



Aquatic Plant Management: The Florida Perspective

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Outline

- Background and Current Position
- Current Research and Preliminary Findings
- Future Research Directions



Background & Current Position

- Education
 - BS - Plant Science, University of Florida (2014)
 - MS - Weed Science, University of Florida (2016)
 - Ph.D. - Weed Science, Mississippi State University (2019)
- 100% Research Appointment at CAIP
- IPA – ERDC Chemical Control Team
- Primarily focused on Florida and SE issues
- Involved in several National projects



Current Research



Maximizing Spray Interception on Invasive Floating Plants

- USACE Statement of Need
- Aquatic Plant Control Research Program
- “How much herbicide gets into the water”
- ERDC PI’s – Drs. Kurt Getsinger & Christopher Mudge



Concept



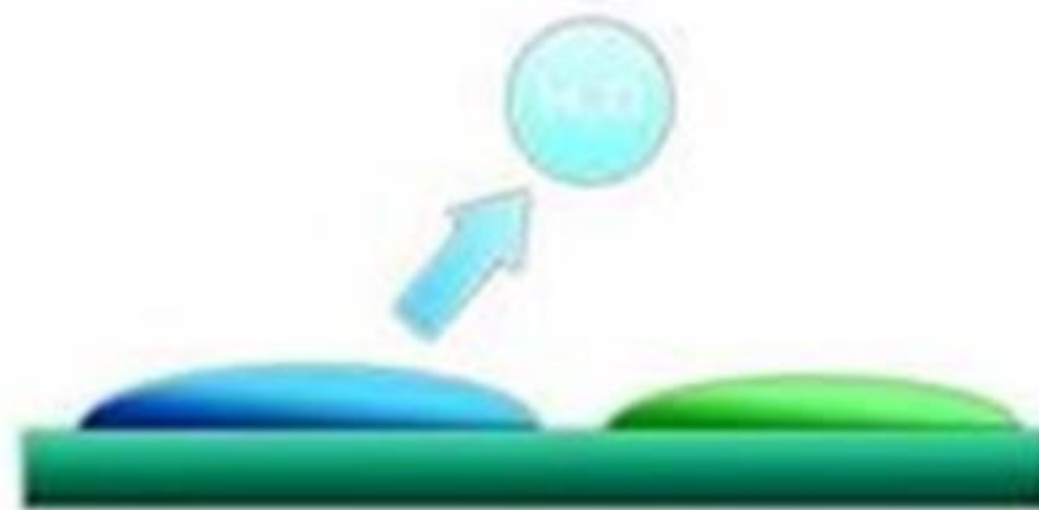
Spray Formation



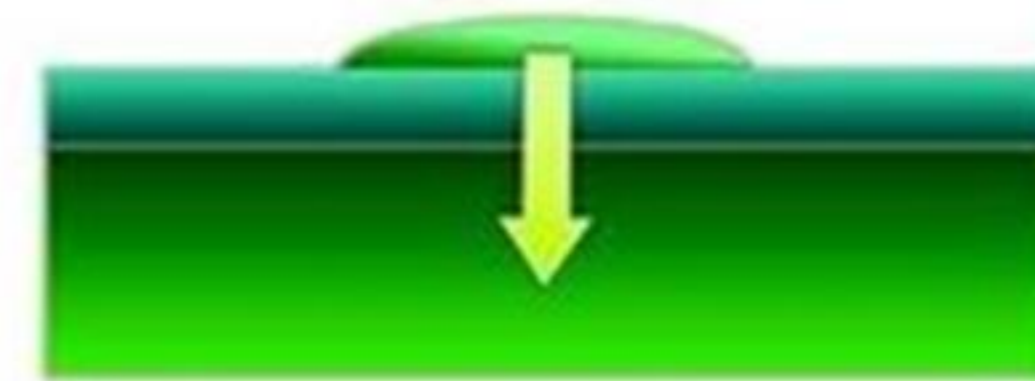
Spray Retention



Wetting



Deposit Formation



Uptake

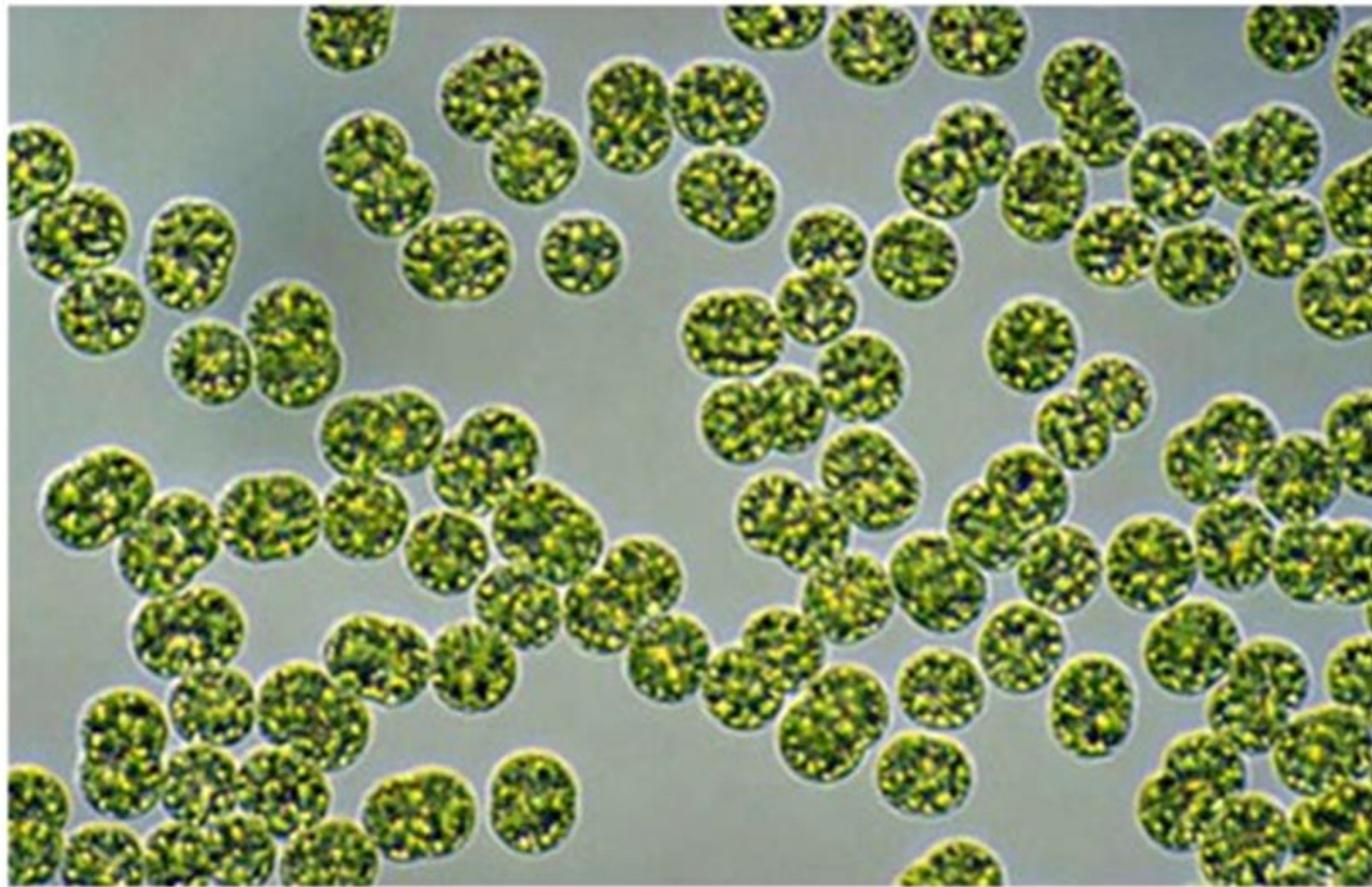
<https://www.crodacropcare.com/en-gb/products-and-applications/adjuvants>

Methods and Approach

- Phase 1 – Methods Development
- Phase 2 – Mesocosm Evaluations and Methods Development for Field Verification
 - Carrier Volume
 - Droplet Size
 - Adjuvant Type
 - Droplet Trajectory Angle
 - Plant Morphology and Growth Stage
- Phase 3 – Field Verification Studies

Lake Okeechobee Peroxide Demonstration for HABs

- Aquatic Nuisance Species Research Program
- ERDC PI – Dr. Kurt Getsinger
- Harmful Algal Bloom concerns in Lake Okeechobee
- Extensive research on biology and long-term management
- Short-term management = algaecides?



http://cfb.unh.edu/phycokey/Choices/Cyanobacteria/cyano_unicells/unicell_of_microcystis/Microcystis_culture_image_page.htm

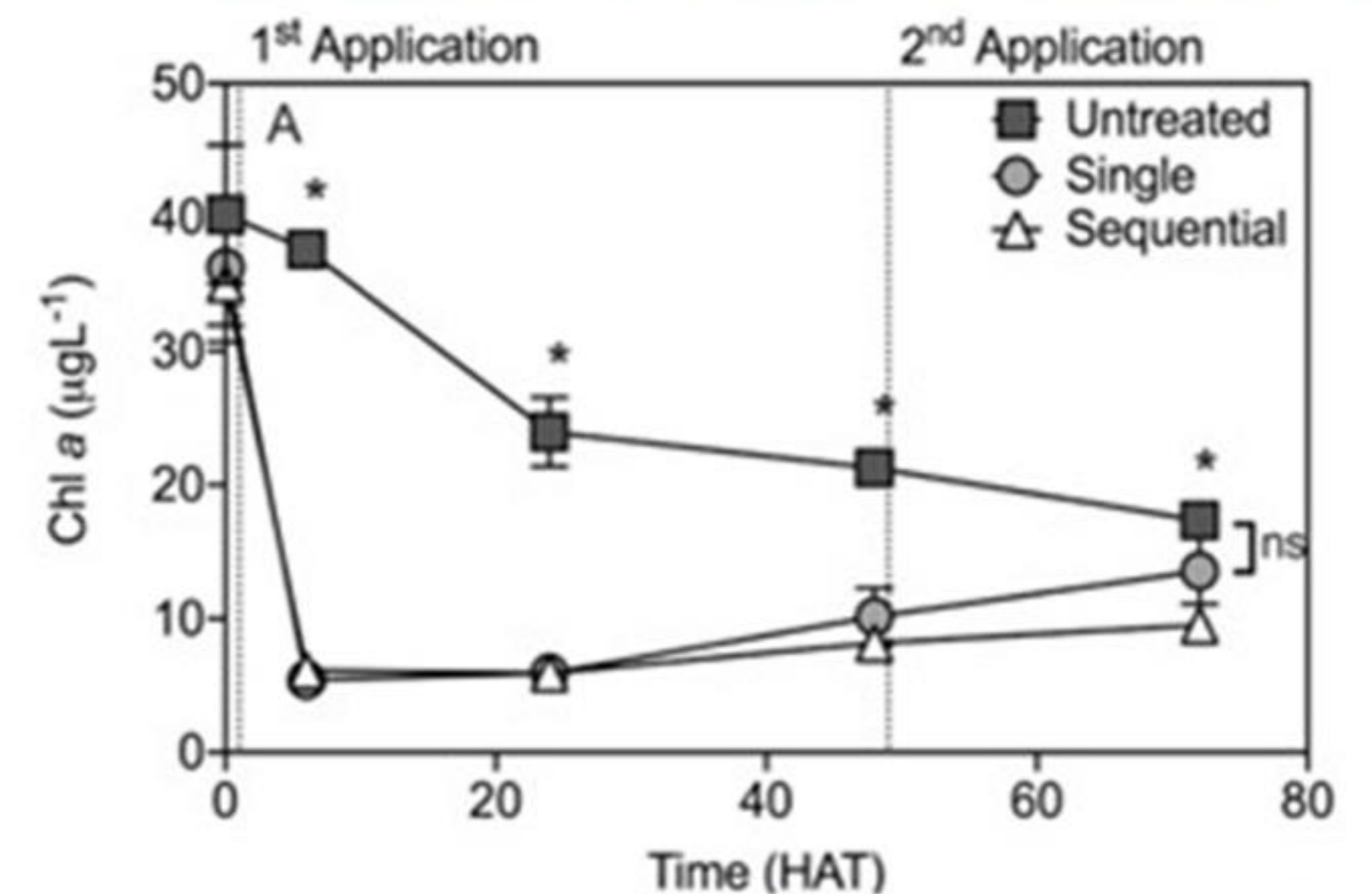
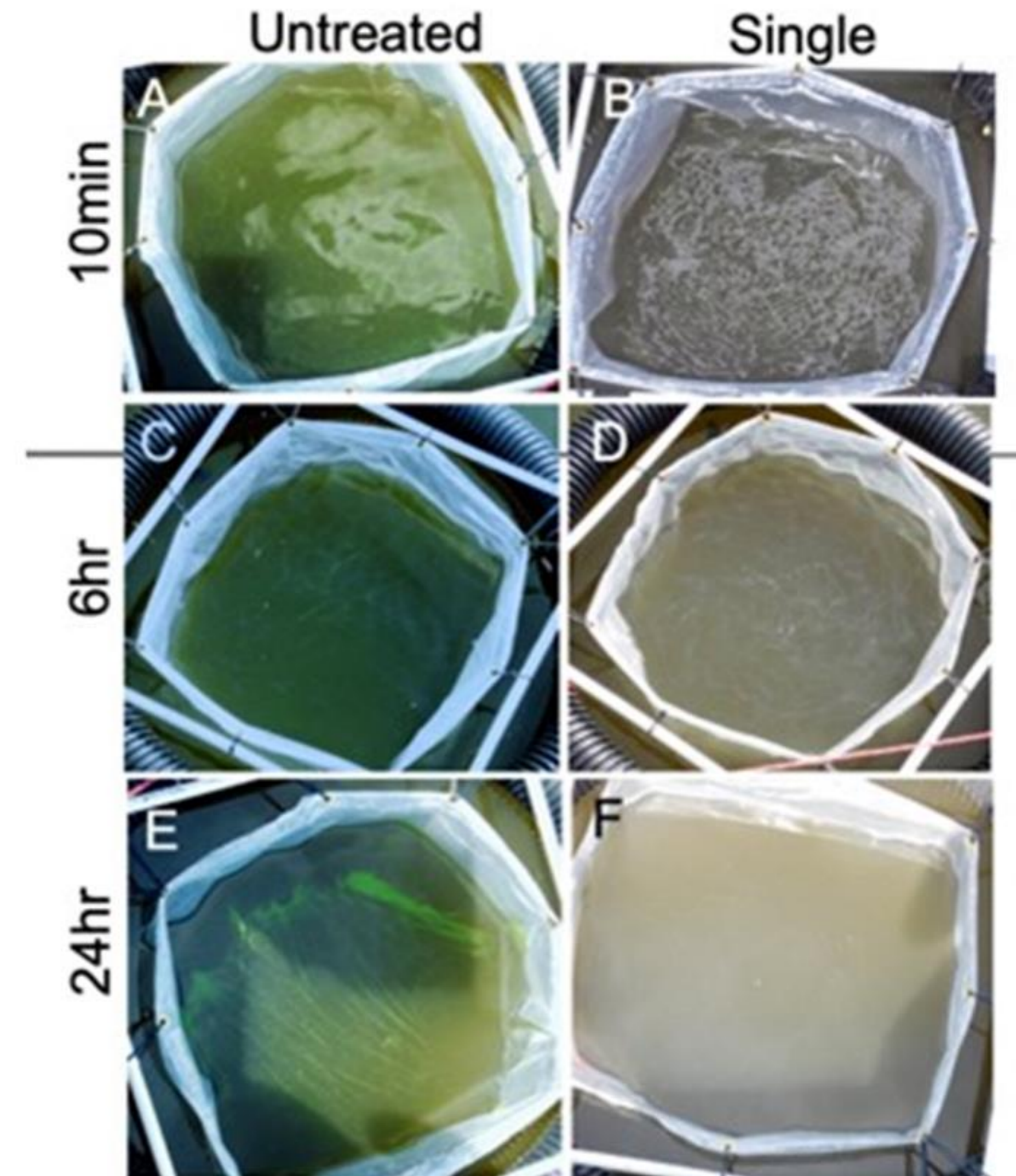


2019

- Inconsistent Bloom conditions
- Conducted *In situ* mesocosm study

2020

- Field work scheduled for June-September (pending bloom conditions and travel restrictions)



Evaluating Low Carrier Volume Techniques for Waterhyacinth control

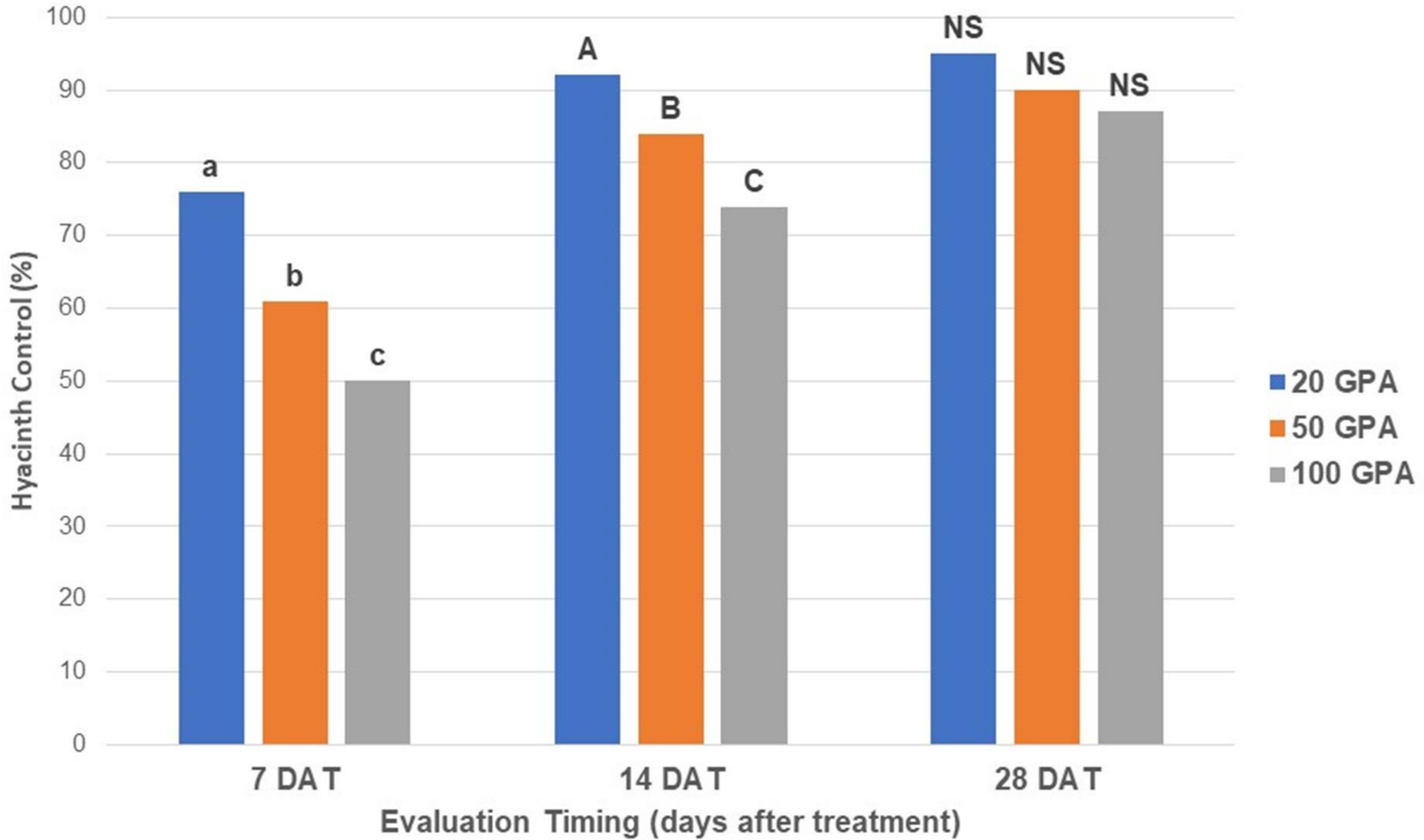


Concept

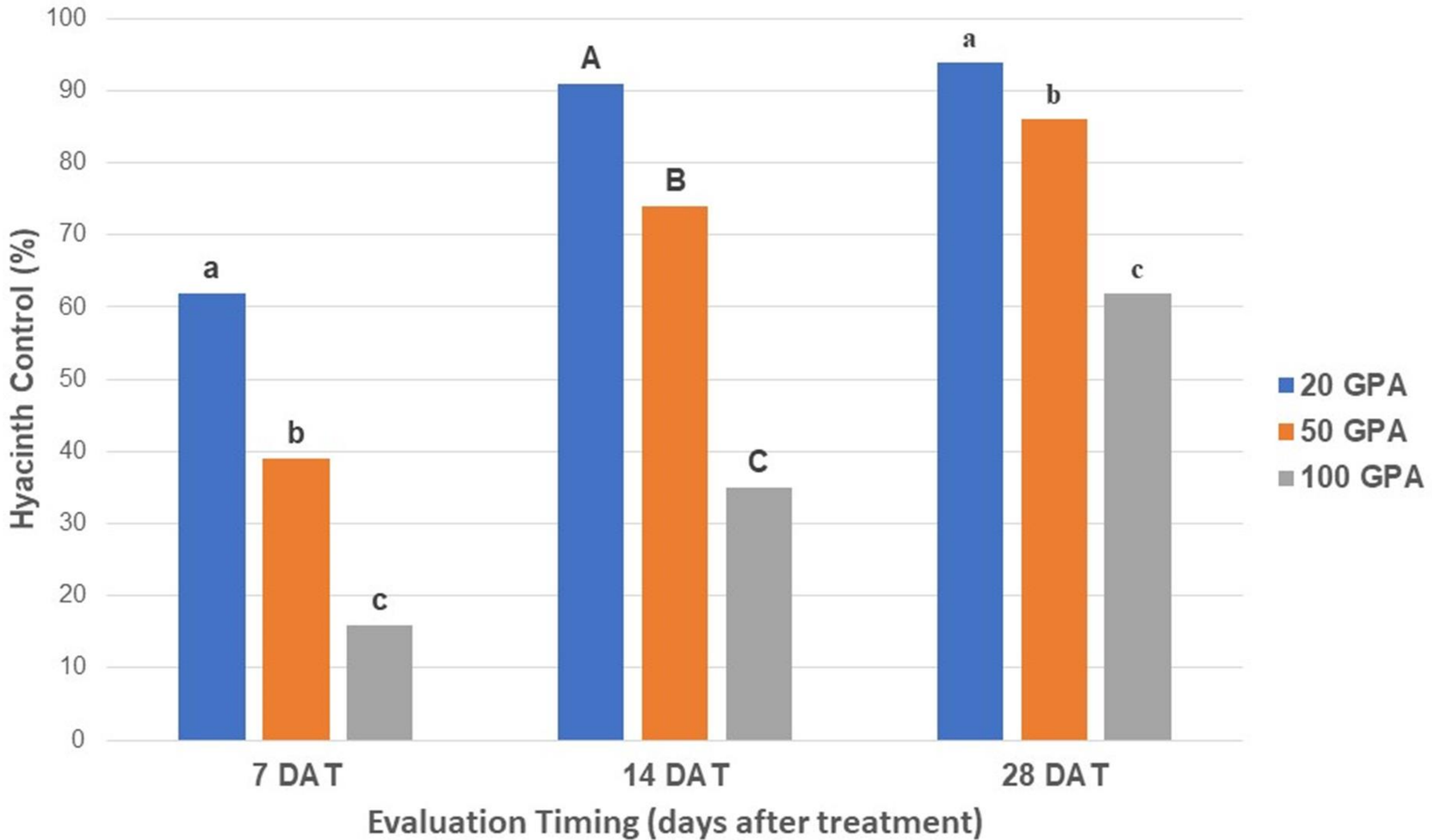
- Common application technique:
 - 100 GPA (highly dilute solution)
 - Single nozzle “hand-gun”
 - Can be viewed as “Heavy Handed”

GPA	Herbicide
100	2,4-D (2 lb/A)
50	Glyphosate (2 lb/A)
20	

2,4-D



Glyphosate

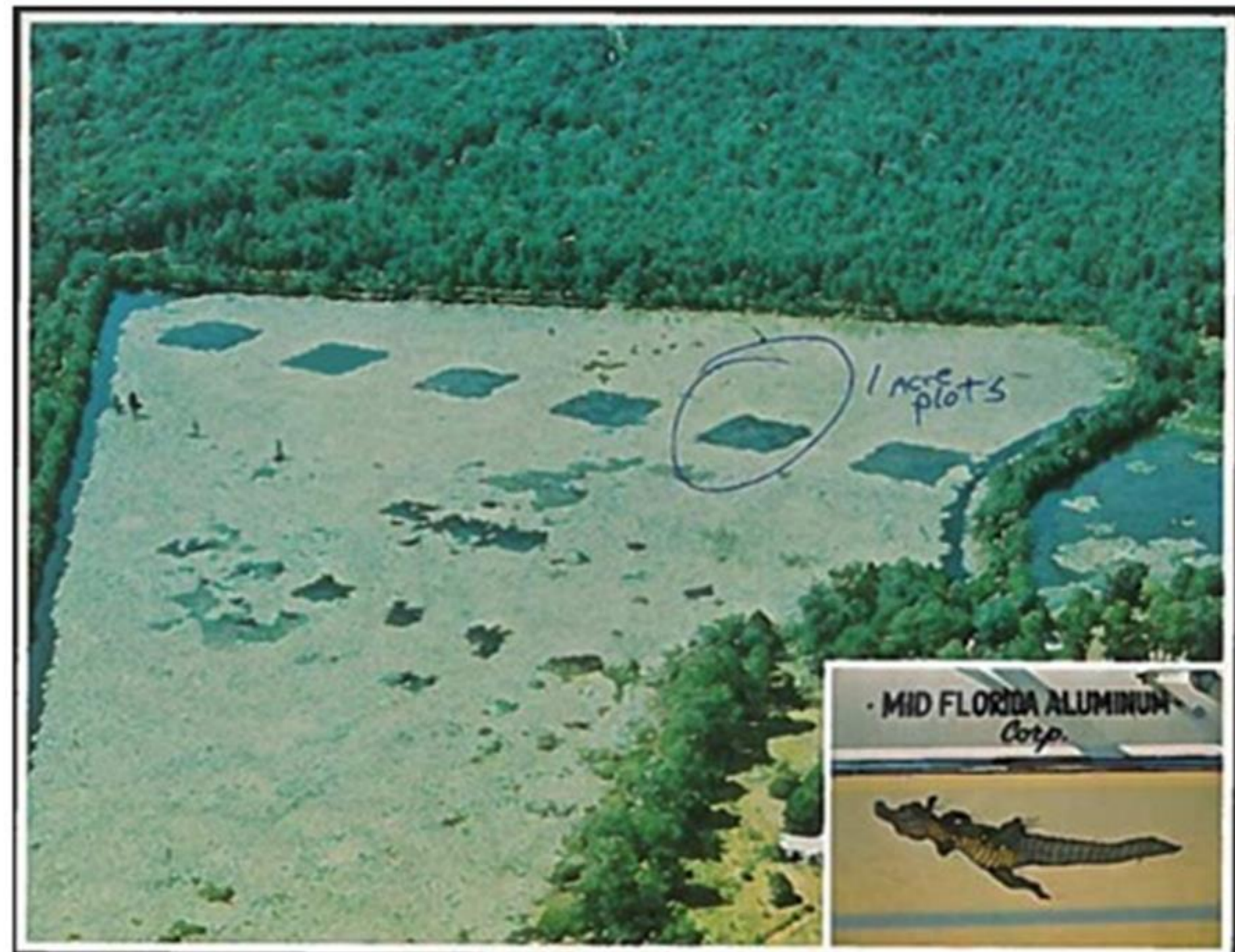


Drawdown Herbicide Treatments for Hydrilla Suppression



Drawdown Herbicide Treatments for Hydrilla Suppression

- Very little modern herbicide data on drawdown activity
- Some aquatic herbicides have soil-applied activity in terrestrial systems
- Drawdown conditions may be an opportune time for management

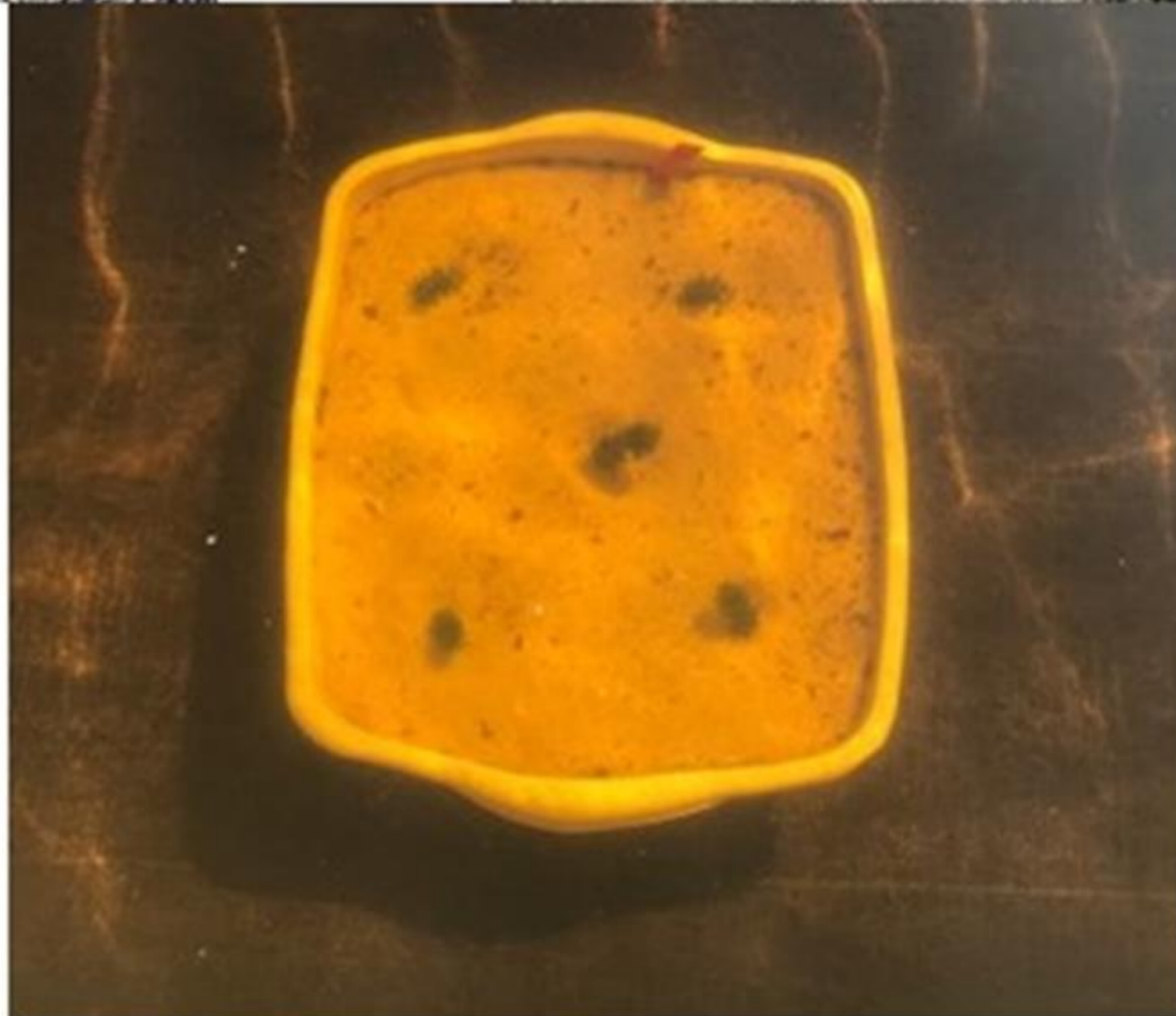


A REPORT ON A SOUTHEASTERN UNITED STATES
CASORON AQUATIC WEED CONTROL RESEARCH TOUR

Methods

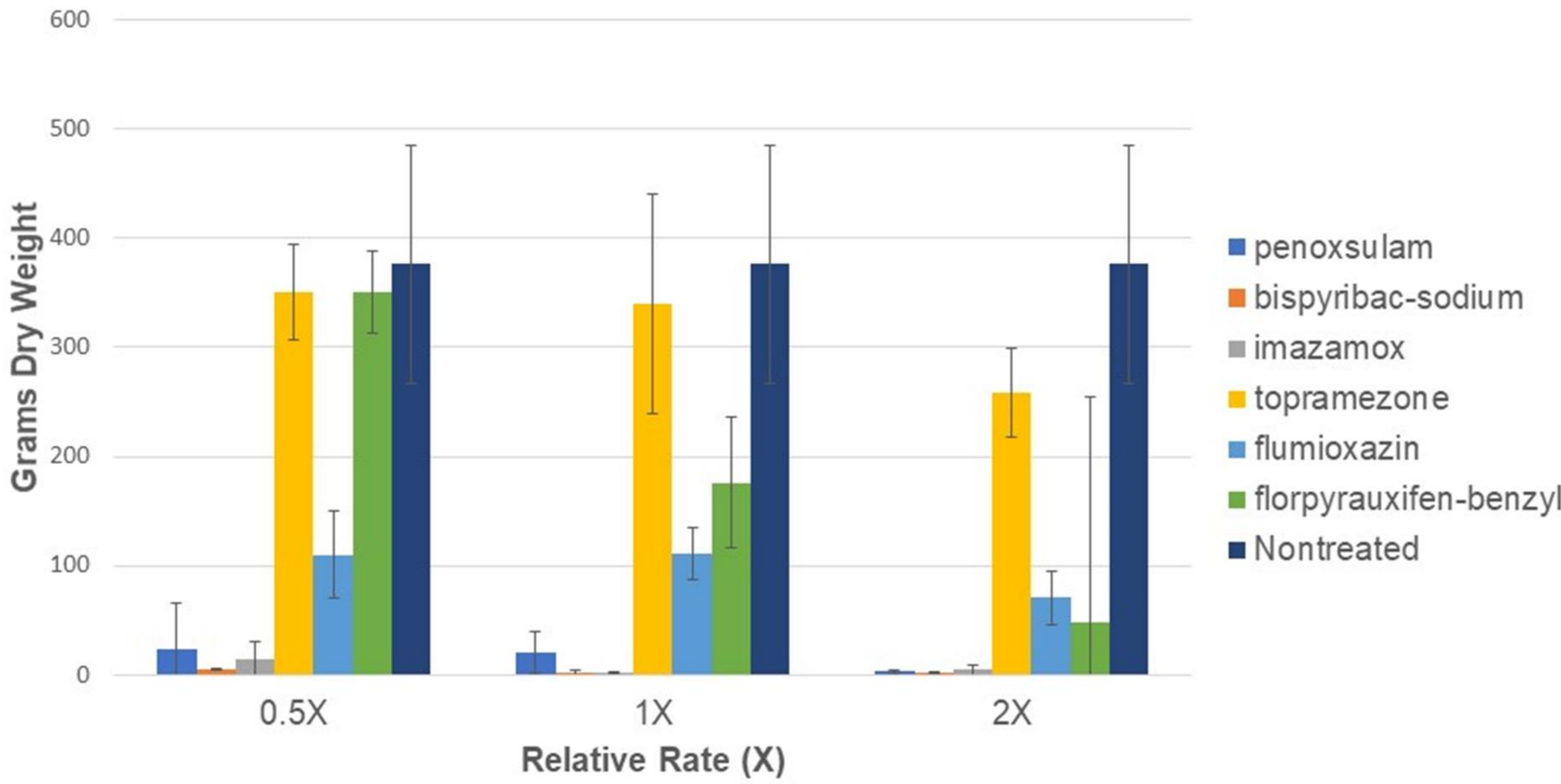
- Sprayed January 22nd 2020 under greenhouse conditions
- Incorporated treatments with 1" water
- Kept moist for 1 week
- Transported to research ponds in South Florida
- Harvested May 27th – (4 months)

Herbicide	Rate (X maximum labeled rate)
Penoxsulam	0.5X
Bispyribac-sodium	1X
Imazamox	2X
Topramezone	
Flumioxazin	
Florpyrauxifen-benzyl	
Nontreated	



Preliminary Results

Hydrilla Drawdown Dry Biomass



Adjuvant and Application Techniques for Brazilian Peppertree Control



Adjuvant and Application Techniques for Brazilian Peppertree Control

- Highly aggressive woody perennial
- Basal bark & hack-and-squirt treatments difficult due to multiple stems
- Foliar treatments often result in epicormic sprouting

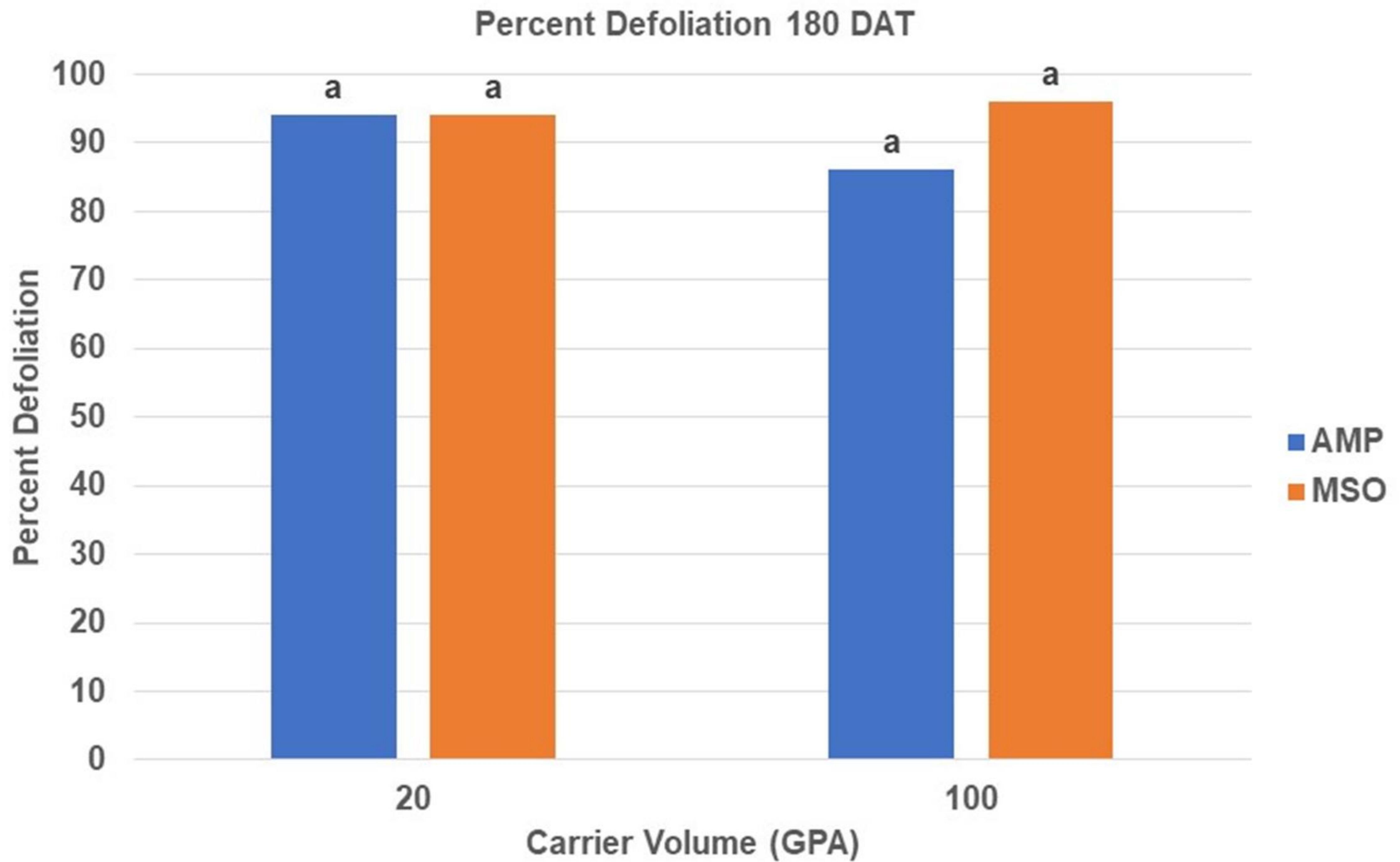


Materials and Methods

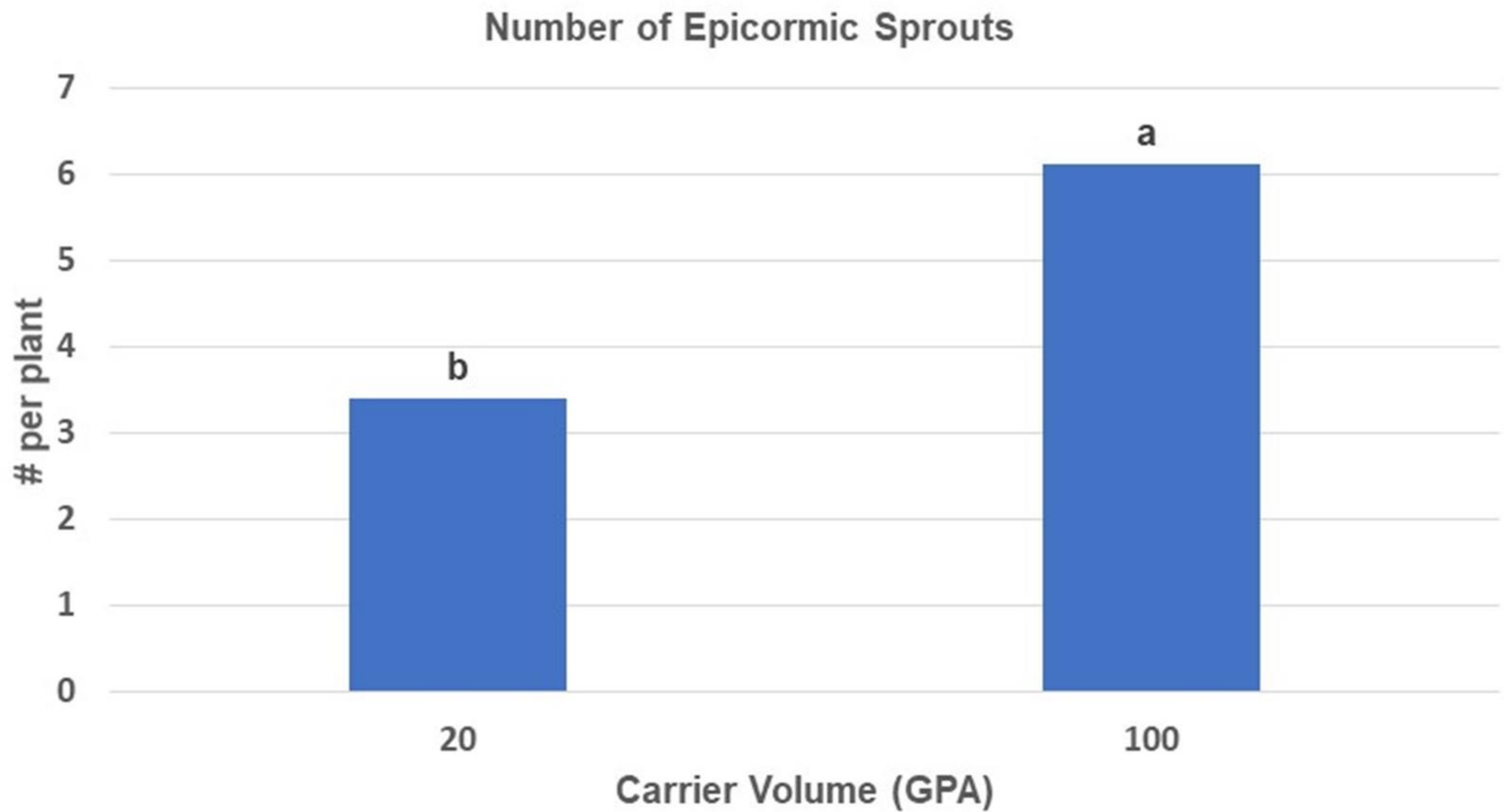
- Triclopyr-acid (Trycera, Helena) at 1 lb ae/A
- AMP vs. MSO
- 20 vs. 100 GPA



Results



Results



Isolation and Management of a New Giant Salvinia Population in Florida



- <5 known populations in FL
- Challenging environment
 - Swamp – Dynamic water levels and difficult for applicators
 - Cannot broadcast treatments
 - Low light conditions (problem for “light-active” herbicides)
- Multiple treatments of flumioxazin plus diquat
- Alternative strategies currently under evaluation (ALS-inhibitors + glyphosate)

Future Directions



Evaluation and Refinement of ACCase-inhibitors for Invasive Grass Management



Management of Hydrilla in Flowing Water Systems



Low-Dose submersed Treatments for Invasive Floating Plants





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Questions?



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