

Effective Partnerships in Georgetown County, SC –

# To Err is Human, To Repair takes Cooperation!

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# Winyah Bay Focus Area

- Third largest east coast estuary
- 525,000 acres total
- 123,000 acres of forested wetlands
- 23,000 acres of tidal freshwater marshes
- 50,000 acres of wetland impoundments
- 20,000 acres still impounded



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Image © 2006 DigitalGlobe





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# Invasive Species Subcommittee

- **Clemson University**
- **The Nature Conservancy**
- **South Carolina DNR**
- **Winyah Bay Task Force**
- **US Fish and Wildlife Service**
- **USC – NERR**
- **Natural Resource Conservation Service**
- **Historic Ricefields Association**
- **Ducks Unlimited**
- **BASF**

# Why?

- Aquatic Invasives are a PROBLEM
- Prioritize Concerns
- Documentation of What Works
- Demonstrate to Landowners
- Cost-share Program for Private Landowners

# Priorities

- Phragmites
- Beach Vitex
- Water Hyacinth
- Alligatorweed
- Chinese Tallow
- Giant Reed

# Asphalt Control of Phragmites







# Phragmites Control Demonstrations

- **Mansfield and Rosemont Plantations**
- **Glyphosate and Imazapyr**
- **Aerial and Backpack**

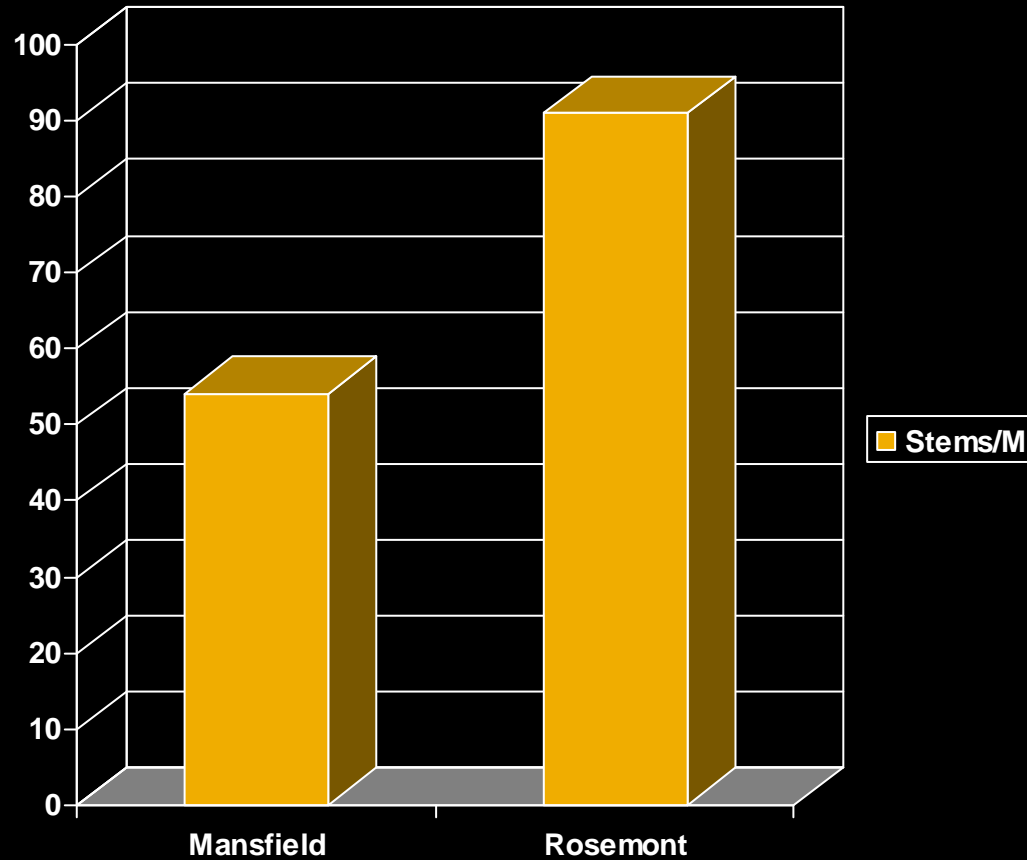
# Phragmites Control Cooperators

- **Mansfield and Rosemont Plantations**
- **Summit Helicopters Inc.**
- **The Nature Conservancy**
- **Clemson University**
- **BASF**
- **SC DNR**





# Mean Stems/Square Meter



# Phragmites Aerial Application Demonstration

- **Five – 7 Acre Plots**
- **32 oz Summit 910 Surfactant**
- **15 Gallons per Acre**

# Sampling Regimen

- **Mid-point/Plot - adjacent 50 foot offset**
- **150 feet into Plot – First Sample**
- **Dead and Alive Stems/Square Meter**
- **Six Samples per Plot**



# Mansfield Aerial Demonstration

- 7 Acre Plots
- 48 oz Imazapyr + 32 oz Glyphosate
- 64 oz Imazapyr



48 oz imazapyr  
32 oz Glyphosate

64 oz Imazapyr

# Rosemont Plantation

- 7 Acre Plots
- 96 oz Glyphosate
- 48 oz Imazapyr
- 64 oz Imazapyr



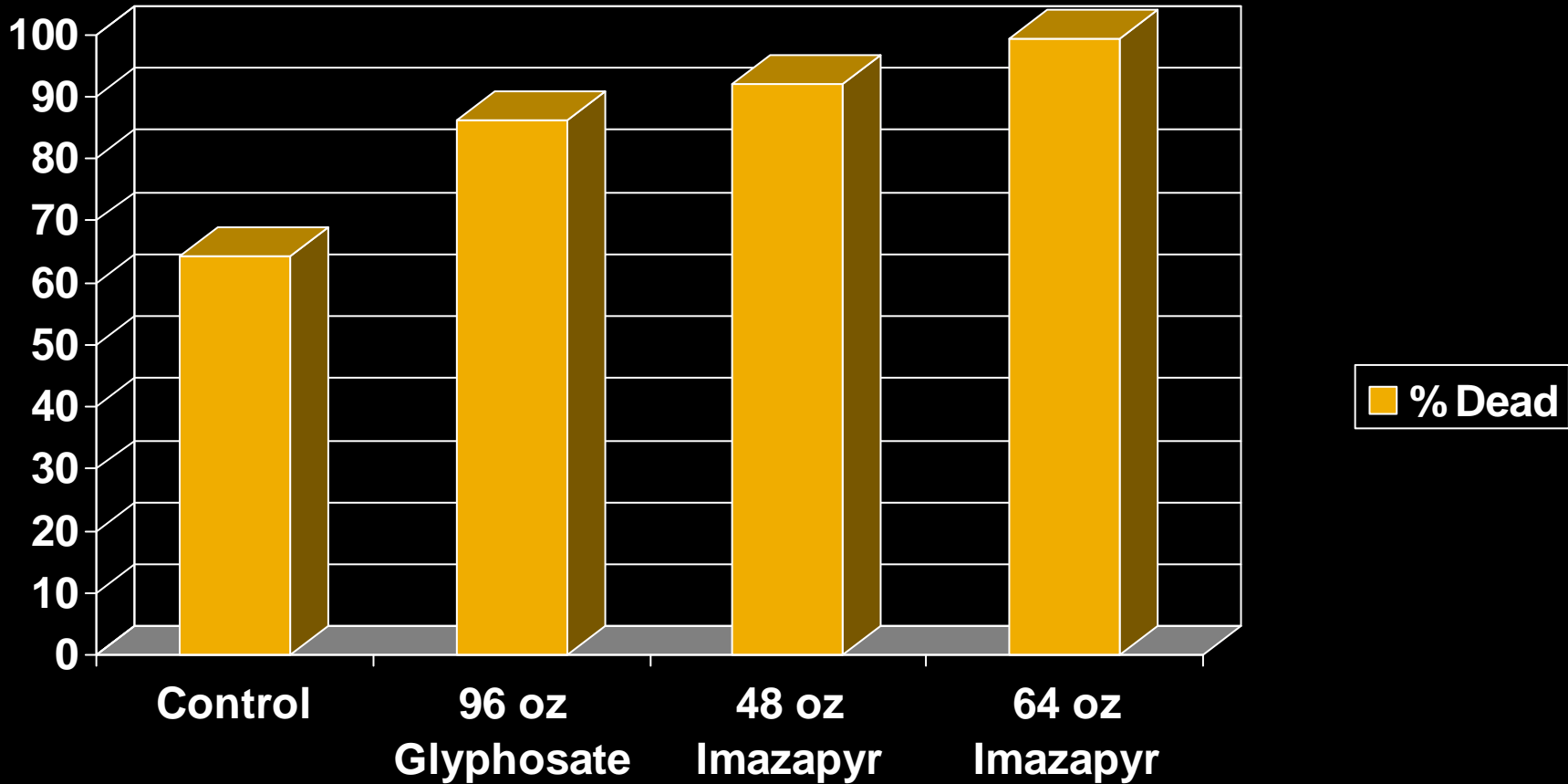
48 oz  
Imazapyr

64 oz  
Imazapyr

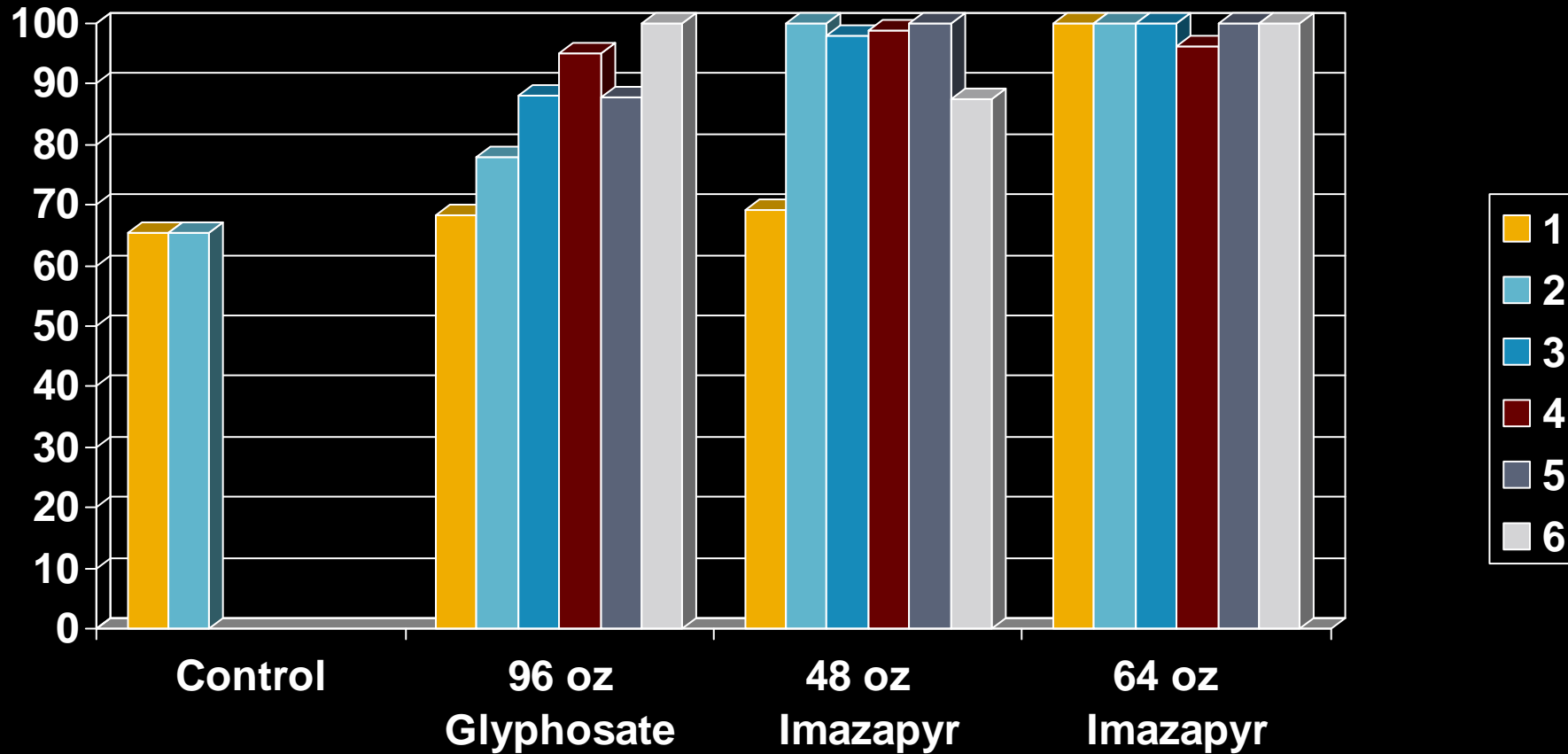
96 oz  
Glyphosate

July  
2005

# Mean Percent Dead Phragmites - Rosemont



# Percent Dead Phragmites - Rosemont





July 2006

# Rosemont – May 2008 – 2.5 YAT





# Cost-share Program – Phragmites

- **Ranking – Acres, Additional Acres, Easement, Proximity to Protected Area**
- **SC DNR Application Recommendations**
- **Licensed Applicators with GPS Recording**
- **Imazapyr (SC DNR) or Glyphosate**
- **\$100 per acre – Imazapyr**
- **\$40 per acre – Glyphosate**
- **\$10,000 Max**
- **Follow-up Treatments**
- **Cost-share Payments after Application**

# Cost-share Technical Committee

- **Clemson University**
- **The Nature Conservancy**
- **SC DNR**
- **USDA – NRCS**
- **Ducks Unlimited**

# Cost-share Funds

- **\$30K - National Fish and Wildlife Foundation**
- **\$50K - SC DNR**
- **\$30.5K - USDA NRCS WIP**
- **\$15K - USFWS Coastal Program**
- **\$10K - Historic Ricefields Association**
- **\$10K - The Nature Conservancy**
- **\$145.5K - Total**

# Cost-share Program to Date

- 24 individual properties
- 2006 - \$56,700
- 2007 - \$33,810
- 2008 - \$18,440
- 1,138 Total Acres
- \$108,950 Total



## SC DNR PROGRAM

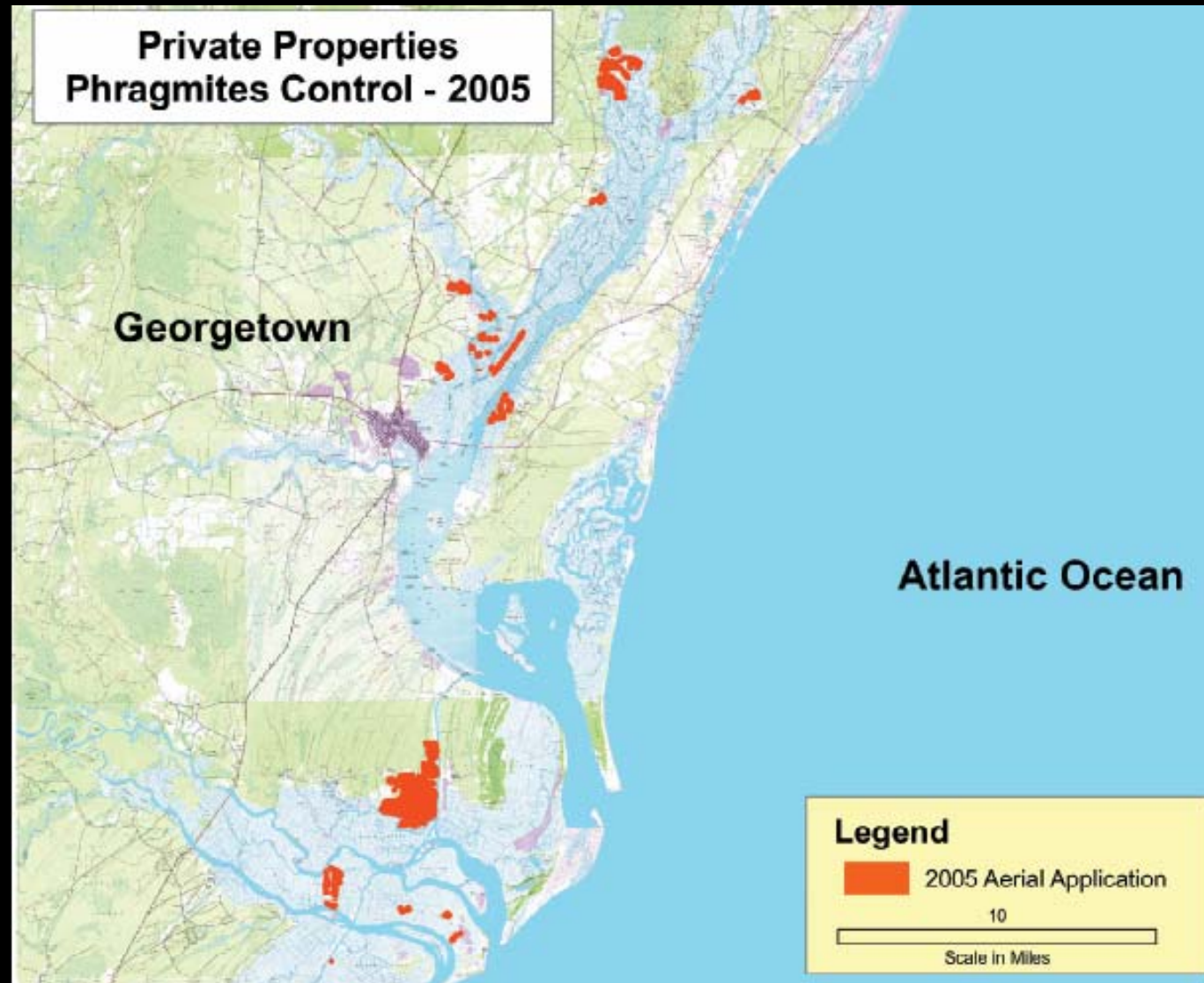
### Recent Control Efforts:

•2005 –	2083 acres	Cost \$349,174
•2006 –	1950 acres	Cost \$352,804
•2007 –	1147 acres	Cost \$194,335
•Totals	5180 acres	Cost \$896,313



# Private Landowners 2005-2006

- 988 Acres



# For More Information

[www.dnr.sc.gov/water/envaff/aquatic/phragmites.html](http://www.dnr.sc.gov/water/envaff/aquatic/phragmites.html)

[www.dnr.sc.gov/water/envaff/aquatic/winyahphragmitesshare.html](http://www.dnr.sc.gov/water/envaff/aquatic/winyahphragmitesshare.html)

# Beach Vitex – *Vitex rotundifolia*





# WHY? A Sea Turtle Volunteer



# Herbicides

- Glyphosate
- Imazapyr
- Triclopyr
- 2,4-D

# Why Those Herbicides?

- Aquatic Label
- 2 - Broad Spectrum
- 2 - Broad Leaf
- Not Restricted Use
- Short Half Life

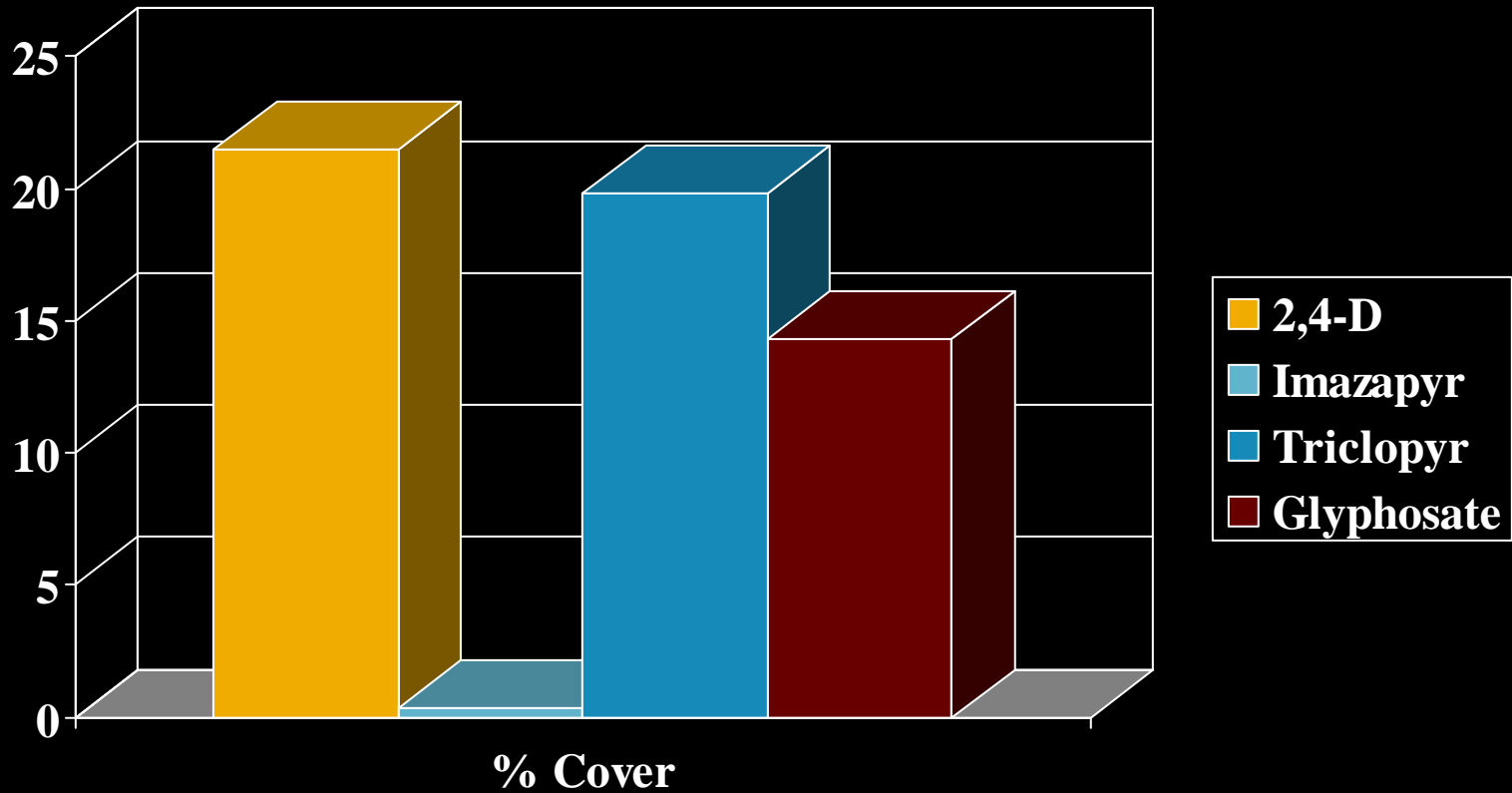
# Before and After - May, 2005



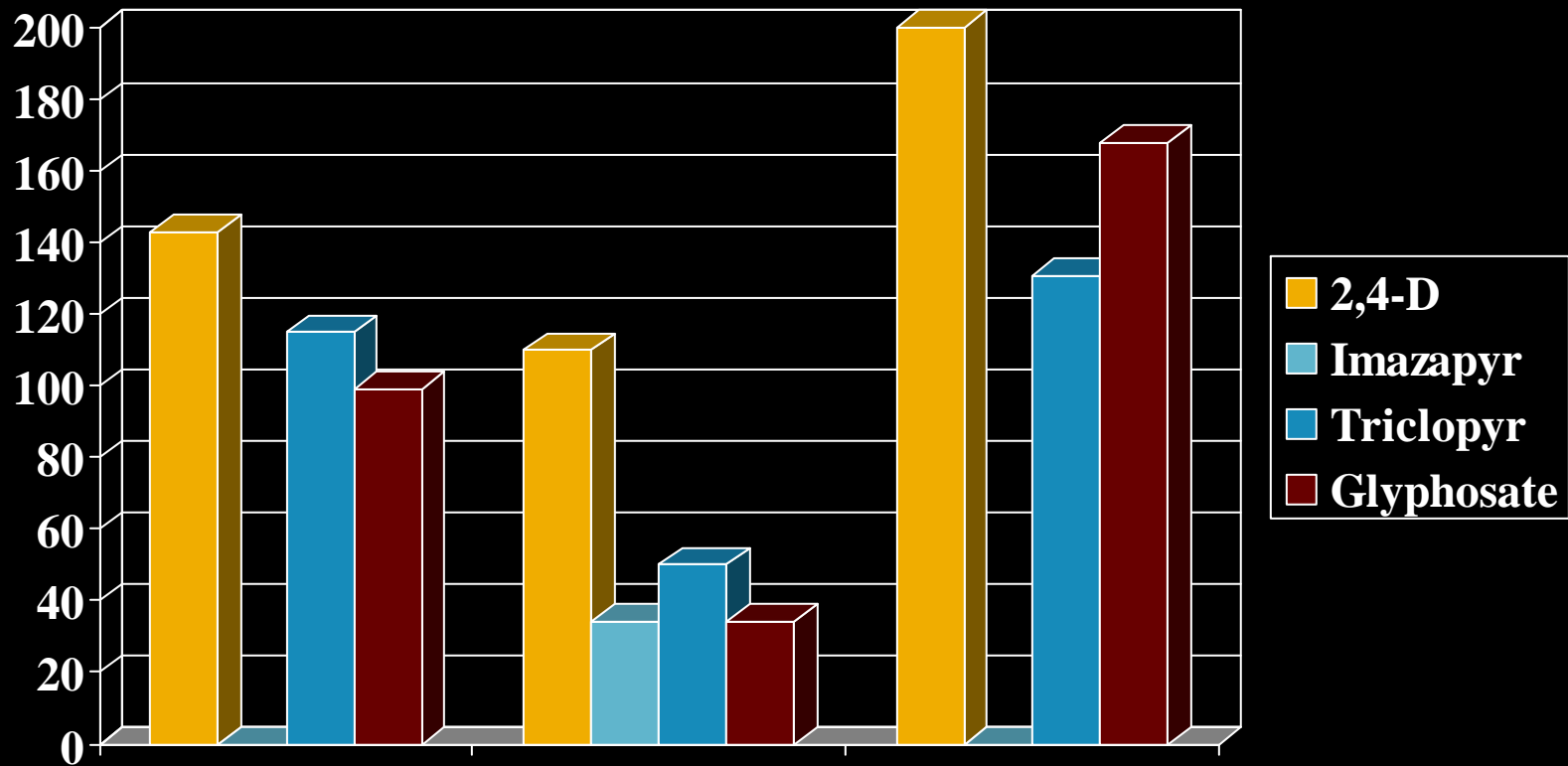
**June 14, 2005**

- **Sampled – 3 - sq m Quadrats**
- **Stems per Quadrat – Various Plants**
- **% Coverage per Quadrat**

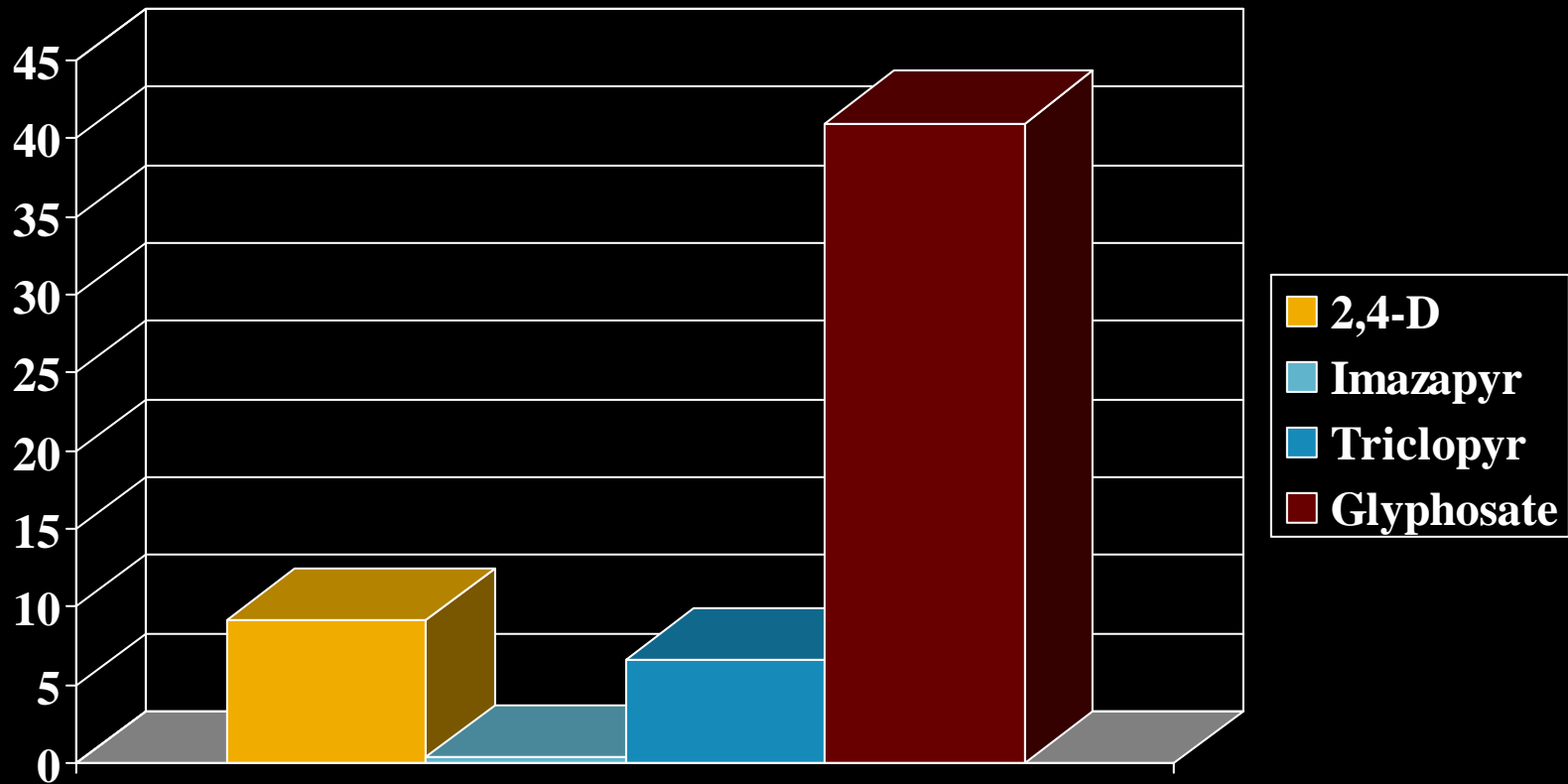
# % Coverage – Beach Vitex



# Beach Vitex Stems per Quadrat

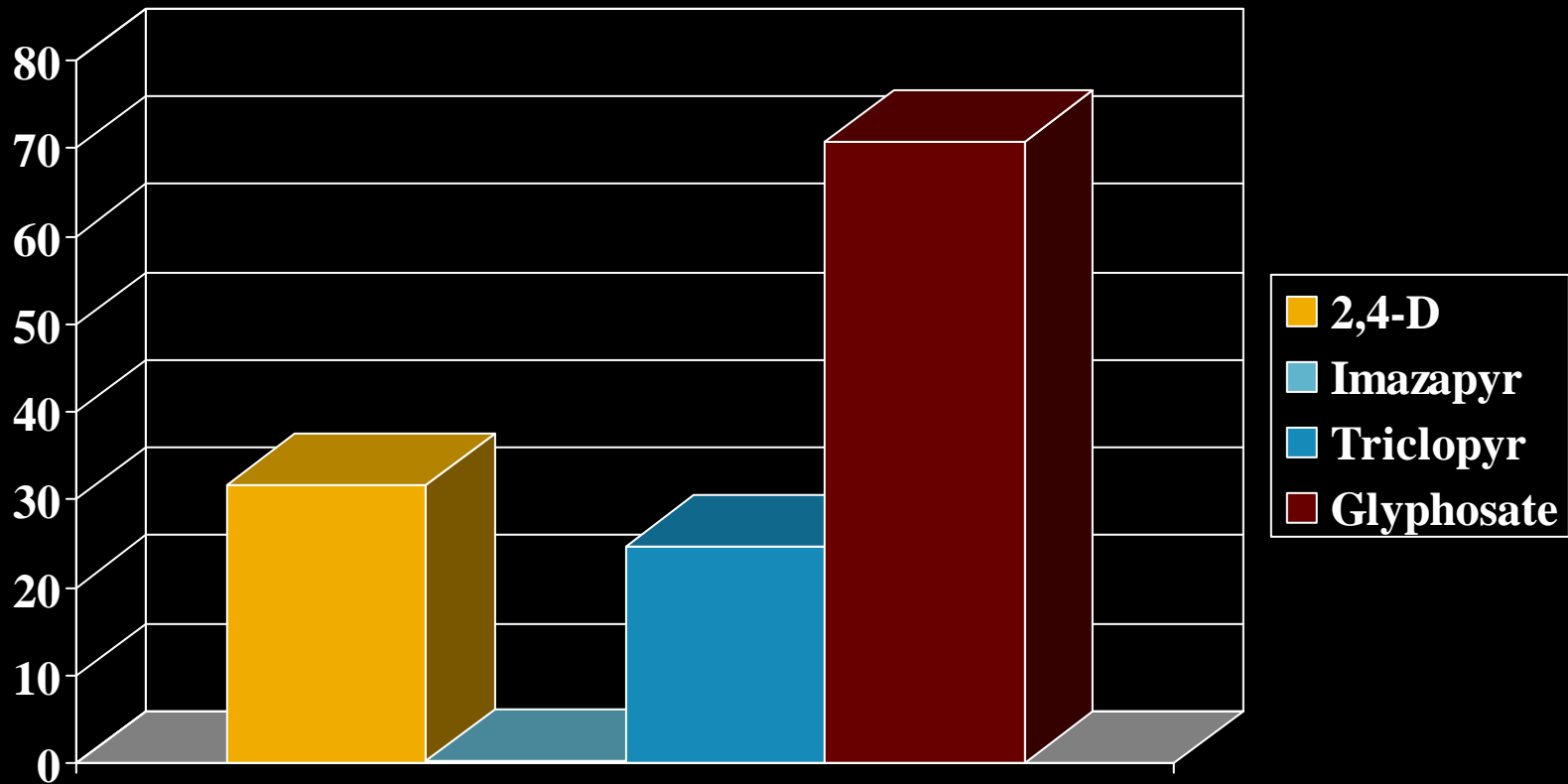


# Sea Oats - % Coverage





# Sea Oats – Stems per Quadrat (Mean)



# Cut and Paint

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- **Cut Vitex at ground level**
- **Paint stumps with 10% ai Roundup Pro (32 oz/gal)**

# Hack and Squirt

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**Wound Stem with Machete**

**Paint wound with 5.3% ai Arsenal AC (12 oz/gal)**

**Plant Sea Oats in Spring of 2006**

# Basal Paint

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**Paint 10" of stem with 12.3% ai Garlon 4 in Bark Oil (25.6 oz/gal)**

**Plant Sea Oats in Spring of 2006**

# Clemson's Eradication Method

- ✓ Search – frontal and inter-dune areas
- ✓ Evaluate – measure and map each site
- ✓ Get Permission – letters to landowners
- ✓ Inject – wound stems, daub herbicide
- ✓ Clear – cut plants at groundline, then chip
- ✓ Replant – sea oats, panicum, beachgrass
- ✓ Monitor – re-visit sites look for sprouting
- ✓ Retreat
- ✓ Interplant



**All treated sites  
are visited to  
search for  
sprouting vitex**









# Grants

- USFWS – SSPD
- USDA NRCS
- Donnelley Foundation
- Town of Pawleys Island
- Frances P. Bunnelle Foundation
- USFWS – Private Stewardship Grant Program
- USFWS – Coastal Program
- USFWS – Pulling Together Initiative

# Chronology

- 2004 - Initial Control Trials
- 2005 - Rate 2004, Refine Technique, Search
- 2006- Rate 2005, Search, Agreements, Treat A List
- 2007- Remove & Plant A List, Treat B List
- 2008- Remove & Plant B List, Retreat and Interplant A List and Treat C List
- 2009- Remove & Plant C List, Retreat and Interplant A & B List

# Progress to Date

- 248 Lots Identified
- 229 Agreements
- All 229 Treated
- 147 Lots Treated, Cleared and Planted
- 59 Lots Treated and Cleared
- 23 Lots Treated Only

# Other Initiatives

- Triclopyr - Spring and Summer
- Triclopyr - Foliar vs Hack and Squirt
- NRCS - Sweetgrass Varieties
- Beach Vitex Seed Germination
- SC Invasive Species List
- Education
- *“Making It Grow!”*
- <http://www.beachvitex.org/>

# Alligatorweed

- Clogs Waterways
- Problem in Waterfowl Impoundments
- No Wildlife Use
- Alligatorweed Fleabeetles
- Glyphosate, Imazapyr, Triclopyr, 2-4-D



# Biological Control - Alligatorweed

- US ACE and SC DNR
- Alligatorweed Fleabeetles
- May Releases
- 5 Year Program

# Alligatorweed Fleabeetles

- Pee Dee Canal
- US Army Corps of Engineers, SC DNR, IP and City
- ~5,000 Adults Released each year
- Good Control

# Alligatorweed Fleabeetles





# Water Hyacinth

- Illegal
- Ornamental Industry
- Waterfowl Problem
- Fisheries Problem
- Rapid Spread
- 2,4-D, Diquat, Triclopyr
- Cost-share Program



# **Arundo donax Control Demonstration**

- **Hobcaw Barony – Baruch Foundation**
- **US ACE – Dredge Spoil Area Dike**
- **Summit Helicopters**
- **Three - ~1 Acre Plots**

# *Arundo donax* - Imazapyr

- 48 oz Imazapyr
- 64 oz Imazapyr
- 96 oz Imazapyr
- 32 oz Summit 910 Surfactant
- 10 Gallons per Acre

# Arundo donax



# Arundo donax - ~1.5 YAT



# Chinese Tallow - Clearcast

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- October 2007
- 3% Formulated Product – 1% Surfactant
- 2% Formulated Product – 1% Surfactant
- 1% Formulated Product – 1% Surfactant

# Clearcast – Chinese Tallow



# Chinese Tallow – 2% Clearcast – 7 MAT





# Chinese Tallow – 1% Clearcast

7 MAT

