

UF/IFAS Center for Aquatic and Invasive Plants Update

Ian Talty

and

Stephen F. Enloe

Hot Tip for Florida Natural Resource Managers

Remember
to drink lots
of water
and stay indoors
between 11:00 AM
and November 1st.

CAIP is in major transition once again...

- Dr. Jay Ferrell (Director) now ALSO serving as interim chair of the UF/IFAS Department of Agronomy
- Dr. Candice Prince resigned in December 2023
 - Currently interviewing candidates this week!
- Currently advertising for a second aquatic weed science research / extension position
- This puts Enloe and Sperry (USACE) on double duty for everything



Projects to Cover

- Glufosinate for cogongrass
- Reduced Hack and Squirt: Earleaf acacia, Java plum, and Melaleuca
- West Indian Marshgrass Management on KRF
- OWCF/native fern spore and gametophyte herbicide tolerance
- New Extension Resources
- New cogongrass work

Is Glufosinate a useful cogongrass herbicide?

- Trade names: Ignite[®], Liberty[®], Rely[®], Finale[®], Cheetah[®], Interline[®]
- Post-emergent, non-selective contact herbicide (with some limited translocation) ⁸
- Inhibits enzyme central to plant metabolism ⁹
- Previously tested on cogongrass as standalone, written off ¹¹
- Rapid foliar action (complete necrosis in 10 days on cogongrass ¹¹)

⁸ EPA Notification Glufosinate 2015, ⁹ Glufosinate-Ammonium BASF 2024 ¹⁰ Takano & Dayan 2021, ¹¹ Gaffney 1996

Ocala

Little Manatee

Gainesville

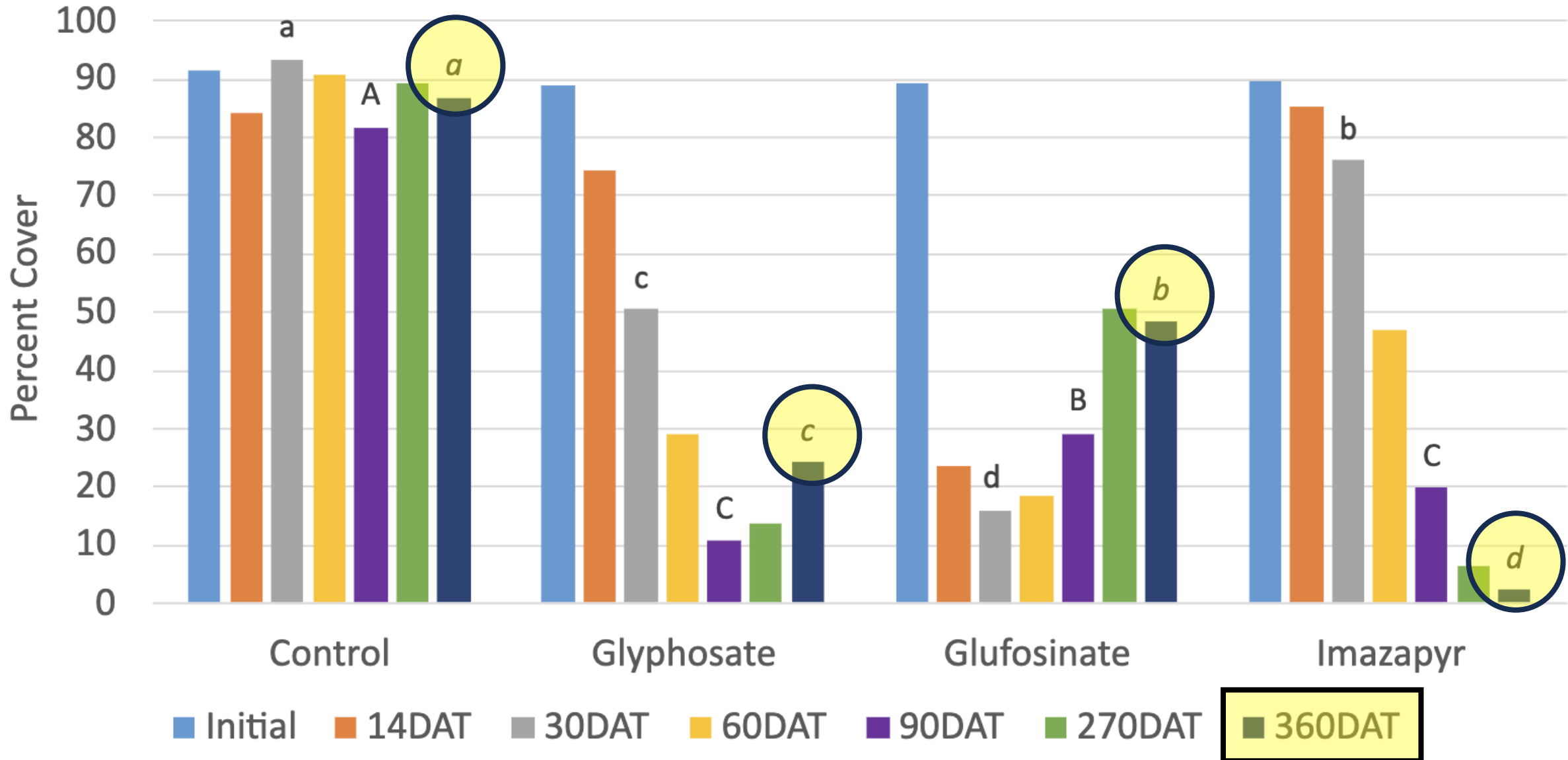


20 x 30' replicated plots
Single nozzle backpack sprayer (50 gal/acre)- from ATV
Applications made in late August

Benjamin Tuttle, UF/IFAS

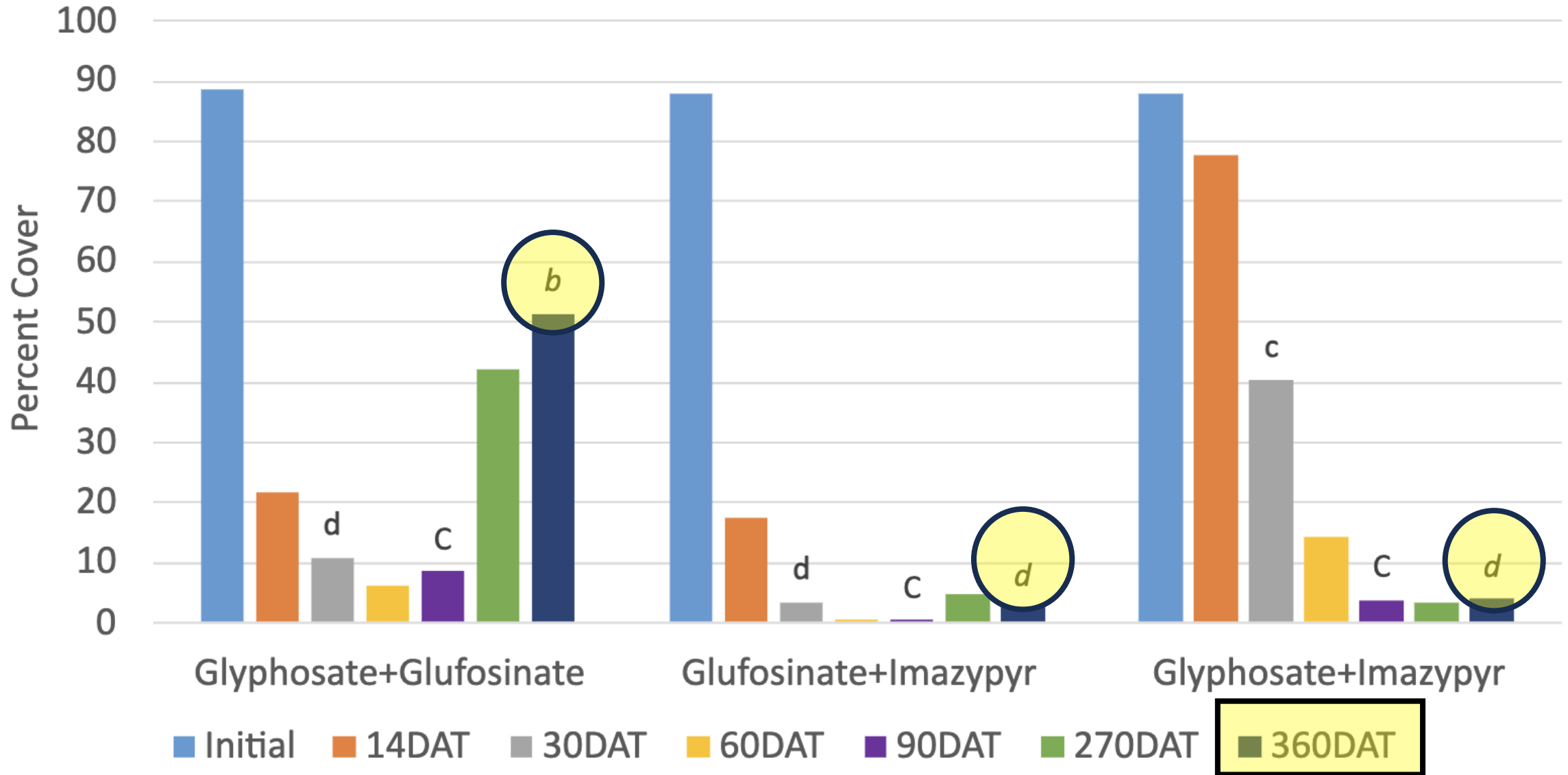
Results

Percent Cover Standalone Treatments

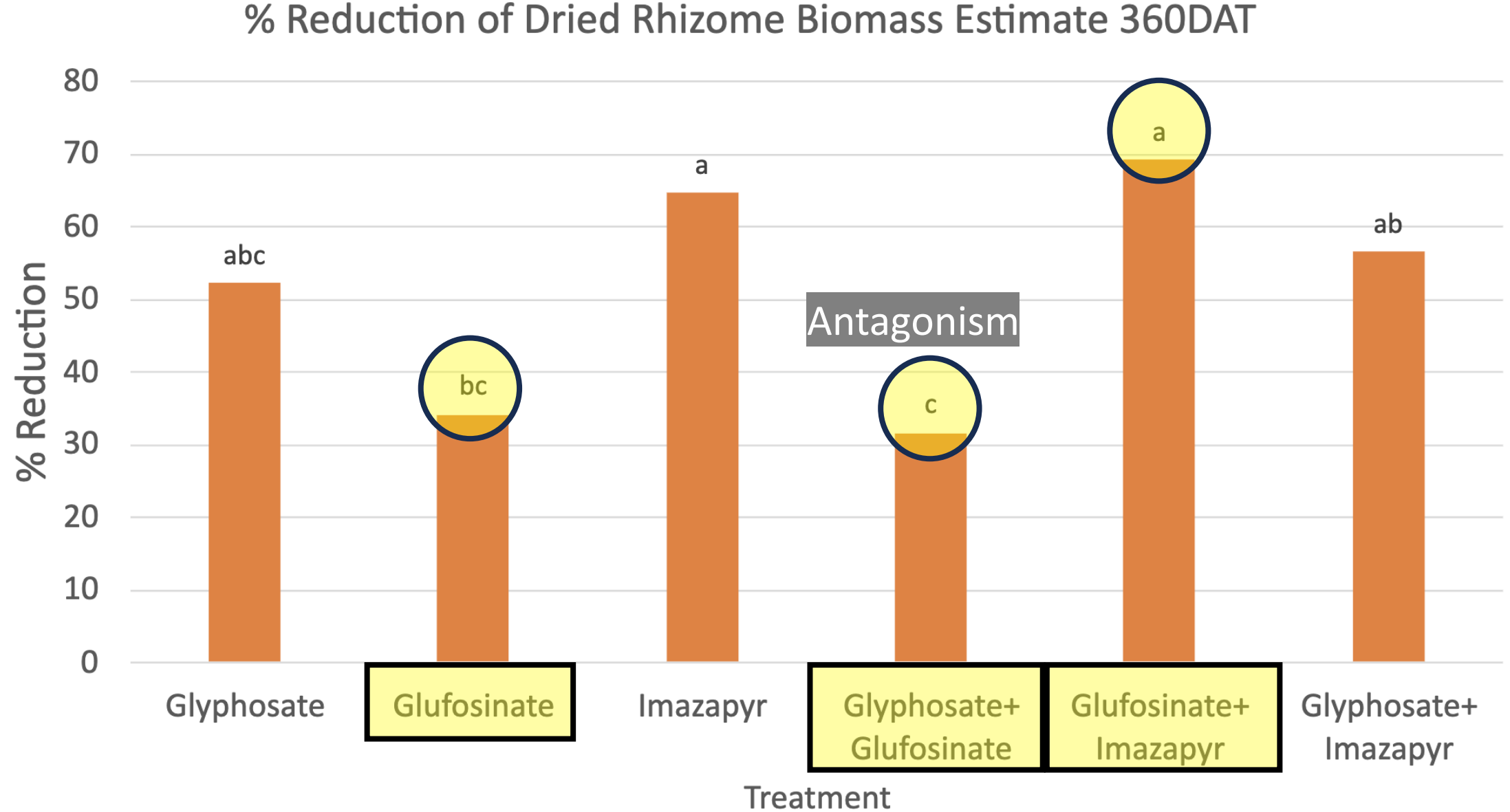


Results

Percent Cover Tank Mix Treatments

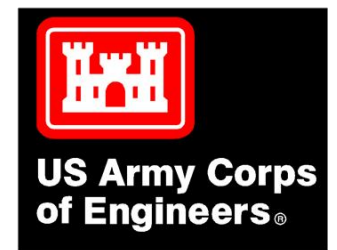


Results



What this means for you

- Glufosinate was comparable to glyphosate for rhizome reduction but not visual coverage 360DAT (surprising on the rhizome finding)
- Glufosinate+Imazapyr comparable to Glyphosate+Imazapyr (Soil activity of imazapyr kicking in)
- Rapid burndown (Glufosinate > Glyphosate) (expected)
- Glyphosate + Glufosinate antagonism ¹⁷ (not surprising)
- ~Prices
 - Glyphosate: \$35/gal ¹⁴
 - Glufosinate: \$60/gal ¹⁵
 - Imazapyr: \$70/gal ¹⁴



EXPANDED REDUCED HACK AND SQUIRT RESEARCH



CURRENT TARGETS

Earleaf acacia
(*Acacia auriculiformis*)



Java plum
(*Syzygium cumini*)



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

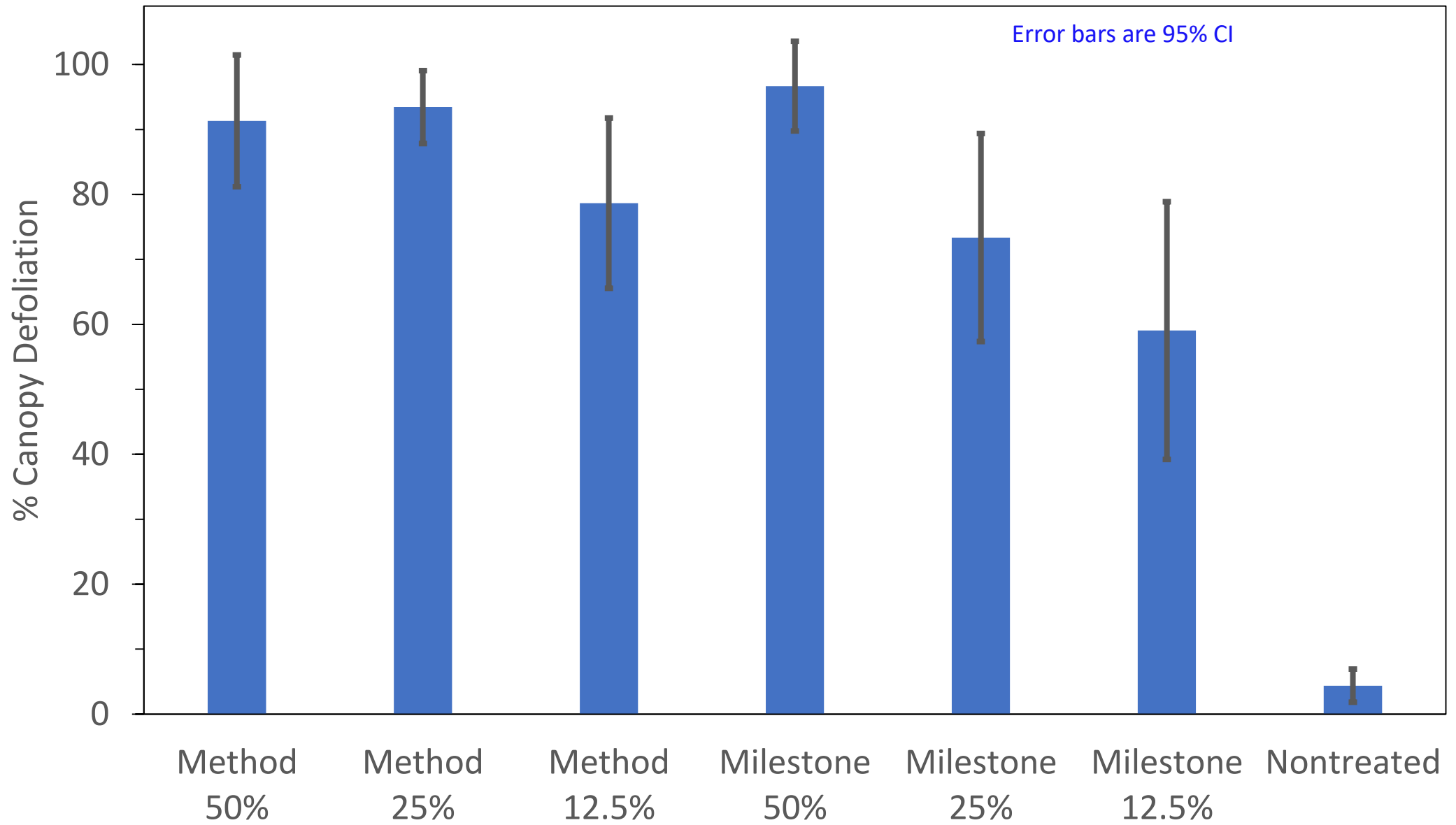


Experimental Design (Java plum)

- Okaloacoochee Slough WMA (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

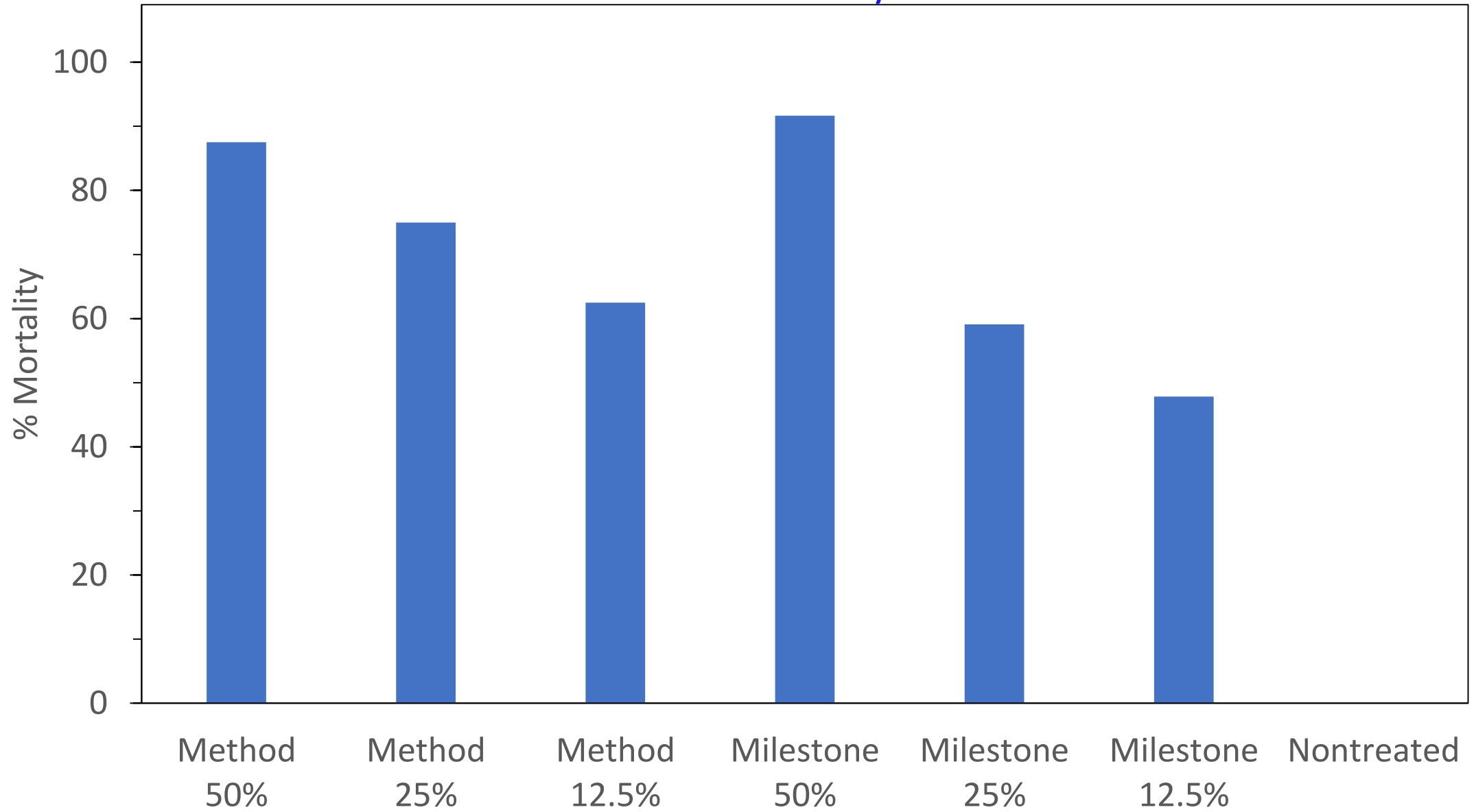


Earleaf Acacia Defoliation 360 DAT



All treatments used 1 hack per 4" DBH

Earleaf Acacia Mortality 360 DAT



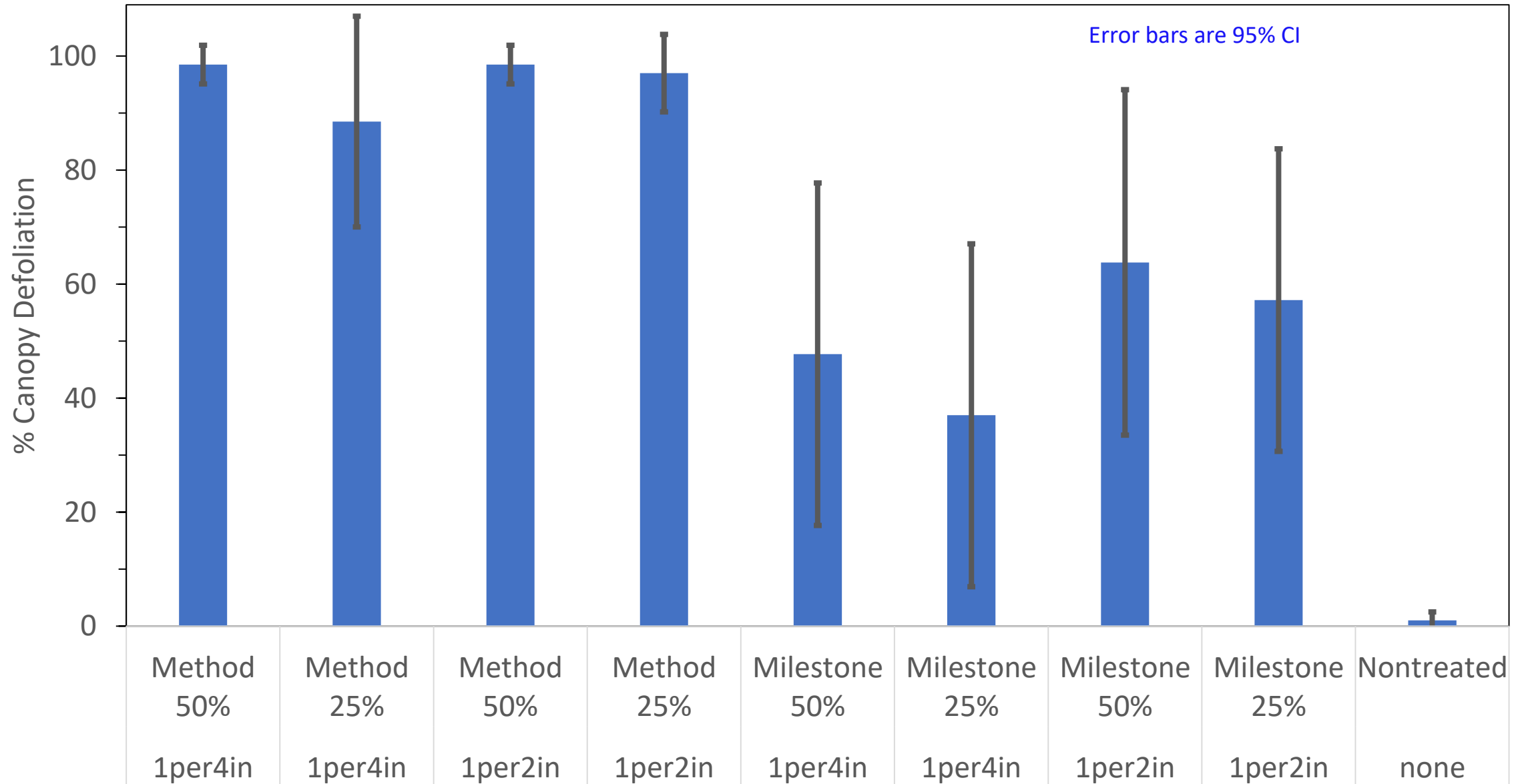
All treatments used 1 hack per 4" DBH



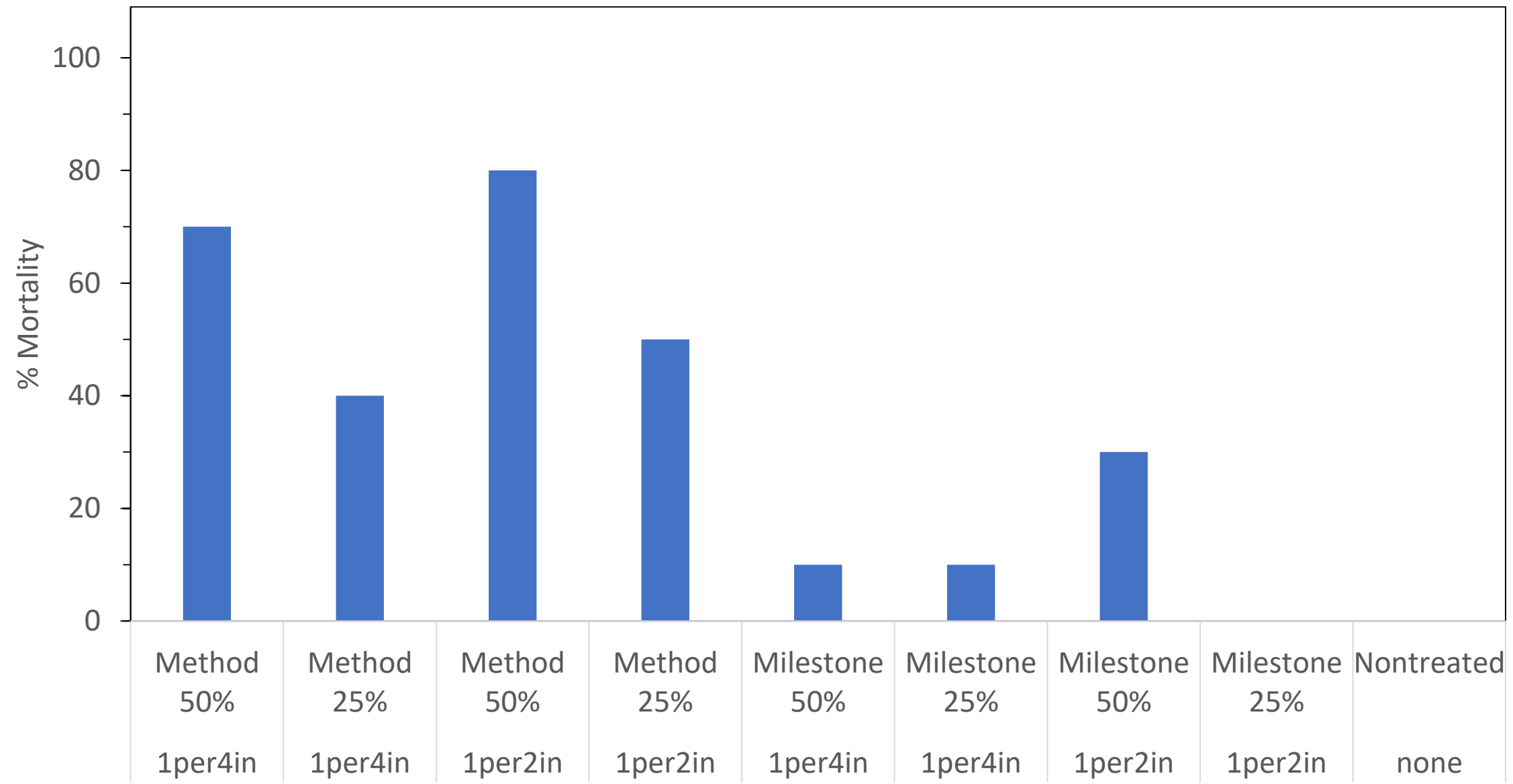
CLEAR EVIDENCE OF DEAD CAMBIUM
ON EARLEAF ACACIA



Java Plum Defoliation 360 DAT



Java Plum Mortality 360 DAT





CLEAR EVIDENCE OF DEAD CAMBIUM ON JAVA PLUM

What this means for you- Reduced Hack and Squirt

- Earleaf Acacia
 - Method and Milestone work well at 50% v/v
 - 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 close-up when the machete is removed



Next step: Can we do this...

Melaleuca quinquenervia



...instead of this?

Also next step: Revisit leadtree and add Chinaberry tree for reduced hack and squirt

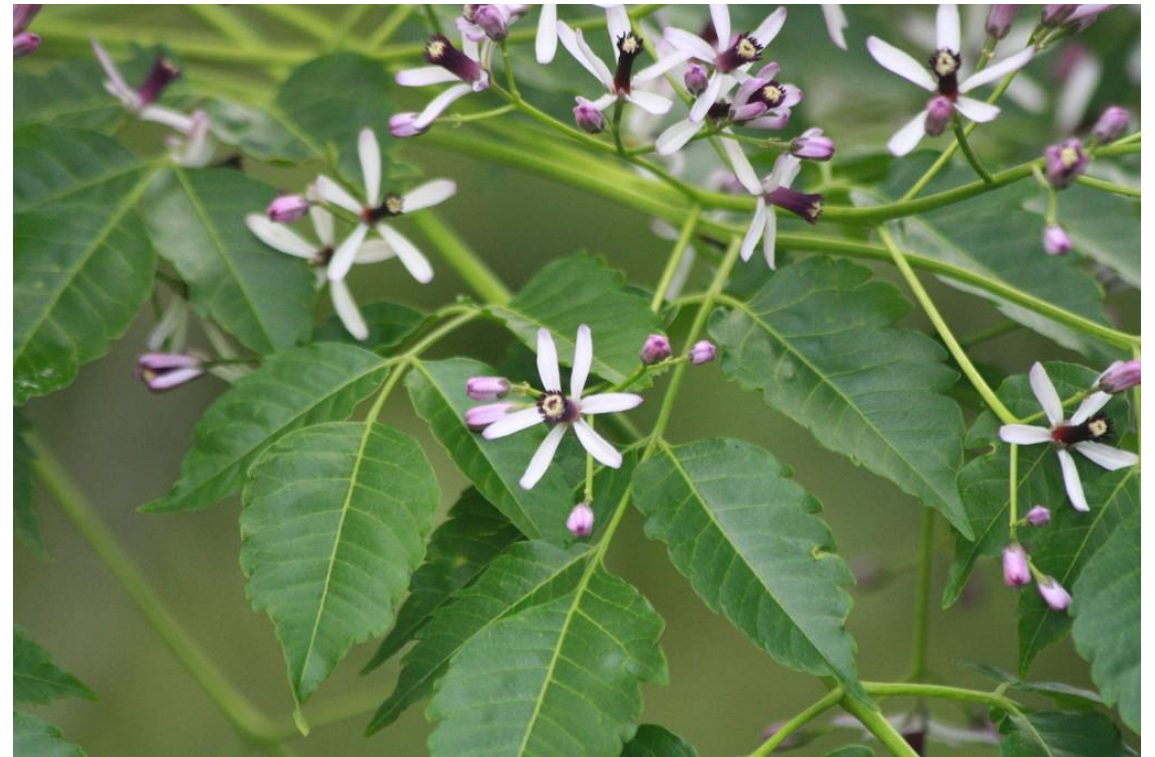




Photo credit: Stephen F. Enloe

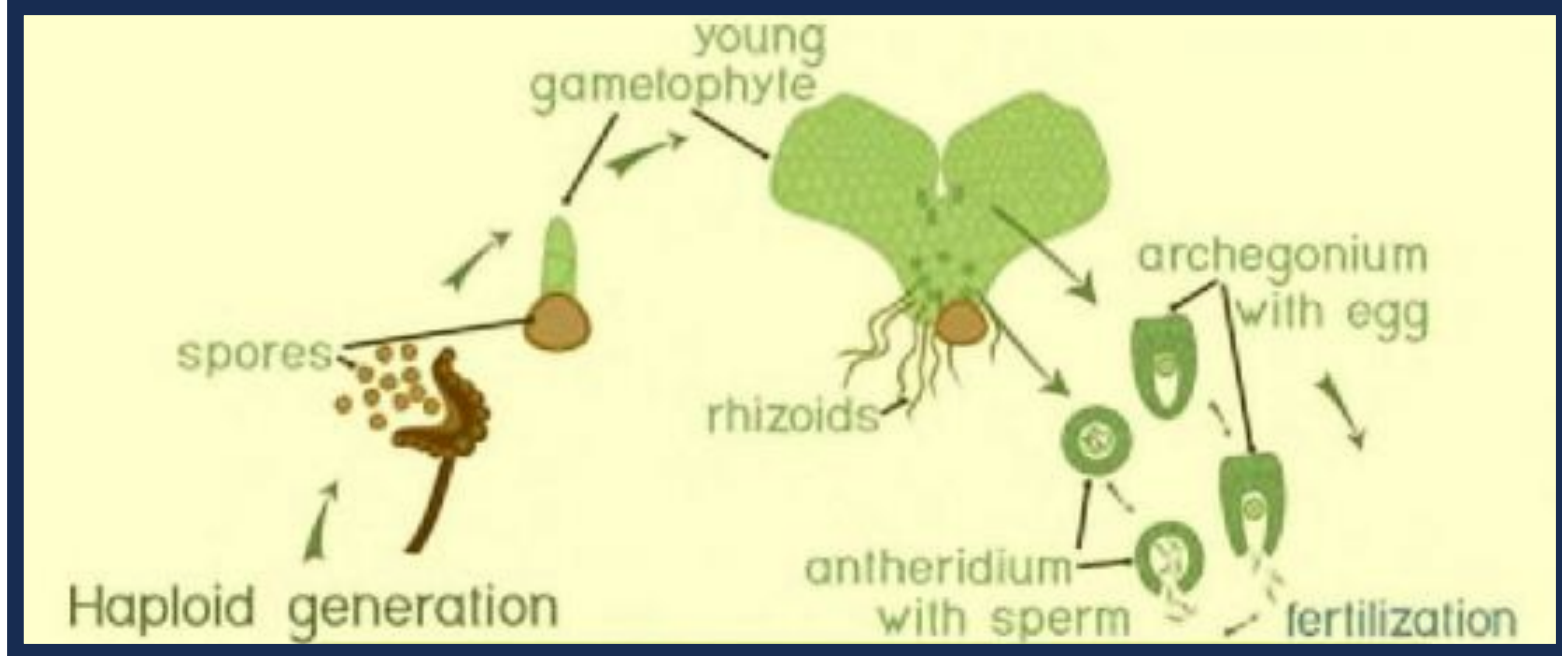
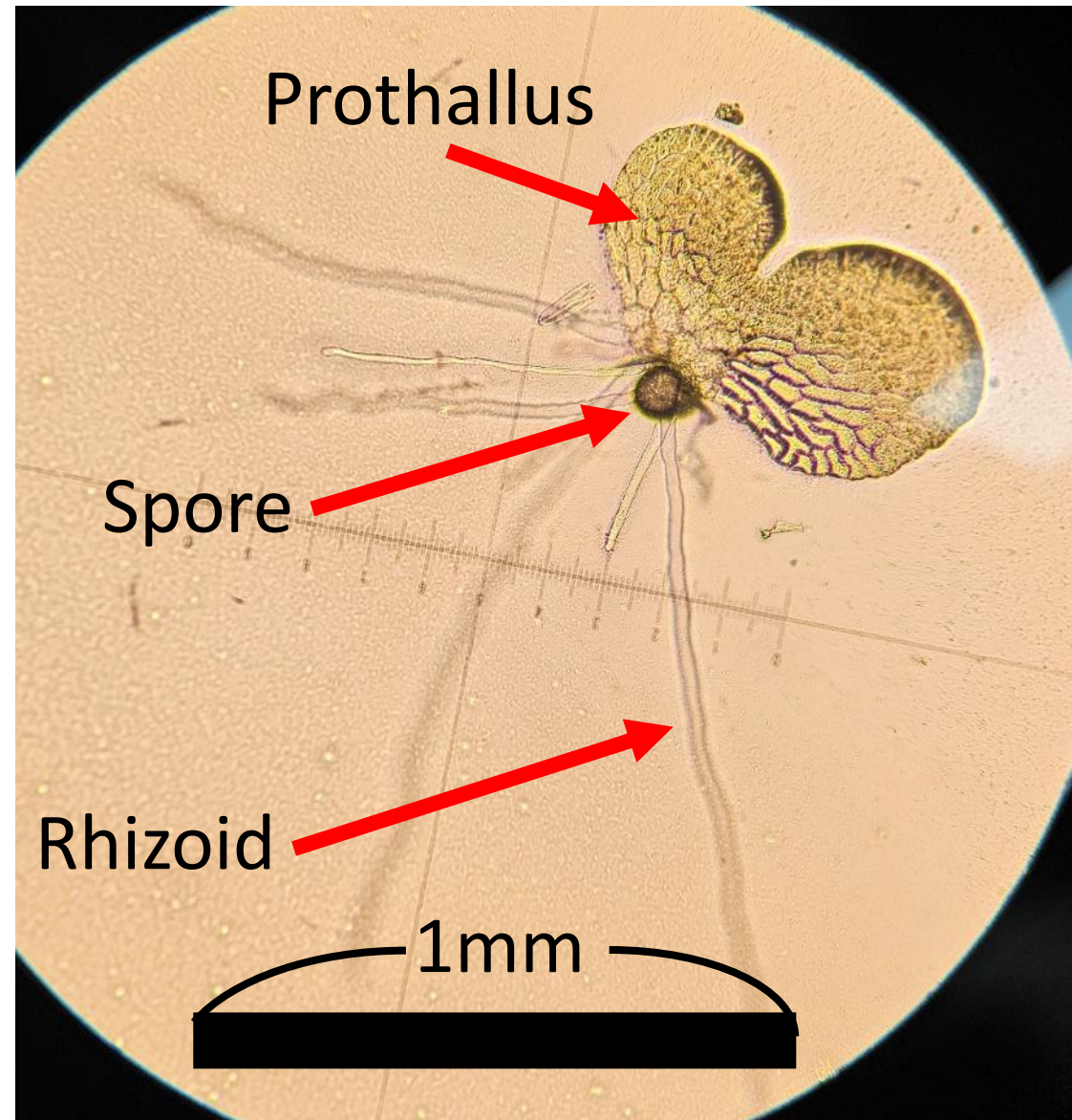


Image credit: Thoughtco.com

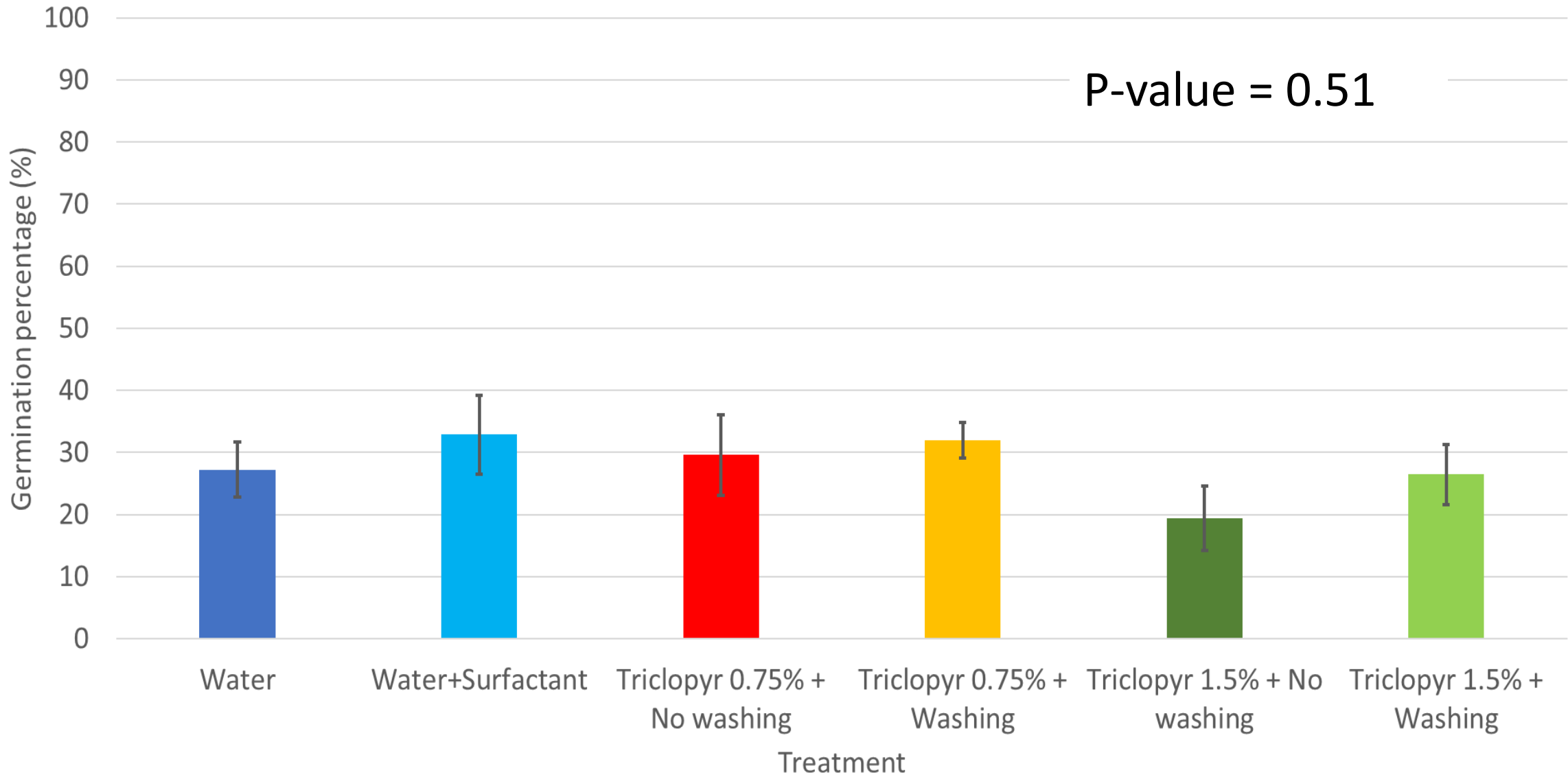
Working on the hidden half of OWCF

- We are digging into native fern spore and gametophyte tolerance to OWCF herbicides
- Soaking spores in herbicide solutions and comparing germination rates
- Improvement for native fern restoration?



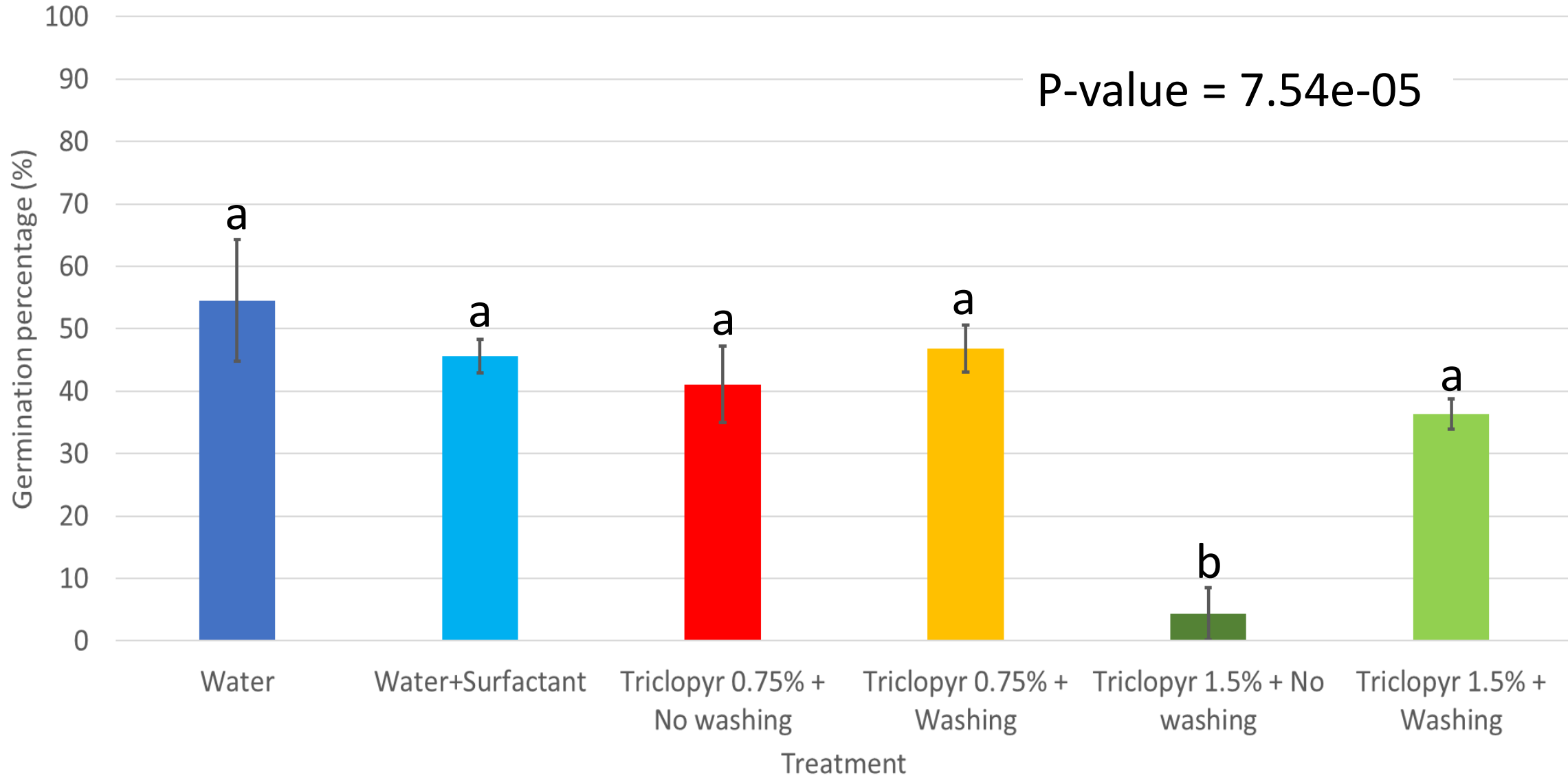
Germination percentage (35DAT, *Lygodium microphyllum*)

P-value = 0.51



Germination percentage (35DAT, *Thelypteris interrupta*)

P-value = 7.54e-05

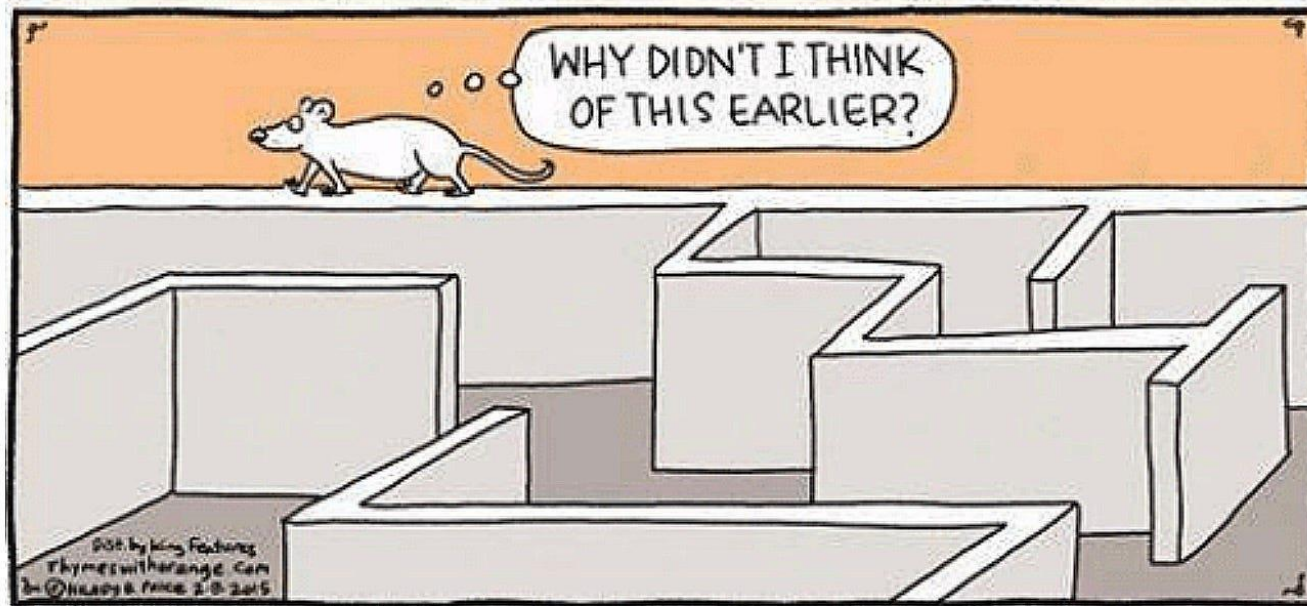


Spore germination

- Surfactant, both 0.75% and 1.5% triclopyr treatment did not affect *L. microphyllum* germination significantly
- All treatments except 1.5% triclopyr treatment without washing did not affect *T. interrupta* germination significantly
- *T. interrupta* germination was inhibited by 1.5% triclopyr treatment when there was no washing
- Rain might be likely to wash out triclopyr herbicide, weakening its inhibiting effect

Where we are headed

- Expanding this work to include more herbicides and native ferns
- The end goal is herbicide treatment + restoration with native ferns in one step (put the spores in the spray tank!)



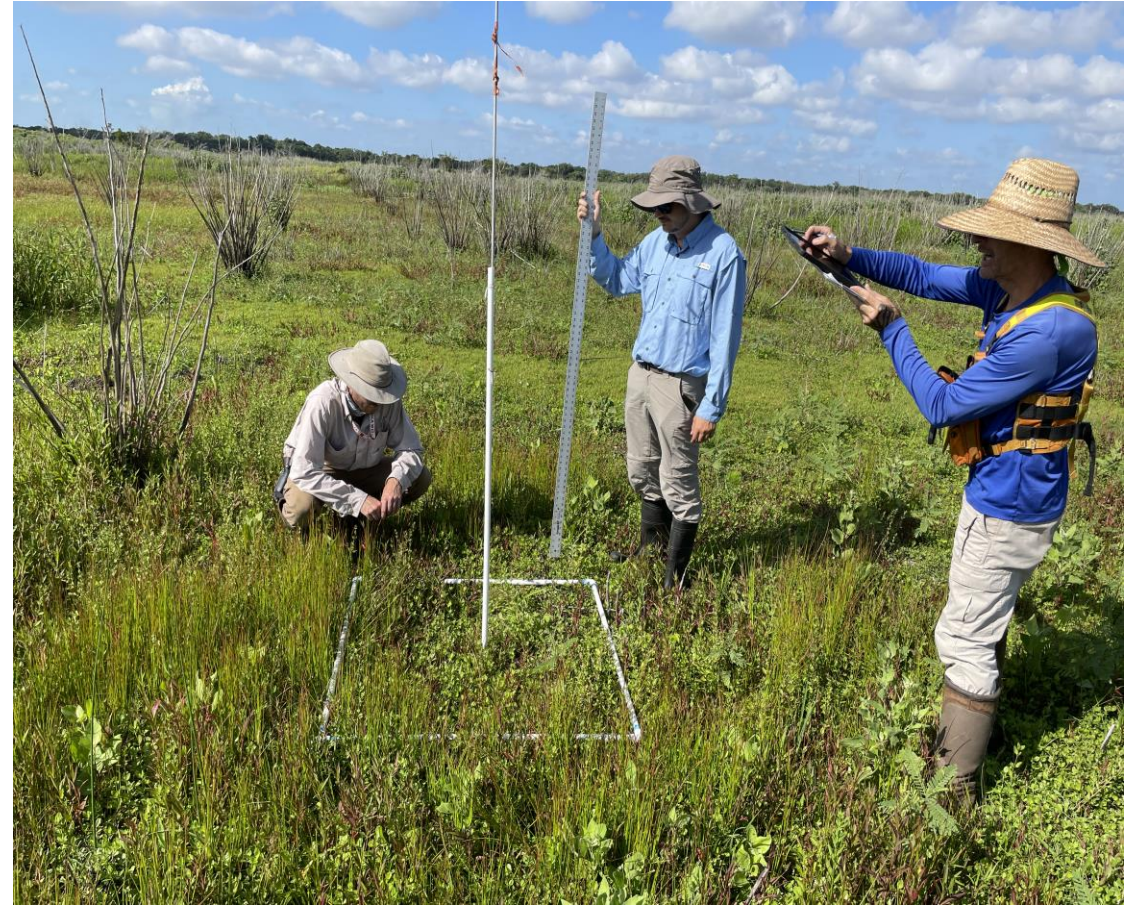
sfwmd.gov

UF | IFAS
UNIVERSITY of FLORIDA



**CENTER FOR AQUATIC
AND INVASIVE PLANTS**

West Indian Marsh Grass Aerial Treatments on Kissimmee River Floodplain



Glyphosate + Imazapyr

- Two timing strategies
 - Dry season (April 2023)
 - Treat before the water comes up (dry conditions)
 - Give the imazapyr time to work for both foliar and soil activity
 - Wet season (September 2023)
 - Treat before flowering
 - Only herbicide foliar activity expected
 - Are there tradeoffs in timing versus native plant community recovery?
- Data collection ongoing



sfwmd.gov



Upcoming projects: Cogongrass and seasonal inundation issues

- What are the flooding limits (time and intensity) of cogongrass survival?
 - Mapping applications, water manipulation as a control?
- Is seasonal hydrology in South Florida impacting treatment?
 - 4 treatment timings with industry standard treatment
 - Long term data collection



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

18 Complete Management Guides

- Introduction video
- Arrowheadvine, Golden pothos
- Brazilian peppertree, Leadtree
- Camphortree, Chinese tallow
- Coral Ardisia, Shoebuttton 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



Questions?
sfenloe@ufl.edu; ian.talty@ufl.edu

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

