Cogongrass, Japanese climbing fern, and coral *Ardisia* control in the landscape and natural areas

Pat Minogue, Ph.D., R.F.
Associate Professor of Silviculture

SFRC School of FOREST RESOURCES & CONSERVATION

UF UNIVERSITY of FLORIDA
IFAS
North Florida Research and Education Center

Cogongrass (*Imperata cylindrica*)

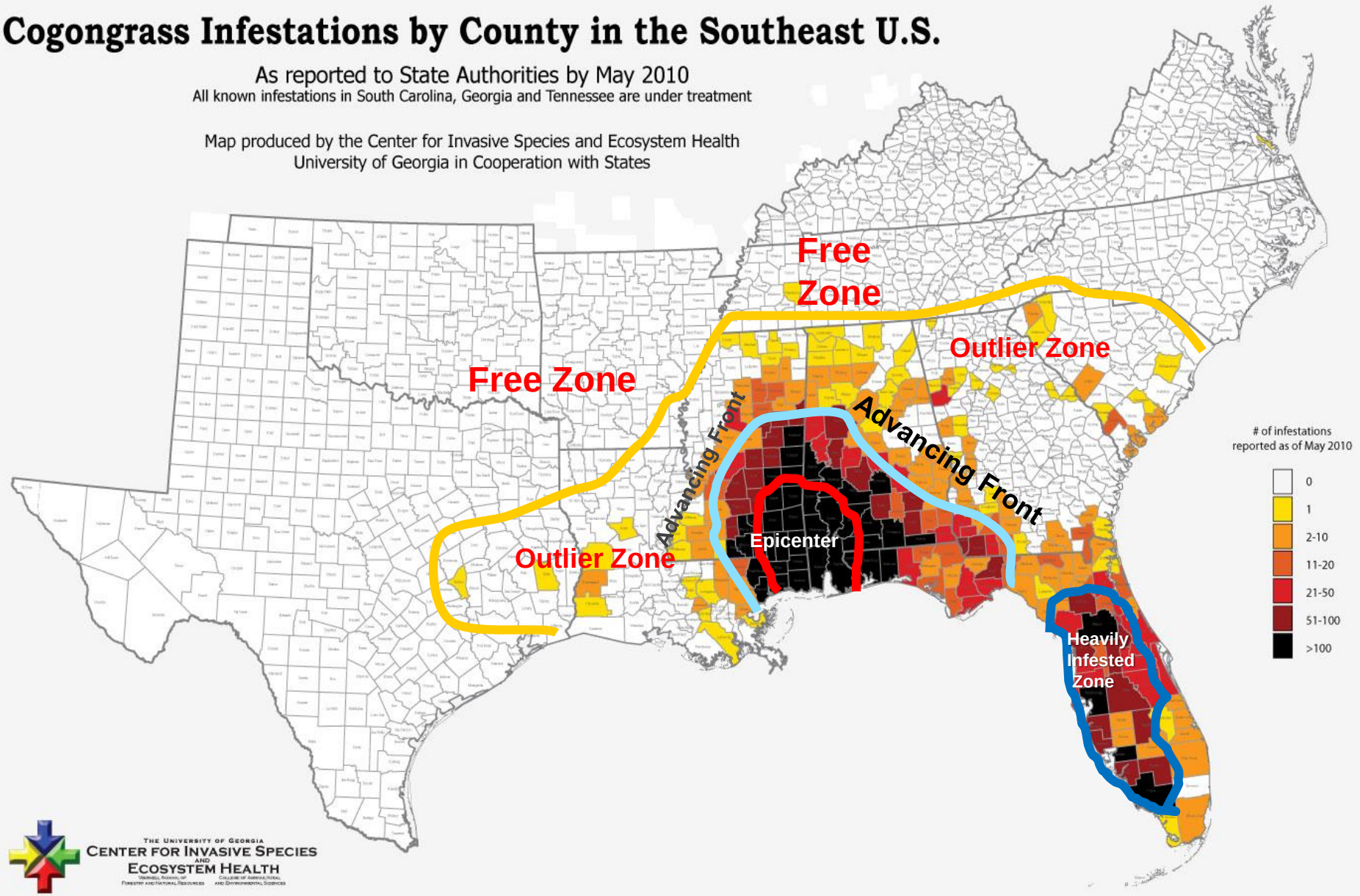
- Worlds seventh worst weed (500 million acres)
- More than 1 million acres in FL
- Displaces native vegetation
- Does not self-fertilize, initially spread by rhizomes in southeast
- Two introduced populations are now crossing and producing fertile seeds in south Mississippi

Cogongrass Infestations by County in the Southeast U.S.

As reported to State Authorities by May 2010

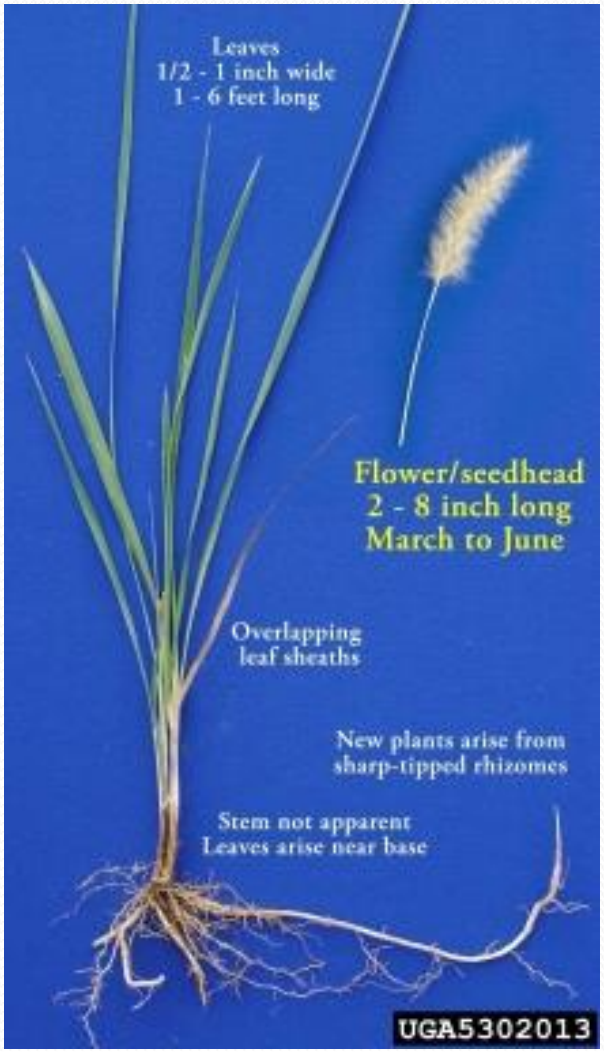
All known infestations in South Carolina, Georgia and Tennessee are under treatment

Map produced by the Center for Invasive Species and Ecosystem Health
University of Georgia in Cooperation with States



The University of Georgia
Center for Invasive Species and Ecosystem Health
Warnell School of Forestry and Natural Resources
College of Agricultural and Environmental Sciences

Recognize Cogongrass



Off-center mid vein, serrated leaf margin

Segmented rhyzomes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UGA2131085

Cogongrass Control in Pine Forests Two Alabama Coastal Plain Studies

- 22 Herbicide treatments compared to non-treated
- 3 Factorial arrangements in a RCB split plot design with 3 replications, re-treatment tested in split plots

- September vs. October Application Timing
- Glyphosate rates: 1.5, **3**, 6, 12 lb ae/acre in 10 GPA
- Imazapyr rates: 0.25, **0.5**., 1.0, 2.0 lb ae/acre in 25 GPA
- **3** lb glyphosate + **0.5** lb imazapyr in 10, 25, 40 GPA

Minogue, P.J., J.H. Miller, and D.K. Lauer. 2012. Use of glyphosate and imazapyr for cogongrass (*Imperata cylindrica*) management in Southern pine forests. Southern Journal of Applied Forestry 36:19-25.

Initial Treatment of New Infestation

Plots were 20 x 40 feet, split lengthwise for re-treatment

Lakeland loamy fine sand, Chop & burn site prep, 1 or 2 year old planted loblolly

Initial Treatment of Old Infestation

Faceville fine sandy loam, burned every 2 years

Percent control of cogongrass 2 years after treatment or retreatment *Application Frequency*

New Infestation

Frequency	Glyphosate	Imazapyr	Gly + Ima
Single	**29** b	**30** b	**48** b
Retreatment	**62** a	**67** a	**80** a

Old Infestation

Frequency	Glyphosate	Imazapyr	Gly + Ima
Single	**33** b	**61** b	**55** b
Retreatment	**60** a	**77** a	**70** a

Percent control of cogongrass 2 years after retreatment- *Application Timing*

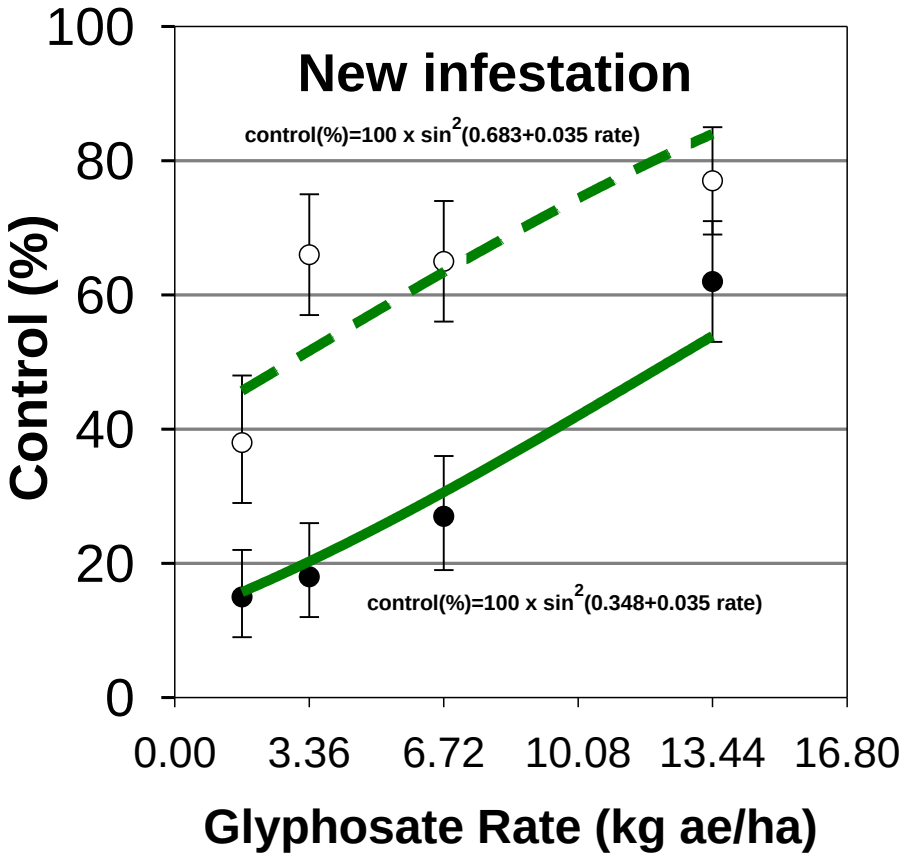
New Infestation

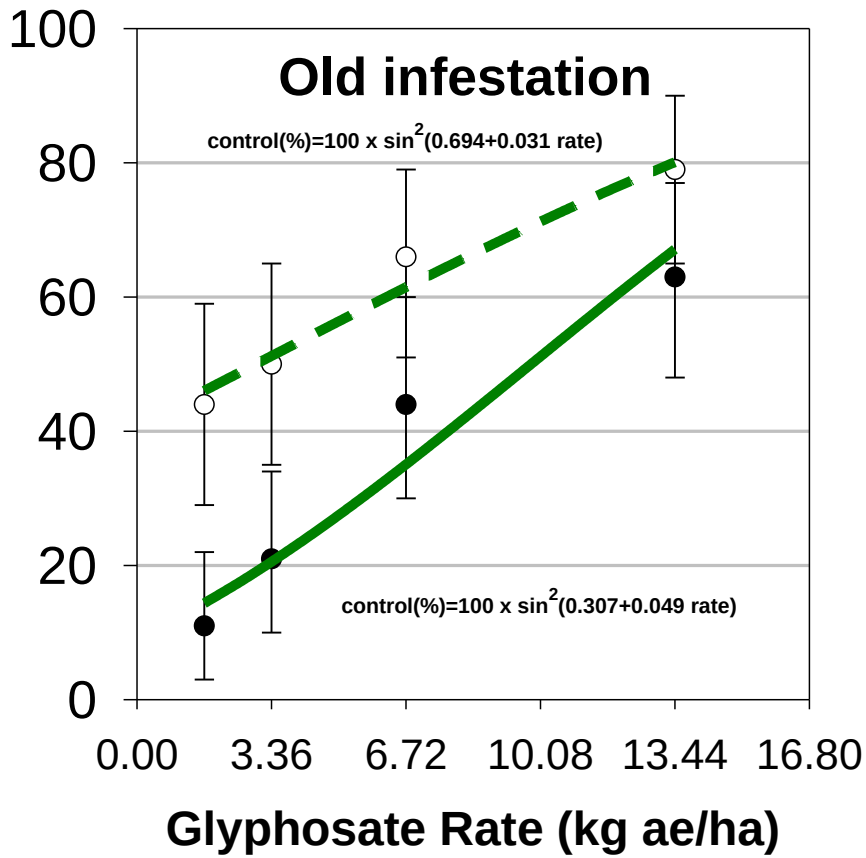
Appl. Timing	Glyphosate	Imazapyr	Gly + Ima	Average
September	**56** a	50 a	**75** a	**59** a
October	**36** b	47 a	**55** b	**45** b

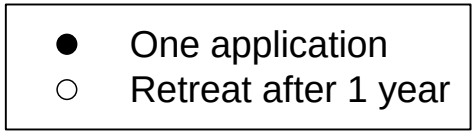
Old Infestation

Appl. Timing	Glyphosate	Imazapyr	Gly + Ima	Average
September	50 a	**74** a	67 a	**64** a
October	43 a	**64** b	58 a	**55** b

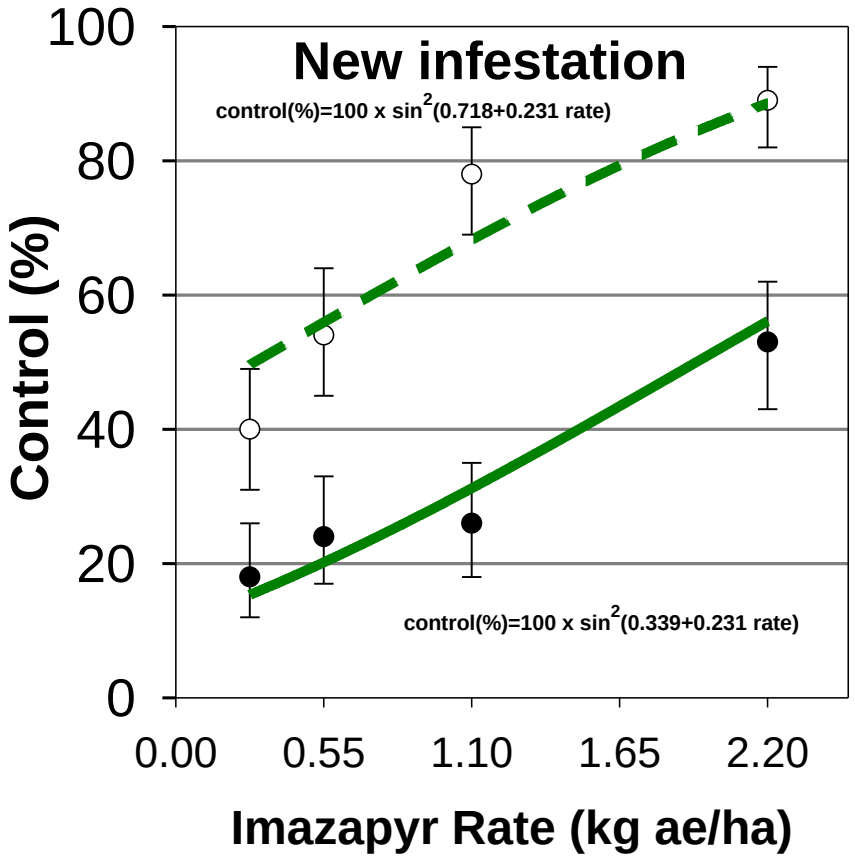
Glyphosate Rate Response

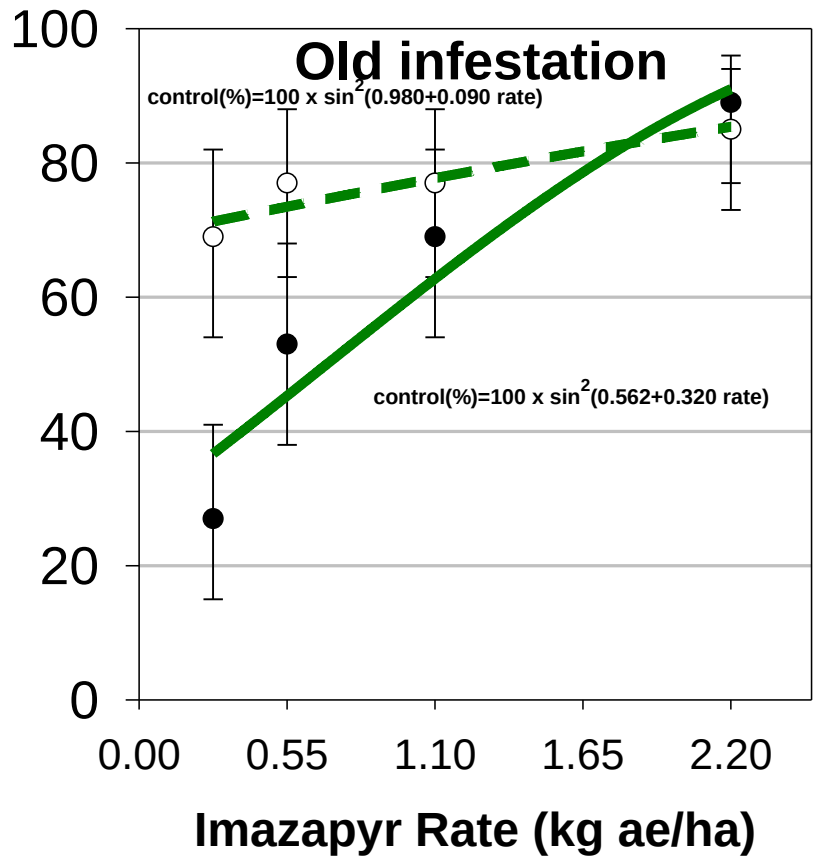


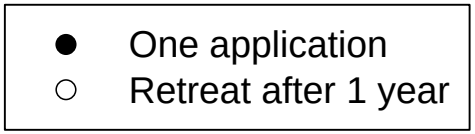




Imazapyr Rate Response



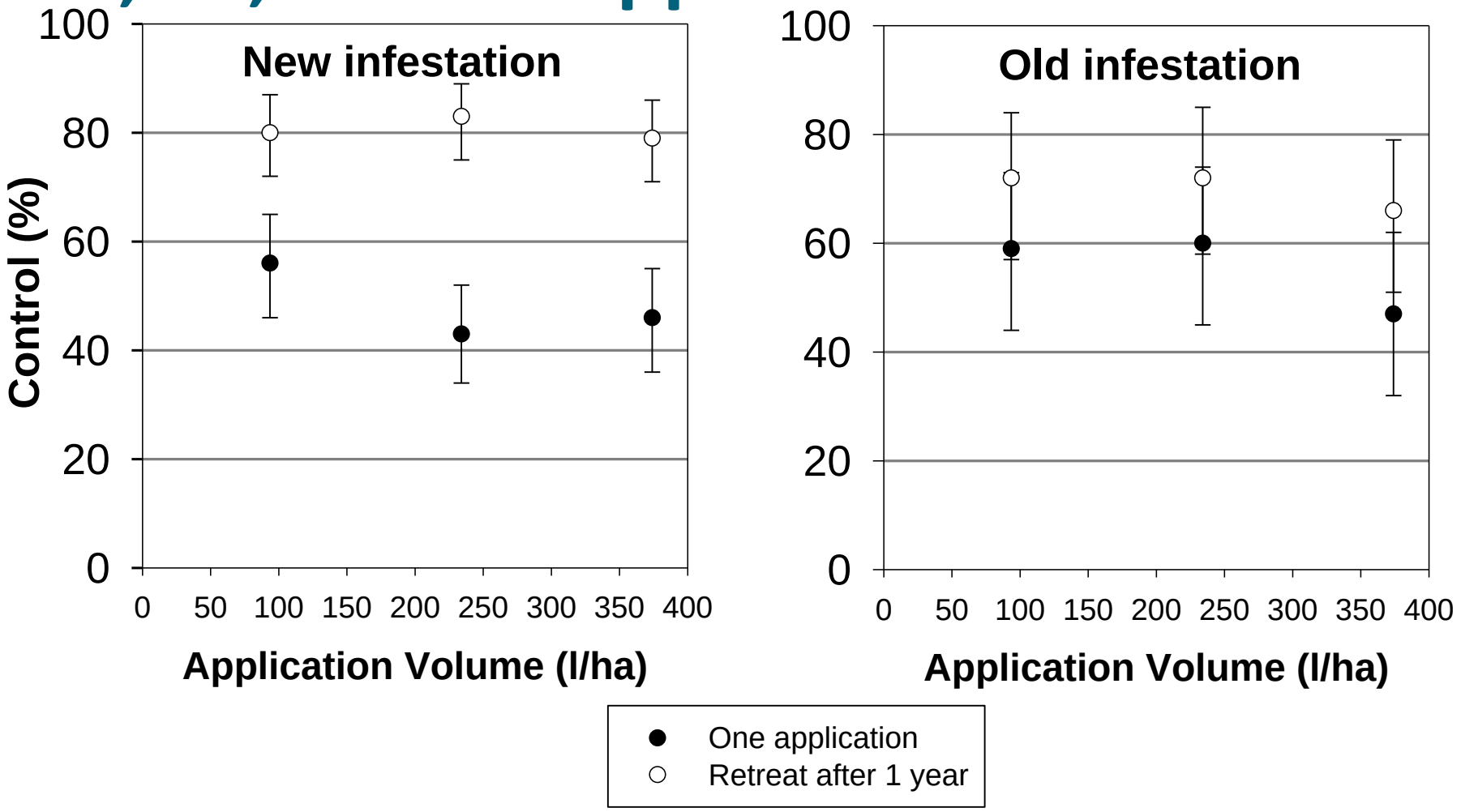




Comparison of glyphosate and imazapyr for cogongrass control

Herbicide	1 X	All Rates	1 X	All Rates
	New Infestation		Old Infestation	
	- - - - - - - - - - - - (Percent Control) - - - - - - - - - - -			
Glyphosate 3 lb ae/Ac	**41** b	45 a	**35** b	**47** b
Imazapyr 0.5 lb ae/Ac	**39** b	48 a	**66** a	**69** a
Gly + Ima 3 + 0.5 lb ae/A	**65** a	--	**63** a	--

3 lb ae Glyphosate + 0.5 lb ae Imazapyr- 10, 25, 40 GPA Application Volumes



Summary

- Herbicide efficacy increased linearly with increasing glyphosate or imazapyr rates (using greater than labeled rates) but eradication was not achieved.
- On average, application in September provide better control than in October.
- Repeated September applications of 2 lb ae/A imazapyr gave the best control (88-90%).
- Control with the combination of 3 lb glyphosate and 0.5 lb imazapyr did not differ between 10, 25 and 40 GPA application volumes.

KILL COGONGRASS - NOW

- Directed spray using 1% Arsenal® + 3% Accord® (imazapyr + glyphosate) plus 1% methylated seed oil (MSO), good coverage.

Broadcast rates per acre

- 2.25 qts/acre Accord® XRT + 24 oz Arsenal® AC
  NOTE: will also kill overstory hardwoods
- 3 qts/acre Accord® XRT where desirable hardwoods are present
- **MULTIPLE** treatments are needed

UF Research plots in Walton County, FL

Recognize Japanese Climbing Fern!

- **Spores produced in late summer**
- **Spores are viable for many years**
- **38,000 spores per square inch!**

Rhizomes are large, mostly black in color

2007-05 Japanese Climbing Fern Control Site Location Map

1: Joe Budd WMA

2: Torreya State Park

3: The Nature Conservancy (TNC)

4: Blackwater River State Forest

5: WFREC, Jay

6: Perdido Water Management Area

● Study Site

Herbicide Treatments Tested

16 treatments, CR or RCB design, 3-4 reps, 6 studies

Glyphosate (Accord® Concentrate) to 6.3 qts

1, 2, 4%

(1.5 – 6.3 lb ai/Ac)

Imazapyr (Arsenal® AC) to 32 oz prod.

0.25, 0.5, 1.0%

(0.23 – 1.0 lb ae/Ac)

Metsulfuron (Escort® XP) to 3.3 oz prod.

0.05, 0.10, 0.20 oz/gal

(0.04 – 0.21 lb ai/Ac)

2-way Combinations

2% Gly + 0.25% Ima

2% Gly + 0.5% Ima

2% Gly + 0.05 oz/gal Met

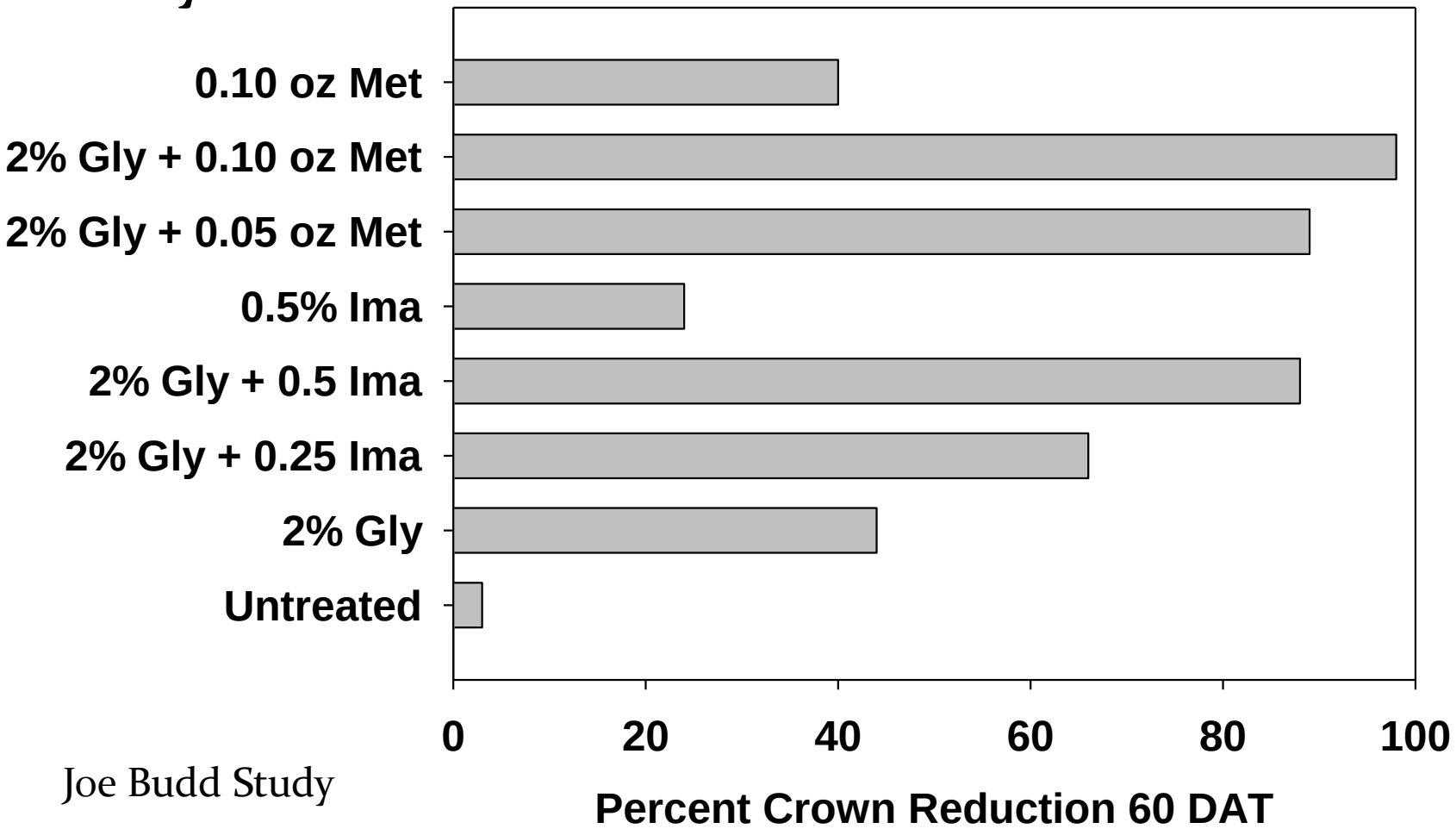
2% Gly + 0.10 oz/gal Met

3-way Combinations

2% Gly + 0.25% Ima + 0.05 Met

2% Gly + 0.5% Ima + 0.1 oz Met

JCF percent crown reduction with herbicide combinations, individual fern rootstocks, 60 days after treatment



Joe Budd Study

Percent reduction in Japanese climbing fern cover at 2 YAT: Means across 3 herbicide rates

Herbicide	TNC Bluffs P=0.0002	Torreya P=0.0001
Glyphosate	90 A	90 A
Imazapyr	72 A	-11 B
Metsulfuron	31 B	7 B
Untreated	-39 C	-75 C

Within a column, means followed by the same letter are not significantly different using LSD tests at alpha = 0.05

Percent reduction in Japanese climbing fern cover at 2 YAT: Glyphosate

Accord Conc %	TNC Bluffs	Torreya
1%	85 A	84 A
2%	91 A	91 A
4%	95 A	95 A
Untreated	-39 B	-75 B

Within a column, means followed by the same letter are not significantly different using LSD Tests at alpha = 0.05.

Percent reduction in Japanese climbing fern cover at 2 YAT: Imazapyr treatments

Arsenal AC %	TNC Bluffs	Torreya
0.25%	46 A	-10 A
0.5%	83 A	-25 A
1%	86 A	3 A
Untreated	-39 B	-75 A

Within a column, means followed by the same letter are not significantly different using LSD Tests at alpha = 0.05.

Percent reduction in Japanese climbing fern cover at 2 YAT: Metsulfuron methyl

Escort XP (g/l)	TNC Bluffs	Torreya
0.375	29 AB	-5 A
0.75	53 A	-1 A
1.5	13 AB	28 A
Untreated	-39 B	-75 A

Within a column, means followed by the same letter are not significantly different using LSD Tests at alpha = 0.05.

Percent reduction in Japanese climbing fern cover at 2 YAT: Combination treatments

	TNC Bluffs	Torreya
2% Glyphosate	91 A	91 A
2% Glyphosate + Imazapyr	94 A	91 A
2% Glyphosate + Metsulfuron	88 A	86 A
2% Gly. + Ima. + Metsulfuron	87 A	90 A
Untreated Control	-39 B	-75 B

Within a column, means followed by the same letter are not significantly different using LSD Tests at alpha = 0.05.

Minogue, P.J., K.K. Bohn, A. Osiecka, and D.K. Lauer. 2010. Japanese climbing fern (*Lygodium japonicum*) management in Florida's bottomland hardwood forests. Invasive Plant Science and Management 3:246-252.

CONCLUSION:

Glyphosate most effective

- **2% Accord CR (4 lb ai/gal) gave 91% cover reduction at 2 years after treatment**

Follow-up treatment is necessary

Apalachicola River terrace site at Torreya State Park

Coral *Ardisia* (*Ardisia crenata* Sims), coral berry, spice berry

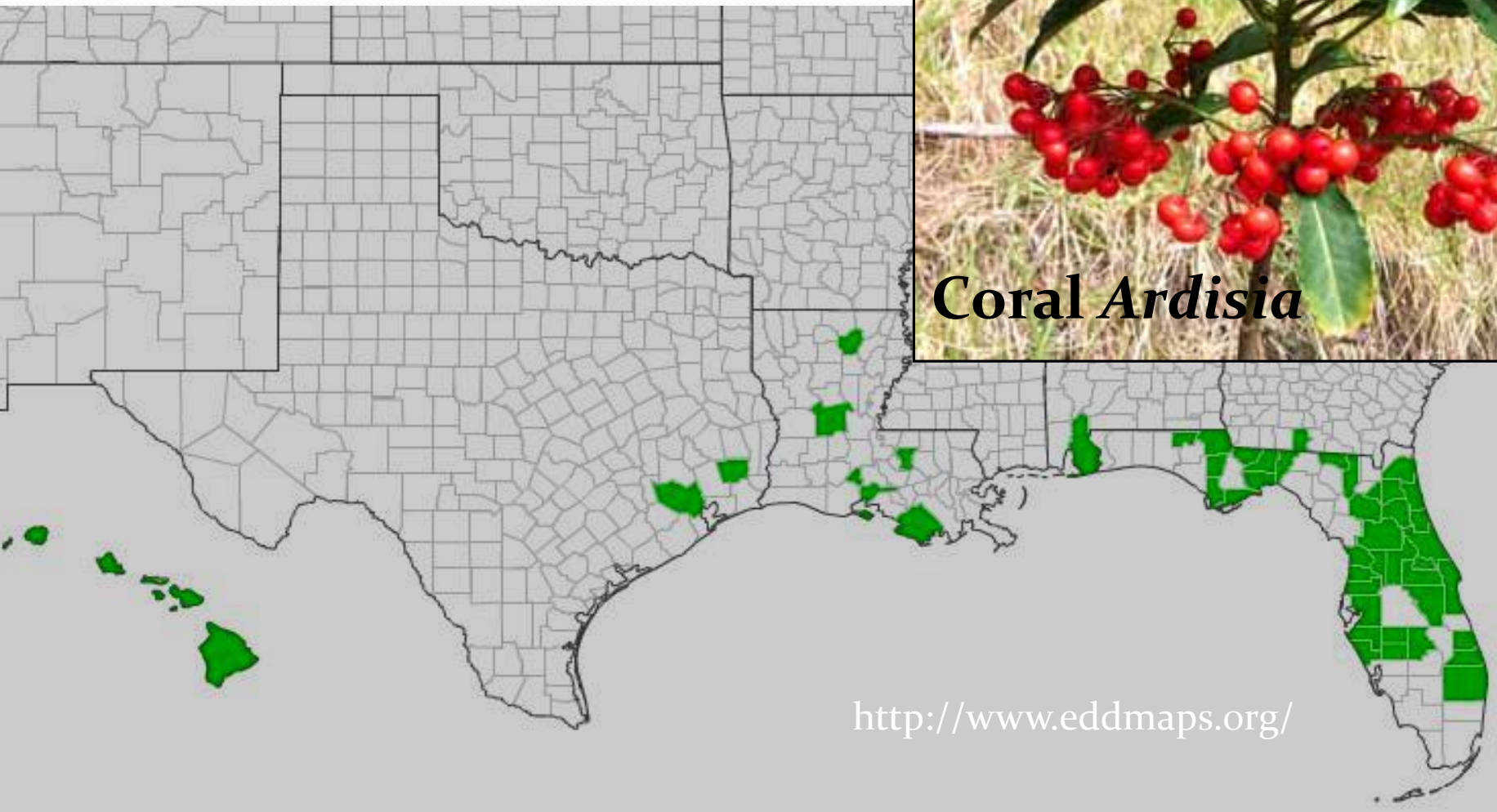
- Introduced to FL in early 1900's as an ornamental
- Invasive to hardwood hammocks, moist woods, grazing lands
- Evergreen shrub reaching 1.5 to 6 feet height in multi-stem clumps
- Berries and foliage are thought to be poisonous to livestock and humans.

- **Considered Invasive by FLEPPC**
- **To be added FL Noxious Weed List**

Coral Ardisia
Ardisia crenata

- ✓Popular landscape plant
- ✓Bird dispersed
- ✓Zones 8-10

Coral *Ardisia*



Coral *Ardisia* Control

Foliar: triclopyr + imazapic
4% Garlon4 +1% Plateau

Basal bark: triclopyr in oil
18% Garlon4 in basal oil

October Timing

Sellers et al. 2007. Identification and control of Coral Ardisia (*Ardisia crenata*): A potentially poisonous plant. University of Florida. http://edis.ifas.ufl.edu/ag281

Sources of Additional Information

New Extension website addresses vegetation management recommendations for forestry and wildlife management objectives:

- **http://nfrec.ifas.ufl.edu/Forest_Vegetation_Management/**

Patrick J. Minogue, Ph.D., R.F.
Associate Professor of Silviculture
North Florida Research and Education Center
Quincy, FL 32303 pminogue@ufl.edu

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