2007 WSU Turfgrass Research Highlights

2008 THIRD ANNUAL
JCC LTD WINTER SEMINAR
JANUARY 8, 2008

"A DAY OF DISCOVERY"

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Washington State University

Overview

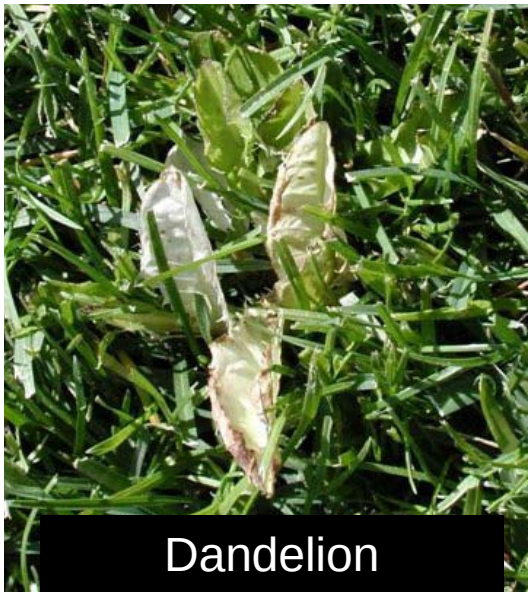
- Herbicides
- NTEP
- Fertilizers
- Wetting Agents
- Cultivar Development
- Fungicides
- Black Sand
- Puyallup-Organic Fertilizer

Projects in 2007-‘**Tenacity**’

- ‘Tenacity’ 4SC at planting of a 3-way mix
- ‘Tenacity’ impregnated fertilizer at planting
- Tenacity 4SC cultivar/species differences (bentgrass/fine leaf fescue)
- Tenacity 4SC pre-plant (greenhouse)


Black Medic

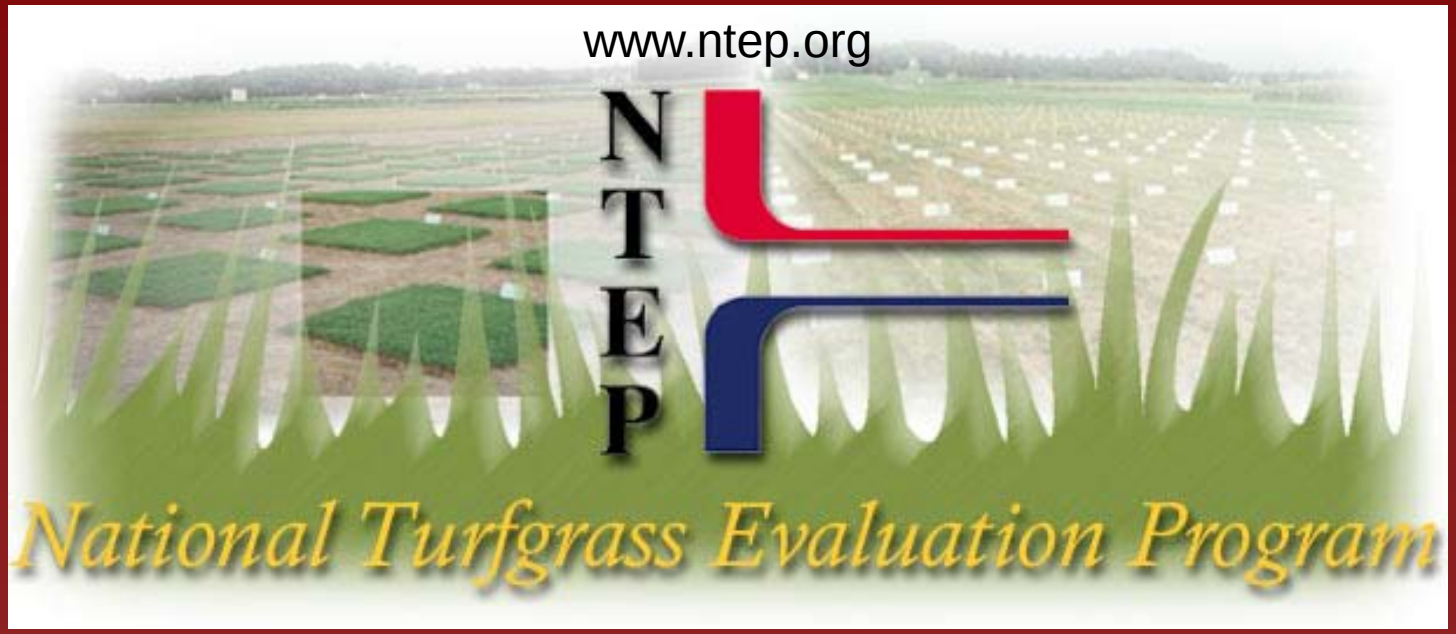

Prickly Lettuce


Dandelion

Projects in 2007
Roundup formulation demo

- Use of experimental K^+-salt formulations
  - Applied to fineleaf fescue
  - Killed fineleaf fescue

Projects in 2007



- 2003 Bentgrass
  - 28 cultivars,MH=0.375”
- 2003 Fineleaf fescue
  - 53 cultivars, MH=1.5”
- 2004 Perennial ryegrass
  - 120 cultivars, MH=1.0”
- 2005 Kentucky bluegrass
  - 110 cultivars, MH=1.0”

Projects in 2007
Steady-delivery N soluble fertilizers

Georgia-Pacific Nitamin fertilizers

– Trials on 1.0” and 0.5” Kentucky bluegrass

Projects in 2007
N Fertilizers

- LESCO® fertilizers
  - Lawn trial on Perennial ryegrass mowed at 1.5”
  - Putting green trial on ‘T-1’ creeping bentgrass mowed at 0.140”
  - Fairway trial on Kentucky bluegrass mowed at 0.5”

Projects in 2007

Kentucky bluegrass cultivar development

- Kentucky bluegrass seed production without field burning
  - Evaluate seed yield and turfgrass quality
  - 50 entries
  - Turf & Field trials

Projects in 2007
Fungicides for snow mold control

- Evaluate new formulations, compounds, and product combinations
  - Sites include Pullman, WA; McCall, ID; Chewelah, WA
  - Bayer, Cleary's, Lesco, and Syngenta

Projects in 2007

Black sand during green establishment

- Evaluated the rate of establishment
  - Different kinds/rates of sand/covers

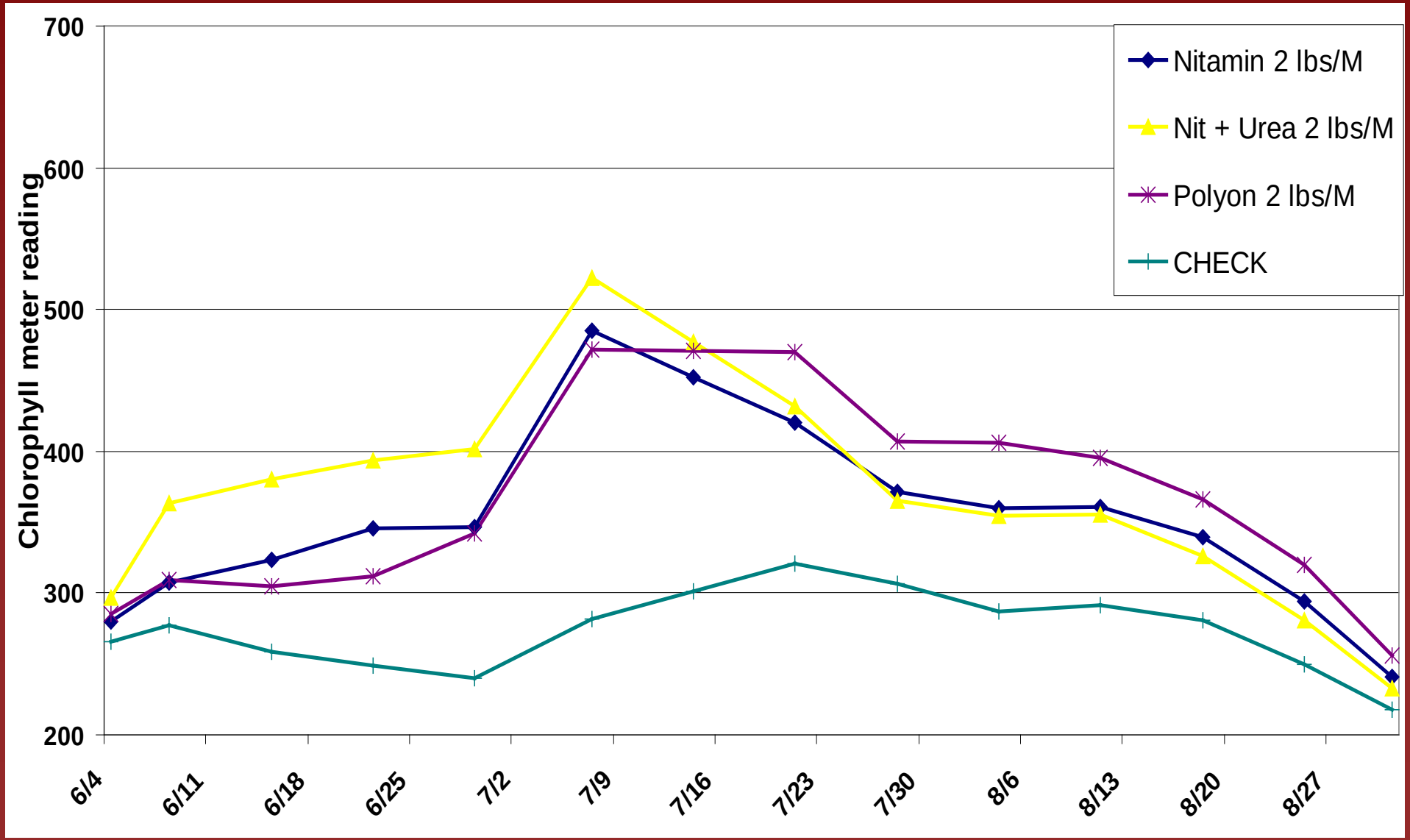
Highlighted Projects - Pullman

- Georgia Pacific fairway fertilizers
- Lesco greens fertilizers
- Black Sand

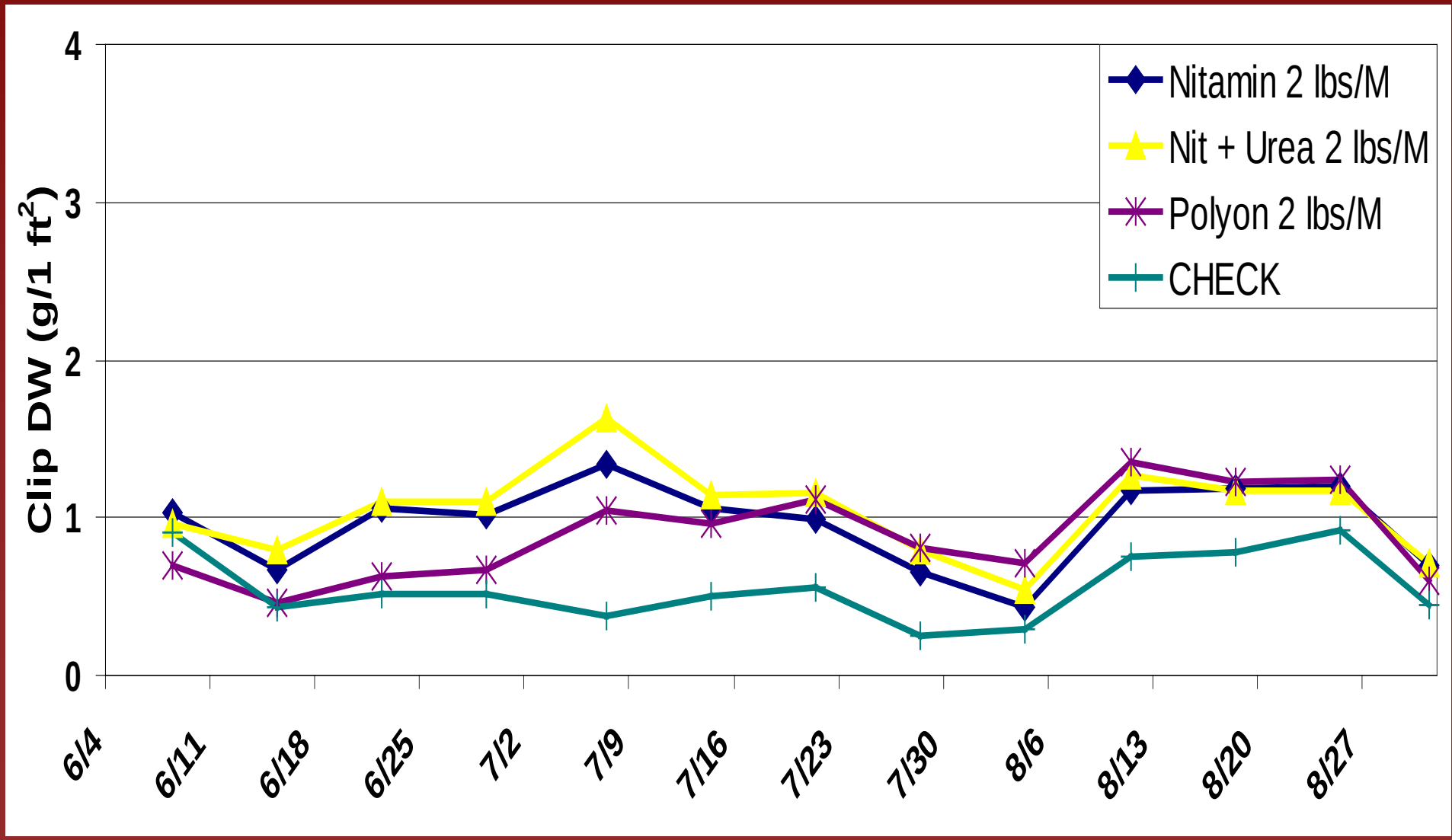
Georgia Pacific Fairway Ferts

- Treatments included:
  - Nitamin Nfusion (25-0-0)
  - Nitamin Nfusion + Urea (50% N blend)
  - Polyon (43-0-0)
  - Unfertilized check
- Treatments applied at 2 & 4 lbs N/M
- Parameters included:
  - Chlorophyll index, clipping dry weight, visual color, and visual quality

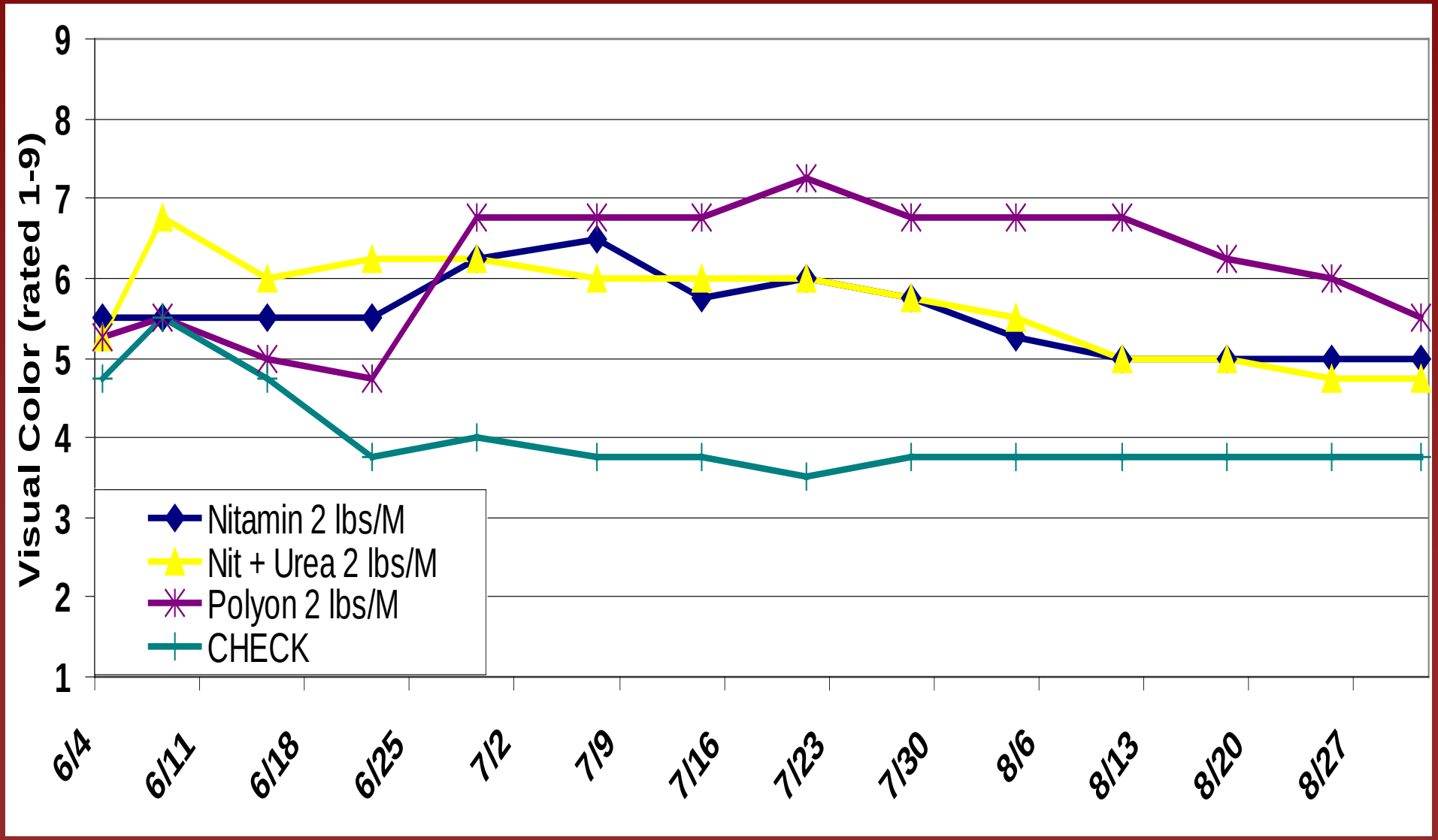
Chlorophyll Index (2 lbs N/M)



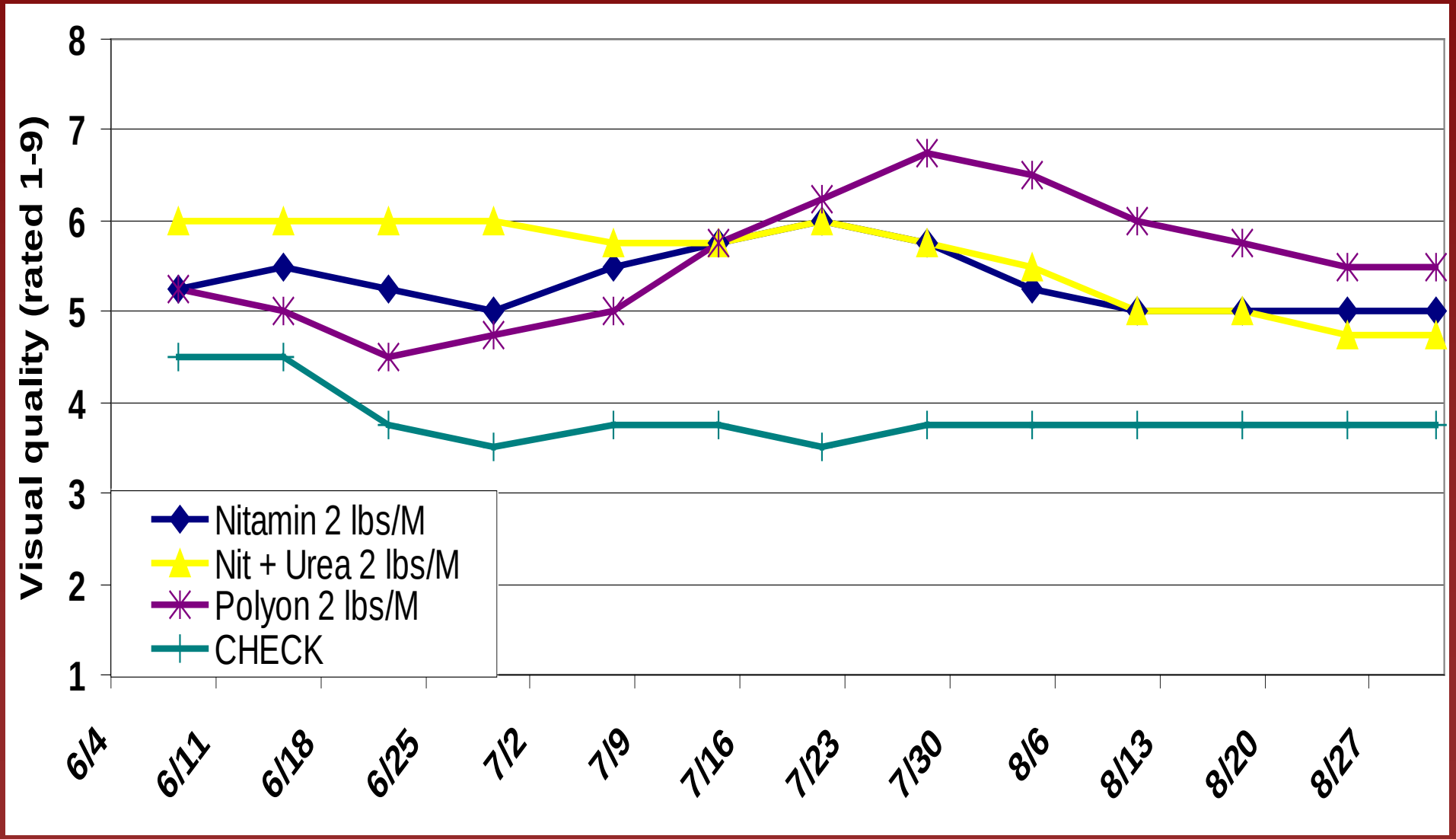
Clipping Dry Weight (2 lbs N/M)



Visual Color (2 lbs N/M)



Visual Quality (2 lbs N/M)



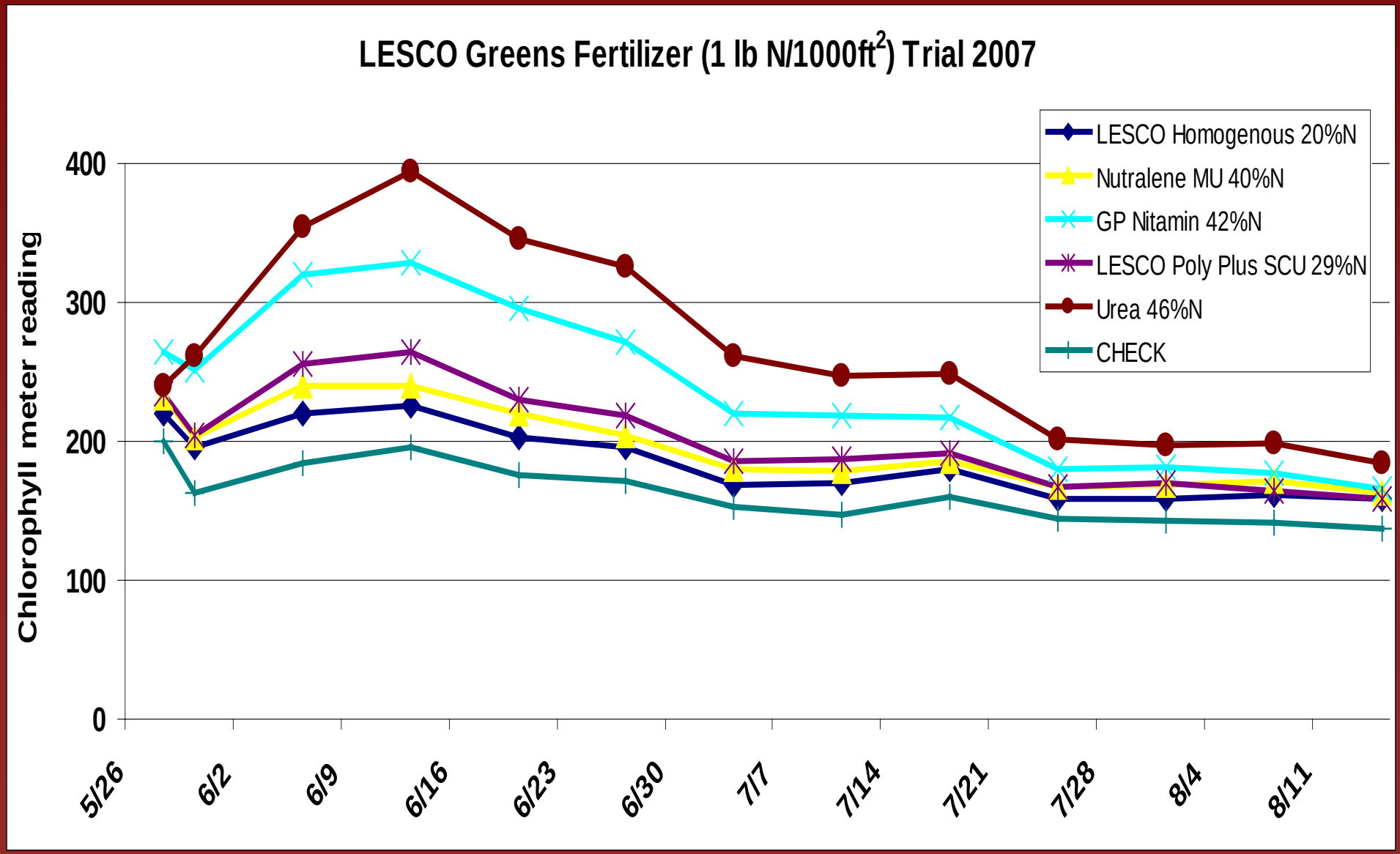
Conclusions

- Prolonged response using Polyon
- Addition of Urea to Nitamin gave initial increases in chlorophyll and color
- Nitamin alone similar response to Polyon initially (0-4 WAT)

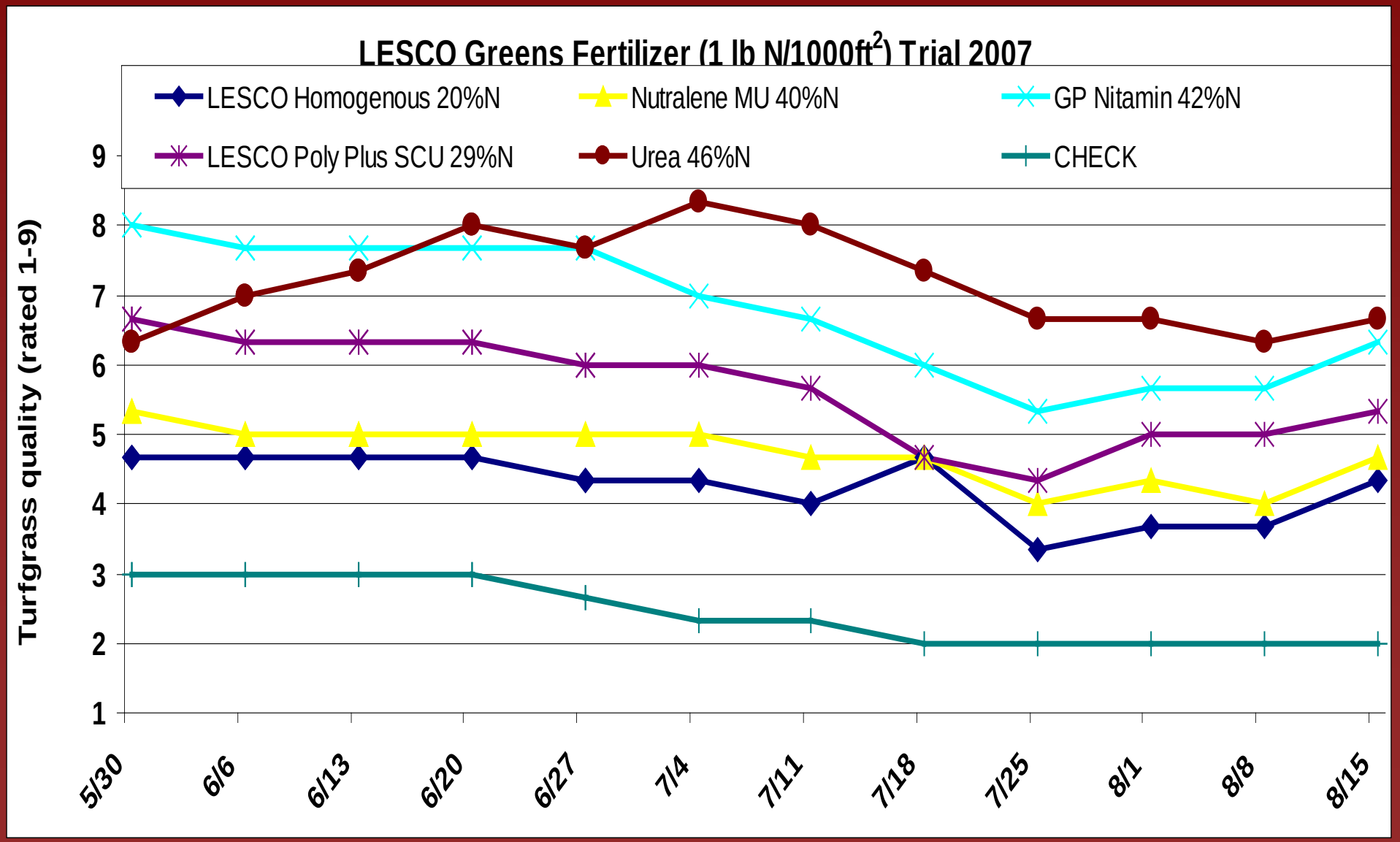
Lesco Greens Fertilizer

- Treatments included:
  - Lesco homogenous 20% N
  - Lesco homogenous 18% N
  - Nutralene MU 40% N
  - GP Nitamin 42% N
  - Lesco Poly Plus SCU 29% N
  - Urea 46% N
  - Check
- Applied at 1 & 2 lbs N/M

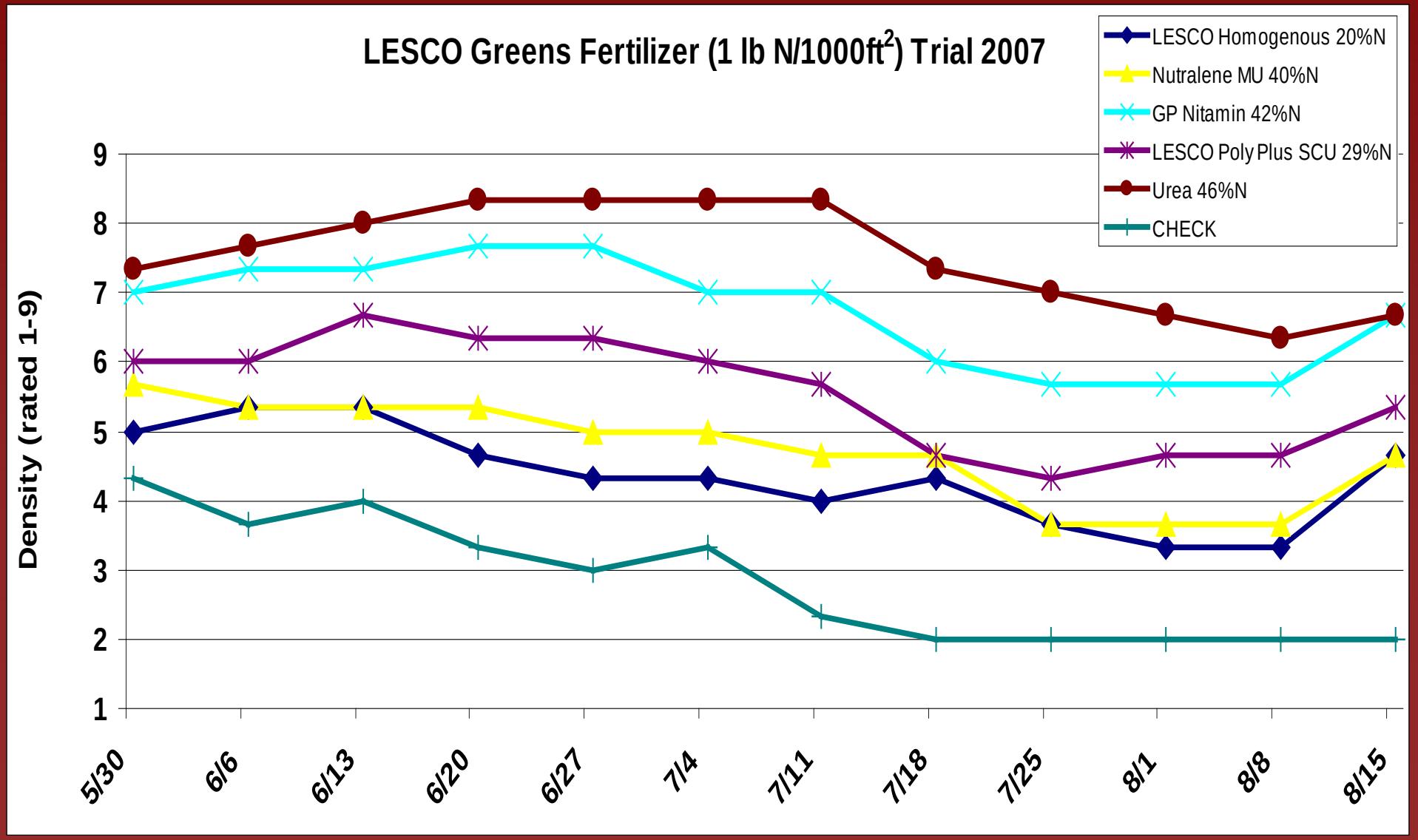
Chlorophyll Index (1 lb N/M)



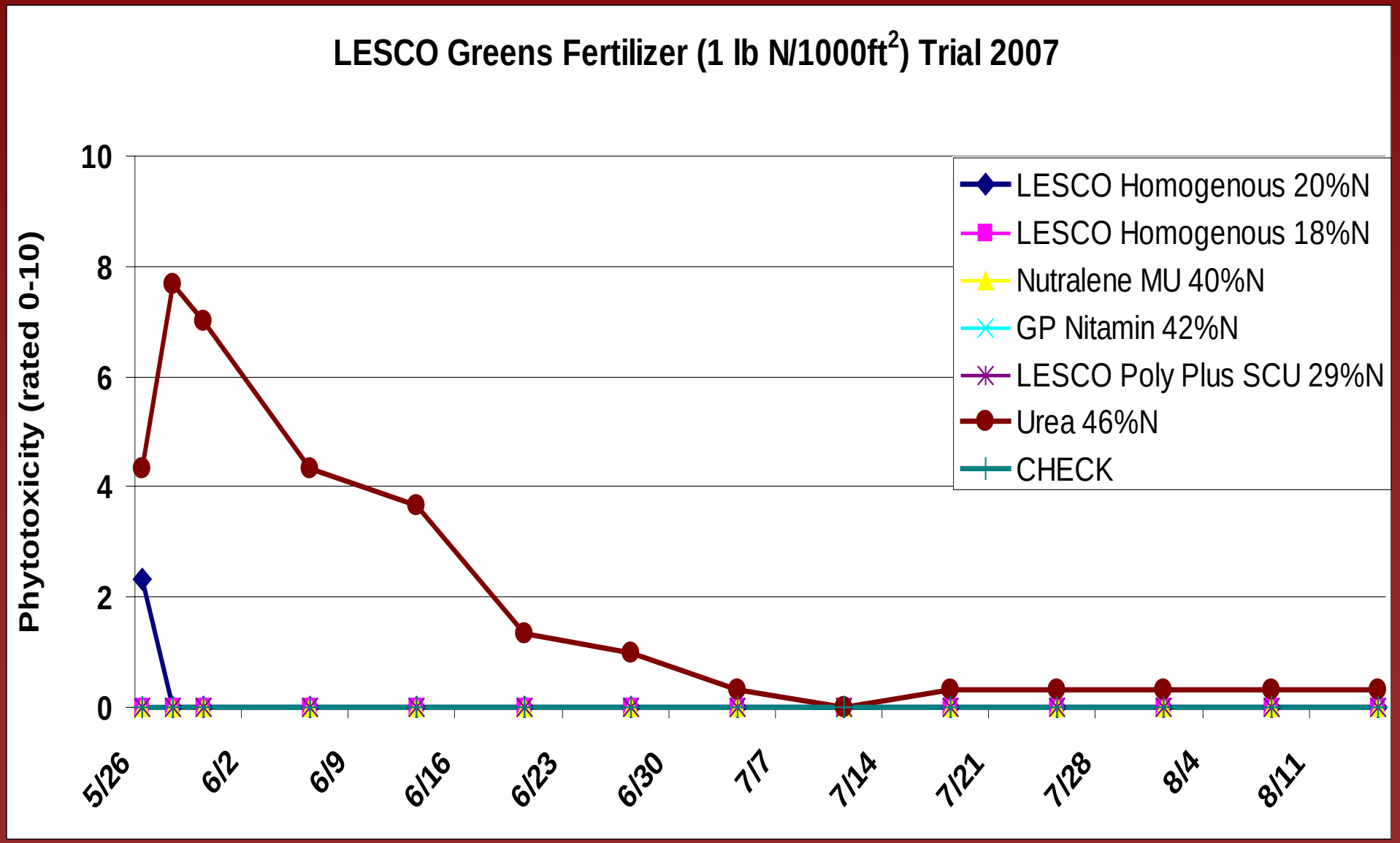
Visual Quality (1 lb N/M)



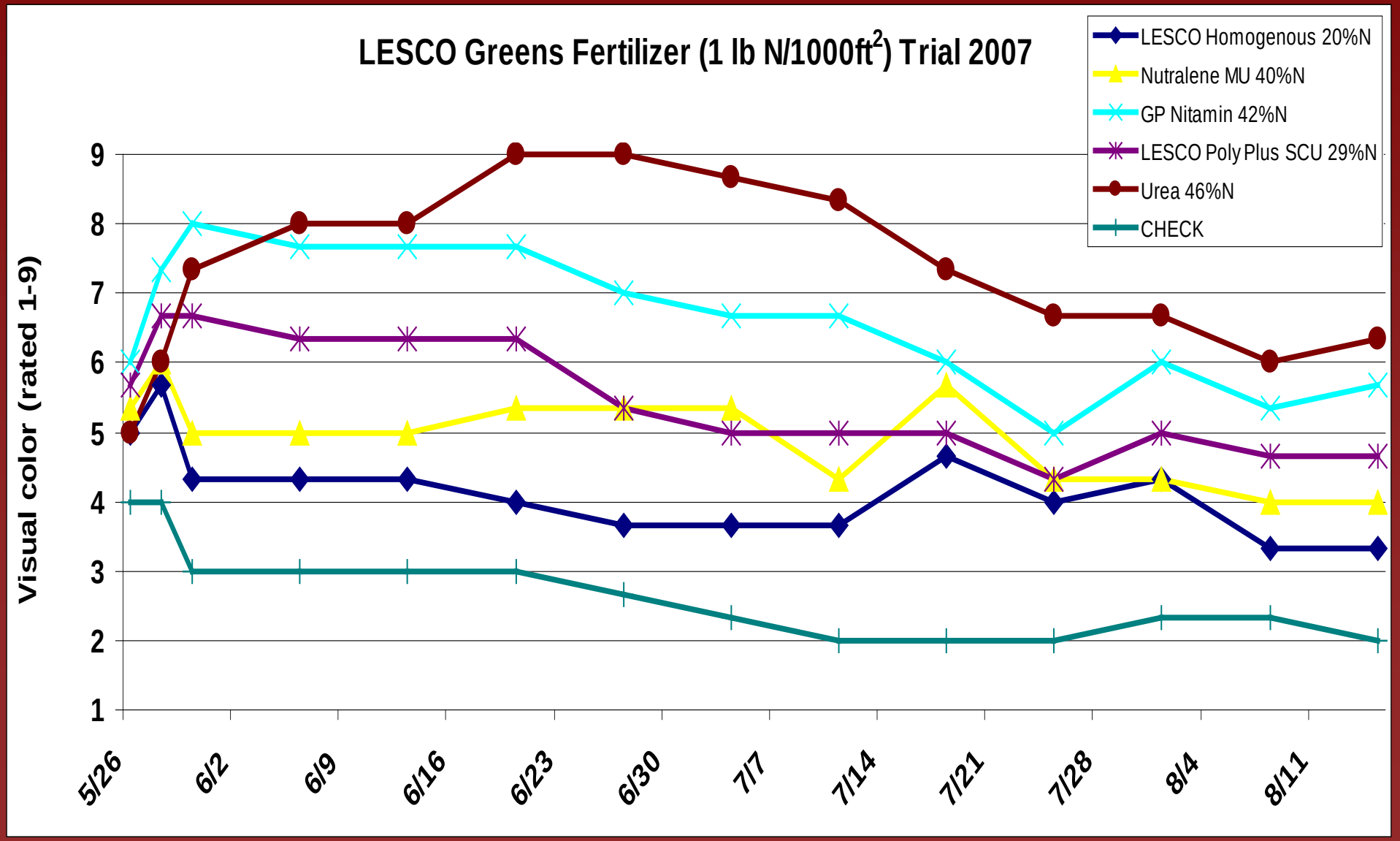
Density (1 lb N/M)



Phytotoxicity (1 lb N/M)



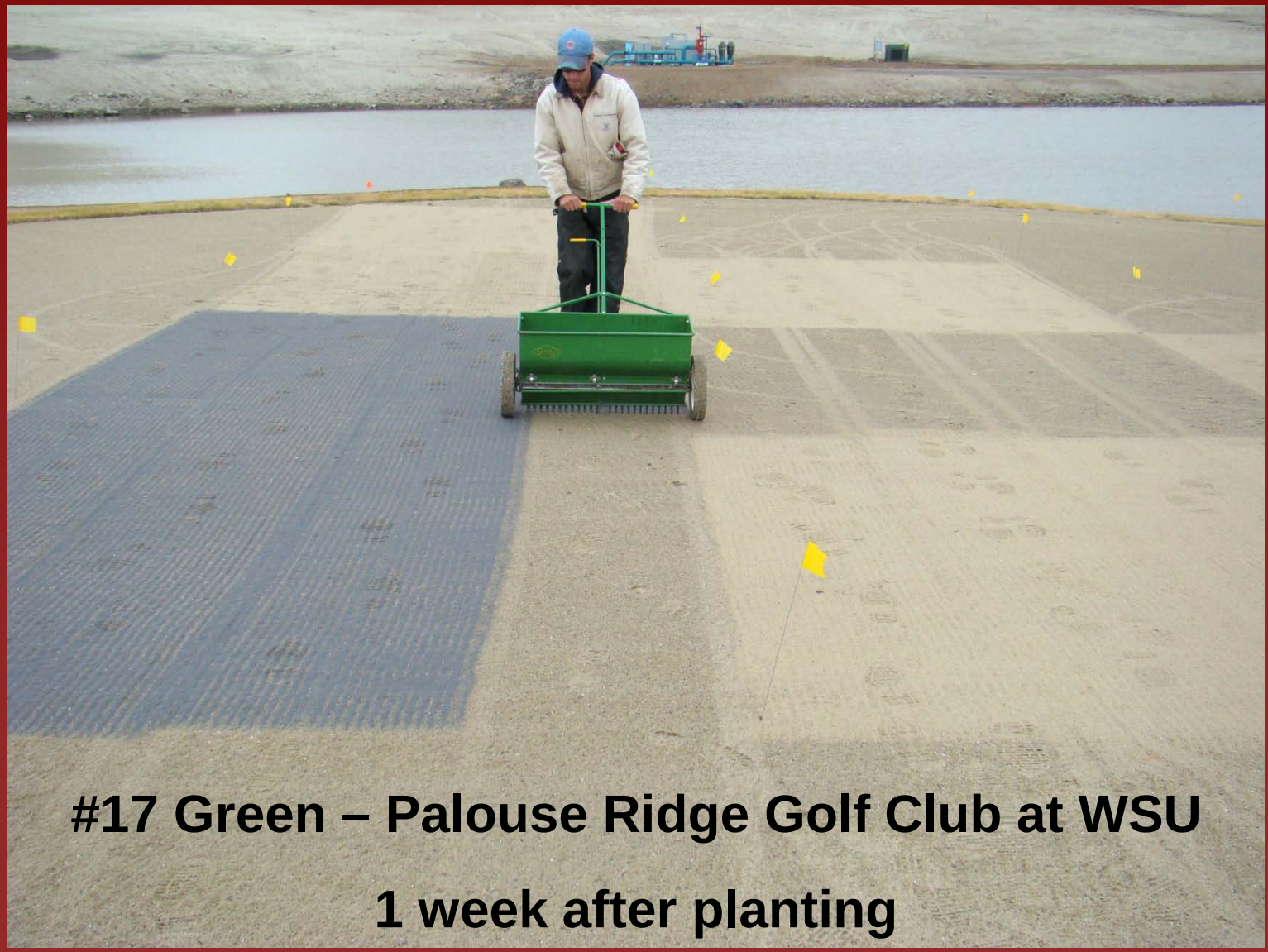
Color (1 lb N/M)


LESCO Greens Fertilizer (1 lb N/1000ft2) Trial 2007
LESCO Homogenous 20%N
Nutralene MU 40%N
GP Nitamin 42%N
LESCO Poly Plus SCU 29%N
Urea 46%N
CHECK
Visual color (rated 1-9)
9
8
7
6
5
4
3
2
1
5/26
6/2
6/9
6/16
6/23
6/30
7/7
7/14
7/21
7/28
8/4
8/11

Conclusions

- Urea performed well, but with phyto
- GP Nitamin also performed well, no phyto
- All other treatments performed similarly
- Turf response similar using urea or slow-release fertilizers

Black Sand



#17 Green – Palouse Ridge Golf Club at WSU

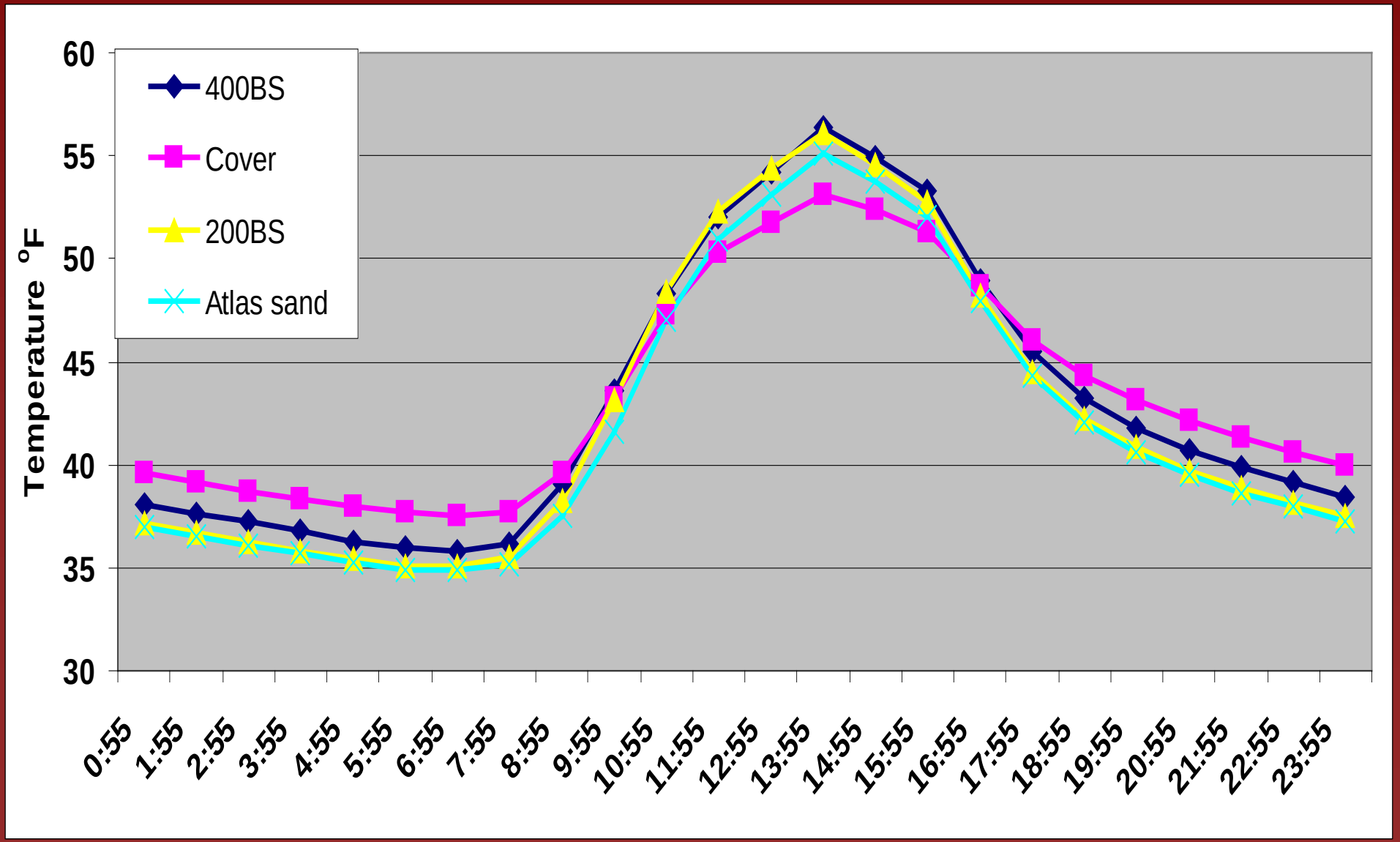
1 week after planting

Black Sand

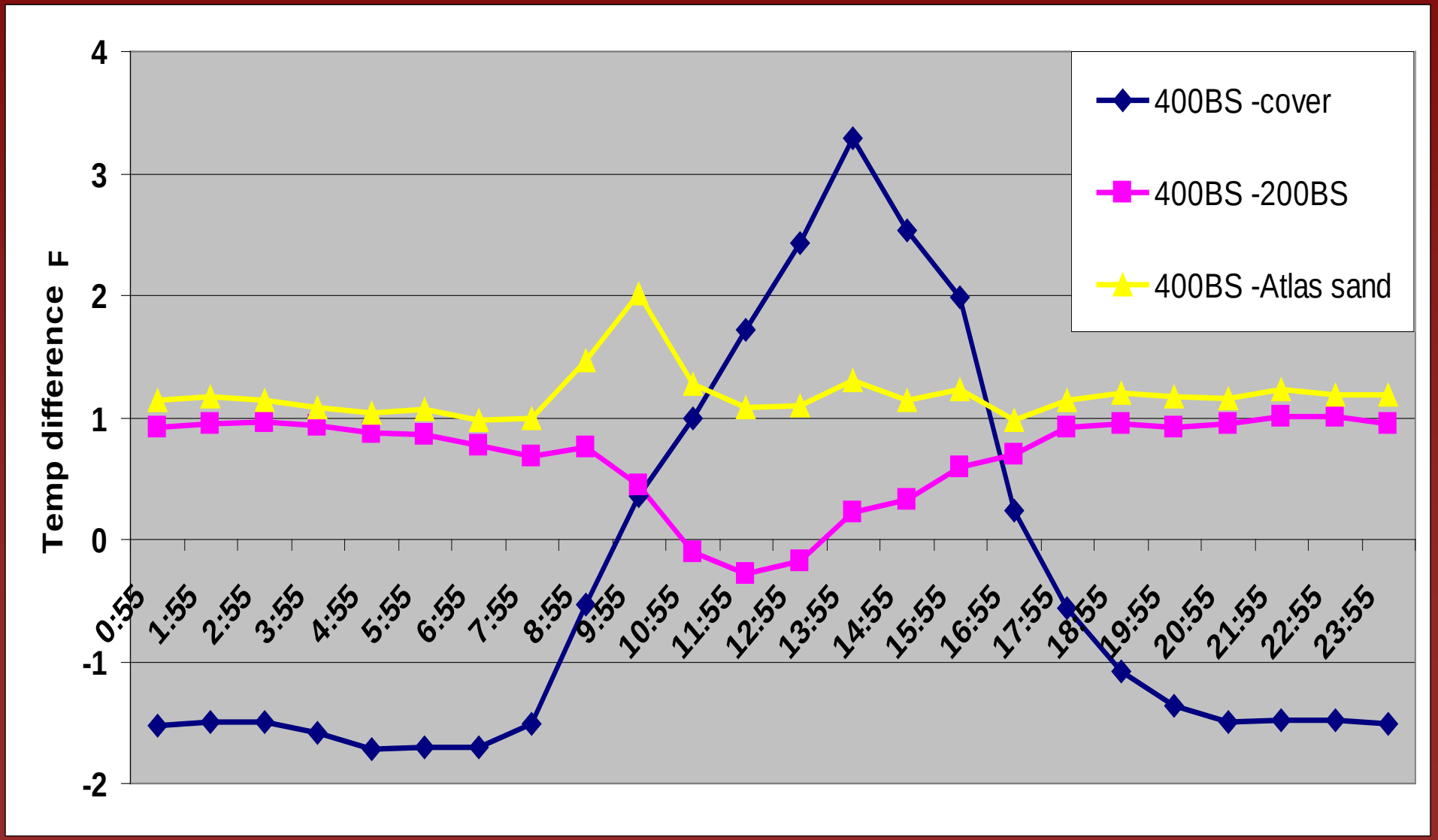
- Treatments included:
  - Black sand @ 200 and 400 lbs/M
  - Atlas sand @ 200 and 400 lbs/M
  - Reemay cover @ 1.5 oz/yd^2
  - Check

- Parameters
  - Soil temperature
  - Germination of ‘T-1’ bentgrass (Visual & Count)

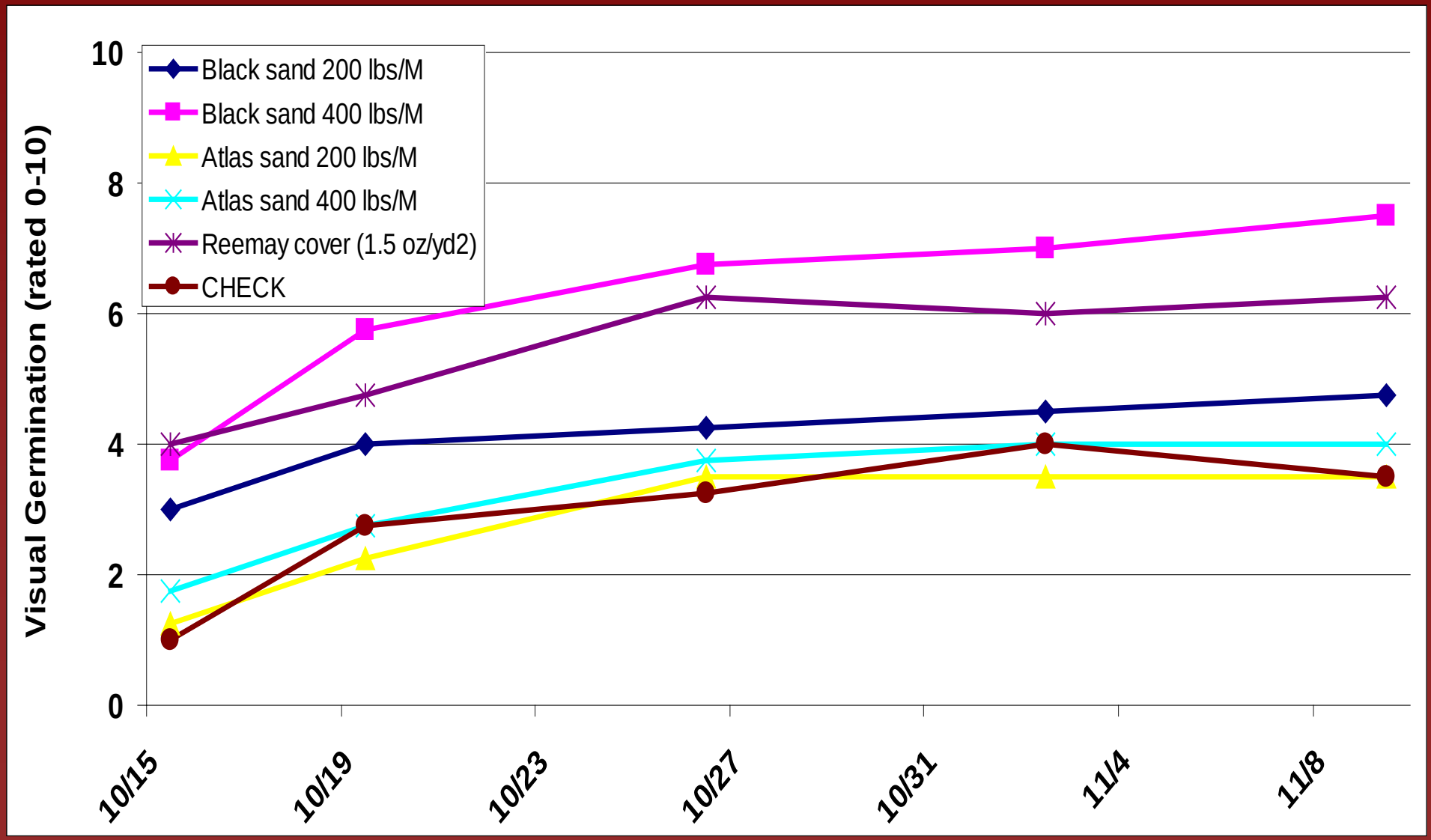
Soil Temperature
Oct 22-Nov 14, 2007



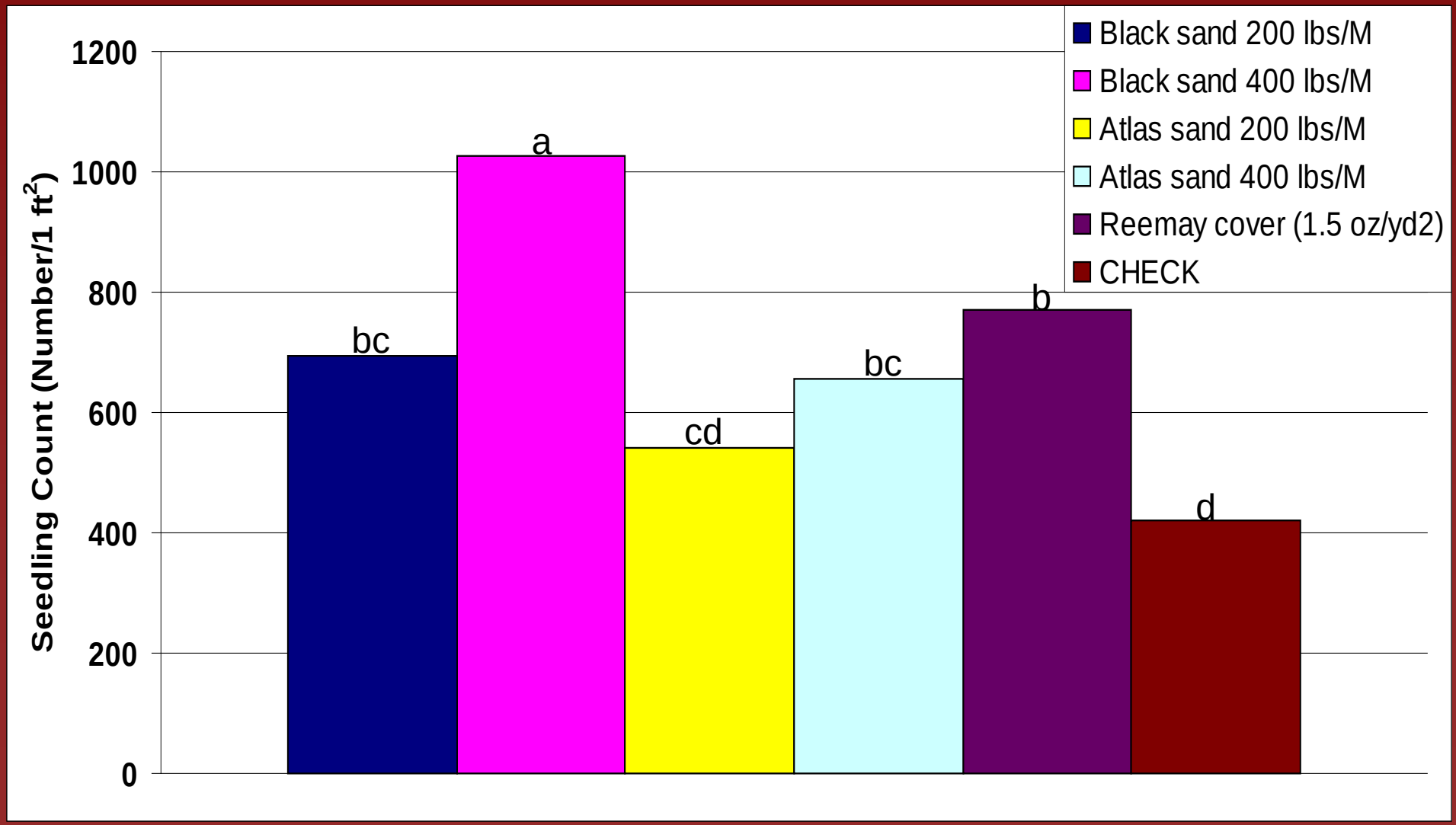
Soil Temperature Difference
Oct 22 – Nov 14, 2007

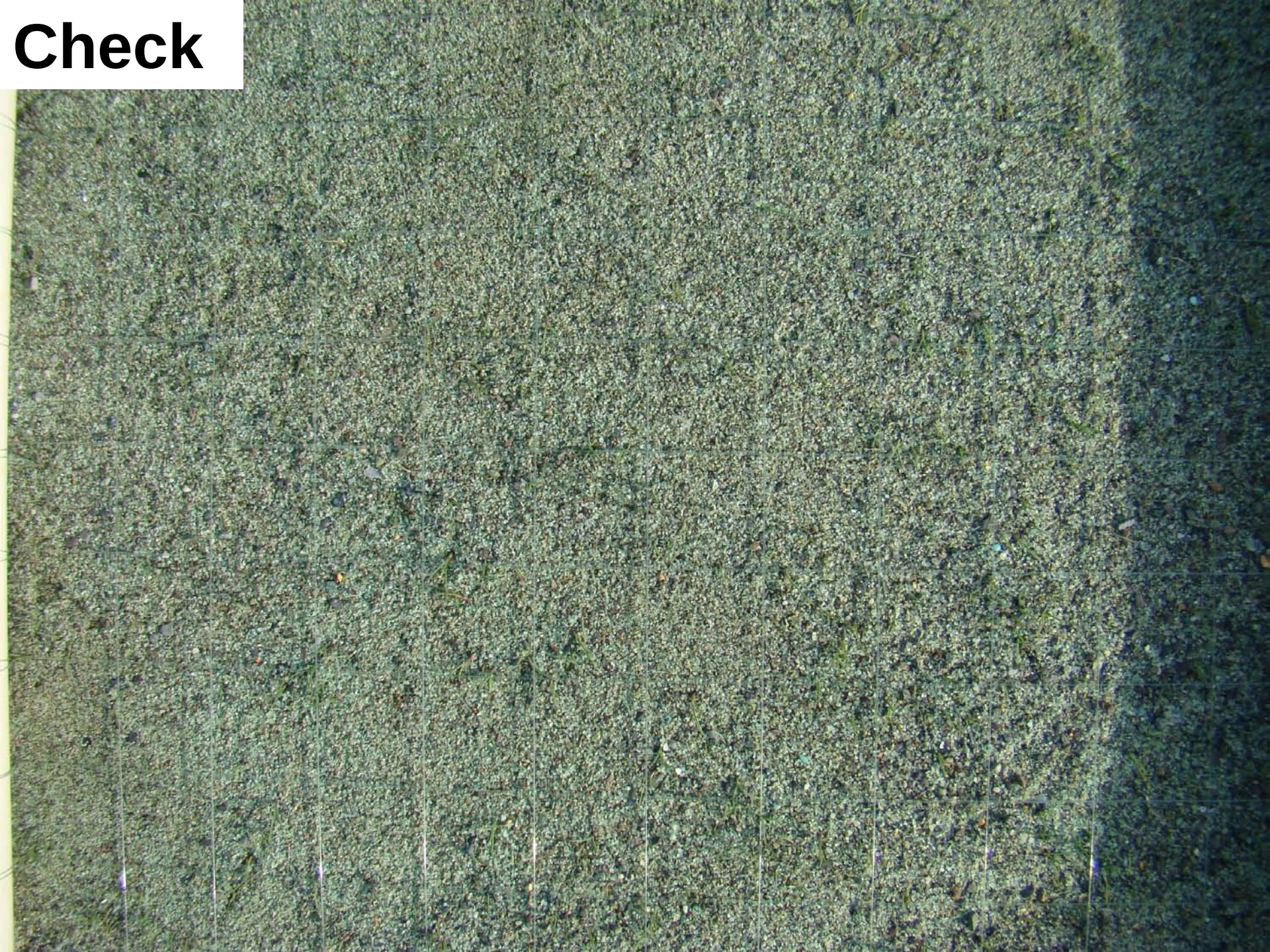


Visual Germination



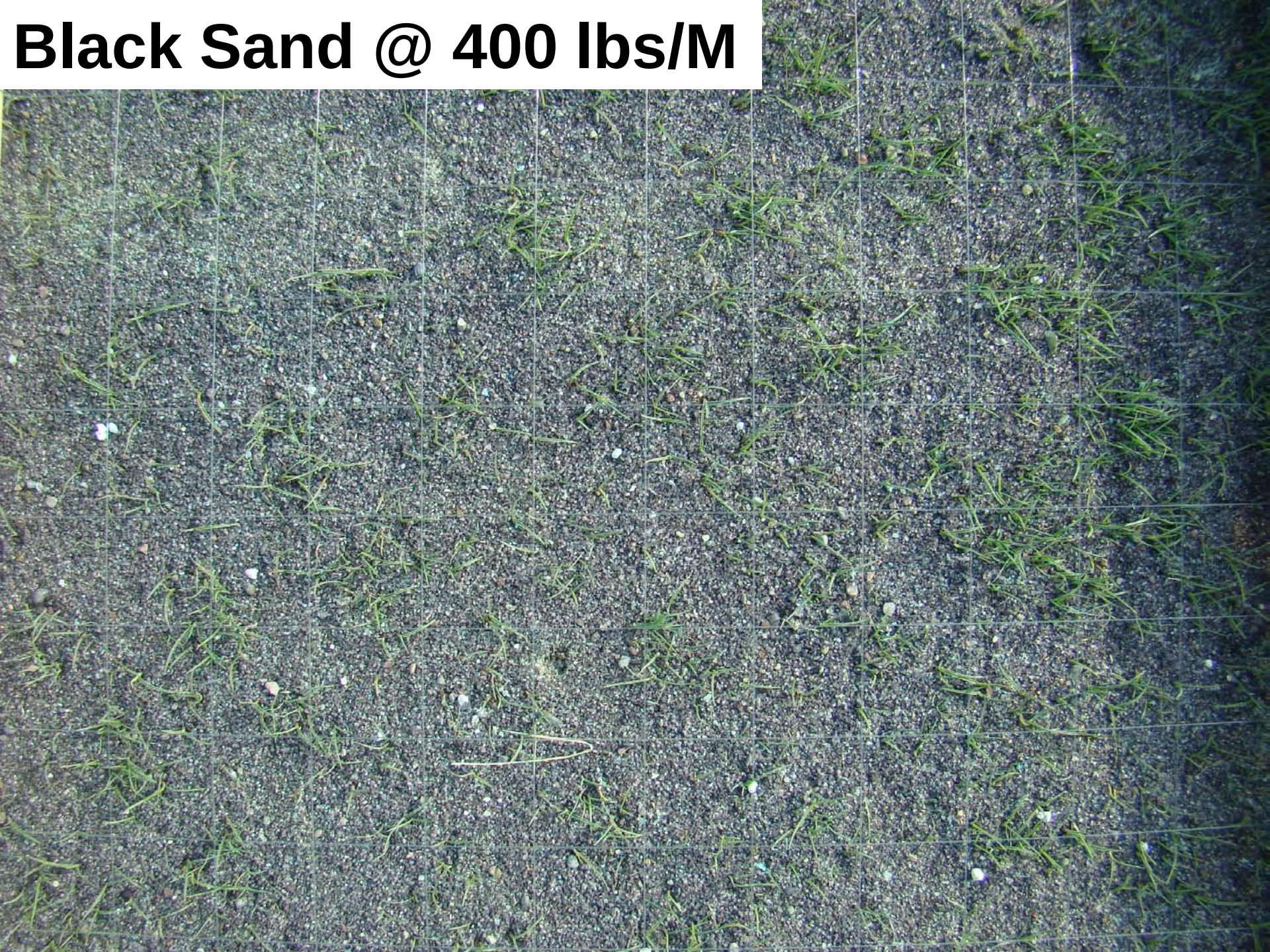
Seedling Count
Nov 9, 2007 – 6 WAP

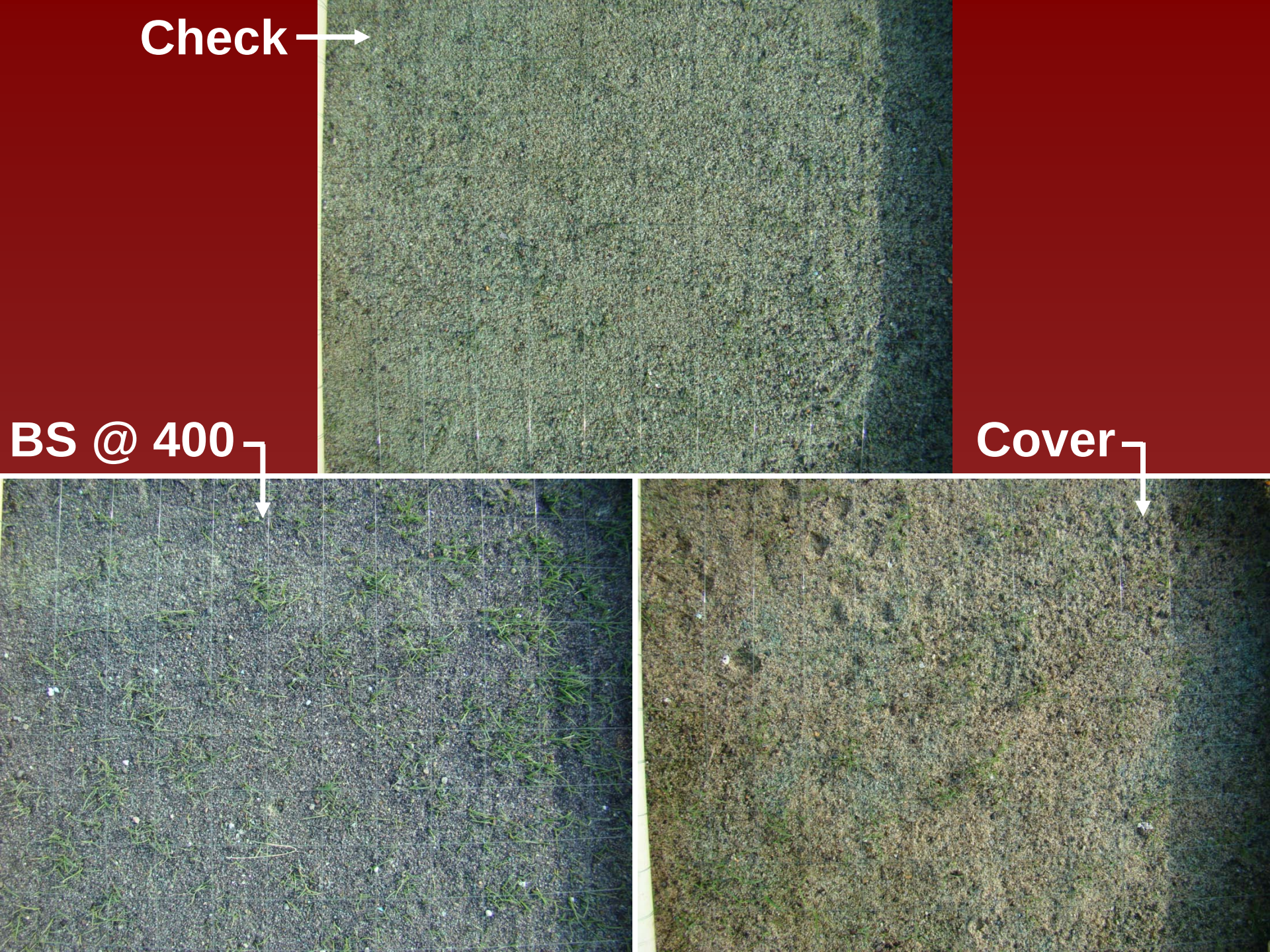



Check

Reemay Cover

Black Sand @ 400 lbs/M




Check
BS @ 400
Cover

Conclusions

- Black Sand @ 400 lbs/M = higher soil temp & more germination
- Reemay, Black sand @ 200 lbs/M, & Atlas sand @ 400 lbs/M had equal germination
- Sand topdressing less labor than covers

The WSU Pullman Turf Team

- Dr. William Johnston
- Charles Golob
- Matthew Williams
- Katie Dodson
- Chris Proctor

Chicken Pieces, Dead Fish, Ground Bones, and Flushables

For Your Fairways?

Eric Miltner, Randi Luchterhand, and Jeff Rutan
Washington State University - Puyallup

WASHINGTON STATE UNIVERSITY
World Class. Face to Face.

Natural organic fertilizers – derived from animal or plant by-products

- Examples: Nature Safe, Nature's Intent, Milorganite

Synthetic organic fertilizers – coated ureas (PCU, PCSCU), methylene urea (MU), ureaformaldehyde (UF), IBDU, and others

- Lots of products
- Many different nutrient source materials
- Many unknowns

- Need to identify commonalities and/or differences

Why Use Natural Organics?

- Slow release nitrogen
- Low leaching potential
- Temperature-based nutrient release (coincides with plant growth)
- Make use of a valuable resource / waste product

Why Not?

- High phosphorus (P)
- No or little potassium (K)
- Release rates dependent upon soil moisture and temperature
- Unknown or unfamiliar release characteristics (we like to stick with what we know)

Pelletized Slow-Release Natural Organic

Biosolids

- Pierce County / Northwest Biosolids Management Association – SoundGro biosolid-based fertilizer
- Manufactured at the Chambers Creek Regional Wastewater Treatment Plant
- Produced from solid residual by-products (biosolids) in the wastewater treatment process
- A Class “A” product
- http://piercecountywa.org

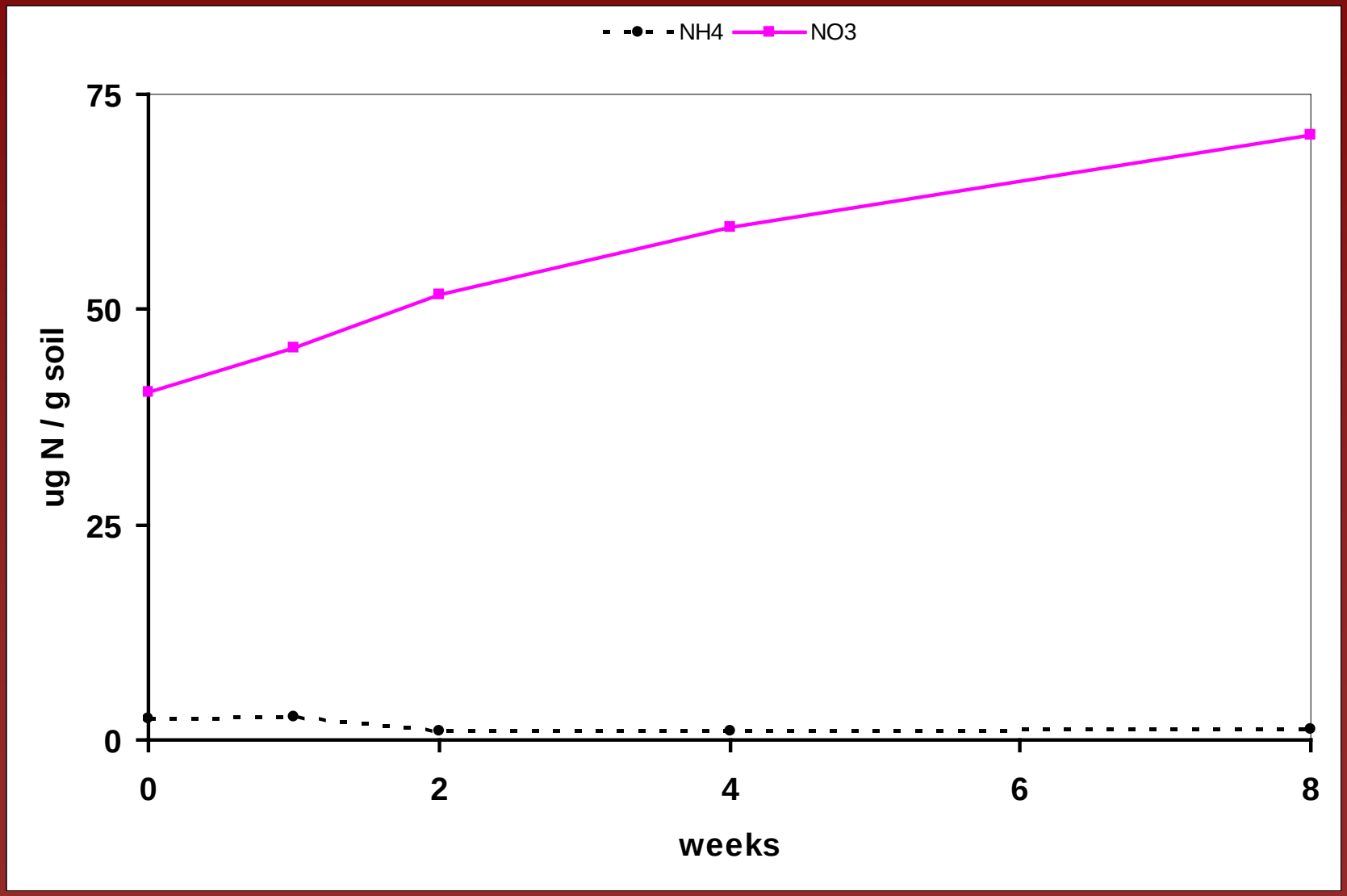
SOUNDGRO™
FERTILIZER

Pierce County / NBMA - SoundGro

- SoundGro, Milorganite, PCSCU (60% slow release), ammonium sulfate, unfertilized
- Seasonal application timings (March, May, July, September, November)
- Characterize turf response (golf turf, parks and lawns)
  - Visual ratings
  - Tissue N content 4, 8, 12, 16 wks

N Mineralization Rates

No fertilizer added



% leaf N, July application*

Source	4	8	12	16
Check	3.7	4.0	4.0	3.3
AmS	4.4	4.0	4.1	3.4
PCSCU	4.1	3.8	3.8	3.2
Milorg	4.1	4.3	3.9	3.3
SG	4.0	3.9	3.9	3.2

*Calculated raw data

% leaf N, Nov application*

Source	4	8	12	16
Check	3.1	2.6	2.4	3.0
AmS	4.1	3.7	3.3	4.3
PCSCU	4.2	3.7	3.3	4.0
Milorg	3.7	3.4	3.0	3.5
SG	3.8	3.5	3.1	3.3

*Calculated raw data

Conclusions…

- Little consistency with regards to source materials and mineralization rates except
- Biosolids appear to release N at a slower rate
- Leaf tissue N content alone might not be enough to measure N uptake – need clipping weights also
- All sources appear to increase tissue N % during winter months

WSDA Study

- 5 organic fertilizers
- 4 others
- Applied Apr, June, Sept, Nov

Apparent Nitrogen Recovery (ANR)

- Grass cut only 4x / yr (prior to fert application)
- Total yield (clipping wt.) measured
- % N measured
- Weed populations
- Calculate total N uptake
- Adjust by subtracting out unfertilized check

- Milorganite 6 – 2 – 0
  - Biosolids
- Nature's Intent 9 – 3 – 4
  - Feather meal, steamed bone meal
- Richlawn 5 – 3 – 2
  - Dried poultry manure
- Ringer Lawn Restore
  - Hydrolyzed poultry feather meal, nitrate of soda, bone meal, soybean meal
- Whitney Farms 8 – 2 – 4
  - Blood meal, dried poultry waste, feather meal, bone meal
- Best Turf K 24 – 3 – 10 PCSCU 67% slow
- Ammonium sulfate, calcium nitrate

Cumulative N recovered in leaf tissue (ANR)

Source	Lb N / M	%
AmS	2.4	59
Cal Nit	2.8	71
PCSCU	2.5	62
Milorg	1.9	48
Ringer	2.1	52
WF	1.6	40
NI	1.9	47
RL	2.3	58

In the end…

- Total N uptake from natural organic fertilizers was approx. 75% of the uptake from inorganic products and PCSCU
- Natural organic fertilizers were similar, except for WF, which resulted in about 20% less uptake compared to others.
- If changing to organic fertilizers, you may need to apply slightly higher rates during the first year (or two?) to compensate