Perspectives on Glyphosate Technologies in Turf and Ornamentals

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Virginia Tech Weed Science

How most homeowners view glyphosate technology.

Glyphosate Resistant Creeping Bentgrass

The latest Technological Development from Monsanto and The Scotts Company

Overview

- Virginia Tech Research Since 2000
  - Phase I, II, & III Cultivar Screens
  - Putting green and Fairway Establishment
  - Benefits of GRCB for Putting Green Mgt.
  - Alternative herbicides for Bentgrass Control
- Regulatory Progress to Date

Phase I, II, & III Cultivar Screens: Comparison of GRCB to Conventional Cultivars under Fairway Conditions

2003

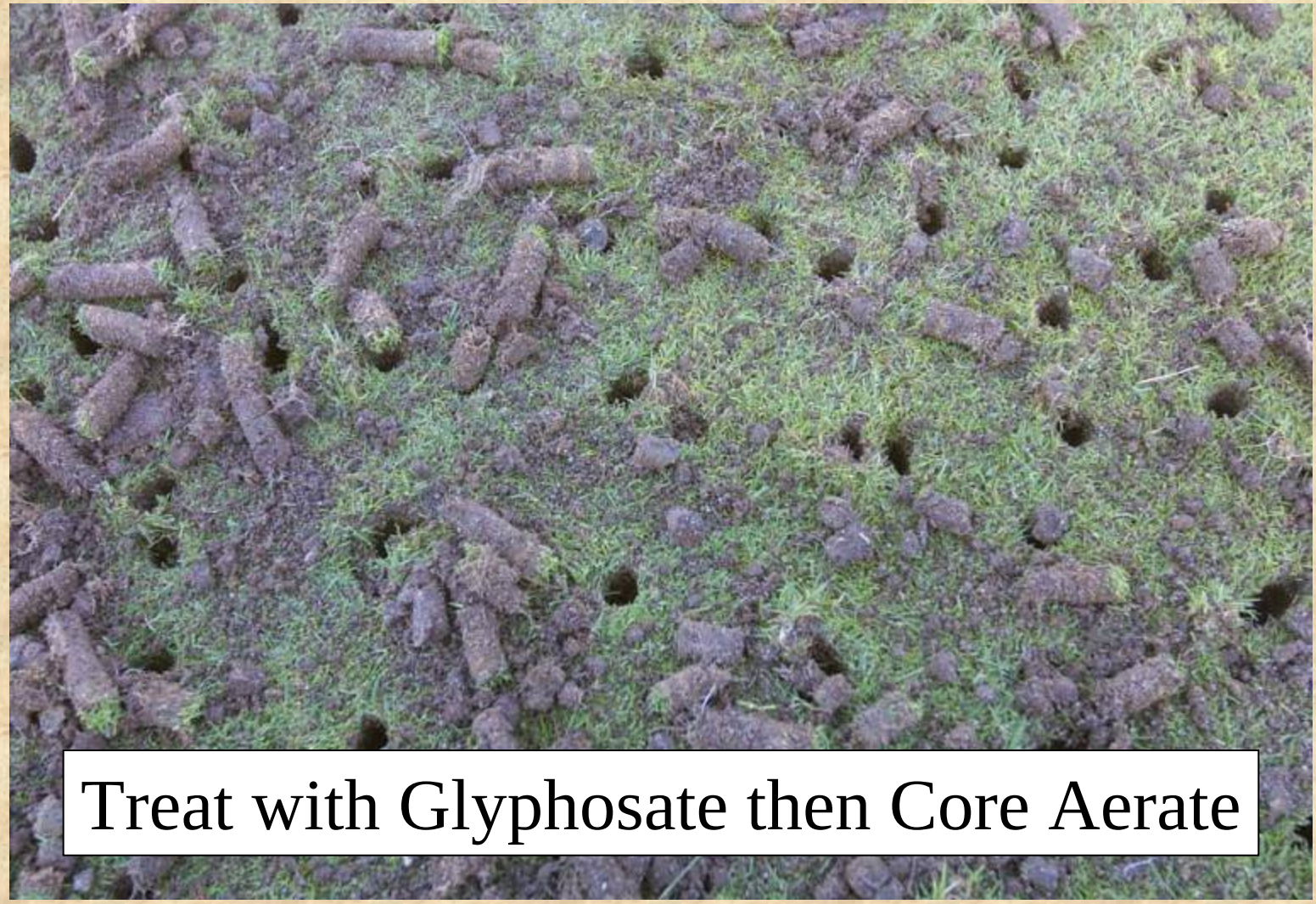
2004

Summary

- GRCB displayed similar characteristics to four popular creeping bentgrass cultivars (L-93, Penncross, Penn A-4, and Crenshaw).
- Penneagle and Providence exhibited decreased color and quality during summer months but were otherwise similar to GRCB.

Converting Established Putting Greens to Glyphosate-Resistant Creeping Bentgrass

Trial Initiation (Step 1)



Treat with Glyphosate then Core Aerate

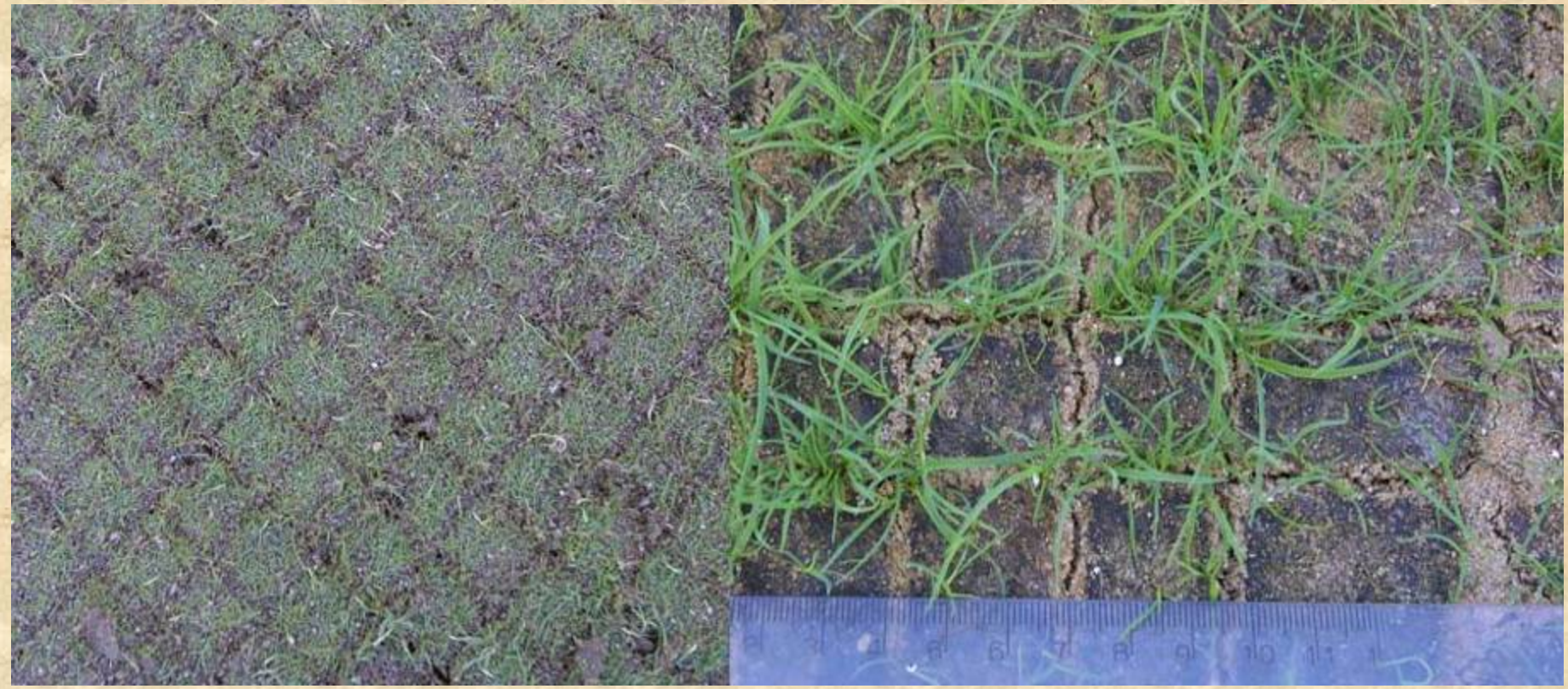
Trial Initiation (Step 2)

Verticut in Two Directions

Trial Initiation (Step 3)

Top Dress with Sand, Seed, Final Top Dressing

Putting Green Thatch is a Barrier to Seedling Establishment



Conditions at planting

15 Days after planting (DAP)

1 Year Later

Image Taken Oct 20, 2004

Image Taken Oct 20, 2003

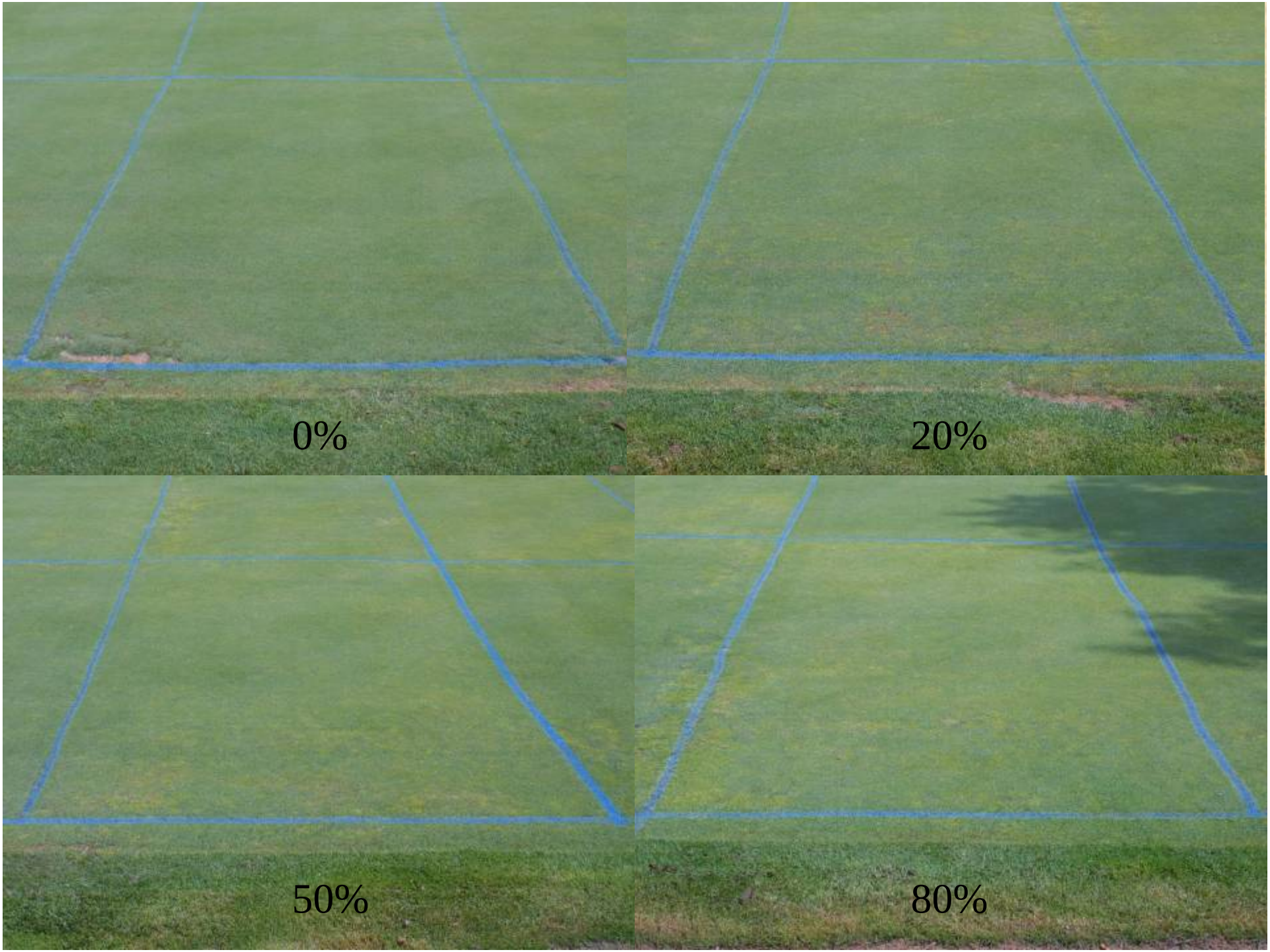
Summary

- Increase seeding rates on thatchy greens
- Substantial disruption of thatch layer required prior to seeding
  - Optional methods of thatch layer disruption
    - Thick Thatch Layer
      - Verticut/aerate in two direction
      - Removal of sod - seed into bare soil (Dant, L)
    - Thin Thatch Layer
      - TIP Green Spiker (Dant, L)
      - Terra Combi Spiker (Dant, L)

Benefits of RRCB on Putting Greens

Hypothetical Benefits of RRCB

- Reduced Pesticide due to control of annual bluegrass (AB)
  - 300,000 # fungicide for anthracnose & brown patch on AB
  - 16,000 # insecticide for AB weevil
  - 17,000 # plant growth regulators to suppress AB seedheads
  - 125,000 # fumigant to eliminate AB in soil
  - 75,000 # less herbicide needed
- Simplified & more effective BMP for irrigation, fertility, cultivation, pest control
- Improved playing conditions & aesthetics


0%
20%
50%
80%

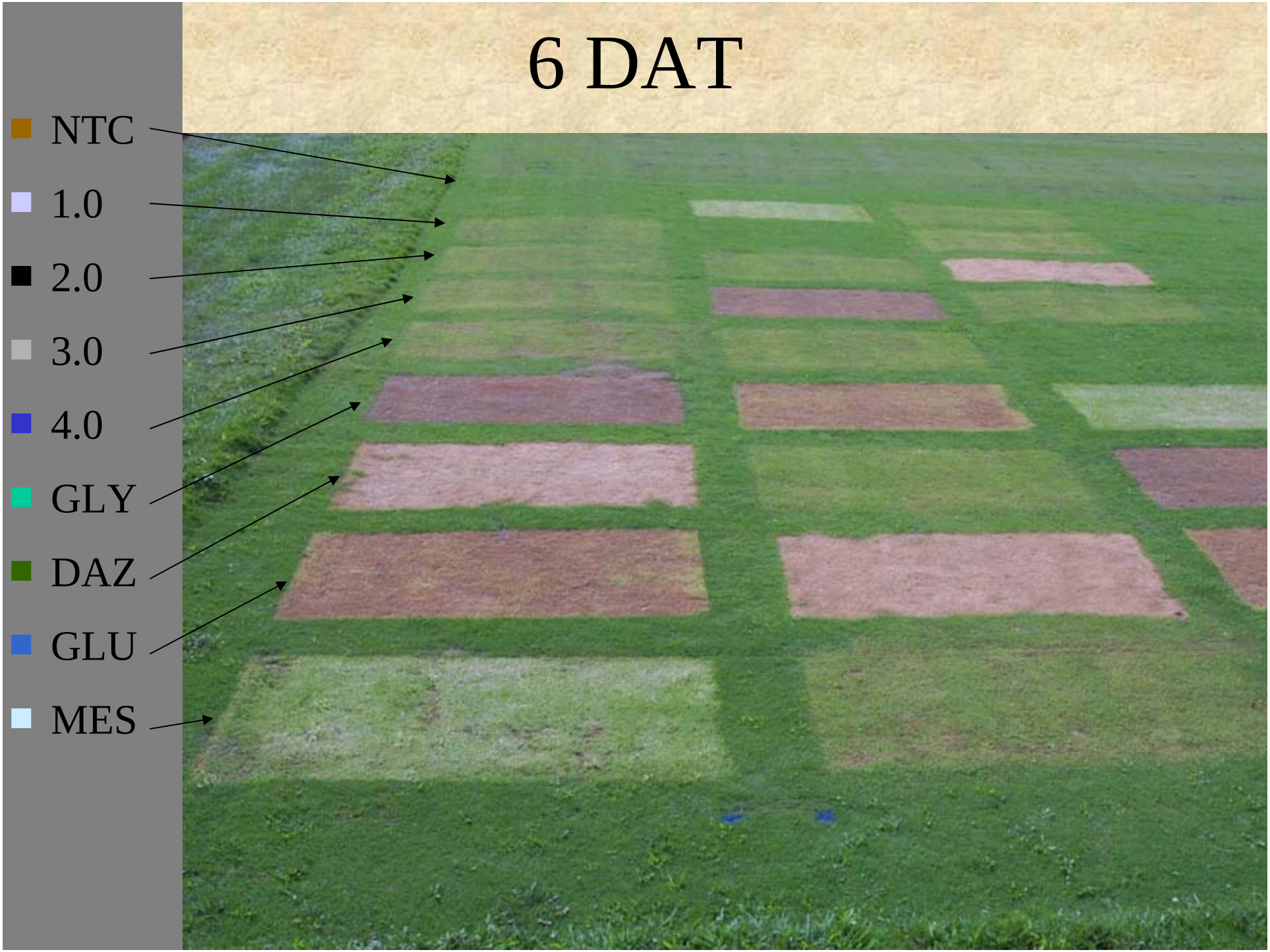
Alternatives to Glyphosate for Creeping Bentgrass Control

- Fluazifop
- Clethodim
- Sethoxydim
- Imazapyr
- Glufosinate
- Paraquat
- Diuron
- Paraquat
- Metribuzin
- Hexazinone
- Dichlobenil
- Mesotrione
- Isoxaflutole
- Dazomet
- Imazaquin
- Foramsulfuron
- Nicosulfuron
- Primisulfuron
- Trifloxysulfuron
- Rimsulfuron
- Methyl bromide

Introduction

- Creeping bentgrass is predominately a weed of turfgrass and riparian areas
- Glyphosate is currently used to control bentgrass in turfgrass and riparian areas
- Glyphosate-resistant creeping bentgrass is under evaluation by Scotts Company and Monsanto Company
- Alternative herbicidal controls are needed since glyphosate resistance can move via pollen or seed to nontarget areas

6 DAT



15 DAT

- MES
- GLU
- DAZ
- GLY
- 4.0
- 3.0
- 2.0
- 1.0

Numerous Alternatives Available

Glyphosate Tolerant Bentgrass Progress

Scotts consultation with the USDA on the deregulation of GTCB

- ✓ **Initiated discussions regarding bentgrass and plans in Spring, 2000**
- ✓ **Formal petition (420+ pg) submitted to USDA on April 14, 2003**
  - o summary of over 25 experiments, 70 environments, 2-3 years.
- ✓ **USDA letter deems petition complete on October 9, 2003**
- ✓ **Preliminary Risk Assessment (RA) published January 5, 2004**
  - o GTCB is no different from traditional bentgrass- morphology, adaptation
- ✓ **Public comment period for preliminary RA completed March 5, 2004**
  - o 72% of 471 respondents (including 100 academics) support deregulation
  - o USFS and BLM express concern: control, outcrossing
- ✓ **Weed Science Society of America report to APHIS April 27, 2004**
  - o Summary of comments from over 90 weed scientists polled
  - o No issues of major concern, no increased risk over other bentgrasses
  - o Bentgrass and sexually compatible species widespread
  - o *Agrostis* and hybrids rarely weeds, GTCB similar, alternative controls available
  - o Report available on web

Provided by The Scotts Company

Glyphosate Tolerant Bentgrass Progress

- ✓ **Environmental Impact Statement (EIS) Initiated - Sept 24, 2004**
  - ✓ Guided by federal regulations (NEPA) to consider all issues
  - ✓ Scotts supportive of effort
  - ✓ Transparent process with public input
    - ✓ Scoping session to allow all groups to identify issues that need to be addressed
    - ✓ 2 Public meetings during May. DC and Oregon - few attendees = lack of concern
    - ✓ Survey of Land Managers ends on Nov 15, 2005 – no new issues
- ✓ **Draft EIS completion anticipated during spring 2006**
- ✓ **Final decision and determination anticipated during 2007**
  - ✓ Outcome: approval, denial, approval with restrictions

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www.turfweeds.net