass, which is subject to winterkill in some situations.





But these issues really should not stop you from:

- Apply the best techniques given the facilities budget and equipment
- Doing them on schedule
- Documenting that you are doing so



Most Important Issues after Turfgrass Selection

1. Wear
2. Mowing
3. Fertilization
4. Weed control
5. Aerification

Situation Report

1. Constantly fighting results of poor construction
2. Constantly fighting results of overuse
3. Insufficient trained labor for tasks
4. Insufficient “useable” equipment for tasks
5. Insufficient money and resources
6. Overcome by environmental influences
7. Dealing with unreasonable expectations
8. Not knowing best “thing” to do
9. Accumulation of problems
10. Communicating the issues with “others”

TABLE 5A. TURFGRASS QUALITY RATINGS OF BERMU DAGRASS CULTIVARS 1/ GROWN AT SEVEN LOCATIONS IN THE U.S. FOR AMMI GROUP 1 **/ 2008 DATA

TURFGRASS QUALITY RATINGS 1-9; 9=IDEAL TURF 2/

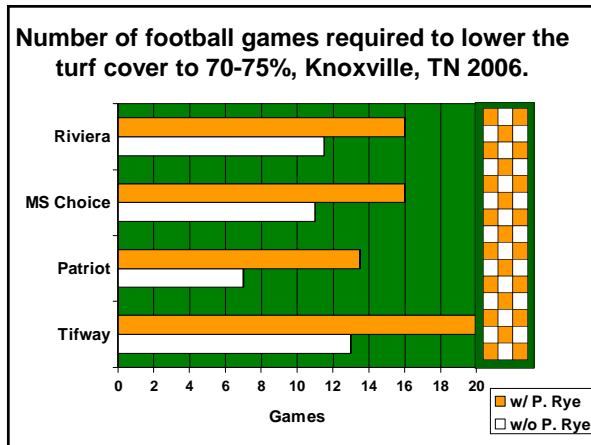
NAME	VA1	NC1	MS1	TN1	LA1	TX2	OK1	MEAN
LATITUDE 36 (OKC 1119)	6.6	8.7	7.1	7.1	7.4	6.5	6.7	7.1
NORTHBRIDGE (OKC 1134)	6.3	8.2	6.8	6.9	7.0	6.2	6.3	6.8
TIPWAY	6.1	8.2	6.8	6.9	6.7	5.8	6.4	6.7
PREMIER	6.0	8.0	6.7	6.8	6.6	5.8	6.2	6.6
PATRIOT	6.1	7.6	6.4	6.6	6.8	6.1	5.9	6.5

FIGURE 11 - TURFgrass QUALITY RATINGS OF RESEARCHER UNIVERSITIES AT RALEIGH, NC 1/17/2017

TURFGRASS QUALITY RATINGS 1-9/9 (W-BEST 2/)

NAME	MAY	JUN	QUALITY RATINGS					MEAN
			7/6	8/6	9/6	10/6	11/6	
TIFWAY (OT-1)	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
PATRIOT	5.0	6.7	6.7	7.7	7.7	7.7	7.7	7.7
TSC 2-21-18-V	6.0	7.0	6.7	7.0	7.0	7.0	7.0	7.0
11-1-1518	5.0	6.0	6.7	7.7	6.0	6.0	6.0	6.0
LATITUDE 30	5.0	6.0	7.0	7.3	4.0	5.0	5.0	5.0
OKS 1302	5.0	5.7	7.0	7.3	4.3	5.0	5.0	5.0
TSC 2-21-1-V	6.7	6.0	6.7	6.7	6.3	6.0	6.0	6.0
OKS 1311	5.0	5.7	6.0	7.3	4.3	4.7	4.7	4.7
ACTUS	4.7	5.7	6.0	6.0	5.0	4.7	4.7	4.7
PADS 1315	4.0	5.7	5.7	5.7	4.0	5.7	5.7	5.7
OKS 1313	5.7	6.0	6.3	6.7	5.0	5.7	5.7	5.7
TIFWAY	4.7	5.7	5.7	6.0	5.7	4.3	5.0	5.0
PADS 1317	4.7	5.7	5.7	6.0	5.3	4.0	4.0	4.0
REVEAL	4.0	4.7	5.7	6.7	6.0	4.0	4.0	4.0
CELEBRATION	5.7	4.0	5.7	6.3	6.0	5.3	4.0	4.0
TSC 2009-13-S	4.0	4.0	5.7	5.3	4.0	4.0	4.0	4.0
PADS 1316	2.7	4.3	6.0	6.0	4.0	4.0	4.0	4.0
11-1-1518	4.0	4.7	5.3	5.3	5.3	4.0	4.0	4.0
HRU 002	3.7	4.0	4.7	5.3	5.3	5.0	4.0	4.0
HSA 281	4.7	5.0	4.7	4.7	5.3	4.0	4.0	4.0
TSC 2009-S	3.7	4.0	5.3	4.7	5.7	4.0	4.0	4.0
OKS 2011-1	4.0	4.0	5.3	4.7	5.7	4.0	4.0	4.0
PRINCESS 77	3.0	4.0	5.3	5.0	4.0	4.0	4.0	4.0
FLORON	3.0	4.7	5.3	4.0	4.0	4.0	4.0	4.0
BAK C301	3.0	4.3	5.0	5.3	5.7	4.0	4.0	4.0
TSC 2009-S	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
OKS 2011-4	3.7	4.3	4.0	5.0	5.7	5.7	4.0	4.0
11-1-1518	3.0	3.7	4.7	5.3	5.0	4.0	4.0	4.0
TSC 2009-1-S	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
OKS 2009-S	3.0	4.0	4.0	4.7	5.7	5.7	4.0	4.0
KASHIRA (POST-BURN)	3.0	3.0	3.7	5.7	4.0	4.0	4.0	4.0
NORTH SHORE SALT	3.0	3.0	3.7	3.7	5.7	5.7	4.0	4.0
PST-ANCT	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0
REVER-LANDBA	3.0	3.0	3.0	3.7	3.0	3.0	3.0	3.0
PST-ANCT	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
LSB VALUE	5.0	6.0	5.0	6.0	5.0	5.0	5.0	5.0
S/W (S)	13.0	12.0	13.0	12.4	13.0	12.0	12.0	12.0

Practice Area Opportunities



Look for Ways To Reduce Wear

Wear - Practice Areas

Linesman Damage



Reduction of Traffic Damage

- Restrict use when soil is very wet. [Helps if defined]
- Restrict use when soil is very dry and turf is wilted.
- Always have coaches rotate heavy play areas during practices.
- Use portable goals when possible and move them around the field.
- If possible move soccer field sidelines of field during the year
- On game fields, restrict all practices to a minimum.
- Have a reduced game schedule when grass is dormant.
- Have regularly scheduled rest times that are used to repair minor damages.
- Do not allow unofficial play.
- Use tarps (covers) on bench areas to reduce severe wear by coaches and team members, and on sideline areas used by the cheerleaders.

Maximizing the Durability of Athletic Fields

Quality athletic fields begin with sound construction and careful planning, and good management practices can increase a field's durability. The more consistent the management, the longer the field will last.

Field managers can do a lot to extend the life of their athletic fields. The key is to manage the field properly. This includes proper watering, fertilization, mowing, and aeration. The amount of water is a major factor in the life of a field. Too much water can lead to disease, while too little can lead to drought stress. Watering should be done in the early morning or late evening to reduce evaporation. The amount of water should be based on soil type and field conditions. Fertilization is also important. The amount of fertilizer should be based on soil tests and field conditions. Mowing should be done regularly and at the correct height. Aeration should be done annually or bi-annually to improve soil aeration and water infiltration.

NC COOPERATIVE EXTENSION

Start with a General Management Plan

- Mowing (equipment, HOC, frequency, etc)
- Aeration (equipment, frequency, etc)
- Fertilization (products, rates, timing, etc)
- Weed Control (products, rates, timings, etc)
- Irrigation - if available (timing, amounts, etc)

Establish Yearly Usage Maxims (2 - 4 - 6 - 8 - 10 Rule)

- 200 hr or less — sustain good field conditions
- 400 - 600 — good field conditions with some thinning and localized wear areas
- 800 - 1000 — fair field conditions; expect thinning and wear
- 1000 or more — expect significant thinning, turf loss, surface damage, increased risk of athlete injury

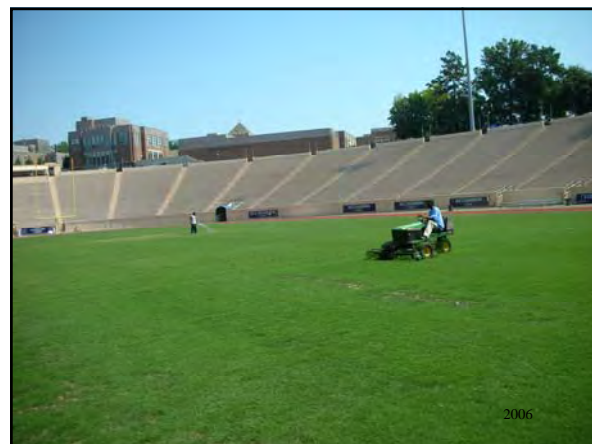
Yearly Growth Patterns of Grasses - Mowing

COOL-SEASON GROWTH CALENDAR

Shoot growth peaks in Spring and Fall. Root growth is highest in Summer and Winter.

WARM-SEASON GROWTH CALENDAR

Shoot growth peaks in Spring and Fall. Root growth is highest in Summer and Winter.



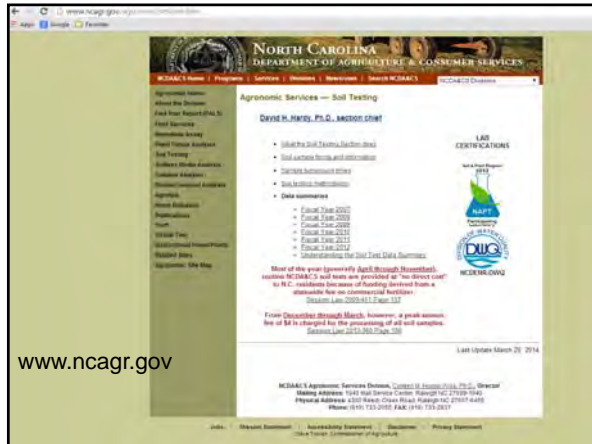
Wear: Mowing Height
Mowing Height - hybrid bermudagrass

- ✓ “Sweet Spot” ¾ to 1 ½ -inches
 - Best wear tolerance
 - Most leaves per stem
- 1 ½ to 2-inches not bad but will see
 - Shoot density decline
 - Blades more prone to wear
 - Fewer plant to recover
- ✗ > 2 – inches should be avoided
 -



Question - Fertilizer

- How do I know if fertilizer is needed?
- How do I know the best rate to use?
- How do I know when to apply it?

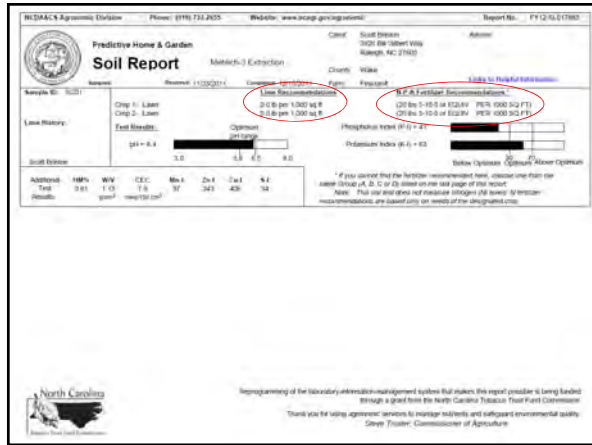


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#1 Field Maintenance Practice to Deal with High-Use Fields

Fertilizer Applications – All fields are to be fertilized every four to six weeks during the growing season with a rate of 0.75 to 1 pound of N per 1000 square feet.

- ✓ Non-nitrogen nutrients, including rates should be based on yearly soil tests.
- ✓ Treat areas of extremely high wear separately.



52 days after sprigging

1 - 1 - 1 ratio

1 - 0 - 2 ratio

Fertility

- Test soil at least every other year and adjust for phosphorus, potassium and pH.
- Gear nitrogen application schedule to grass, field use, and environmental conditions . . . and budget.
- May need to force growth and recovery in high traffic areas with additional nitrogen.

Fertilizer Math

Fertilizer A. 10-3-5 analysis at \$240 per ton
 Fertilizer B. 20-6-10 analysis at \$360 per ton

Which is cheapest?

A => (2000)(0.10) = 200# => \$240/200 = \$1.20 per #N
 B => (2000)(0.20) = 400# => \$360/400 = \$0.90 per #N

Comparison of Fertilizer Equivalents based on 5 pounds of N per year or 215 pounds per acre per year and the “per application” rates

Equivalent	Urea	Amm sulfate	16-4-8	Milorganite
Lbs fertilizer per 1000 sq ft	11	24	31	83
Pounds fertilizer per acre	470	1,050	1,361	3,630
Bags needed for one soccer field per year	20	42	56	146
Number of bags per application for field	4	8	12	29

- Involves an Integrated Approach*
- Follow Proper Cultural Practices
 - Proper Weed Identification
 - Prevention of Weed Introduction
 - *If Needed*, Use Herbicides (but know what you are doing)

Pests Control

- Weeds (broadleaf, grasses, sedges)
- Diseases
- Insects
- Mammals




Consult your state’s Pest Control Guide.
NC’s available on www.turffiles.ncsu.edu

- ### Practical Control Tips
- Use only labeled herbicides
 - Scepter vs Image
 - Folicur vs Torque
 - Get the right equipment
 - Trained applicator
 - Calibrate all equipment
 - Control weeds during the off-season or off-times



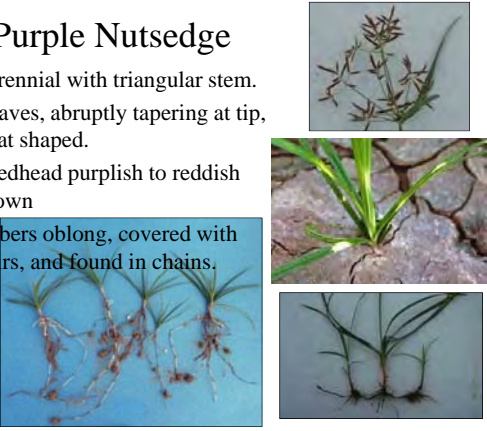
Weed Identification

- Proper weed identification and a basic understanding of growth habits/life cycles are important in understanding the biology and best control strategy.
- Send Extension Specialist Pictures!




Purple Nutsedge

- Perennial with triangular stem.
- Leaves, abruptly tapering at tip, boat shaped.
- Seedhead purplish to reddish brown
- Tubers oblong, covered with hairs, and found in chains.




Aerification



Athletic Fields - Preemergence Herbicides

- Be careful on severely damaged fields
 - Most PRE herbicides affect root development from stolon nodes
- Select oxadiazon (Ronstar or Generic version)
 - Does not affect root development from stolon nodes
- On non-damaged healthy fields numerous herbicides may be used



Aerification




- Core fields regularly
 - Low traffic – once or twice per year
 - High traffic – two to five times per year
- Use hollow tines when possible.
- Heavily compacted areas may require deep tine or shatter tine aerification.




Herbicide damage – spot treatment

Aeration Methods

- Core
- Solid Tine
- Deep Time
- Deep Drilling
- Grooving
- Slicing




Continuous Grooving



Aerification

Verti-drain: Used to break through subsurface layering and/or compaction



Establish Field Categories

- Championship
- Tournament
- Recreational

or

- Game
- Practice
- Class/Recreation

Spring Dead Spot of bermudagrass

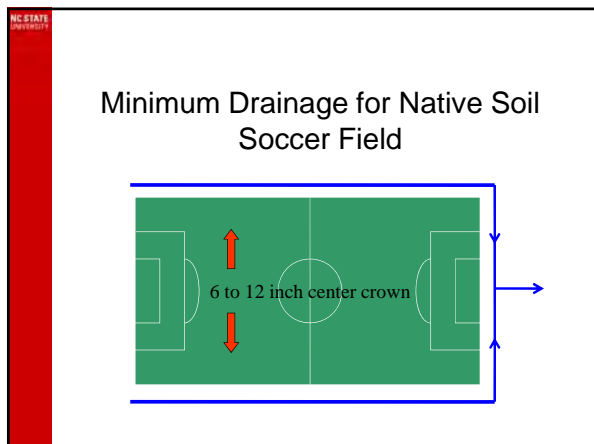


Fix problems before they get too big!

Other Tips and Observations



Drainage Problems – off the field



Ryegrass Overseeding

The problem is often not growing the grass, but getting rid of it. In transition zone, often best to remove ryegrass for optimum bermudagrass health.

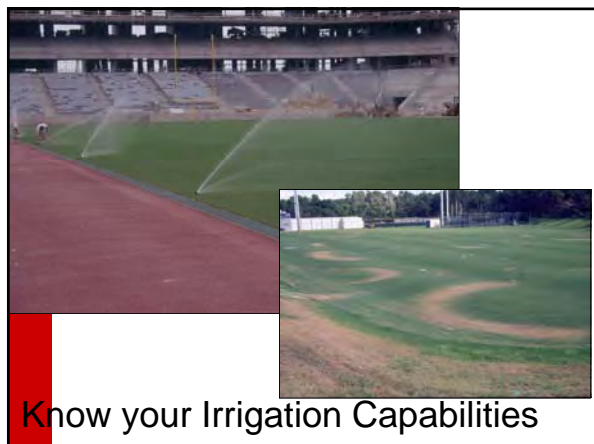
So have a plan on how you will GET RID of it.



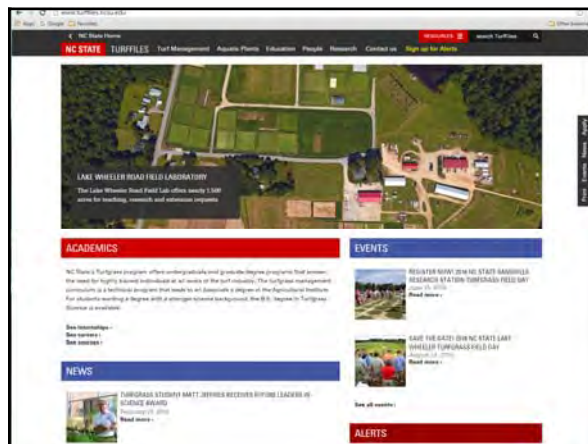
Overseed Removal Products

- Kerb (Pronamide)
- Manor [or Blade] (metsulfuron)
- TranXit GTA (rimsulfuron)
- Revolver (foramsulfuron)
- Monument 75WG (trifloxysulfuron)
- Corsair (chlorsulfuron)
- Certainty (sulfosulfuron)
- Katana (flazasulfuron)

[many of these have activity on other weeds, including broadleaf weeds]



Know your Irrigation Capabilities



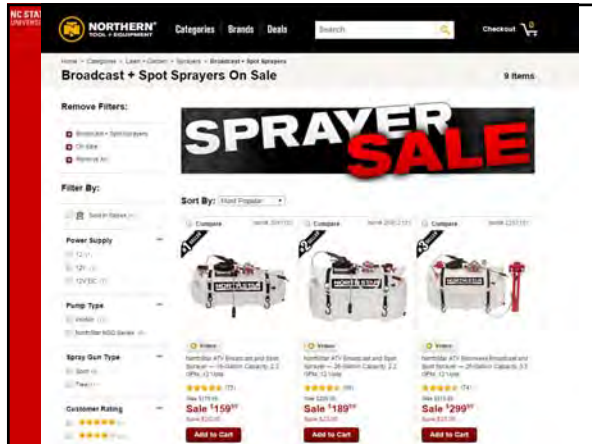
Use Signs



Publication Resources

- Where do I get Help?
- Fellow "Field Managers"
 - STMA members
 - University Extension Service
 - Other turf managers (e.g., golf course)
 - Local schools (labor, knowledge, etc)
 - Periodicals
 - Online Help
 - University sites
 - Search engines (e.g. Google.com)

Sprayers – Have One!



1/128th Acre method

- 1. Check the Nozzles for evenness
- 2. Measure nozzle spacing
- 3. Divide 340 by nozzle spacing in feet
- 4. Measure out distance from step 3
- 5. Drive that distance forward at spraying speed and time it.
- 6. Catch one nozzle for time in step 5
- 7. Ounces caught = gallons per acre

