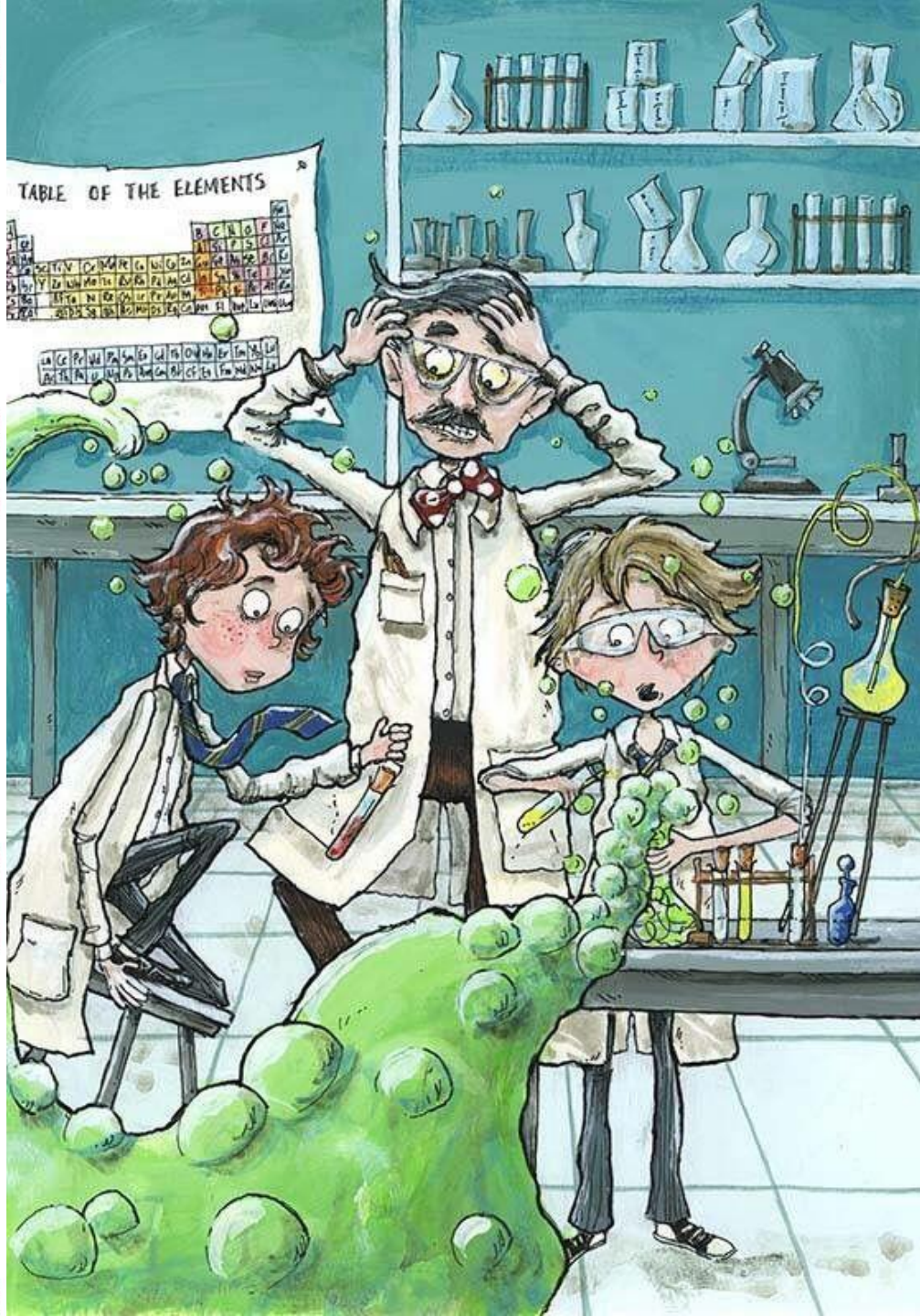


CAIP Research Update

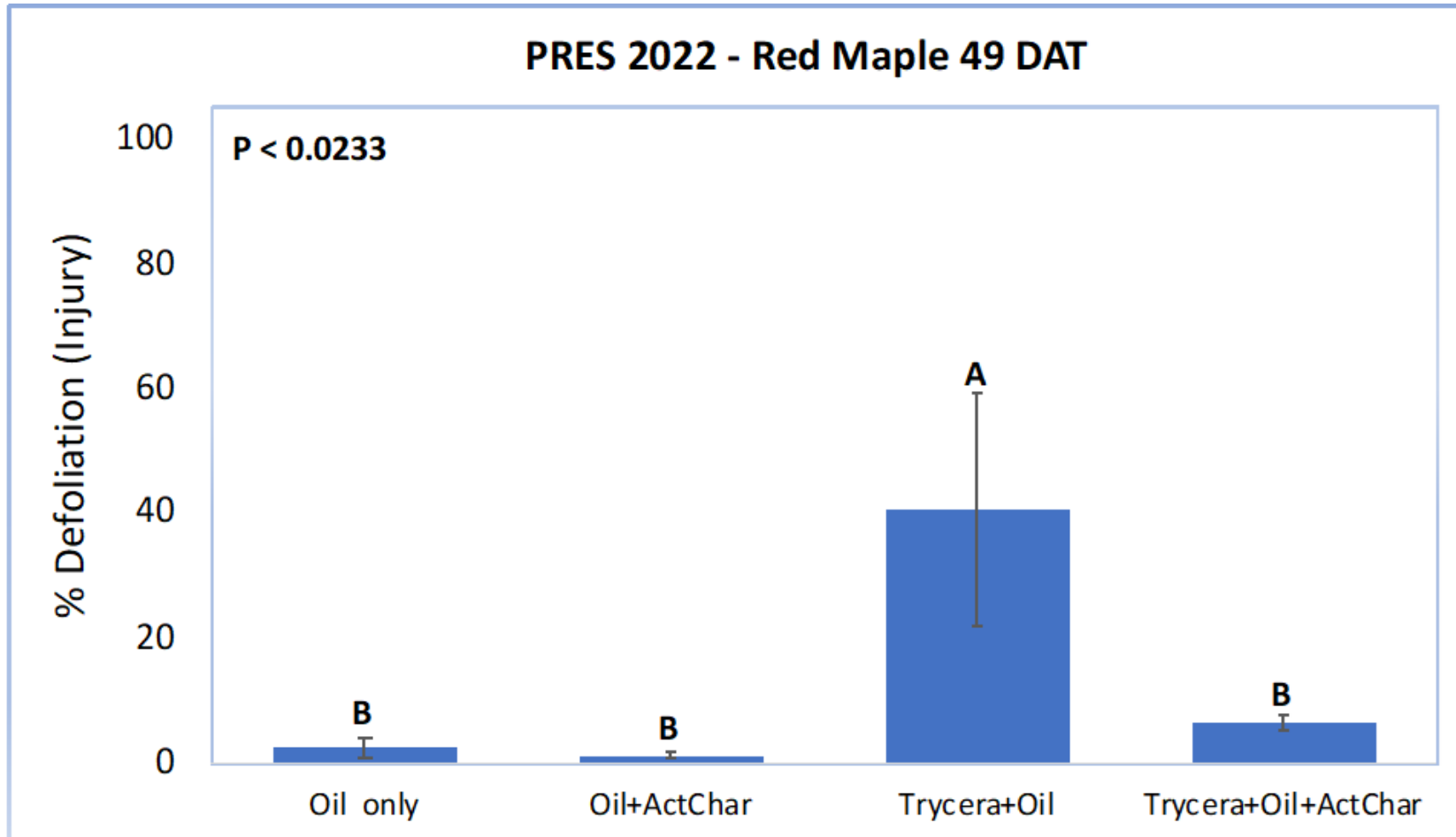
Jonathan Glueckert
and
Stephen F. Enloe



- Theory is when you know everything but nothing works
- Practice is when everything works but no one knows why
- At CAIP, theory and practice are beautifully combined, so that nothing works and no one knows why...



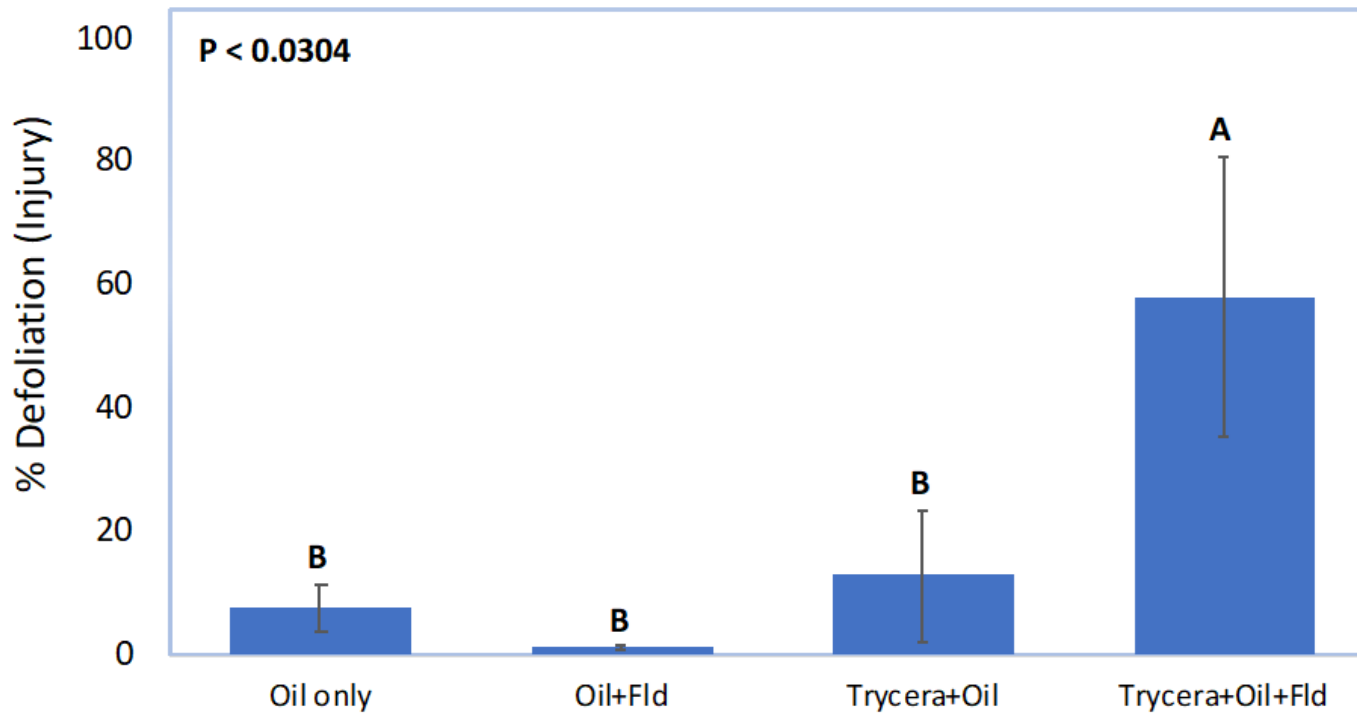
Triclopyr Root Exudation Study



- Root exudation is not a concern for triclopyr

Triclopyr Flooding Study

PFS 2020 - Red Maple 49 DAT



- Flooding can release triclopyr from basal bark treated stems, resulting in non-target injury

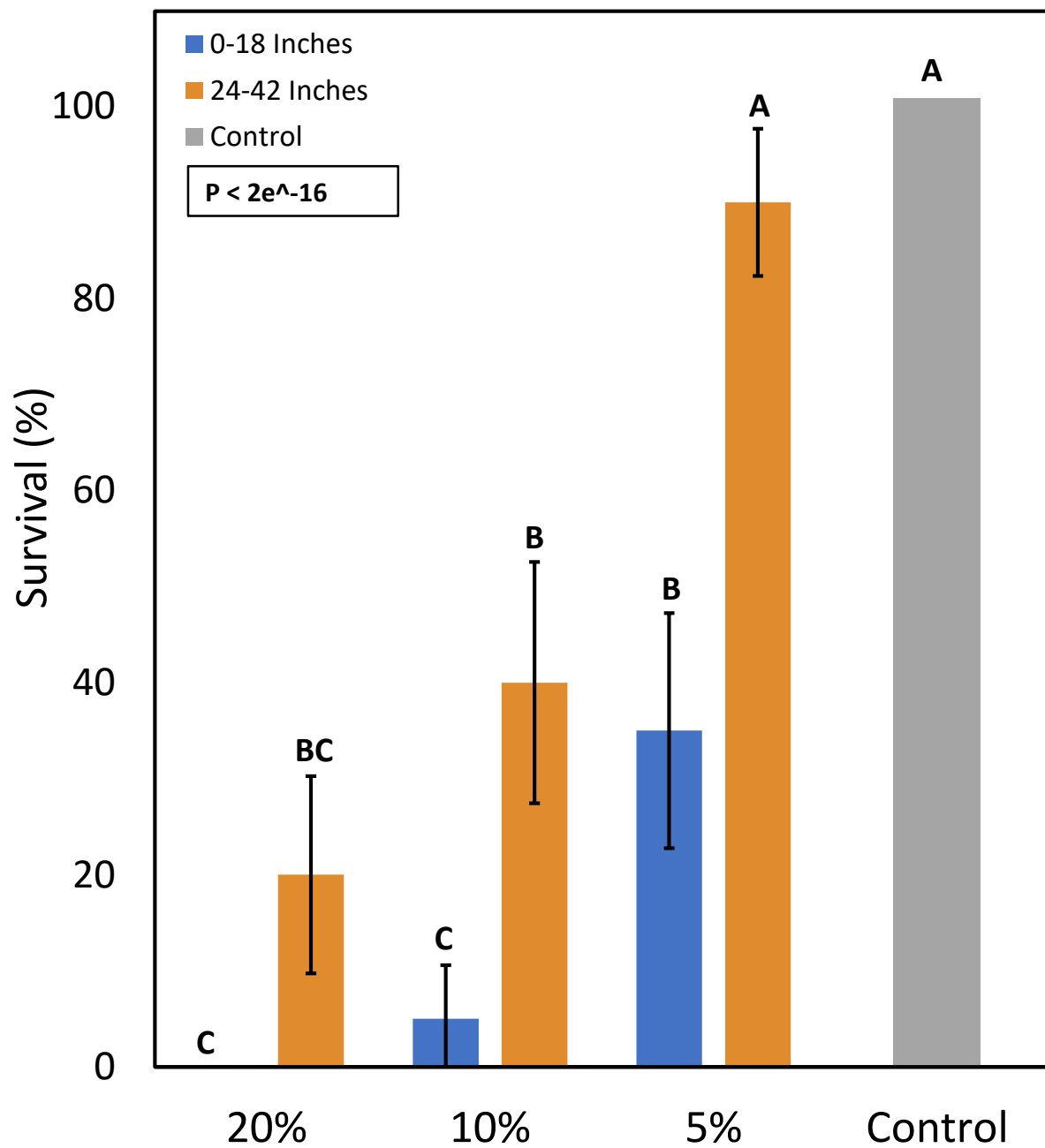


Can elevated basal bark treatments be effective?

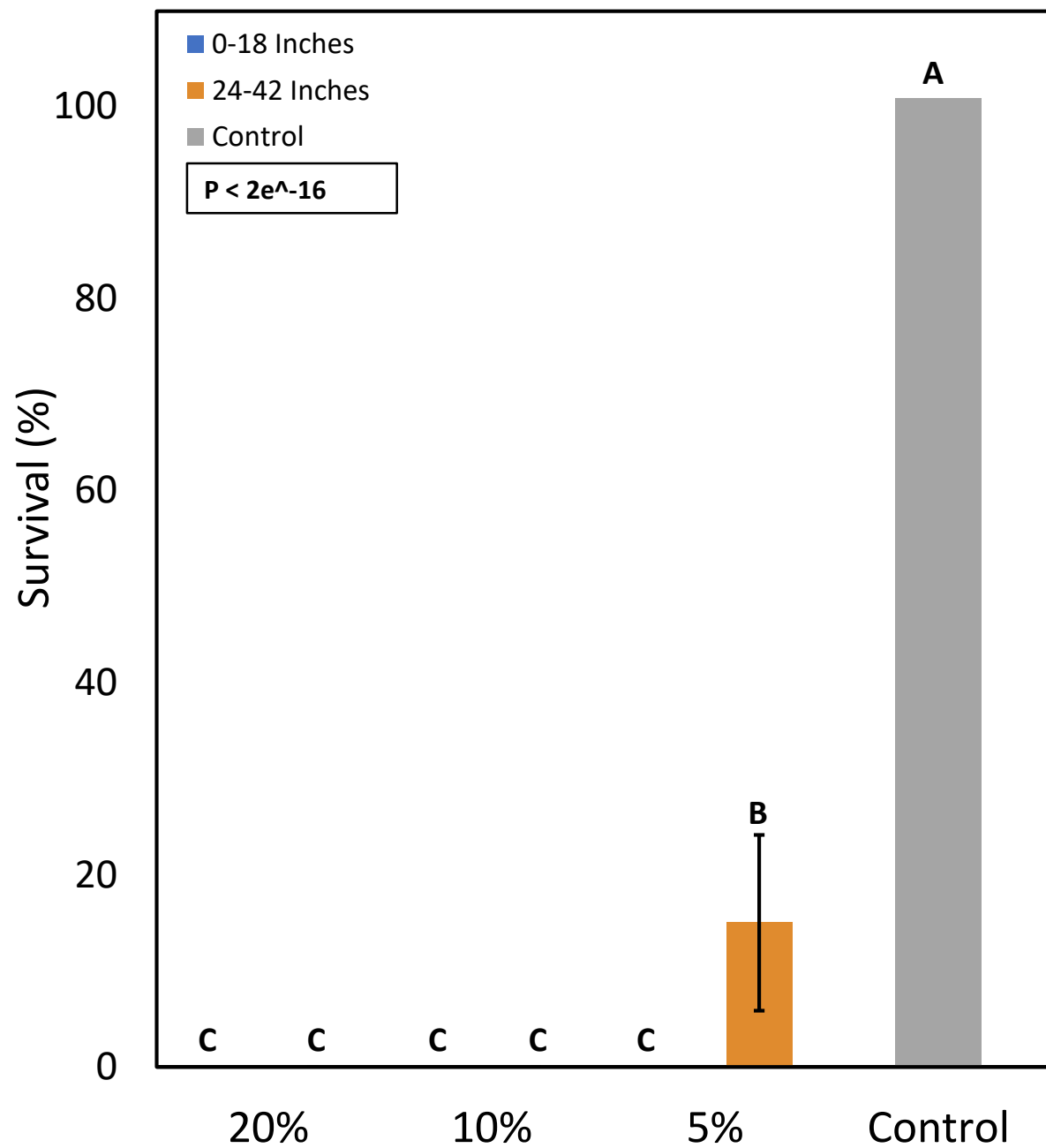
- Triclopyr acid (Trycera) + Impel Red Basal Oil
 - 5%, 10%, 20% v/v
- Band Heights (from the ground)
 - 0-18 inches
 - 24-42 inches



Tree Survival 360 DAT (Large trees)



Tree Survival 360 DAT (Small trees)

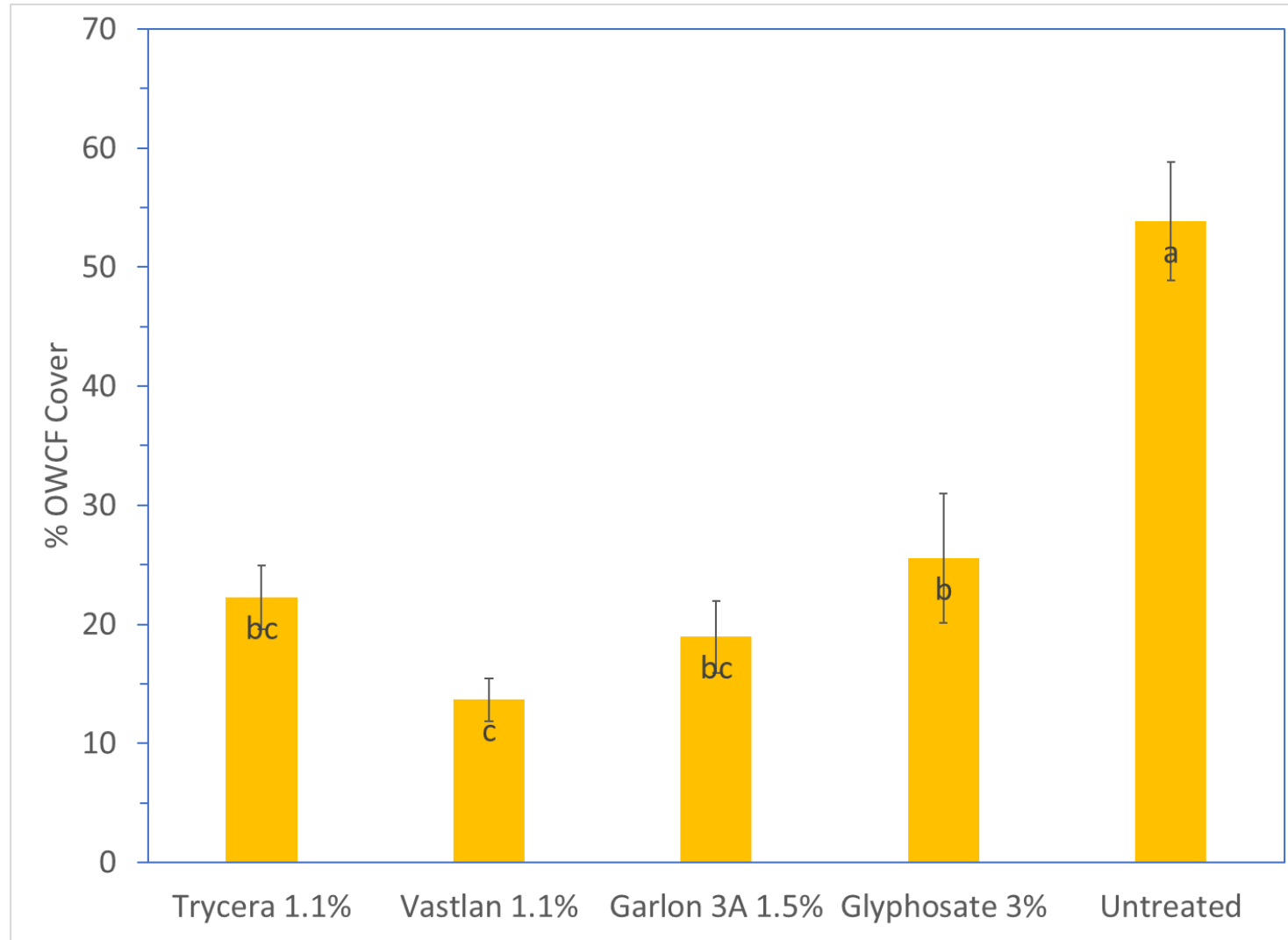


What this means for you

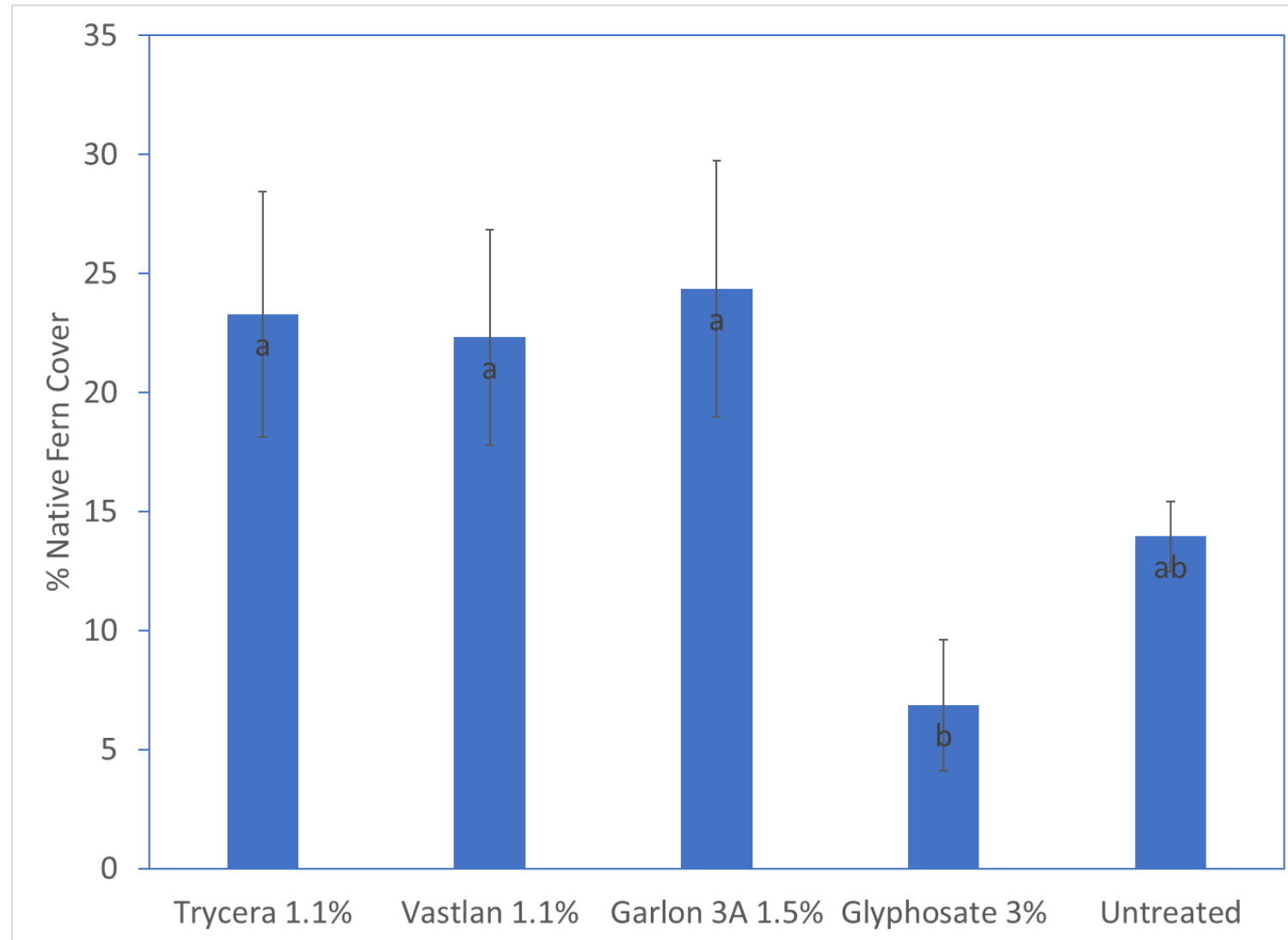
- High band treatments can be effective on smaller diameter stems ($\sim < 4$ inches) at Trycera concentrations as a low as 10% v/v
 - It is a slower application process
 - It is the equivalent of Garlon 4 at 7% v/v



Previous studies: OWCF response to triclopyr formulations (840 DAT)



Native fern response to triclopyr formulations (840 DAT)



Golden pothos and arrowhead vine



Foamer Application for Cut Stems and Aerial roots



0.8 ml/stroke



Dip Application for Cut Stems and Aerial Roots



2 second dip, 2 second drip



Poodle Cut +
Glyphosate Foamer



Poodle Cut +
Glyphosate Dip



Poodle Cut only



Translation

- No more hand pulling out of most trees!
- Bigger stems (>1 inch in diameter require a longer dip)
- Make applications when transpiration rates are high
- Technique is not effective when cut stems bleed sap



Cuban bulrush (*Cyperus blepharoleptos*) seed biology and control (Dr. Candice Prince)

Research questions:

- 1) How long do seed remain viable?
- 2) When are seeds most likely to germinate?
- 3) What substrate is best?



Stratification Treatments

3 storage treatments: cold (4 °C) and warm (30 °C) moist stratification, and dry stratification (21 °C in glass desiccator)

Germination assay timings: after 0, 1, 3, 6, 9, and 12 months

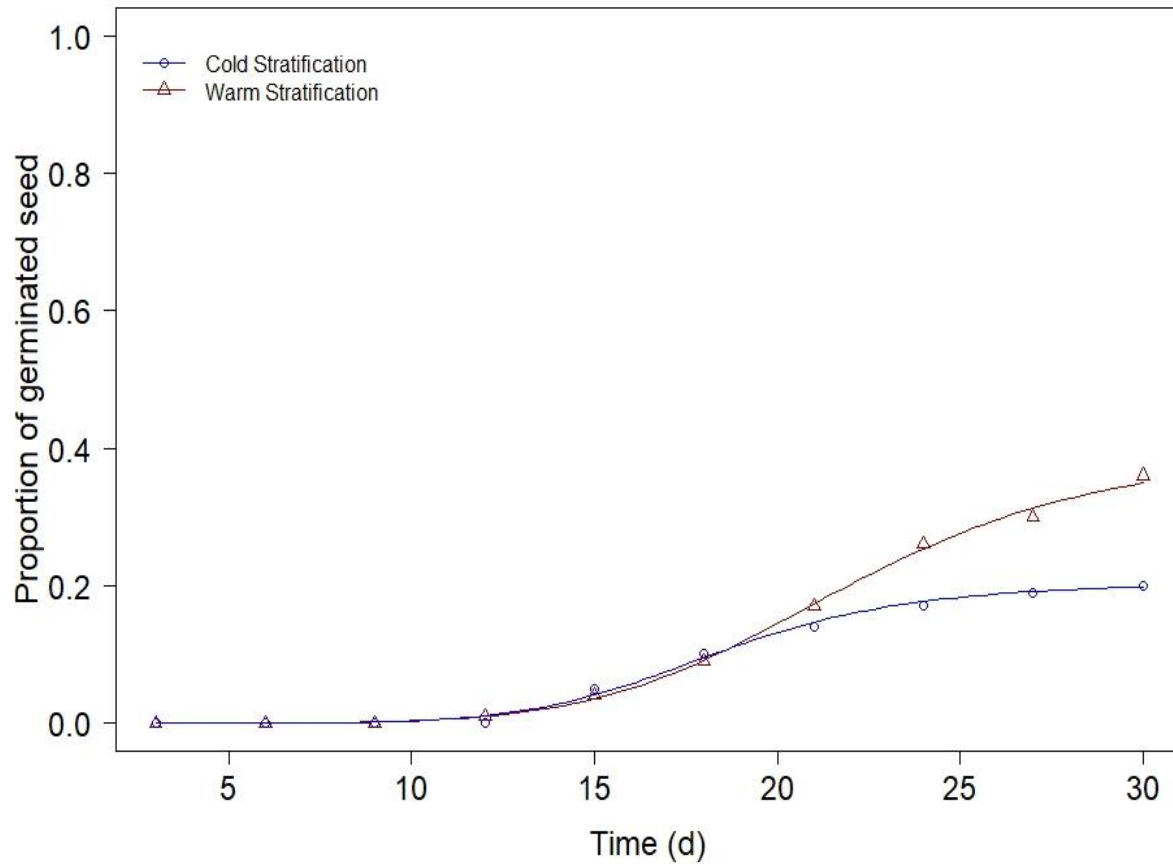
4 germination day/night temperatures: 22/11, 27/15, 29/19, or 33/24 °C

There was no germination at 22/11 or 27/15 °C

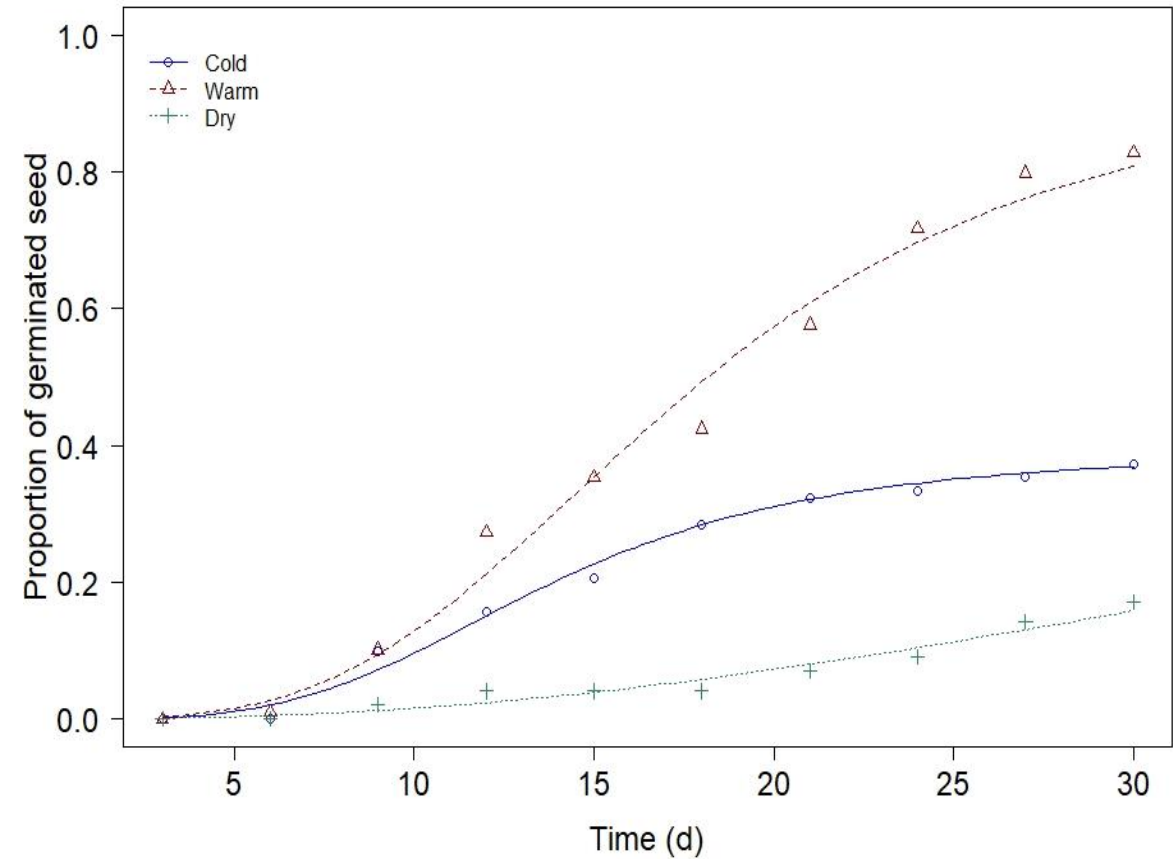


6 months of storage

Germination temp: 29/10 °C

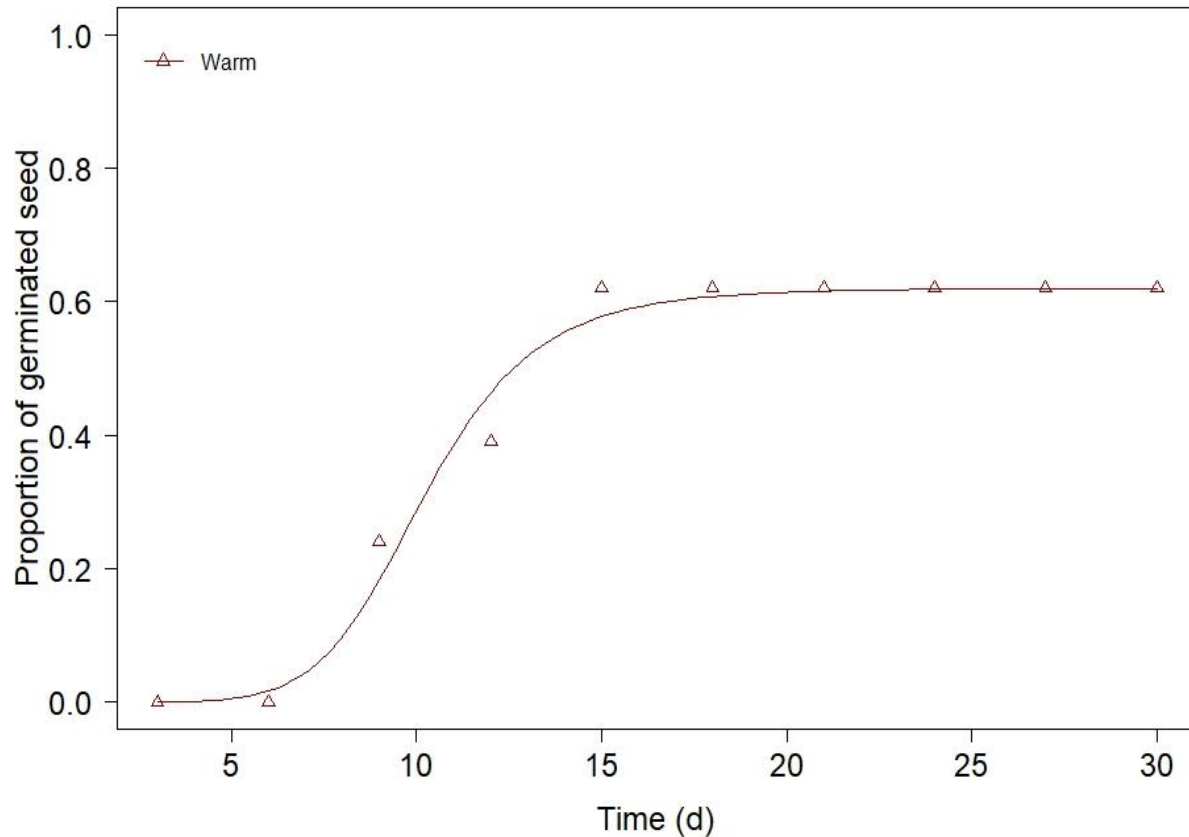


Germination temp: 33/24 °C

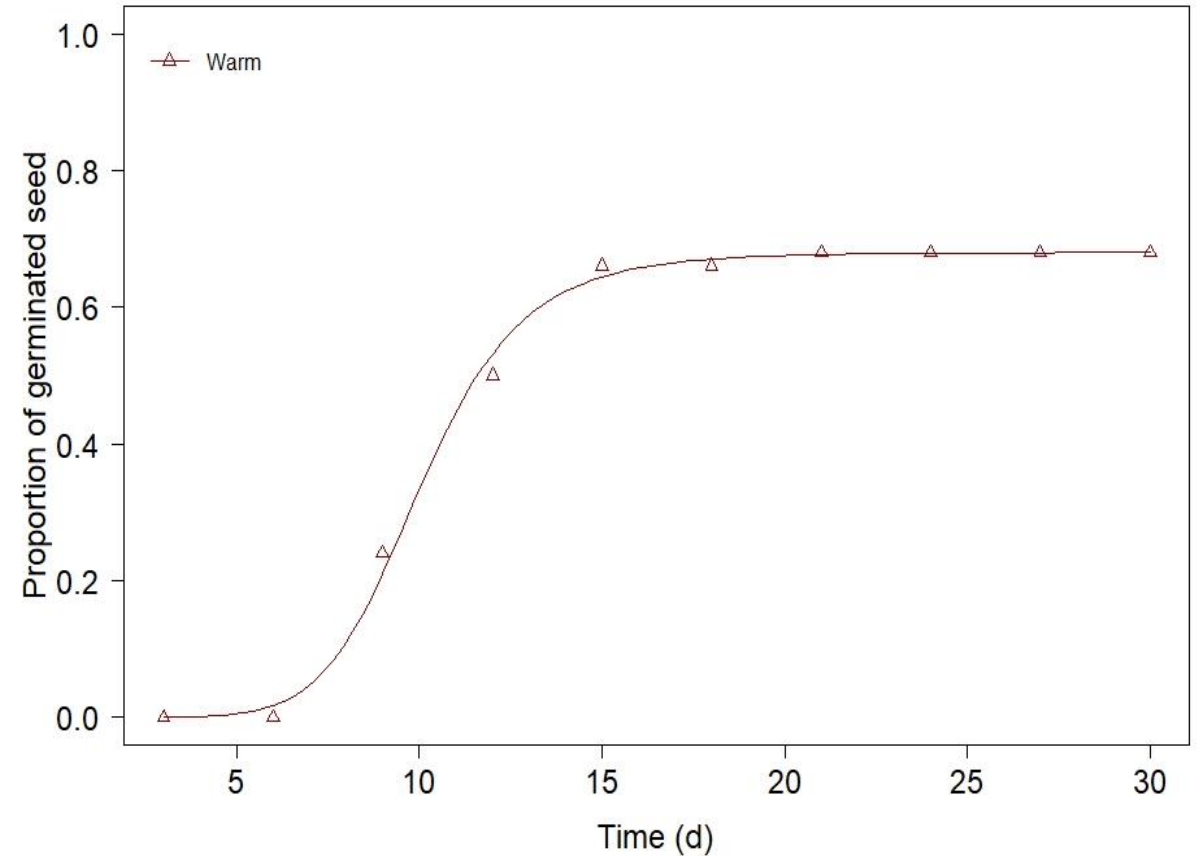


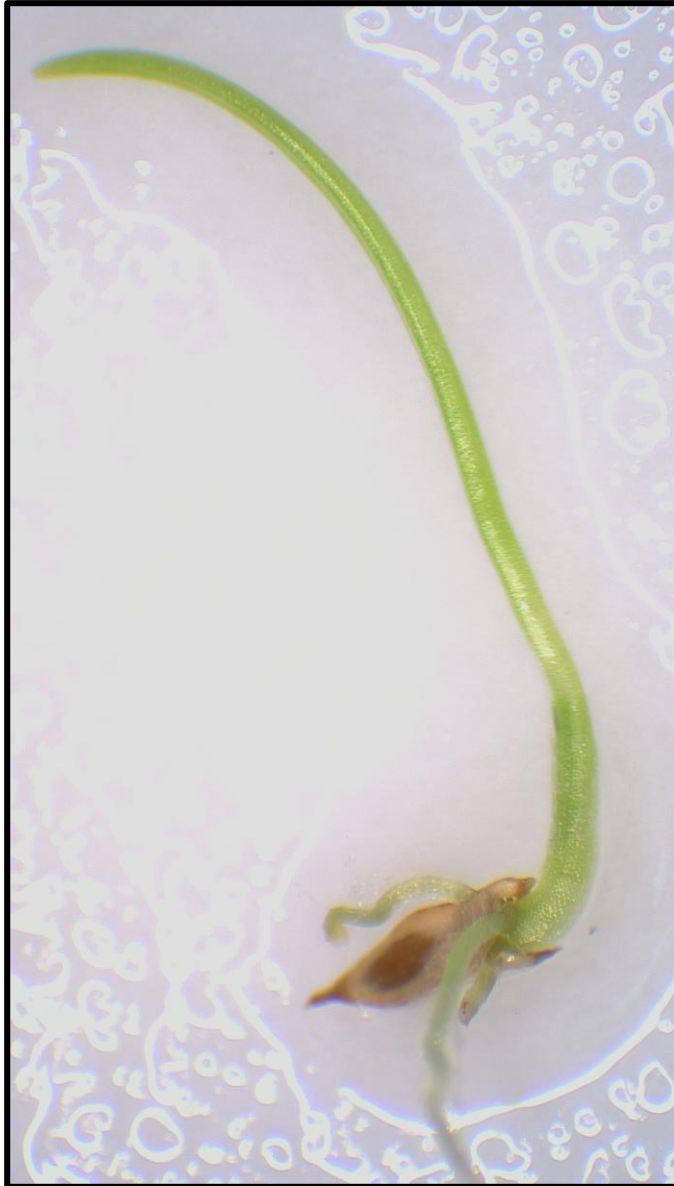
12 months of storage

Germination temp: 29/10 °C



Germination temp: 33/24 °C





Conclusions

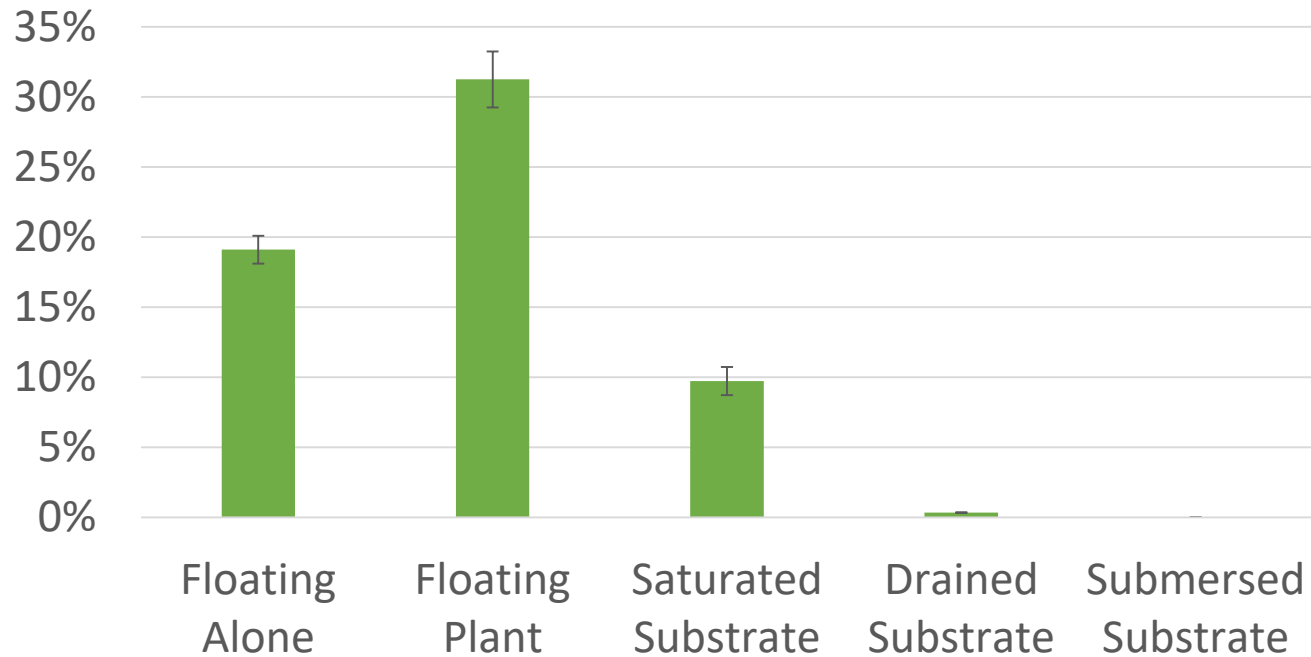
Highest germination at warm temperatures

Germination increased over time, indicating seed dormancy

Germination highest after storage in moist, warm conditions

Habitat suitability for germination

Average Germination after 30 days



Seed biology take home message

- Cuban bulrush
 - Exhibits signs of seed dormancy
 - Can recolonize from seed for at least one year after management
 - Germinates better at warmer temps
 - Germinates well on top of floating plants





Herbicide take home message

- Diquat: excellent foliar burndown
- Glyphosate: good foliar burndown
- 2,4-D: foliar burndown but not spectacular
- Florpyrauxifen-benzyl: good foliar burndown with 2 PDUs

- None of these sunk the mat, ALL had regrowth from stolons and some seed germination

- Triclopyr has excellent activity and can sink the mat at high concentrations, but we are not comfortable with it yet

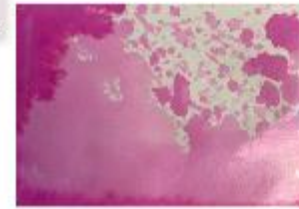


Foliar Spray Deposition Patterns

- Spray retention/loss rates
- Developing optimal application techniques



100 GPA = 92%



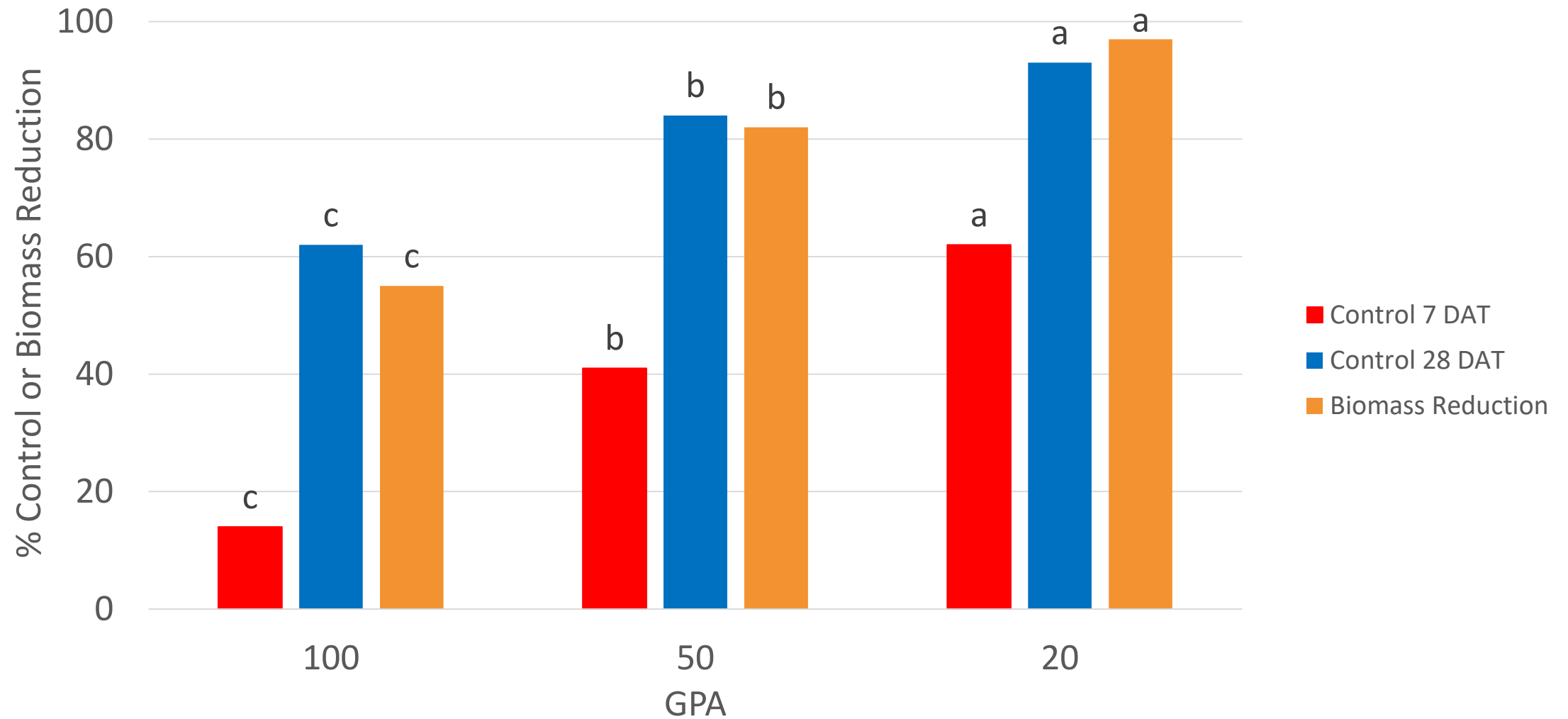
50 GPA = 87%



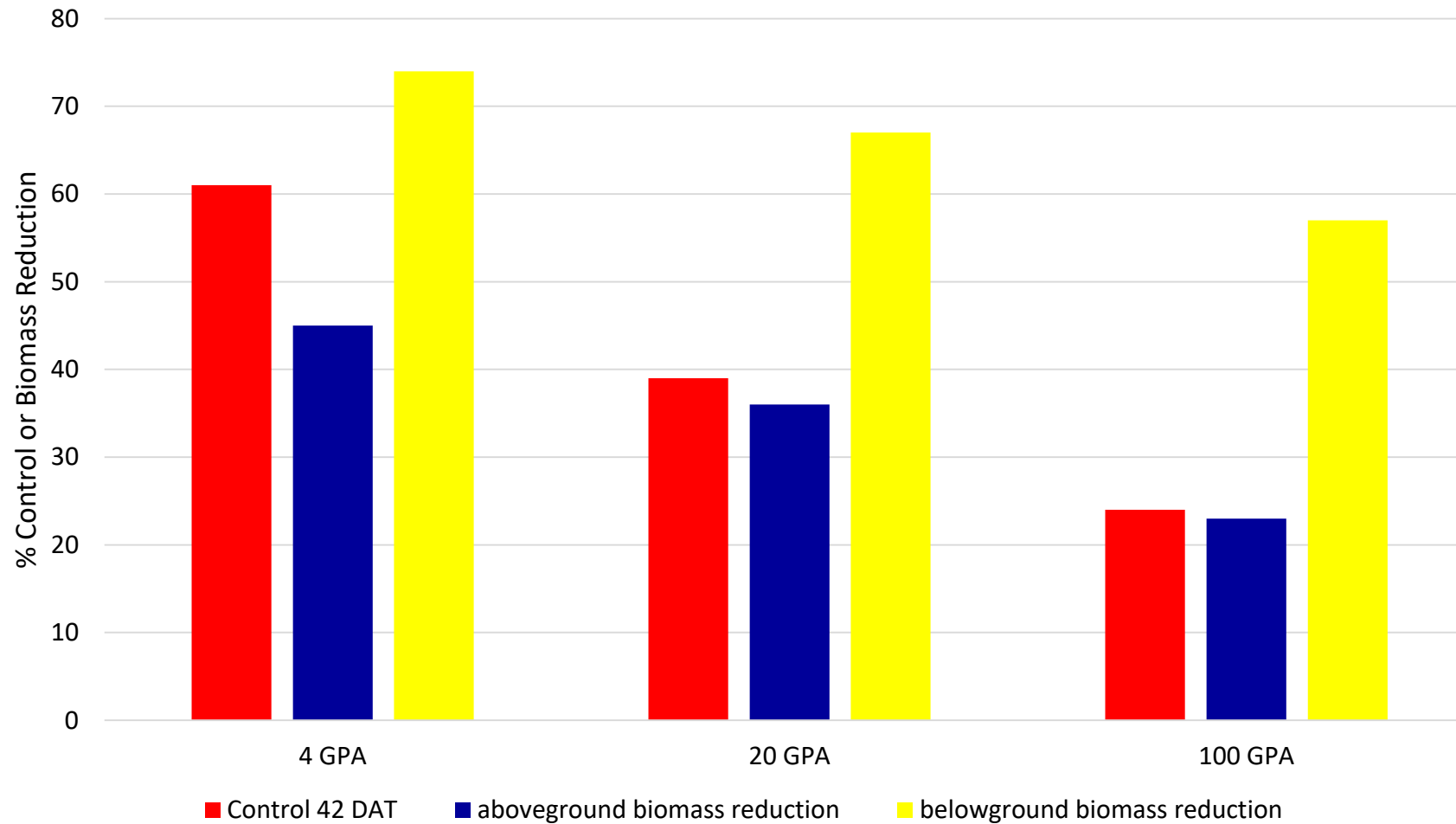
20 GPA = 66%



Waterhyacinth - Glyphosate



Torpedograss - Sethoxydim



Results – Application Equipment

Application Equipment	Percent Spray Loss to Water Column		
	Water Hyacinth	Water Lettuce	Giant Salvinia
Handgun (Cone)	51 a*	35 b*	32 a*
Handgun (Stream)	34 b*	61 a*	27 ab*
Broadcast Boom	25 c*	40 b*	19 b*

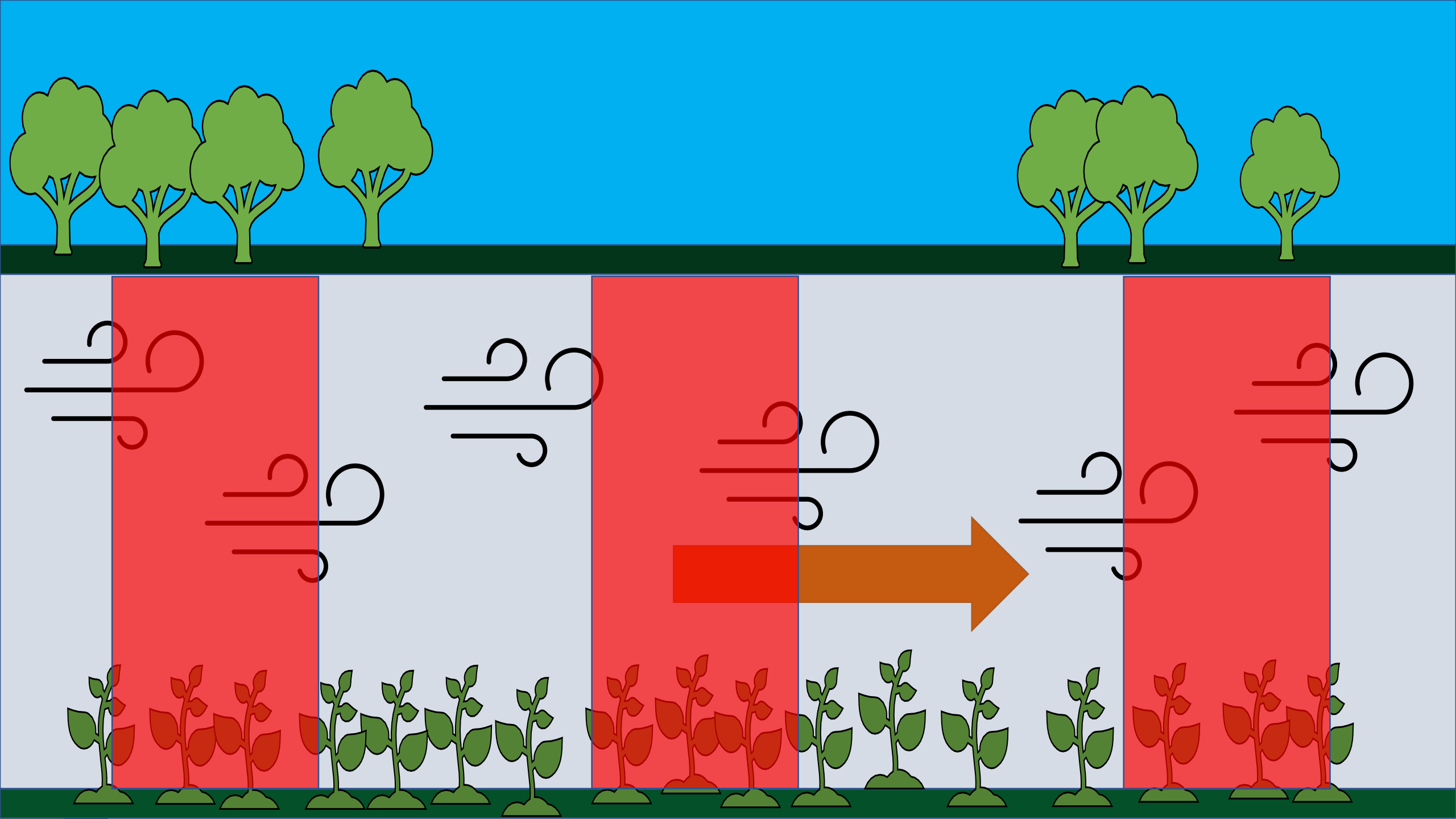
^a Means within a column followed by the same letter are not significantly different based on Fisher's Protected LSD test ($P < 0.05$); $n = 16$ for hyacinth/lettuce and $n = 8$ for salvinia.
^{*} Signifies mean is different from the "control" treatments (sprayed open water without plants).




Water Exchange and Herbicide Application Techniques


- Intermittent exposures
- Time of travel studies
- Plant/herbicide exposure relationships
- Automated application systems








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WORKING IN THE WEEDS



Working In The Weeds

Podcast Trailer



Extension in the Pipeline

- Individual Plant Treatment Technique Training
 - Basal Bark
 - Cut stump
 - Hack and squirt
 - Foliar



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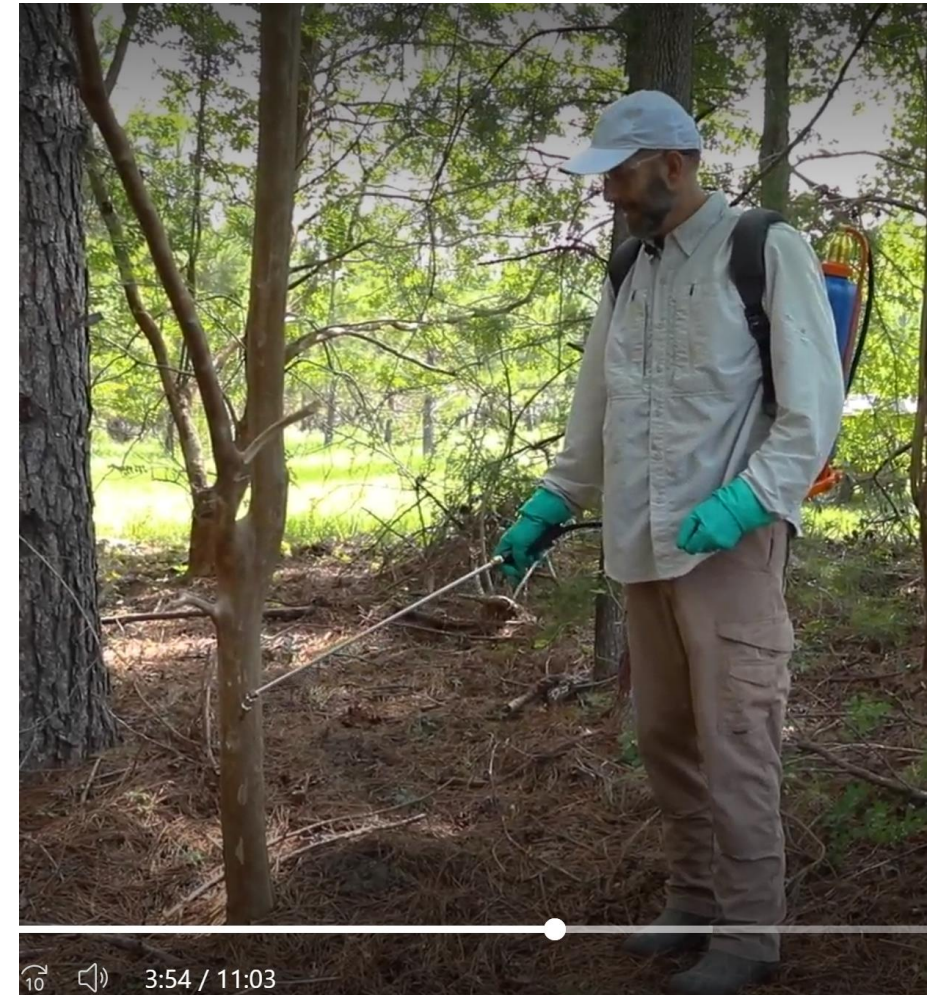
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Invasive Plants in Florida

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The UF/IFAS Center for Aquatic and Invasive Plants works to find solutions to invasive plant issues in the state of Florida. This video describes aquatic and invasive plant impacts on the state of Florida and its residents.



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