Promising new herbicide technologies for the management of Old World Climbing Fern

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Old World Climbing Fern (*Lygodium microphyllum)*

Partnerships

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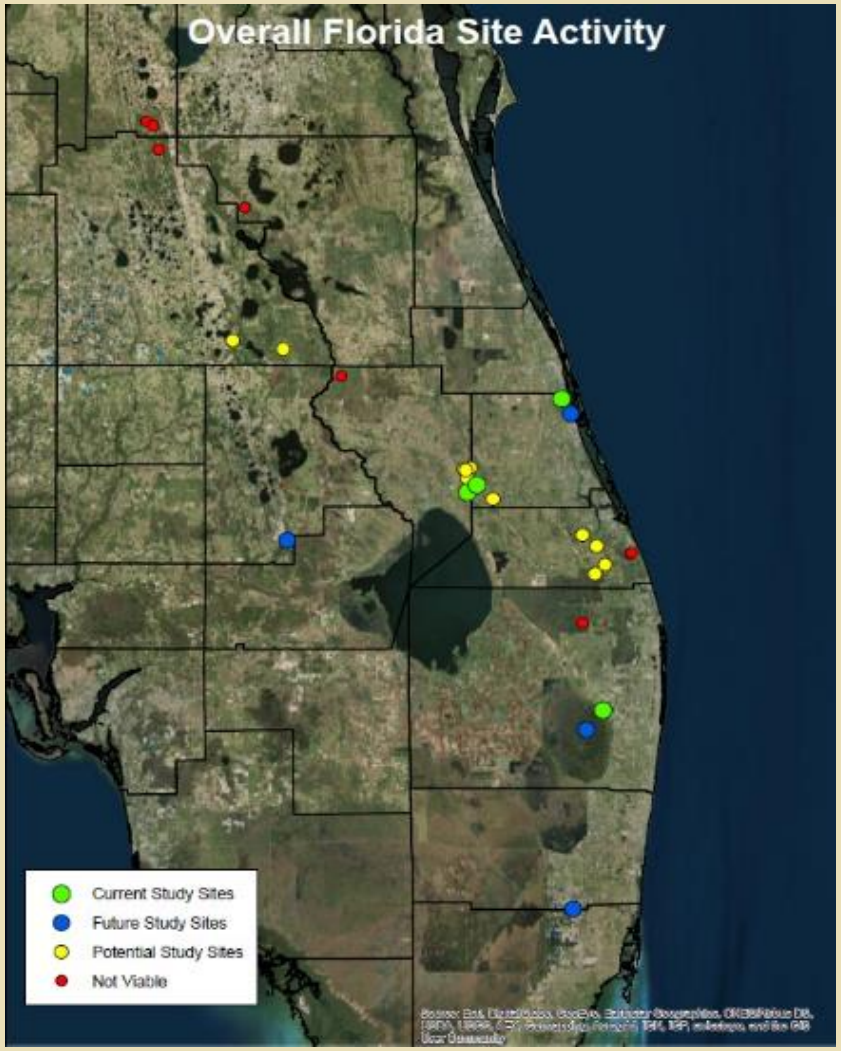
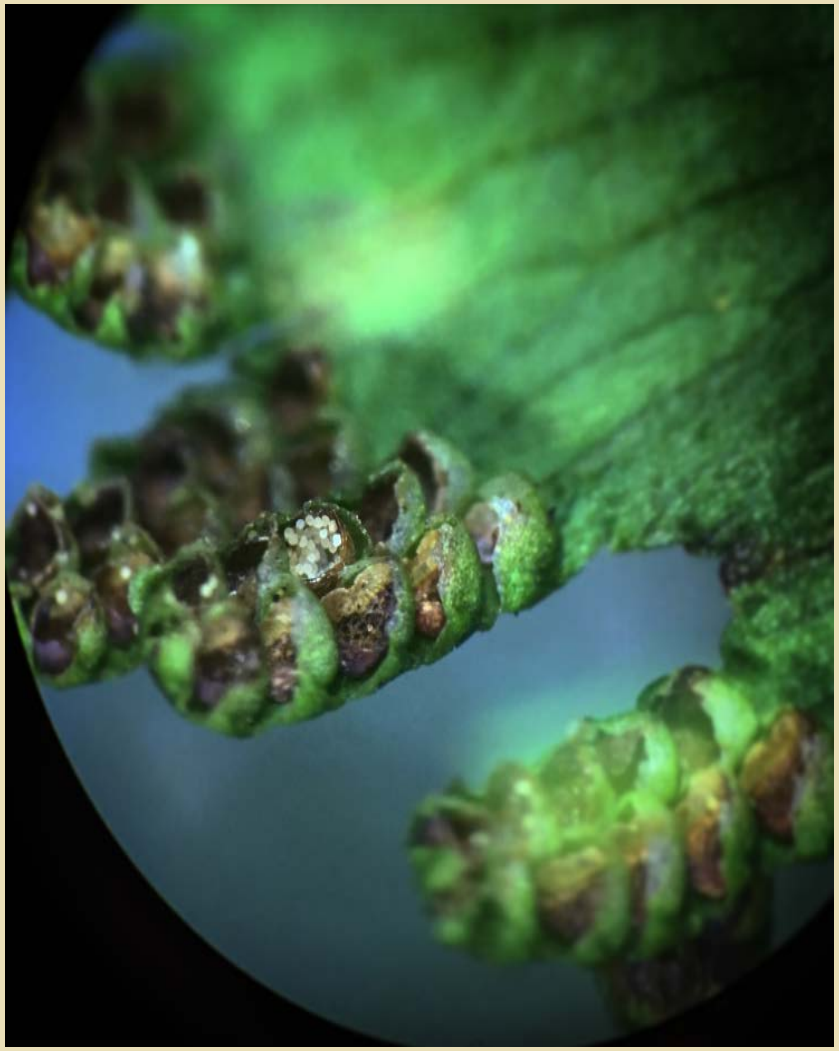
Objectives

- Implement an aggressive herbicide screening program to develop new OWCF management strategies
- Reduce impact to non target native species
- Re-evaluate the use of Glyphosate and metsulfuron, the most common control treatments
- Evaluate older and more recently labeled aquatic approved and terrestrial herbicides
- Examine the effects of seasonal variation in environmental conditions such as seasonality, hydroperiod, and temperature
- Retreatment Intervals

Efficacy Trials

- Over 400 plots
- 12 studies
- 15 herbicides
- 33 total treatments with varying rates and tank mixes
- 4 sites
  - Berman Dairy
  - Stokes Cattle
  - Spanish Lakes Blvd
  - Strazzulla





Methods

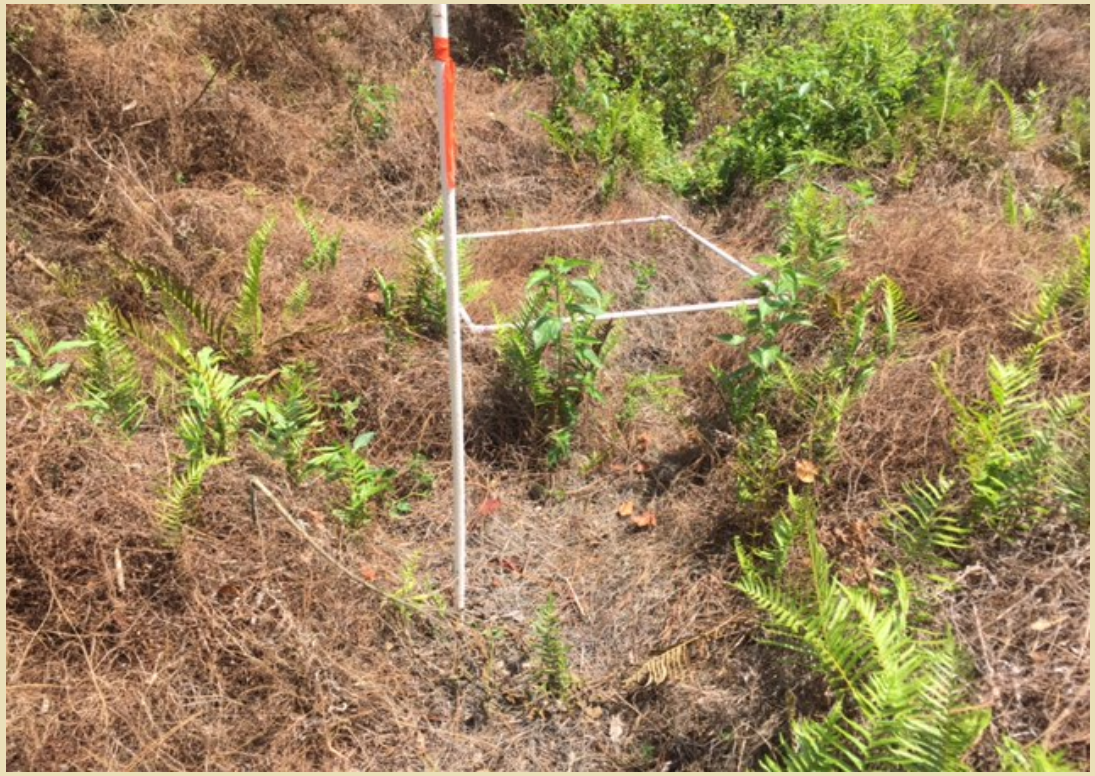
- 5m x 5m plots with one center pole
- Established in a grid and block pattern
- Application volume 40GPA
- Sprayed with a CO2 backpack and single adjustable cone nozzle
- 4 replicate plots per treatment
- Data was collected at baseline, 30, 60, 90, 180, 365 DAT
- % Visual Cover of live (green) OWCF from 4 quadrats within each plot
- Separate regrowth into recovery from rhizomes and sporeling recruitment

Treatments

Herbicide / Tank Mixes	
Roundup Custom	Glyphosate
Garlon 3A	Triclopyr (Amine)
Vastlan HL	Triclopyr (Choline)
Trycera	Triclopyr (Acid)
Method	Aminocyclopyrachlor
Escort	Metsulfuron
Method + Escort	Aminocyclopyrachlor + metsulfuron
Procellacor (SX-1552)	SLF9523
Clipper	PPO
Stingray	PPO
[redacted]	
Roundup Custom + [redacted]	Glyphosate + PPO
Roundup Custom + Clipper	Glyphosate + PPO
Roundup Custom + Stingray	Glyphosate + PPO
Londax	Bensulfuron
Permit	Halosulfuron
Sharpen	Saflufenacil
Newpath	Imazethapyr
Basagran	Bentazon

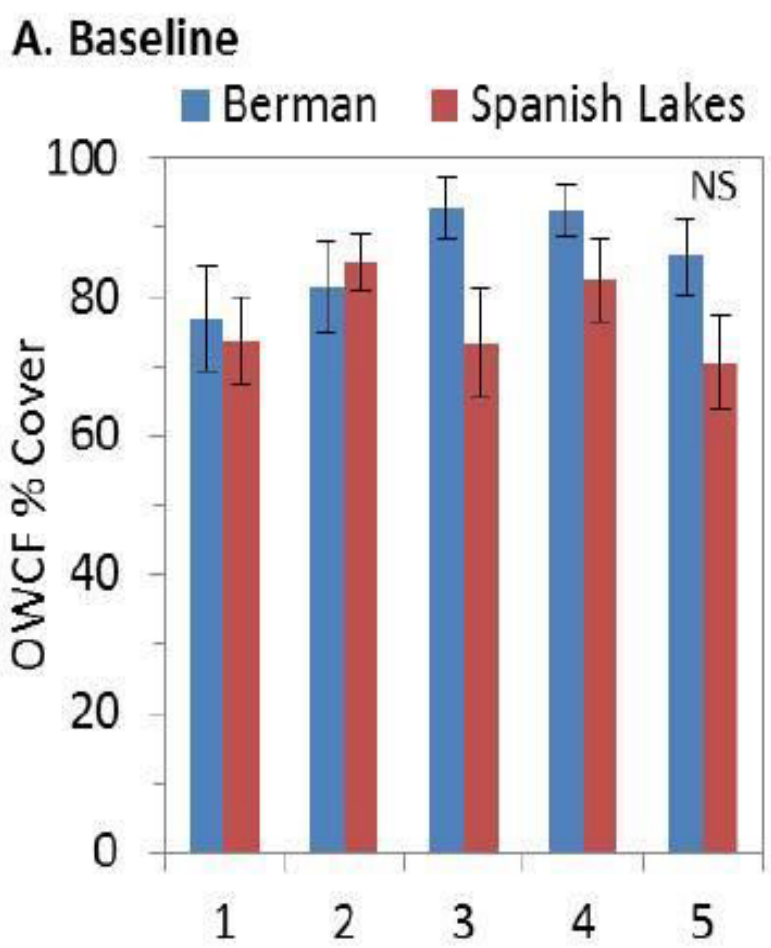
What is Procellacor?

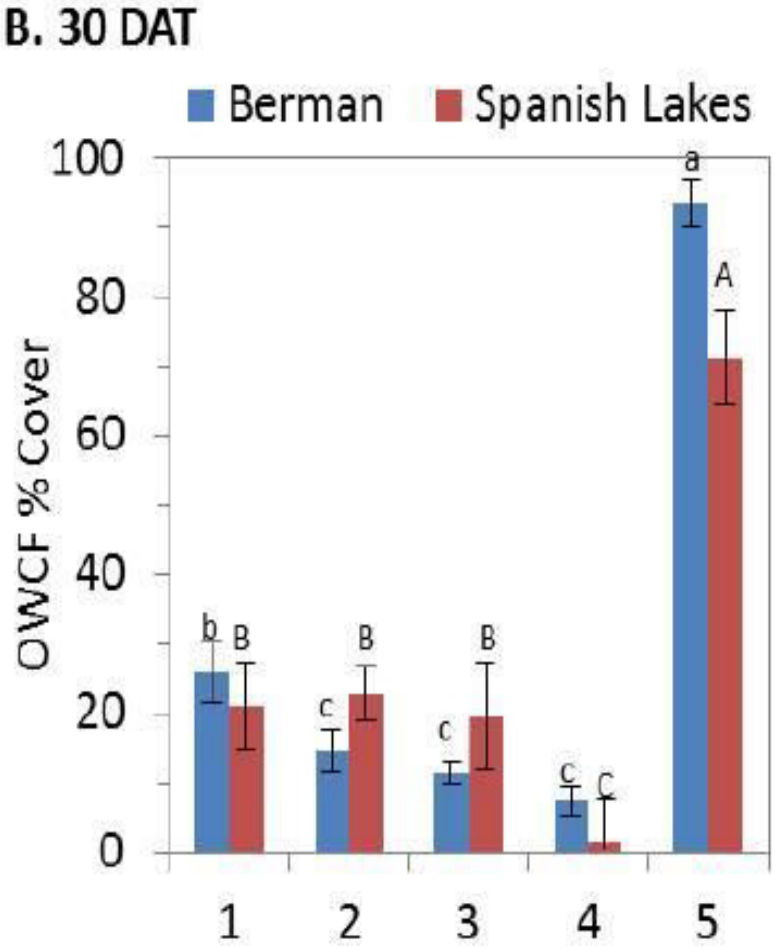
- Florpyrauxifen-benzyl
- New auxin type herbicide by SePRO
- Highly active on SAV (*Hydrilla, Myriophyllum*) and floating leaved plants
- Limited data on emergent/riparian species
- Excellent toxicology package
- Active Ingredient EPA approved
- https://www.regulations.gov/docket?D=EPA-HQ-OPP-2016-0560



BMD- Plot 182 60 DAT Procellacor 16oz/A

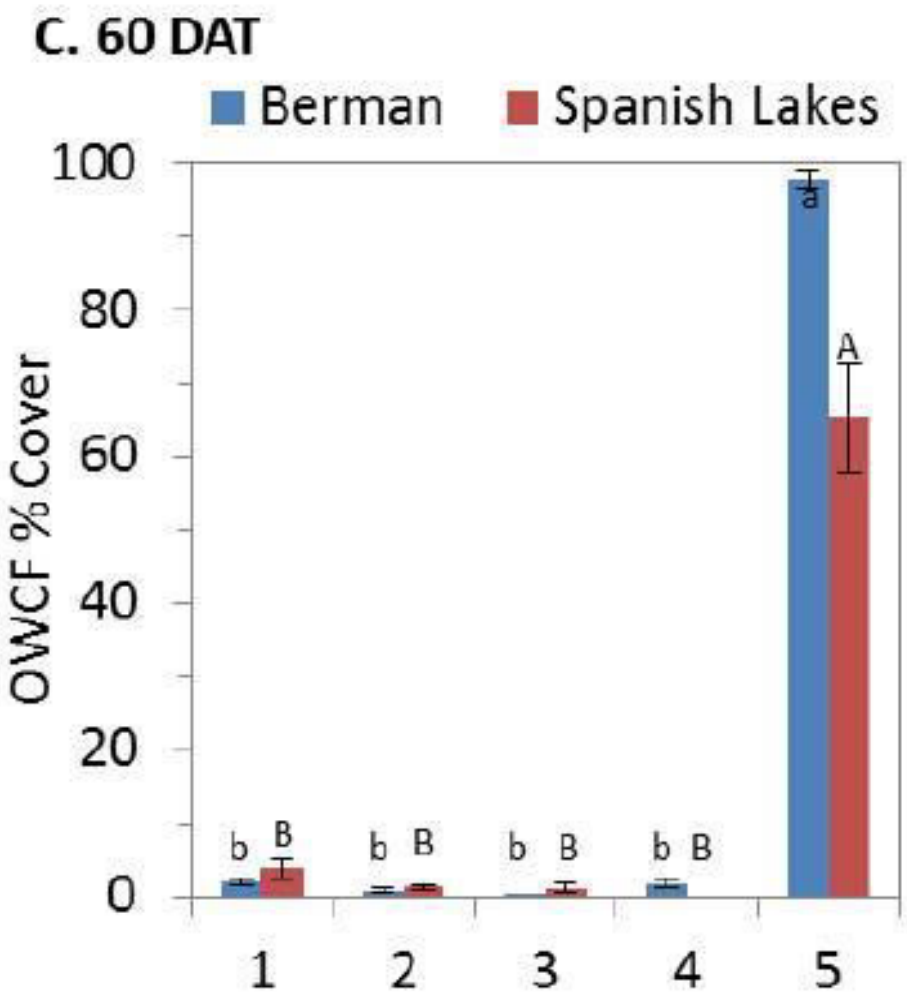
ProcellaCOR Trials

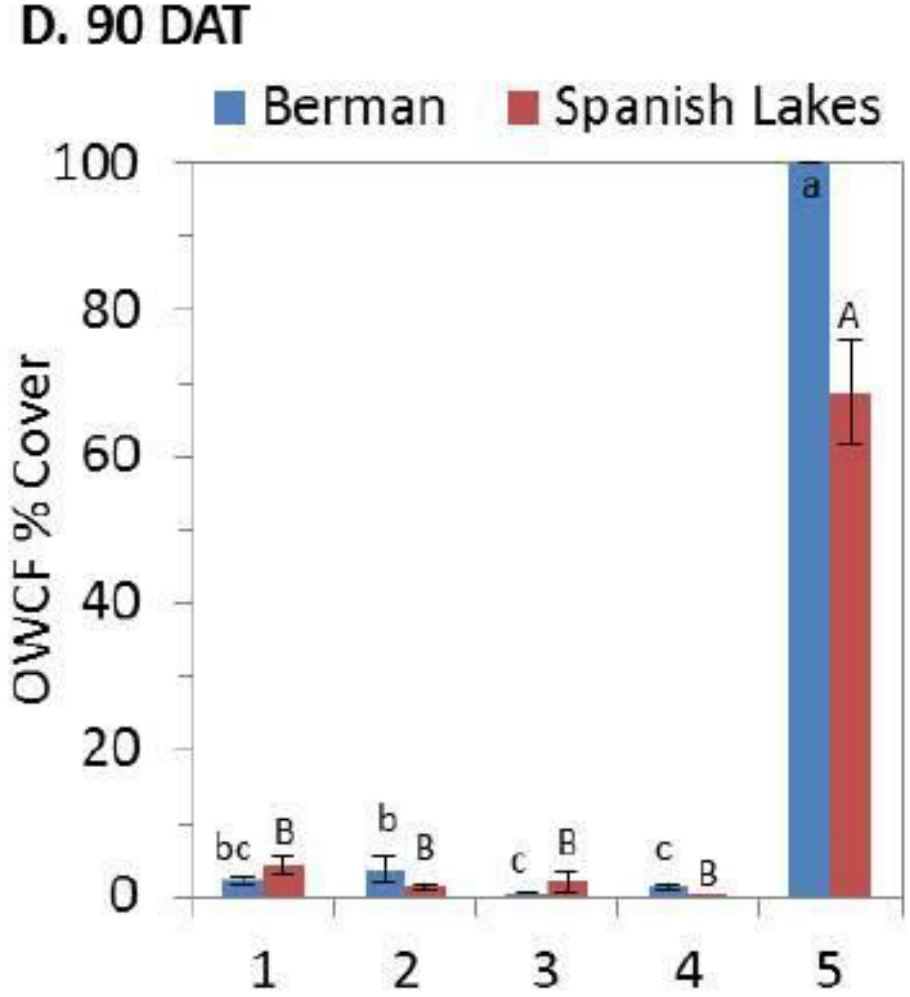




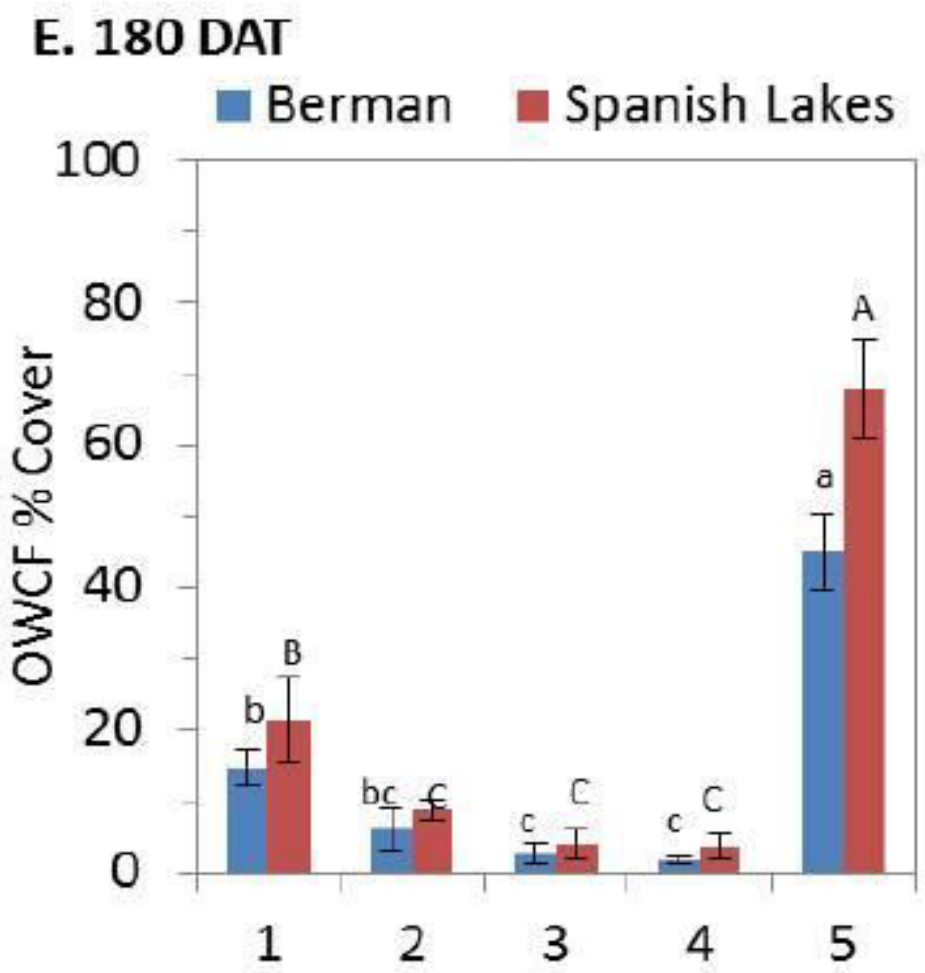
Trt # (Herbicide)	Rate
1 SX-1552	16oz
2 SX-1552	32oz
3 SX-1552	64oz
4 Roundup Custom	3%

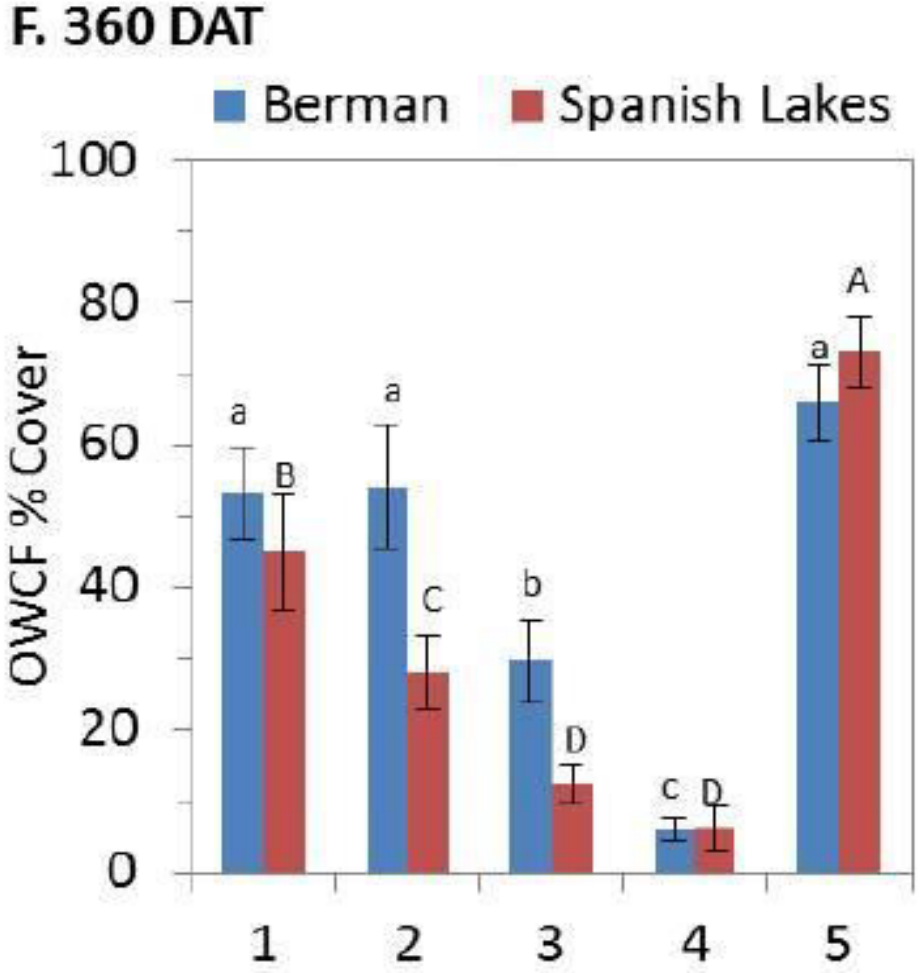
ProcellaCOR Trials





ProcellaCOR Trials





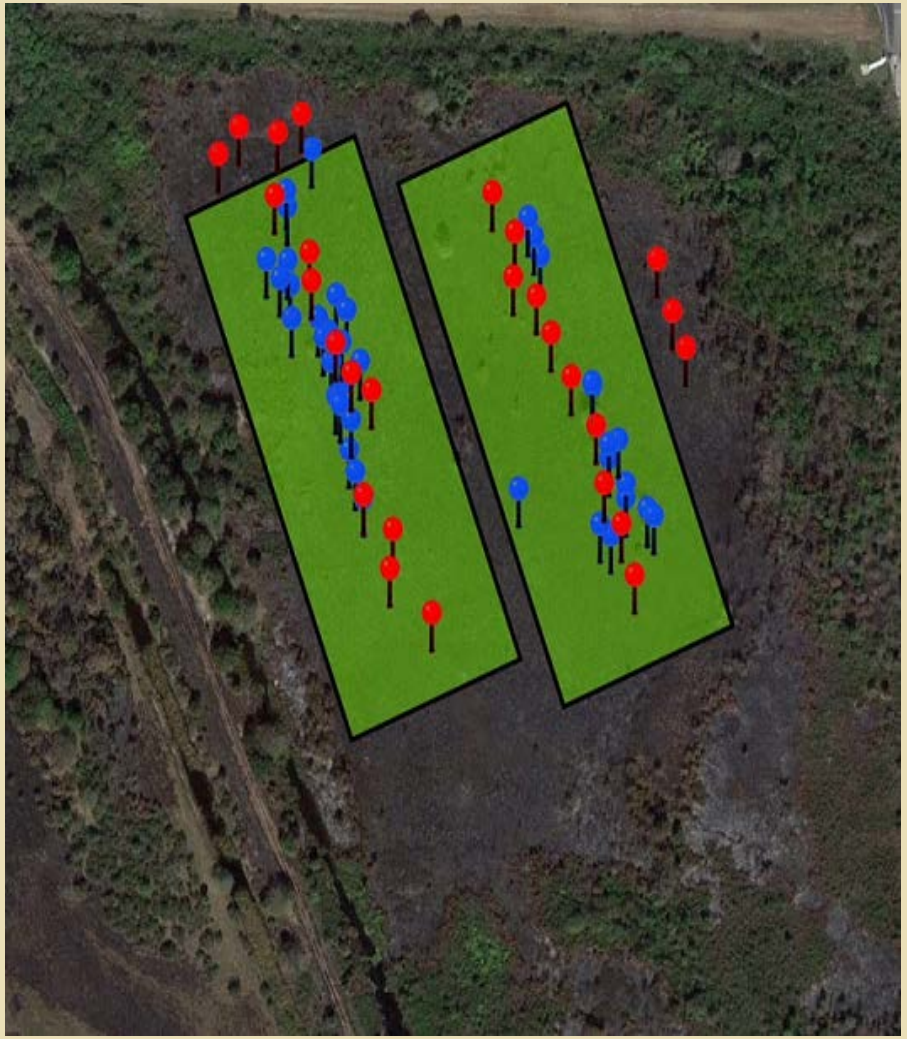
ProcellaCOR: Take Home Message

- Procellacor has very good activity on OWCF at all rates tested
- Very promising as an alternative option to Glyphosate
- Still evaluating its non-target damage
- We used the EC formulation, SePro has registered the SC formulation for FL
- We expect there to be similar activity among the SC but have initiated testing to verify the efficacy

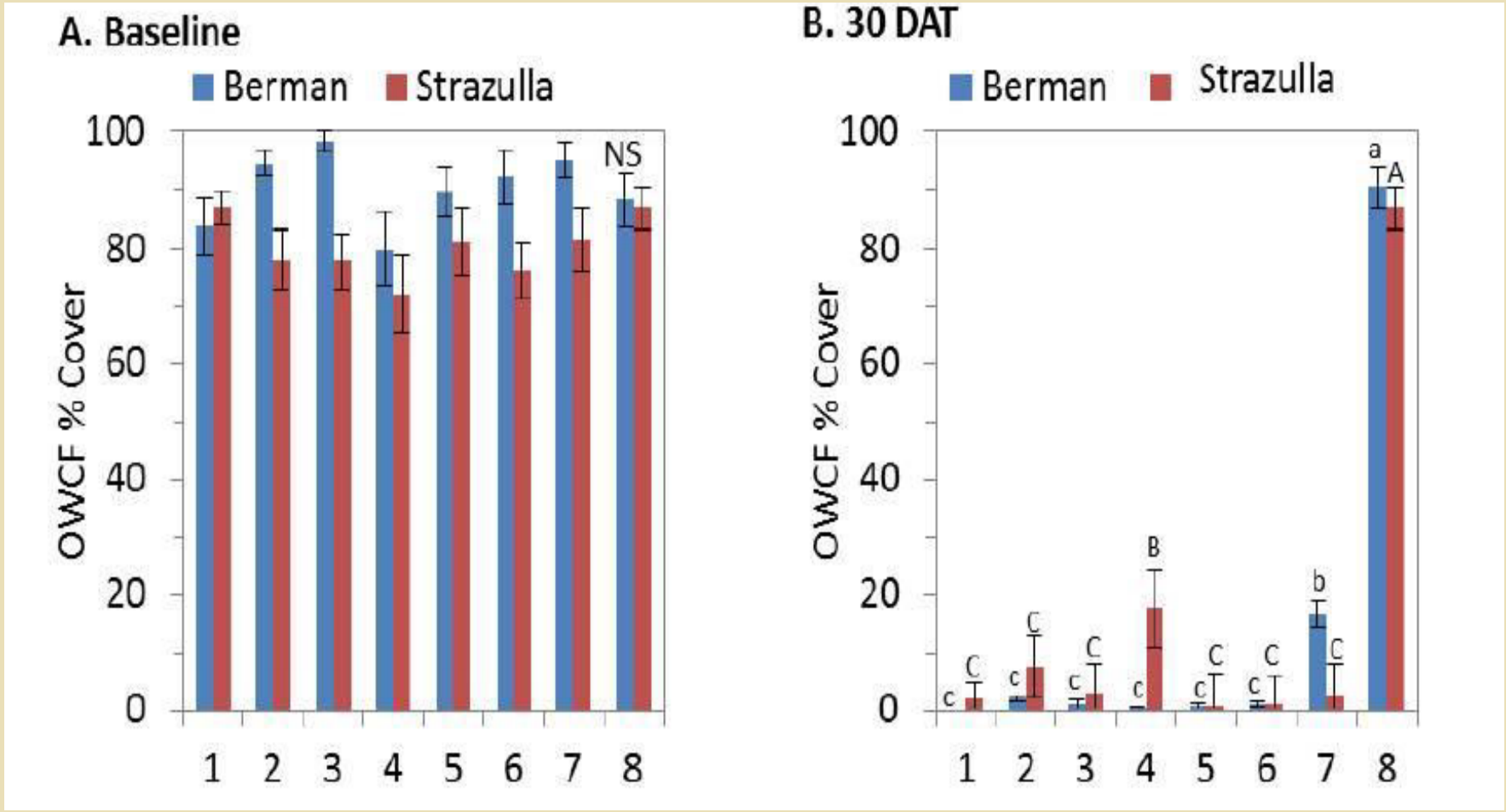
Product	Formulation	Recommended Rate per acre for OWCF control	Label specific PDU equivalent[a]
ProcellaCOR EC	0.21 lb ae/gal	16-32 oz/A	5-10 PDU
ProcellaCOR SC	2.5 lb ae/gal	1.35-2.7 oz/A	1-2 PDU

[a]PDUs differ by herbicide label.

Procellacor SC Efficacy Trials

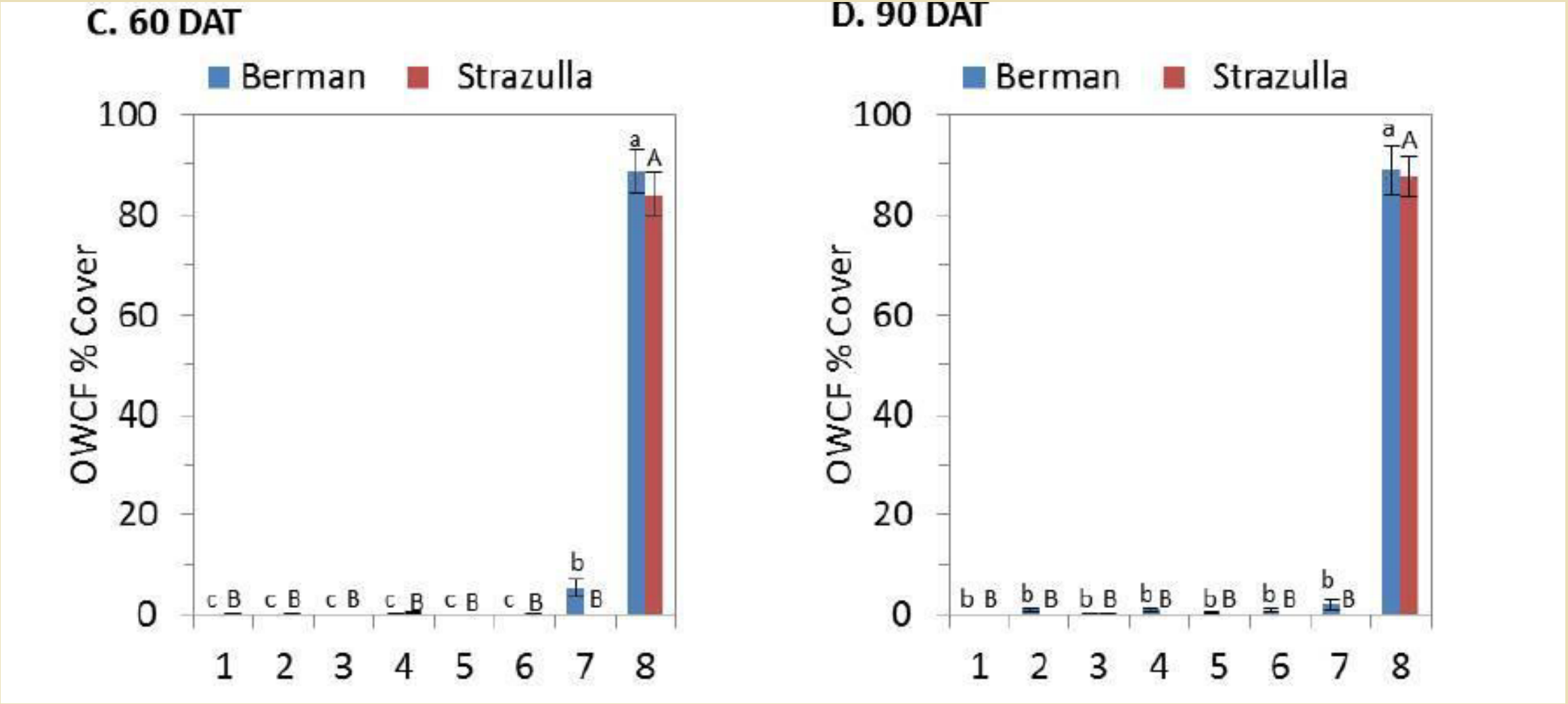


Triclopyr Formulations

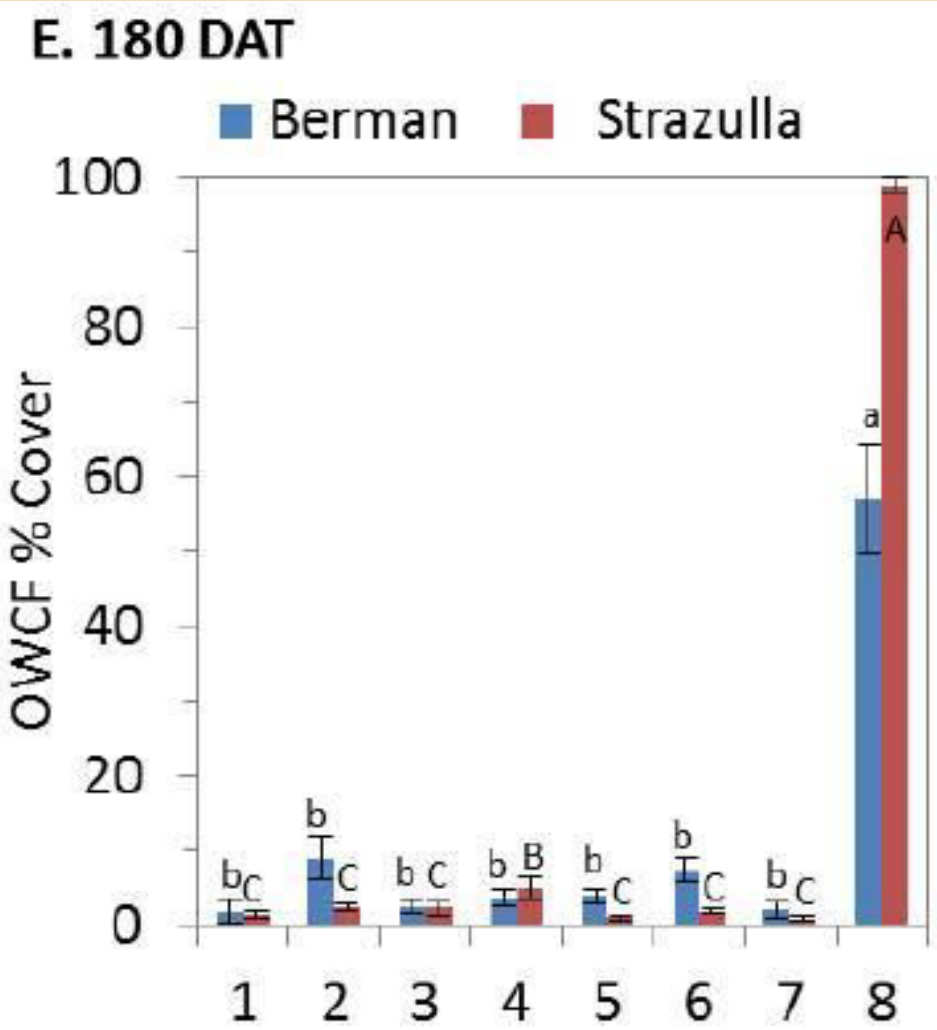


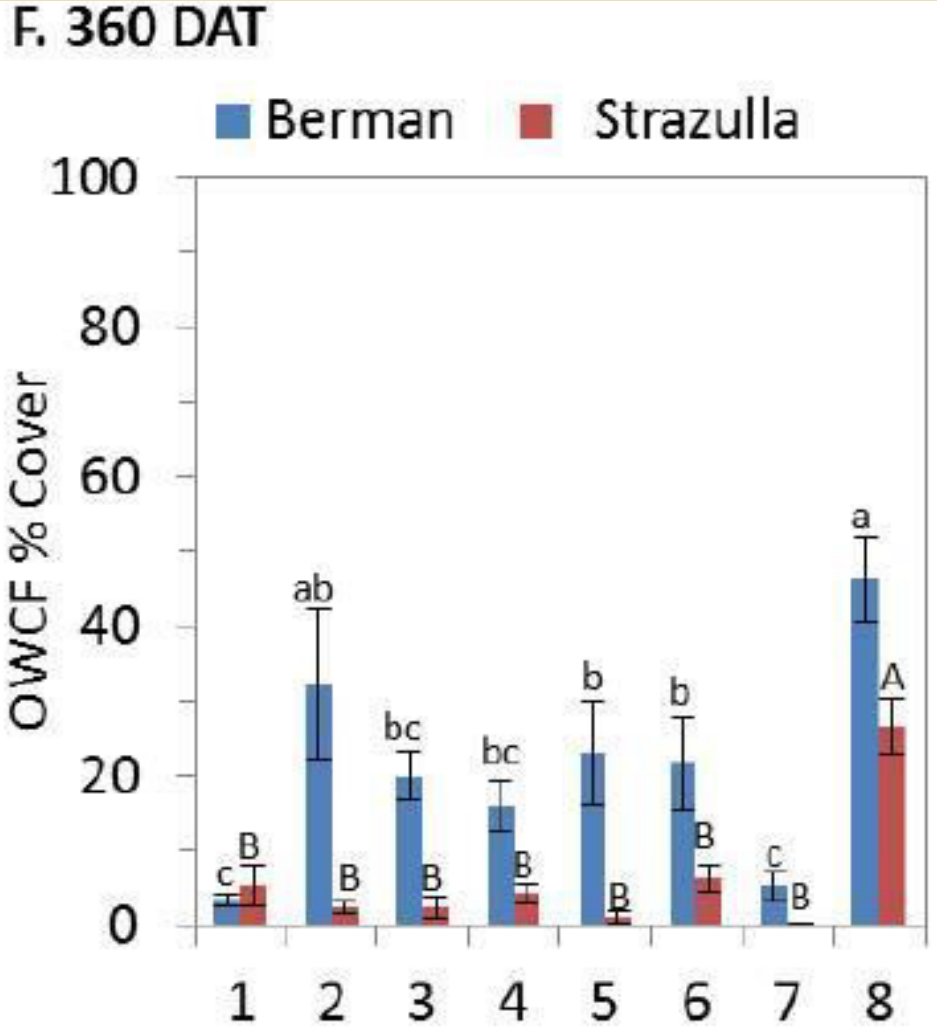
Trt# (Herbicide)	%v/v
1 (G3A)	3%
2 (G3A)	1.5%
3 (VastlanHL)	2.25%
4 (VastlanHL)	1.12%
5 (Trycera)	3.14%
6 (Trycera)	1.57%
7 (Roundup Custom)	3%
8 (untreated)	---

Triclopyr Formulations



Triclopyr Formulations





Triclopyr: Take Home Message

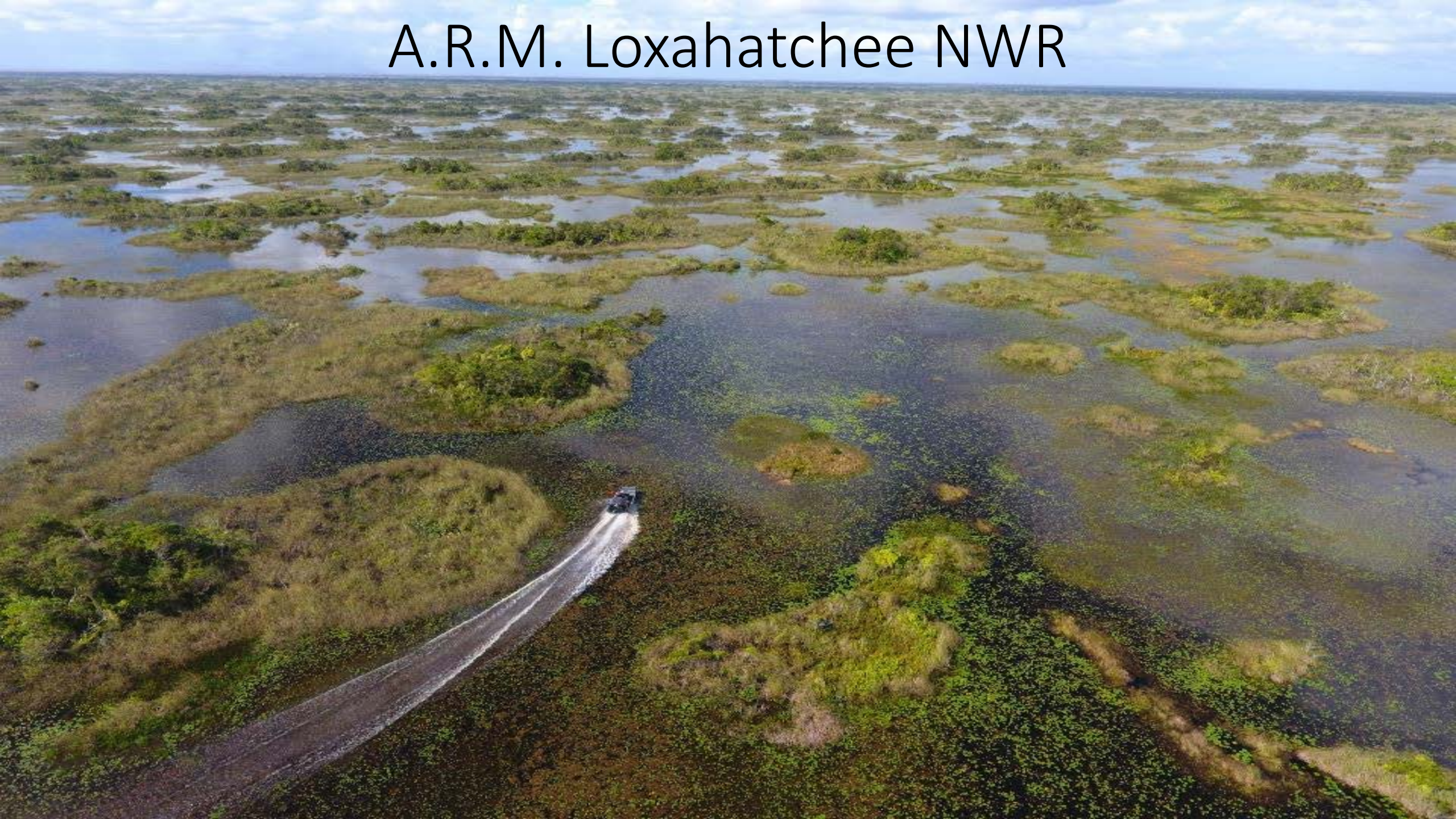
- All three triclopyr formulations control OWCF and may be alternatives to Glyphosate
- Concentrations from any of these formulas equivalent to Garlon 3A at 1.5 and 3.0 %v/v may be useful
- Applicators exhibit preference to some formulations due to safety considerations and product odor.
- Long term variation (1 year) in efficacy is likely as conditions vary amongst sites

BMD- Plot 111 60DAT: Garlon 3A 1.5%

Herbicide Treatment Summary

- ProcellaCOR has excellent activity
- Two newer triclopyr formulations effective
- Method did not substantially improve Escort
- PPO herbicides did not improve glyphosate activity but can be used if burn down time is of interest
- Data confirmed reduced efficacy of Escort when mixed at 2oz/A
- Rice herbicides were not effective but testing will be expanded to include new treatments during 2018

A.R.M. Loxahatchee NWR



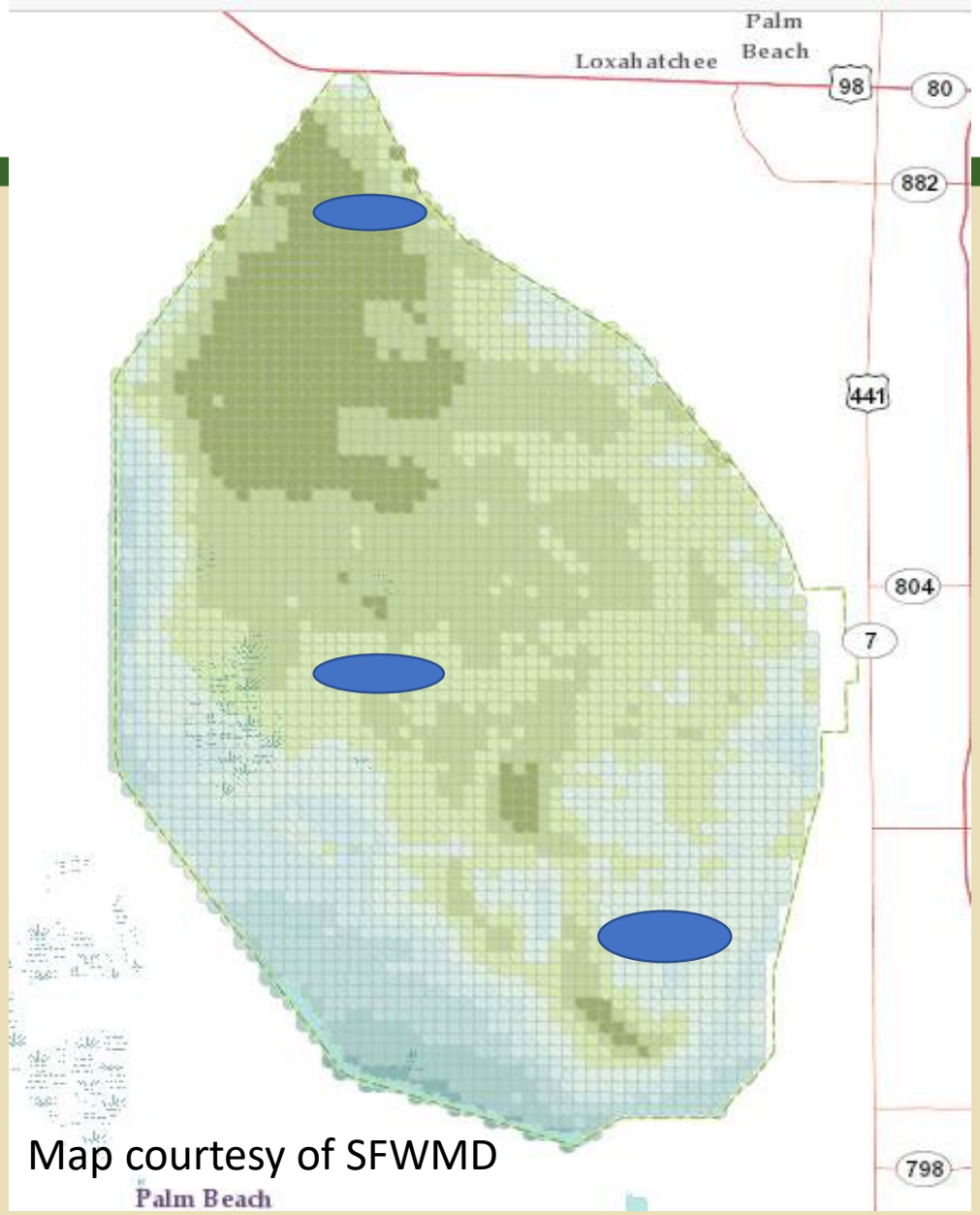
Tree Island Studies

- 20 Tree Islands are currently being monitored after a Triclopyr study was initiaited. Each island is an experimental unit.
- ProcellaCOR has been approved for use in Lox and 20 islands will be chosen this month to begin efficacy and non target damage studies with the SC formulation


BIRCHMEIER
Iris 15

Hydrology Studies

- Place plots within OWCF infestations in the North, Central, and Southern sections of the refuge.
- Test the theory that when submerged, Lygodium is more difficult to kill
- 16 plots per region
- 3 Treatments



Map courtesy of SFWMD

Mesocosm Studies

Moving Forward

- Continue to monitor Triclopyr testing on OWCF infested tree islands in Loxahatchee NWR, examine efficacy and non-target damage
- Tree island studies initiated as herbicides are evaluated and approved within Loxahatchee NWR
- Continue to implement and monitor water depth studies at Loxahatchee NWR
- Evaluate Procellacor efficacy and non-target damage
- Mesocosm studies
- Evaluate treatments to possibly replace poodle cutting
- Expand rice herbicide testing
- Retreatment Intervals
- Examine seasonality of treatment, spore biology, wildlife surveys with Lox NWR, IPM possibilities.

Thanks! Questions?

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