Research Update from CAIP

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CAIP is in an ongoing transition…

- Dr. Jay Ferrell (Center Director) now ALSO serving as Chair of the UF/IFAS Department of Agronomy
- Dr. Candice Prince resigned in December 2023
  - Currently advertising for Associate Director position to replace Dr. Prince's position
- Dr. Leary moved on to Lead Scientist with SFWMD Lake & River Ecosystems Group
- We recently hired Dr. Eli Russell as a new aquatic plant management specialist
- CAIP Communications:
  - Christine Krebs moved to UF Graduate School
  - Cayla Romano moved to SJRWMD

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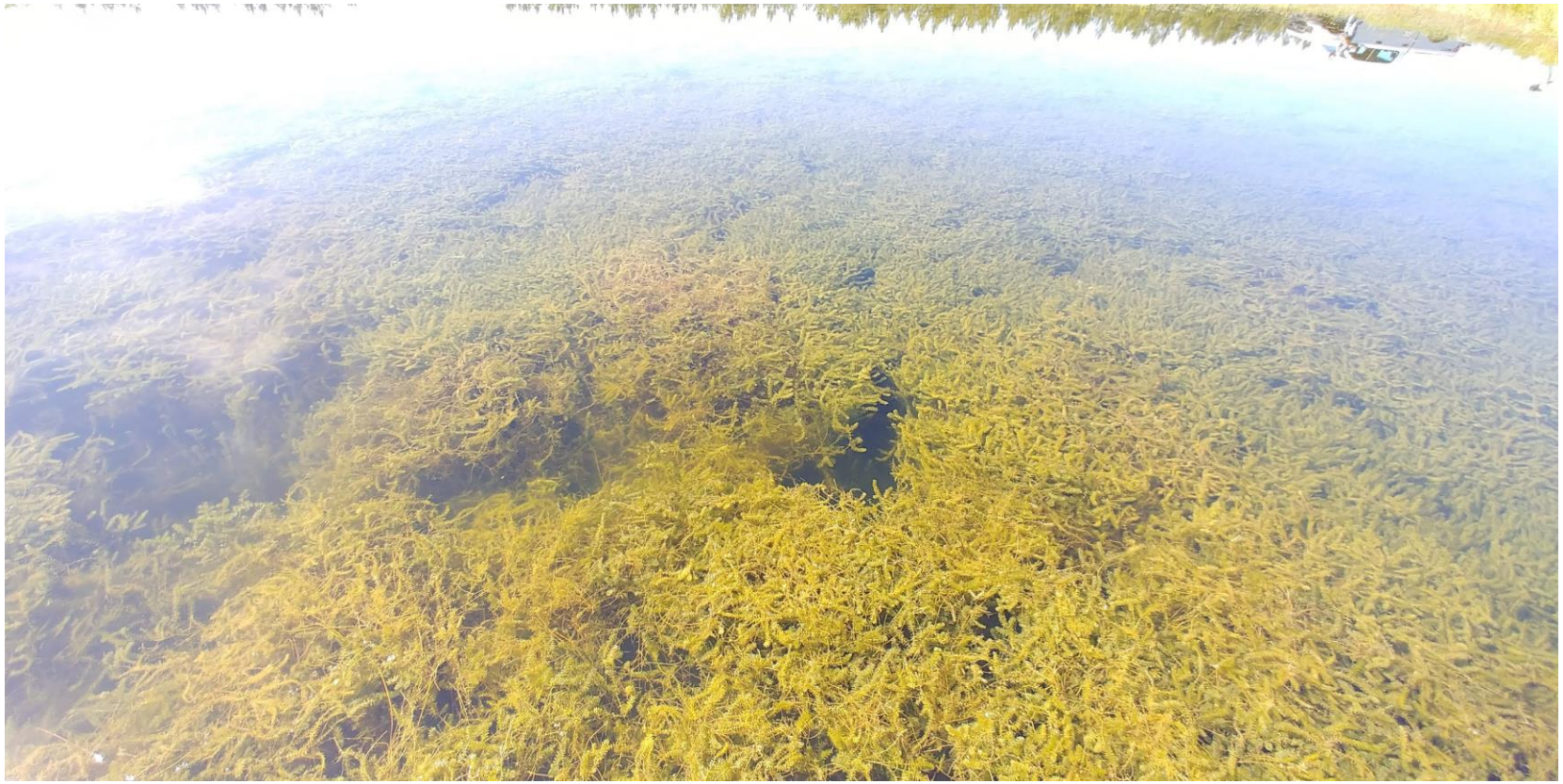
We still focus on hydrilla and floating plants!



Dr. Ben Sperry
USACE

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Projects to Cover

- Reduced Hack and Squirt: Earleaf acacia, Java plum, Leadtree
- Melaleuca wedge versus girdle treatments
- Basal bark elevated band treatments
- New Extension Resources

REDUCED HACK AND SQUIRT ADVANCES

- Method: 1 ml (50% v/v)
- For each stem, 1 hack per 4 inches of stem diameter

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Earleaf acacia (*Acacia auriculiformis*)

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Java plum (*Syzygium cumini*)

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Research Questions

- Is reduced hack and squirt an effective approach for these species?
- What herbicide concentration is required?
- What hack spacing is required?

Experimental Design (Earleaf acacia)

- Martin County Pine flatwood site (March 2023)
- Individual trees served as experimental units
  - 24 experimental units/trt
  - 2.5-16.5 inch diameter trees (mean diameter = 5.8 inches)
- Hack protocol
  - 1 hack per 4 inches stem diameter
- Herbicide Treatments
  - Method herbicide at 50, 25, and 12.5% v/v in water
  - Milestone herbicide at 50, 25, and 12.5% v/v in water
  - Nontreated control

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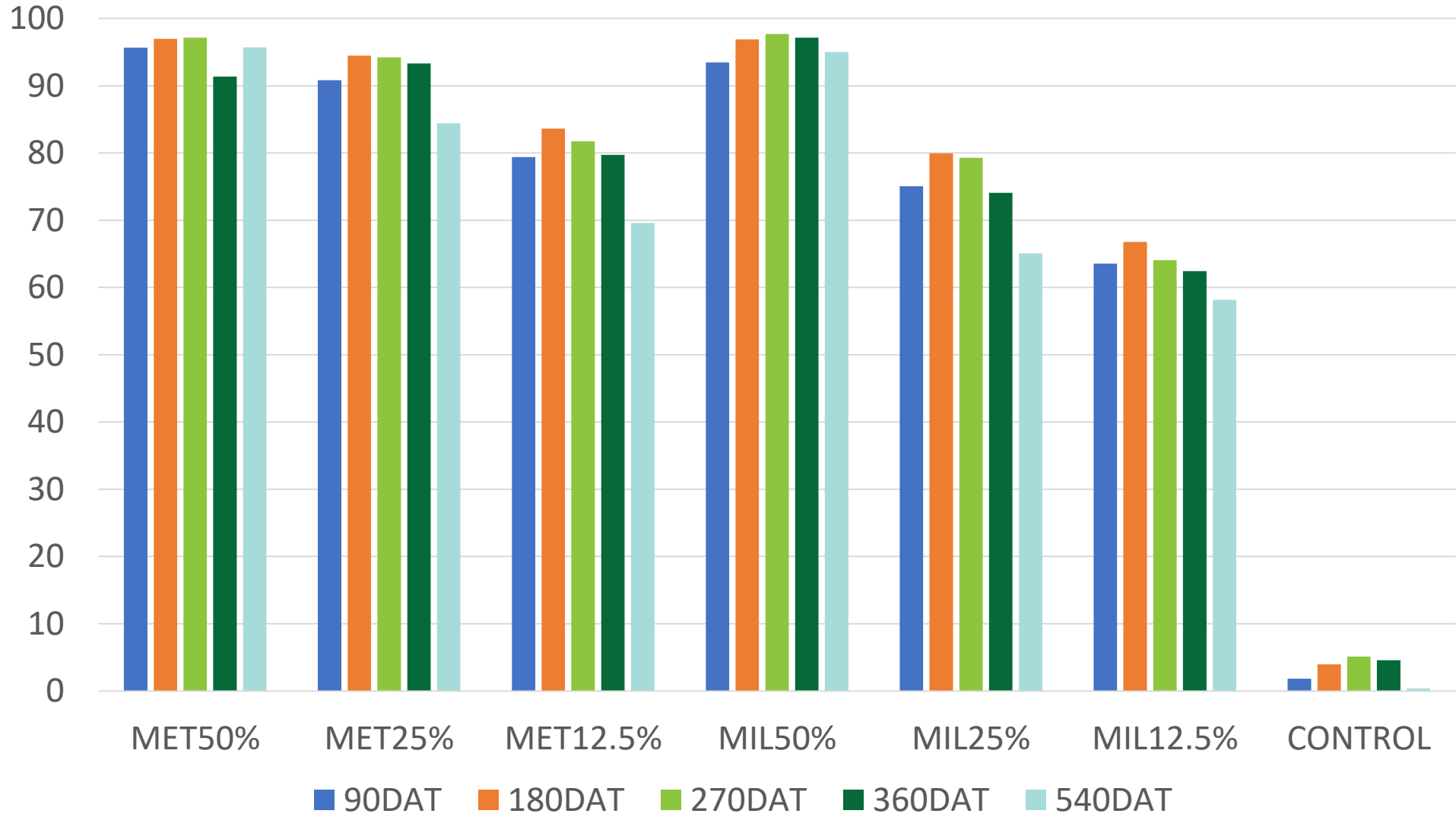
Earleaf Acacia Defoliation



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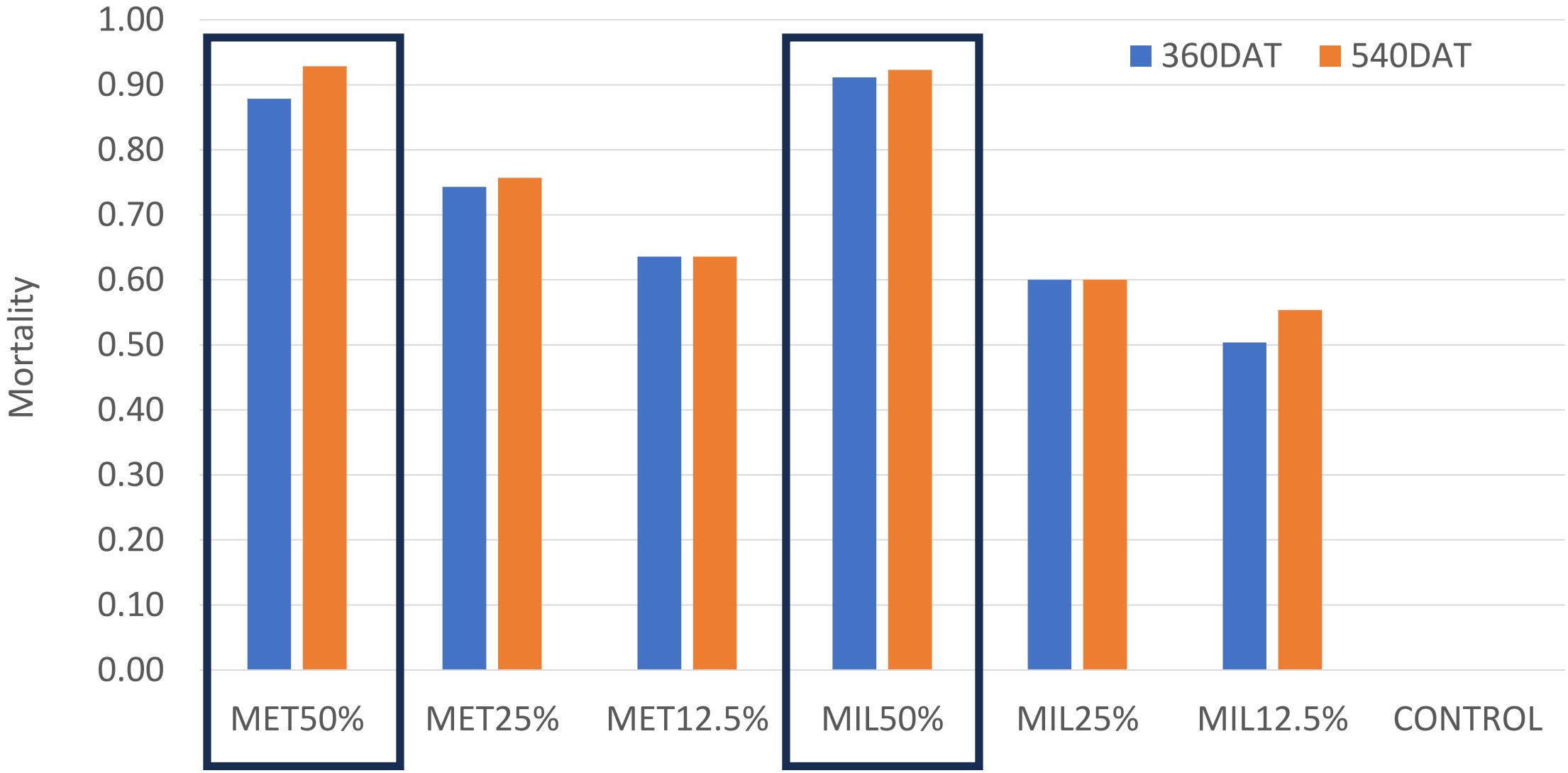
Earleaf Acacia Mortality 360 and 540 DAT



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CLEAR EVIDENCE OF DEAD CAMBIUM

Experimental Design (Java plum)

- Okaloacoochee slough wildlife management area (March and May 2023)
- Individual trees served as experimental units
  - 20 experimental units/trt
  - 4-14 inch stem diameter (mean diameter = 8 inches)
- Hack Protocol
  - 1 hack per 4 inches stem diameter
  - 1 hack per 2 inches stem diameter
- Herbicide Treatments
  - Method herbicide at 50, and 25% v/v in water
  - Milestone herbicide at 50 and 25% v/v in water
  - Nontreated control

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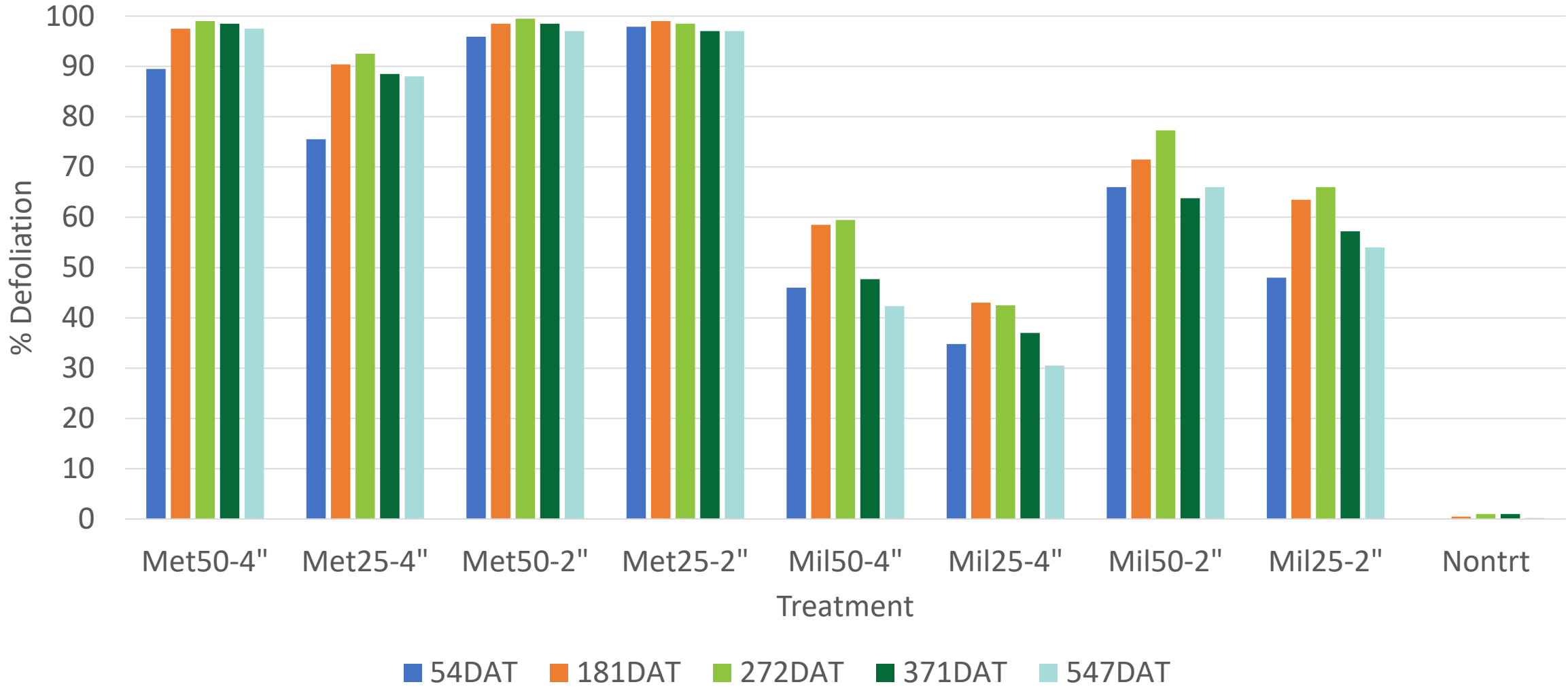
Java Plum Defoliation



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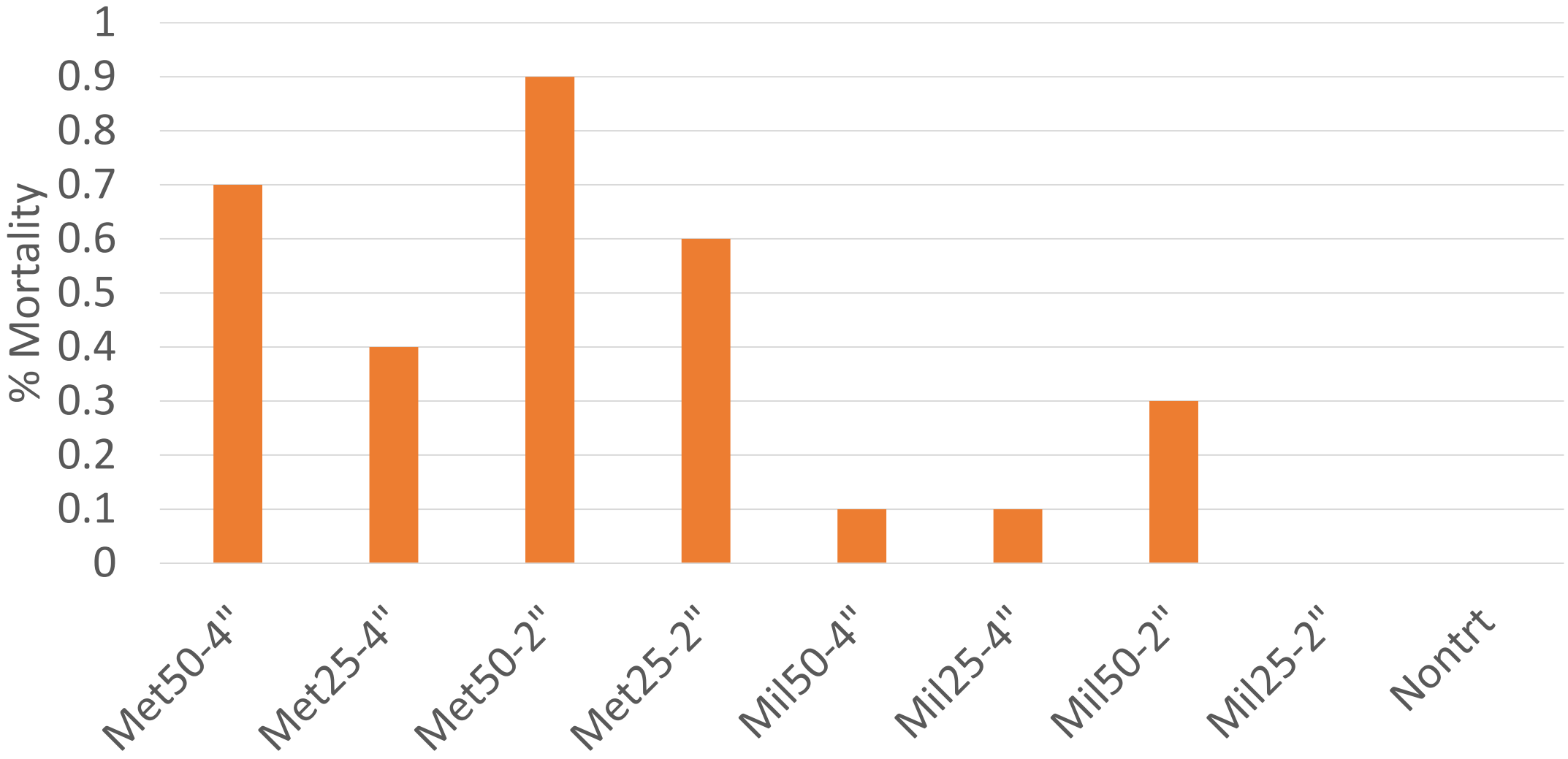
Java Plum Mortality 540 DAT



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CLEAR EVIDENCE OF DEAD CAMBIUM ON JAVA PLUM

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Leadtree Work Ongoing at 3 locations

- 3 locations
- 10-20 trees per treatment
- Method herbicide (50% v/v)
  - 1 hack / 4” stem diameter
  - 1 hack / 2” stem diameter
- Late winter, spring timings

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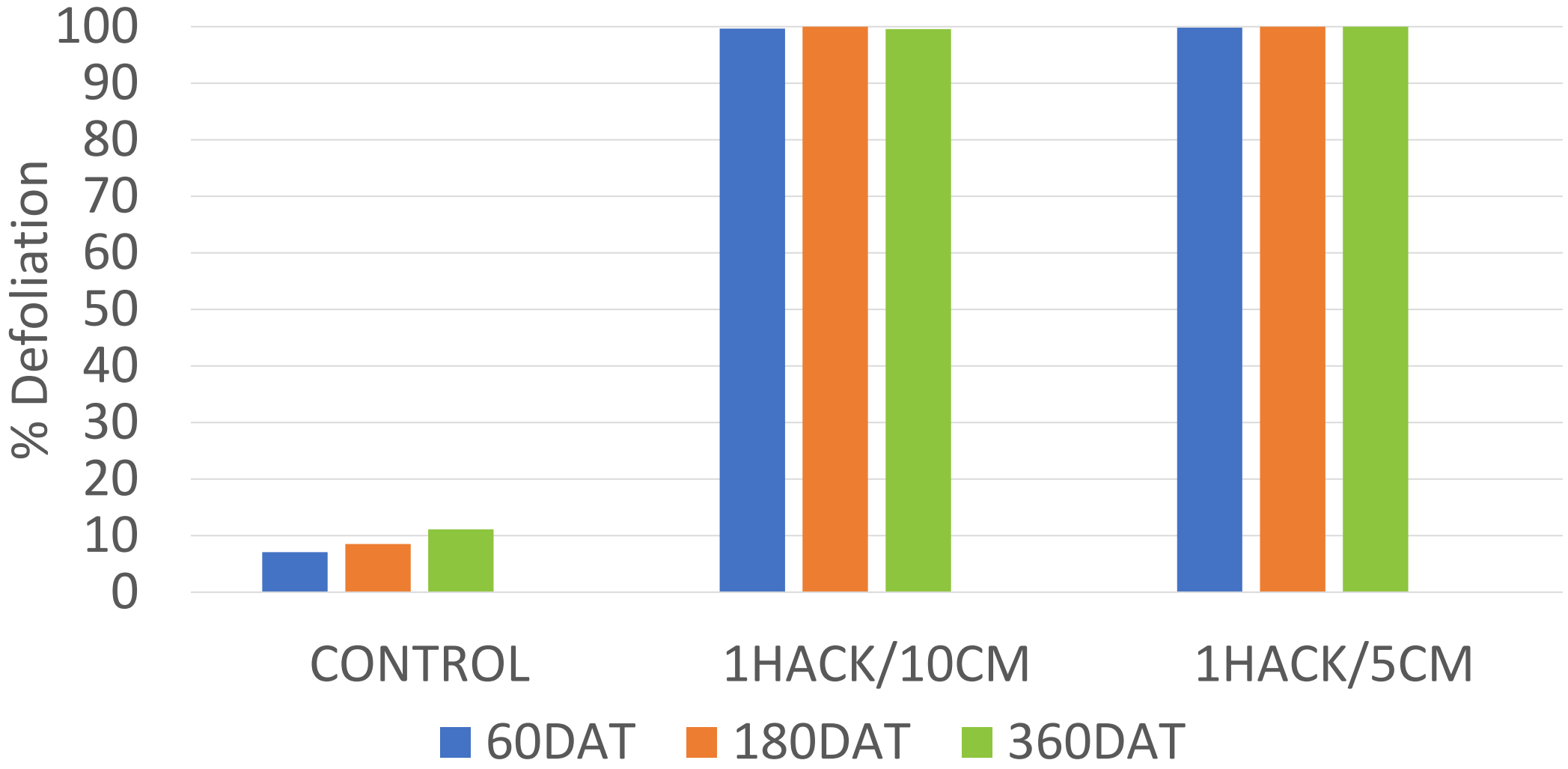
UF's Tamarac Lead Tree Research 360DAT



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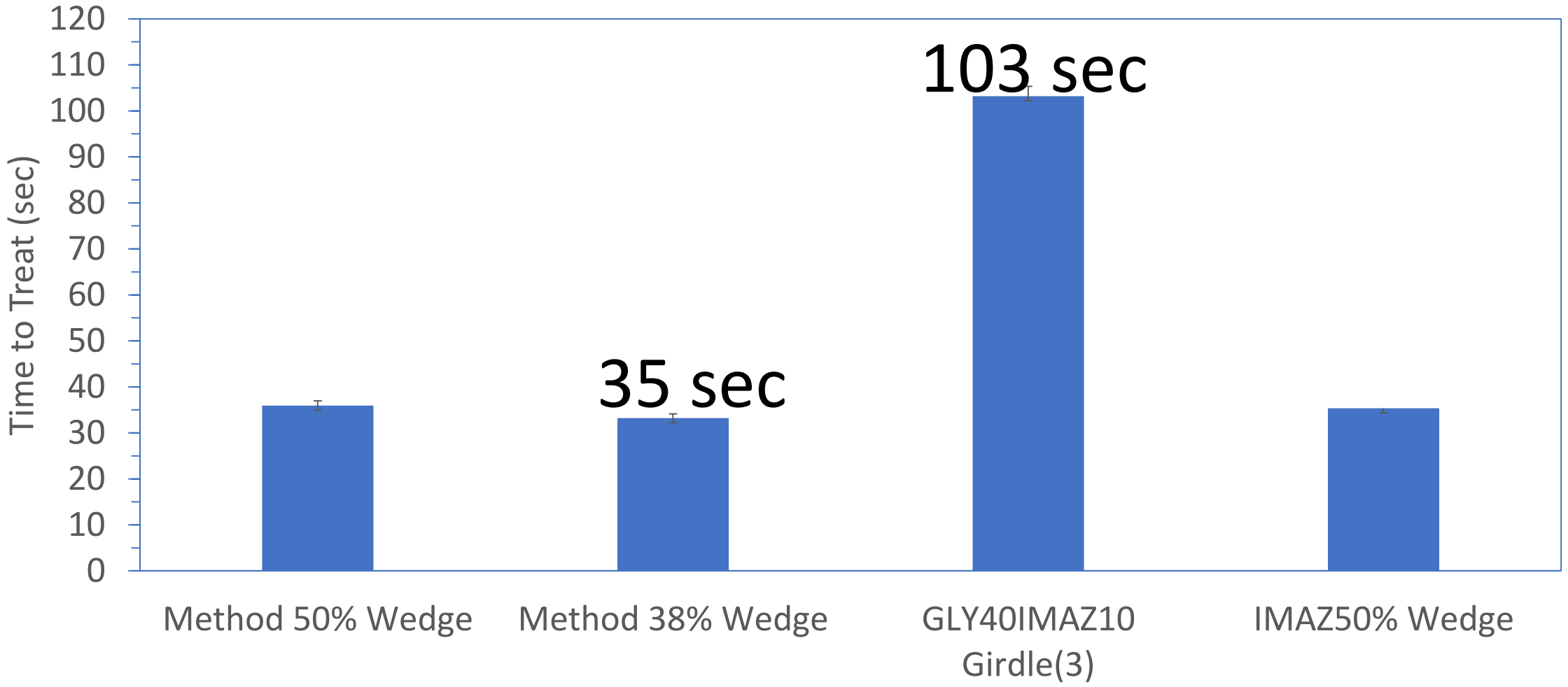
Melaleuca quinquenervia

1 wedge / 4”
Method 50% or 38% @ 1 ml application volume

V/S

Full girdle + spray
Gly 40% + Imaz 10%

Melaleuca Time to Treat: WEDGE vs. GIRDLE



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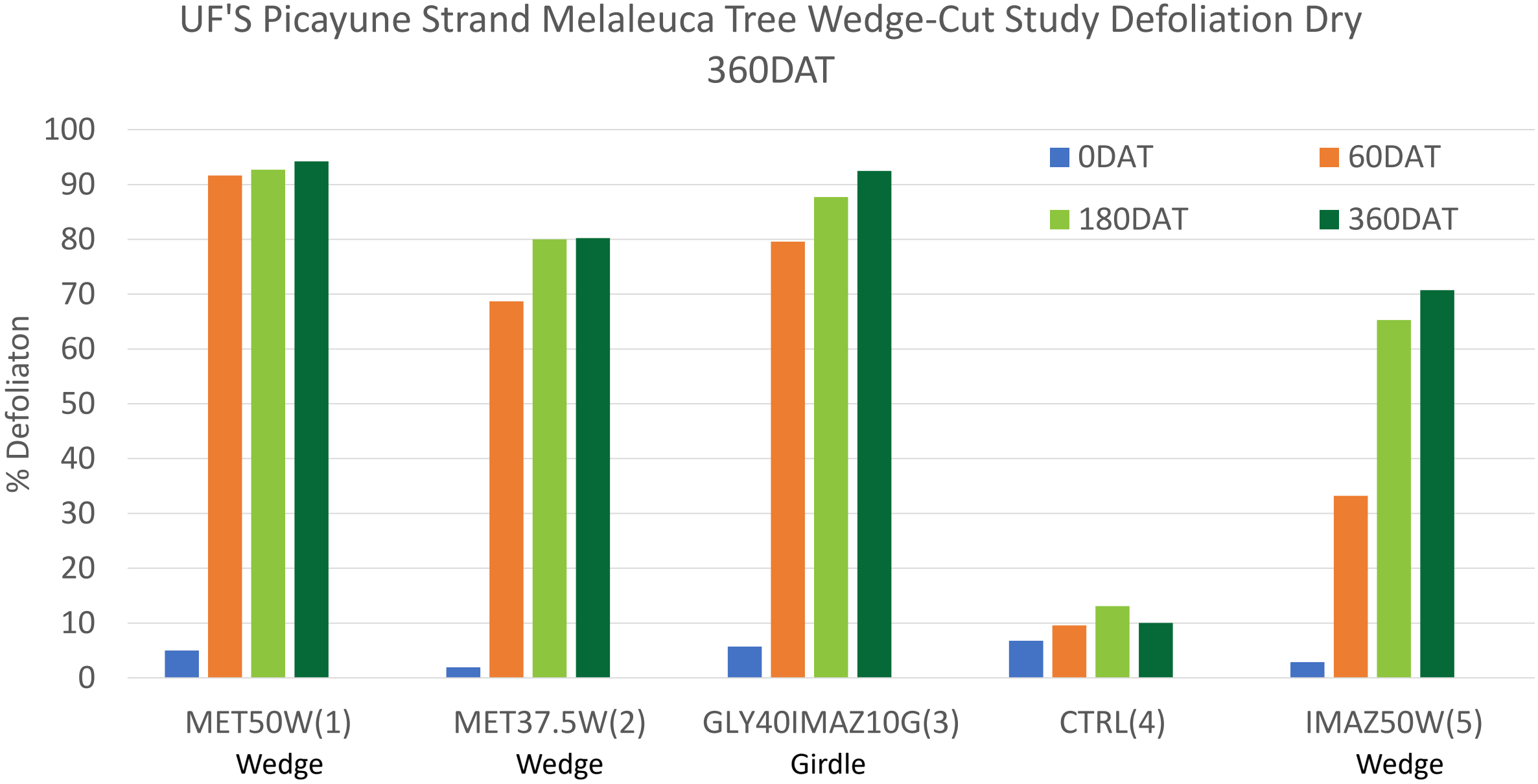
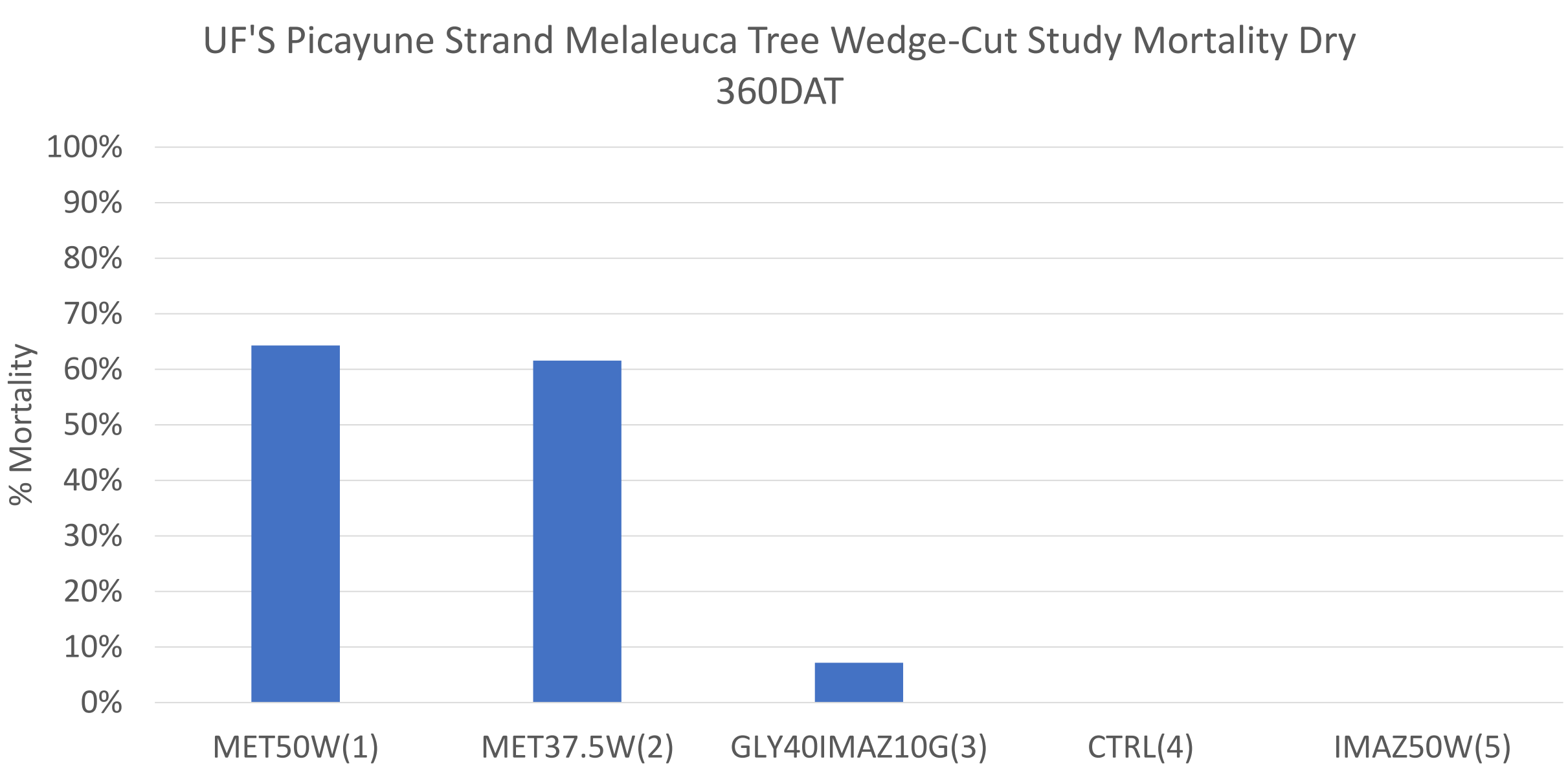

UF'S Picayune Strand Melaleuca Tree Wedge-Cut Study Defoliation Dry 360DAT
% Defoliaton
100
90
80
70
60
50
40
30
20
10
0
0DAT
60DAT
180DAT
360DAT
MET50W(1)
Wedge
MET37.5W(2)
Wedge
GLY40IMAZ10G(3)
Girdle
CTRL(4)
IMAZ50W(5)
Wedge


UF'S Picayune Strand Melaleuca Tree Wedge-Cut Study Mortality Dry 360DAT
% Mortality
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
MET50W(1)
MET37.5W(2)
GLY40IMAZ10G(3)
CTRL(4)
IMAZ50W(5)

Summary to Date

- Earleaf Acacia
  - Both herbicides working well at 50%
  - Lower concentrations currently show lower mortality, but patience is required!
  - This is very hard wood! Keep your machetes sharp or switch to hatchets
- Java Plum
  - Milestone is not consistent (off the table)
  - Method working well at 50% with 2 and 4-inch hack spacings
  - The spongy bark tends to break off in chunks below the hack, or closes up when the machete is removed

Summary to Date

- Leadtree at 360 DAT
  - Method (50%) working well with 2 and 4 inch hack spacings
- Melaleuca Wedge with Method
  - ~1/3 the time needed to girdle
  - Wedge treatment with Method appears to be working well at 360 DAT

UF Data and Operational Efforts Confirm Efficacy for these targets

- Brazilian peppertree
- Chinese tallowtree
- Bishopwood
- Australian pine
- Melaleuca
- Tung oil tree
- Surinam cherry
- Crepe myrtle
- Camphortree
- Chinaberry tree
- Silktree
- Earleaf acacia
- Java plum

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High band basal bark treatment
Melbourne and Little Manatee River State Park

Pepp AT

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IVE PLANTS

Pepp AT

100
90
80
70
60
50
40
30
20
10
0

% Mortality

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Revisiting Melaleuca Individual Plant Treatments in Wetlands

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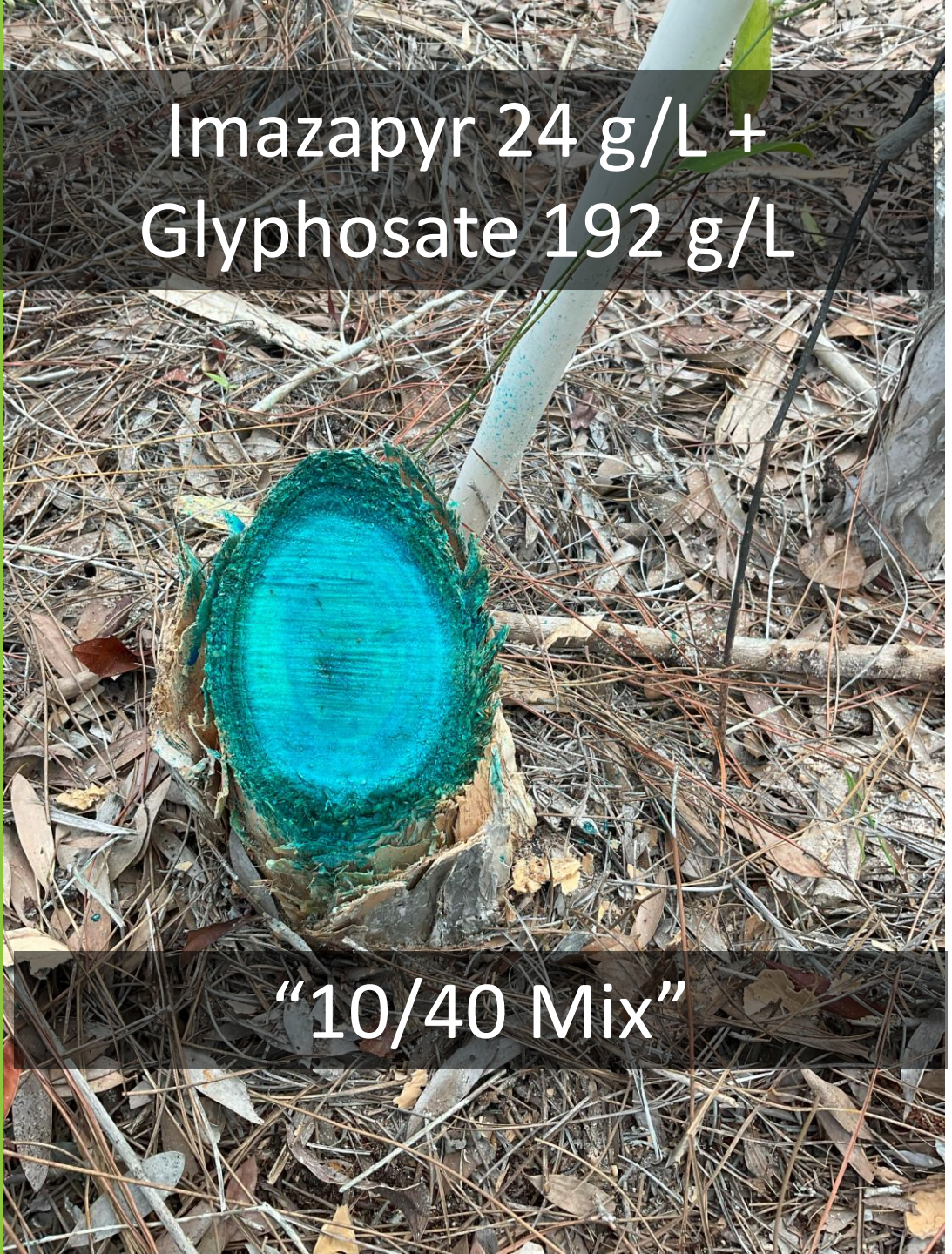

Imazapyr 24 g/L +
Glyphosate 192 g/L
“10/40 Mix”


Imazapyr 60 g/L +
Glyphosate 120 g/L
“25/25 Mix”

Where we are headed

- Continuing melaleuca IPT wedge/reduced girdle efforts
- Revisiting *Ludwigia uruguayensis* and digging into *L. peruviana* management (Spirit of the Wild WMA)
- Wetland nightshade *(Solanum tampicense)*
- New species of interest: Giant water sensitive plant *(Aeschynomene fluitans)*
- Continued refinement of basal bark treatment

plants.ifas.ufl.edu/resources/management-guides/

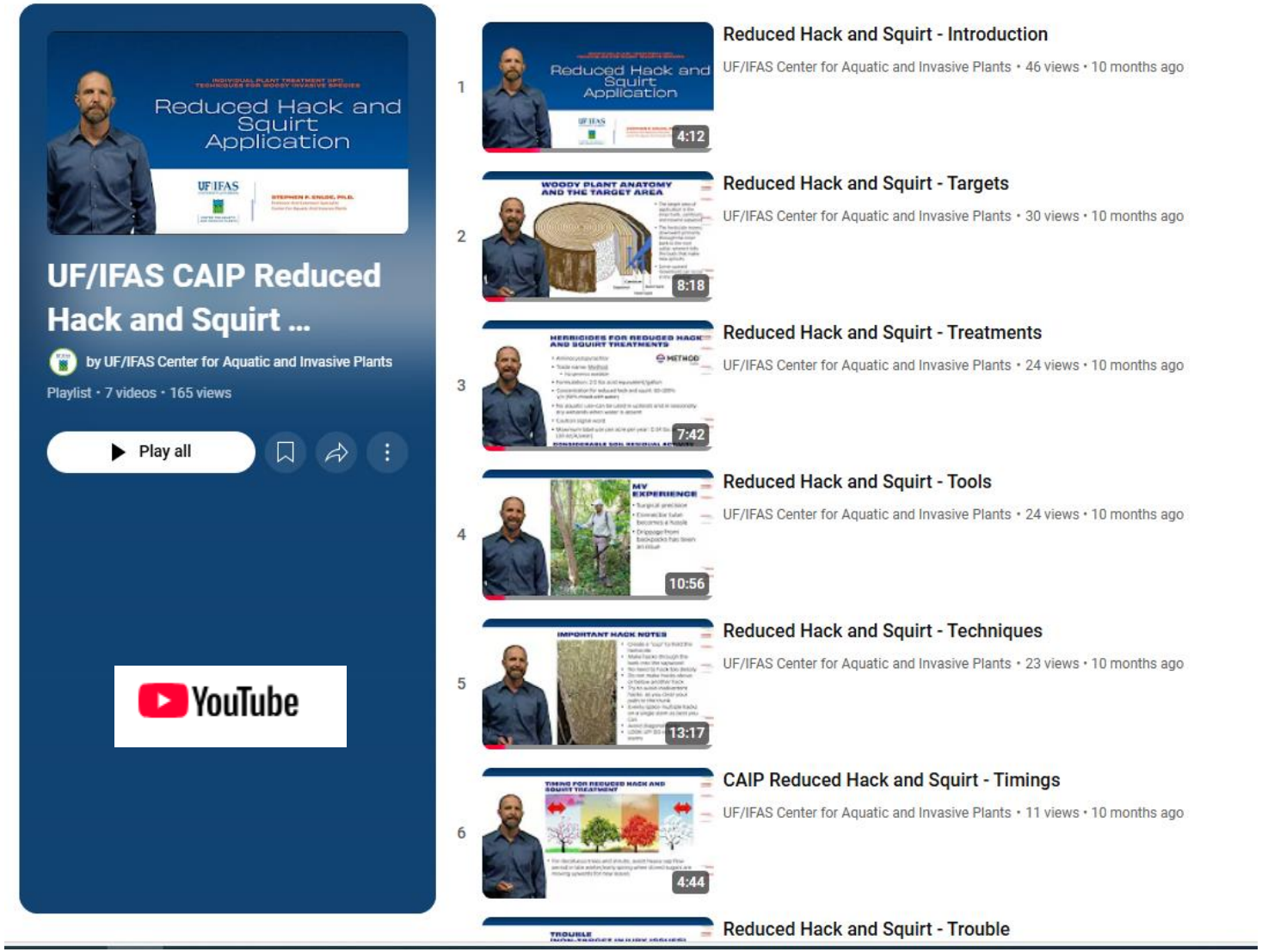
26 Complete Management Guides

- Introduction video
- Arrowheadvine, Golden pothos
- Brazilian peppertree, Leadtree
- Camphortree, Chinese tallow
- Coral Ardisia, Shoebutton ardisia
- Earleaf acacia, Java plum
- Melaleuca, Bishopwood
- Downy rose myrtle, Skunkvine
- Guineagrass, Cogongrass
- OWCF, Japanese climbing fern

Youtube training videos- technical skills!

- Basal bark, cut stump, reduced hack and squirt, reverse cut stem

https://plants.ifas.ufl.edu/resources/management-guides/



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Questions?

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https://plants.ifas.ufl.edu/resources/management-guides-and-videos/

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HERBICIDES TESTED FOR REDUCED HACK AND SQUIRT TREATMENTS

METHOD® 240SL

- Aminocyclopyrachlor
  - No generics available
- Label concentration for hack and squirt:
  - 1 ml of a 50% v/v (mixed with water)
  - 0.5 ml of 100% (undiluted herbicide)
  - 1 hack per 2 inches Diameter at breast height (DBH)
- Our research experience:
  - 1 ml of a 50% v/v mixed in water
  - For each stem, 1 hack per 4 inches of stem diameter
- Maximum label use per acre per year: 0.14 lbs ae/A/year (18 oz/A/year)

Milestone® HERBICIDE

- Aminopyralid
  - Generics available
- Label concentration for hack and squirt:
  - 1 ml of a 10% v/v (mixed with water)
  - Continuous hacks around circumference
- Our research experience:
  - Weaker than Method on many species but a 50% solutions works for some
- Maximum label use per acre per year: 0.11 lbs ae/A/year (14 oz/A/year)

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TRAINING IS EASY FOR THIS TECHNIQUE

- Determine the number of hacks per stem needed with a standard 2 liter soda bottle, which is 4 inches in diameter

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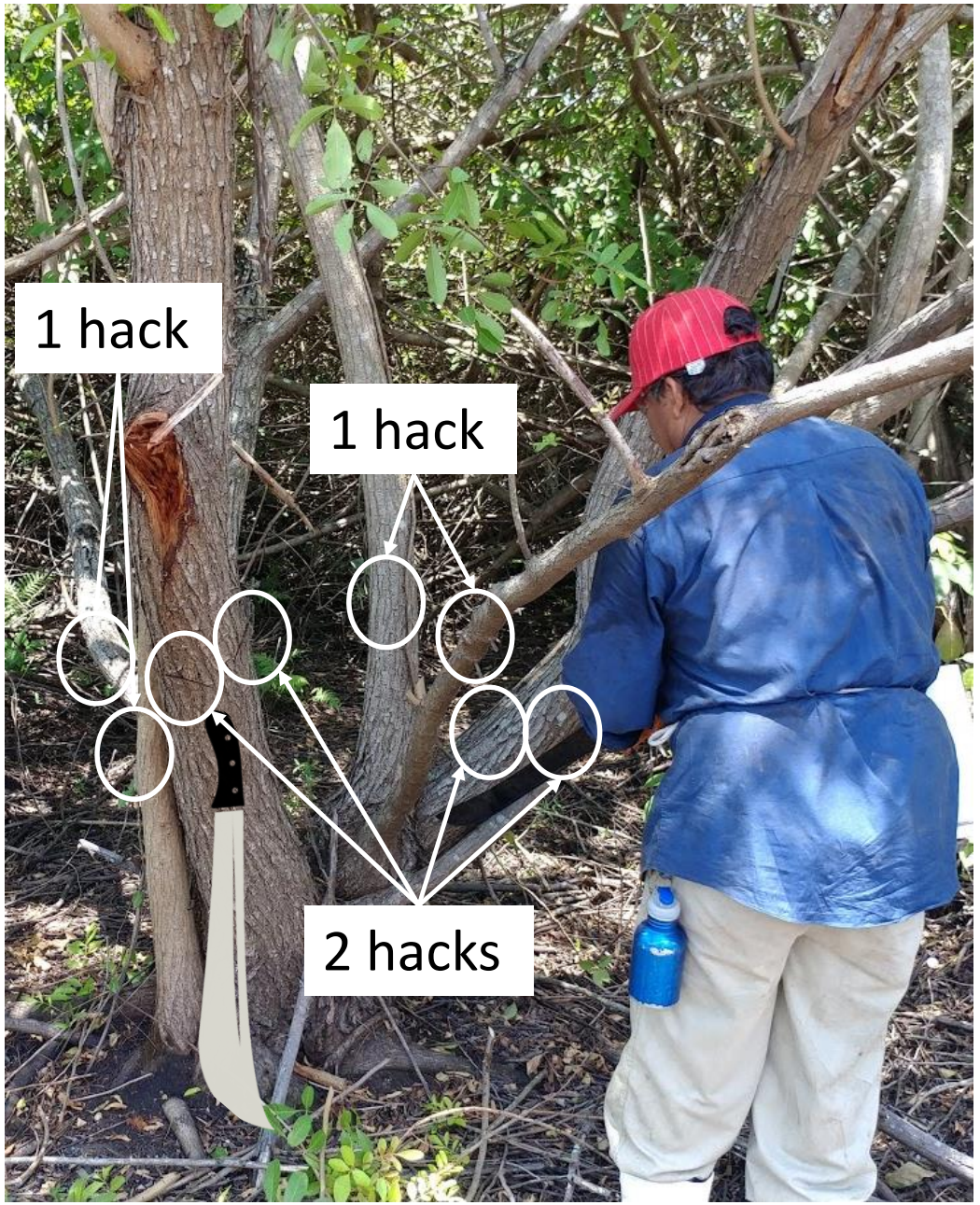

TRAINING IS EASY FOR THIS TECHNIQUE

- 0 hacks for <1 inch diameter stems at the base of bigger stems (< 1 soda bottle cap wide)
- 1 hack for 1-4 inch diameter stems (<1 soda bottle wide)
- 2 hacks for 4-8 inch diameter stems (1-2 soda bottles wide)
- 3 hacks for 8-12 inch diameter stems (2-3 soda bottles wide)
- 4 hacks for 12-16 inch stems, etc.

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- *SPRAY BOTTLES MATTER*
- *~ 1 ML/STROKE IS THE TARGET*
- *AVOID HIGHER VOLUME SPRAY BOPTTLES THAT RESULT IN RUNOFF!*

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Girdle + Spray treatment

Imazapyr 24 g/L +
Glyphosate 192 g/L
(10/40 mix)
Drier sites

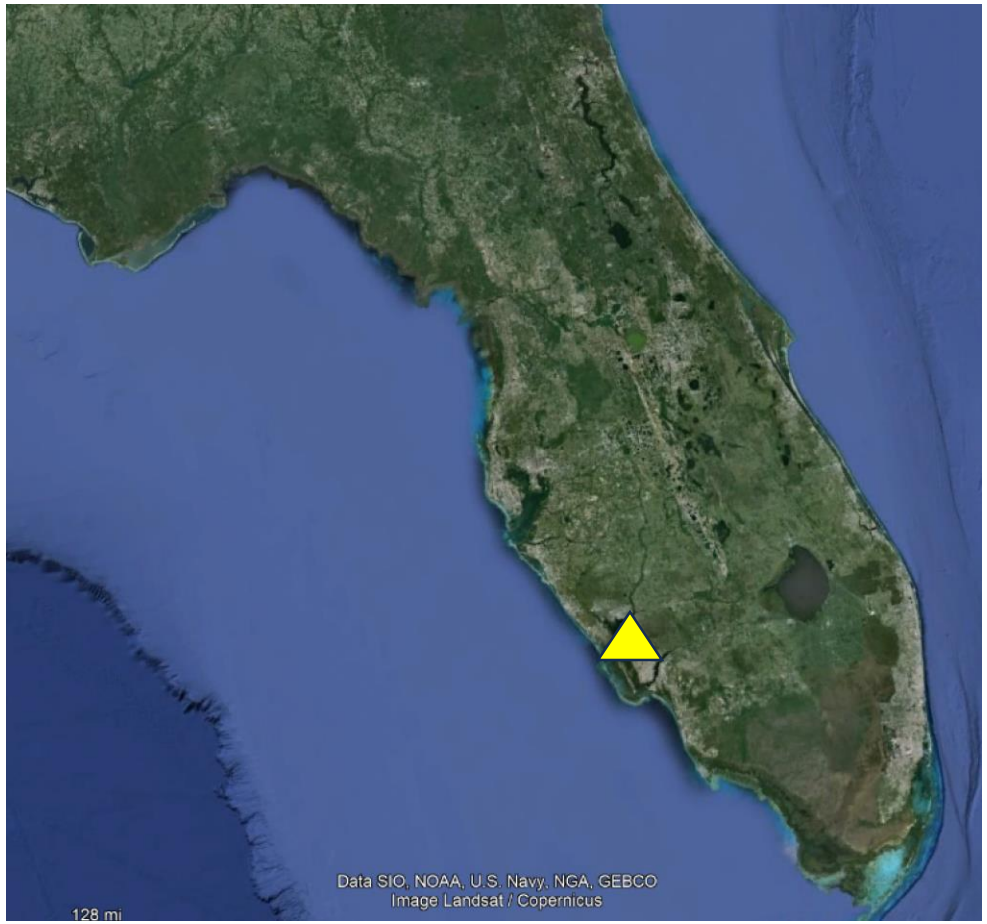
Imazapyr 60 g/L +
Glyphosate 120 g/L
(25/25 mix)
Flooded/deep water sites

Research Questions

- Can glyphosate be replaced in the melaleuca mix with triclopyr for cut stump or girdle treatments?
- Does season of treatment influence herbicide efficacy for cut stump or girdle treatments?
- Does stump height influence herbicide efficacy for cut stump treatment?
- Can a “wedge cut + spray” approach work as well as the girdle + spray approach?

Experimental Approach (Cut Stump Studies)

- Season of treatment study
  - Spring treatments applied May 2022
  - Fall treatments applied November 2022
- Stump height study
  - Treatments applied May 2022
  - 6 or 18 inch stump heights
  - Stumps cut with a brush saw and treated with a squirt bottle (1 ml/stroke)
- Both studies used 20 reps trees/trt



Charlotte Harbor Preserve State Park

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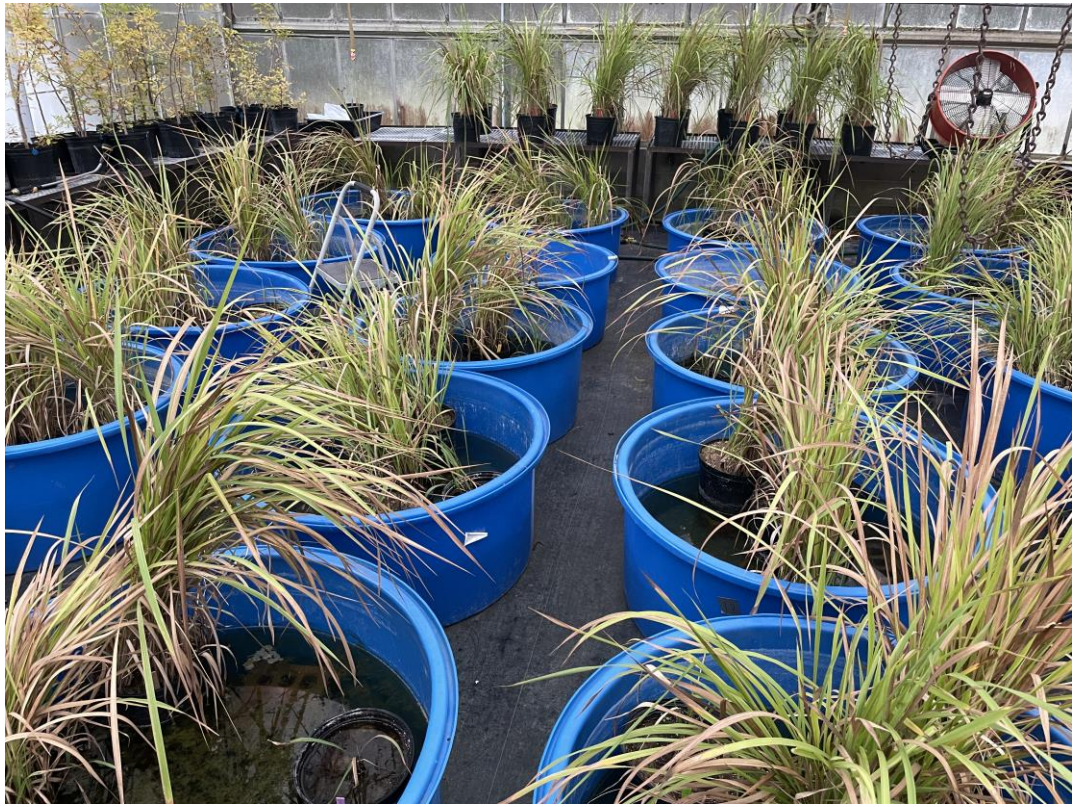
Cogongrass Hydrology (CAIP)

- Evaluating flooding tolerance of cogongrass
- Populations from Panther Wildlife Refuge and Gainesville
- Testing well established and juvenile plants
- Flooding periods of 0, 2, 4, 6, 8, 10 months



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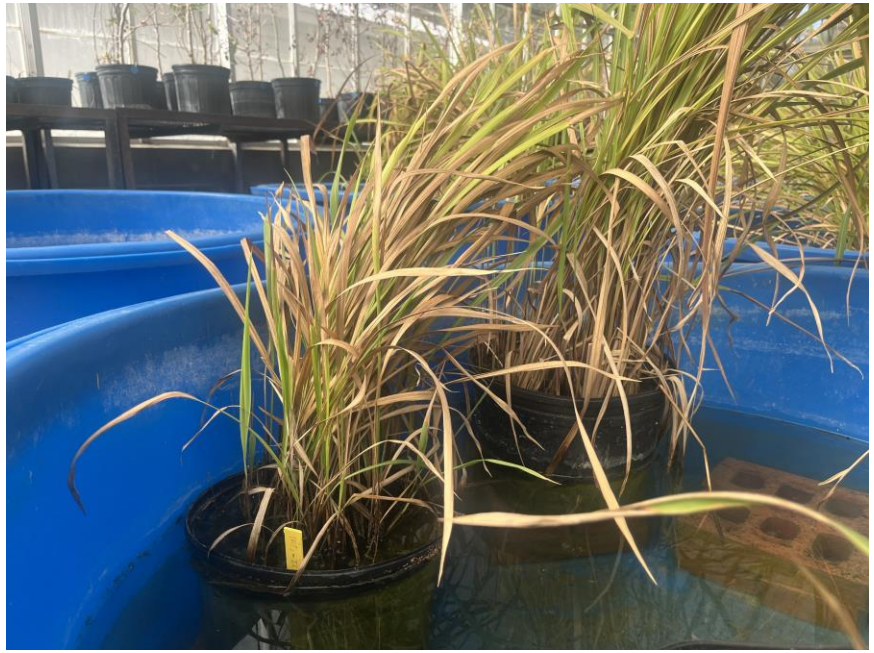
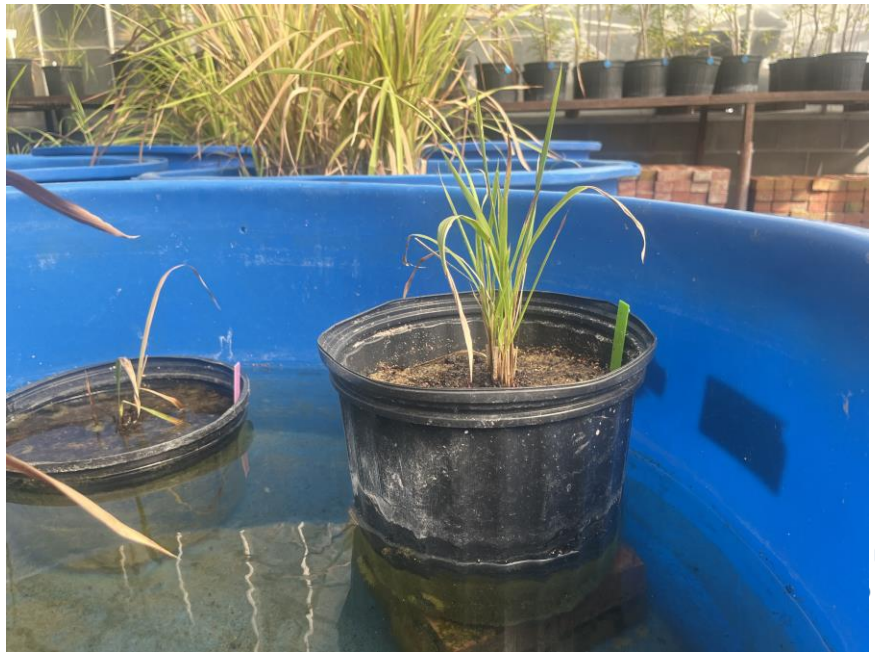
Current Status

- Both adults and juveniles currently surviving for four months of continuous inundation
- Some rhizome rotting apparent but it is not clearly linked to underwater depth of rhizomes





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Cogongrass Field Hydrology (CREW)

- Study established where long wet season inundation occurs
- Coupled with seasonal treatment timings to test hydrologic differences

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