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Weed Science Program Update

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UF IFAS Extension
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Outline

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- Students
- Perennial peanut
- Smutgrass
- Bermudagrass

Students


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Jose Dias PhD Student	Olivia Zugay MS Student	Logan Martin MS Student

Perennial peanut (*Arachis glabrata*)

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- Tropical and subtropical rhizomatous perennial forage
- Strong tap root and a dense mat of stolons
- Single yellow or orange flower
- Native to Brazil
- Supplemental forage crop and commercial hay production
- Once established, highly persistent under wide range of management conditions
- Reproduces vegetatively due to minimal seed production
- Expensive to incorporate into existing forage by sprigging



Previous Research


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- Imazapic is the standard in perennial peanut
- 2,4-D & hexazinone
- Clethodim for grass weeds

Weed Shifts

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- Imazapic and 2,4-D have been used repeatedly
- Weeds tolerant to these herbicides are becoming increasingly problematic
 - Spiderling
 - Blackberry briars
 - Hairy indigo



Objective



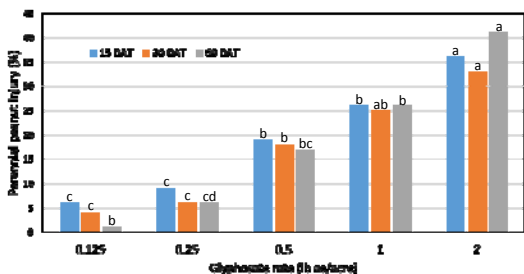
- Determine tolerance of perennial peanut to:
 - Glyphosate (0.125 to 2 lb ae/acre)
 - Triclopyr (0.06 to 1 lb ae/acre)
- Two Locations:
 - Zolfo Springs ('UF-Peace'; disturbed in 2014)
 - Ona (4 varieties; planted in 2005)

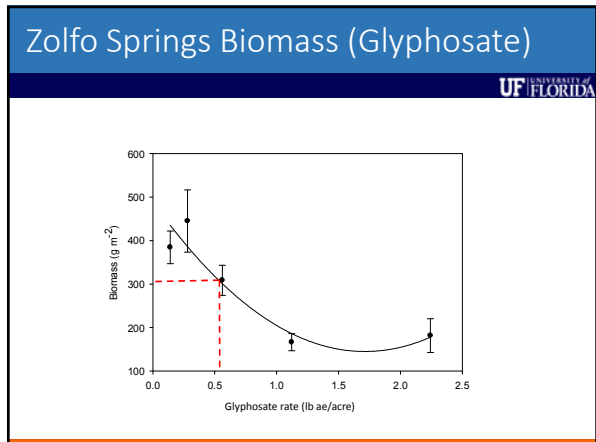
Materials & Methods

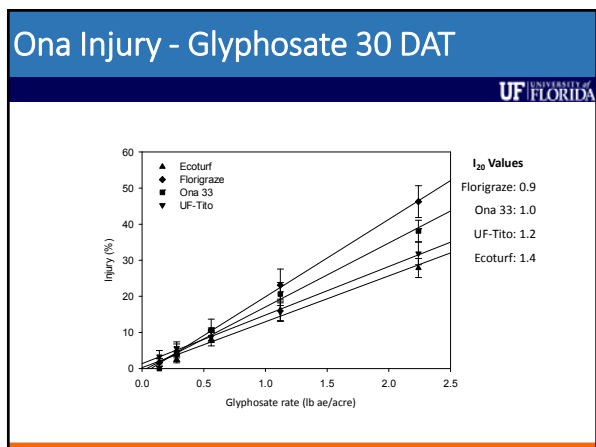


- Plot size: 5 by 5 ft
- Application made 14 days after clipping at a sprayer output of 30 GPA
- Visual estimations of crop injury recorded 7, 15, 30, & 60 DAT
- Biomass collected from center 0.25 m² of each plot 60 DAT

Zolfo Springs – Injury (Glyphosate)





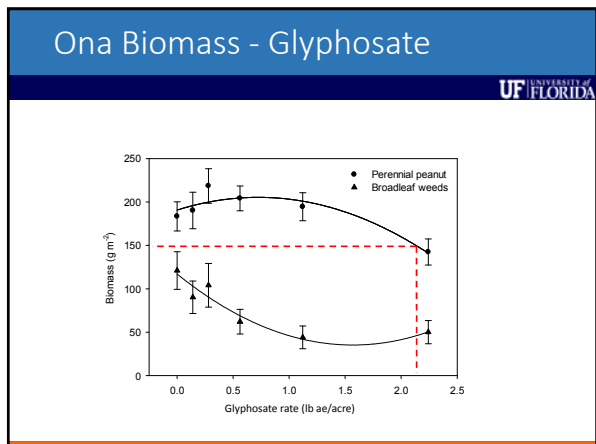


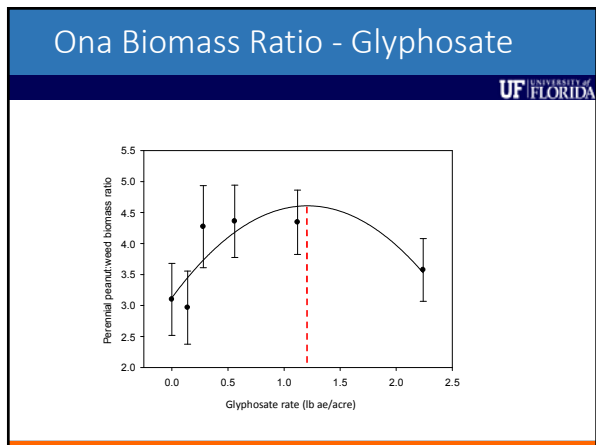
Ona Injury & Biomass - Glyphosate

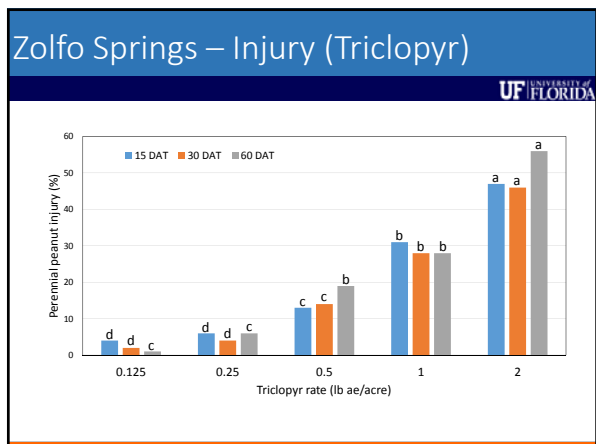
Response of perennial peanut varieties averaged over glyphosate rate at Ona, FL in 2016

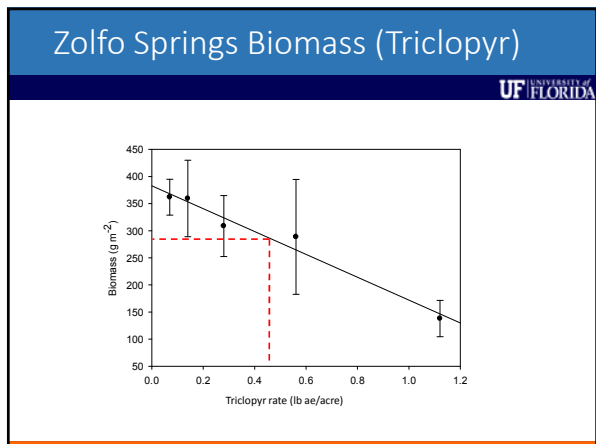
Variety	Injury			Biomass	
	15 DAT	30 DAT	60 DAT	Peanut	Weed
		(% injury)		(g/m ²)	
Ecoturf	13 a	11 c	13 a	221 a	80 b
Florigraze	13 a	17 a	13 a	93 b	147 a
Ona 33	16 a	15 ab	14 a	208 a	43 b
UF-Tito	12 a	13 bc	11 a	235 a	46 b

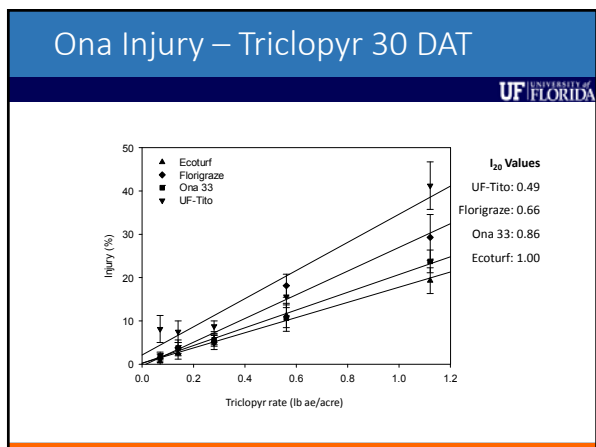
*Means followed by the same letter within columns are not significantly different at P≤0.05.











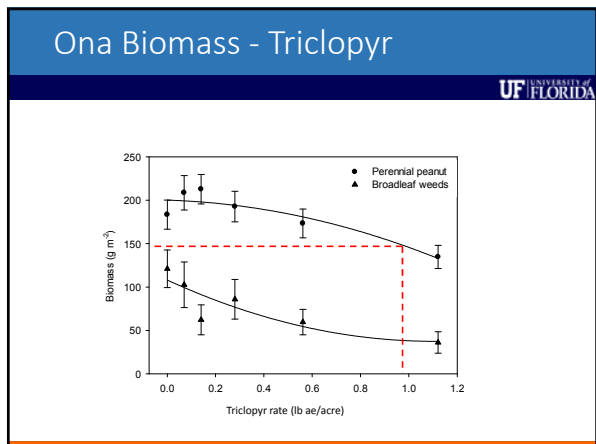
Ona Injury & Biomass – Triclopyr

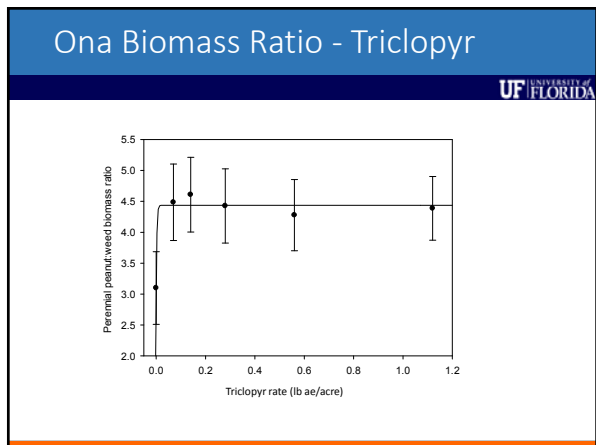
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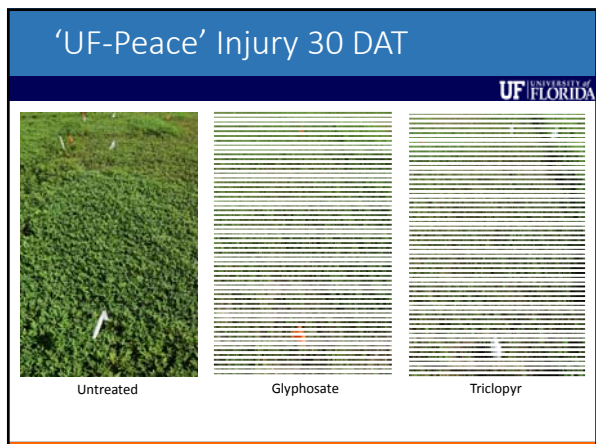
Response of perennial peanut varieties averaged over triclopyr rate at Ona, FL in 2016

Variety	Injury			Biomass	
	15 DAT	30 DAT	60 DAT	Peanut	Weed
	(% injury)			(g/m ²)	
Ecoturf	8 b	8 c	11 bc	207 ab	93 b
Florigraze	11 b	12 b	15 a	95 c	155 a
Ona 33	11 b	9 bc	8 c	234 a	21 c
UF-Tito	17 a	16 a	13 ab	199 b	48 c

^aMeans followed by the same letter within columns are not significantly different at P≤0.05.







Summary



- RPP relatively tolerant to glyphosate and triclopyr
- Glyphosate and triclopyr can be used for postemergence weed control if some injury can be tolerated
- Age of the stand will likely impact tolerance



Smutgrass (*Sporobolus sp.*)



- ❖ Serious perennial warm-season grass weed
- ❖ Invasive, native to tropical Southeast Asia
- ❖ Beef-Forage Range Practices Survey → top three
- ❖ Low preference (mature) with high seed production



Past Research

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- Researchers have been studying smutgrass control since 1950s
 - ❖ Mechanical:
 - Mowing → Temporary solution / Spread Seeds
 - ❖ Cultural:
 - Grazing → Too labor intensive
 - ❖ Biological:
 - Fungus
 - ❖ Chemical:
 - Hexazinone at 1 lb/acre during mid-summer
 - Good control, but ...

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Challenges with Hexazinone

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- Very expensive (≈ \$40-50/A) whereas \$8/A (2,4-D) or \$18/A (Grazonnext + Pasturegard)
- Ranchers are forced to accept losses
- Will kill oak trees if you don't pay attention !
- Occasional lack of control / leaching or lack of incorporation.
 - Xylem mobile
 - Primarily absorbed by the roots
 - Limited foliar absorption

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Objectives

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- 1) To determine the minimum amount of rainfall necessary for hexazinone incorporation within the root zone.
- 2) To determine the maximum amount of rainfall that can occur after hexazinone application, before it leaches below the smutgrass root zone.

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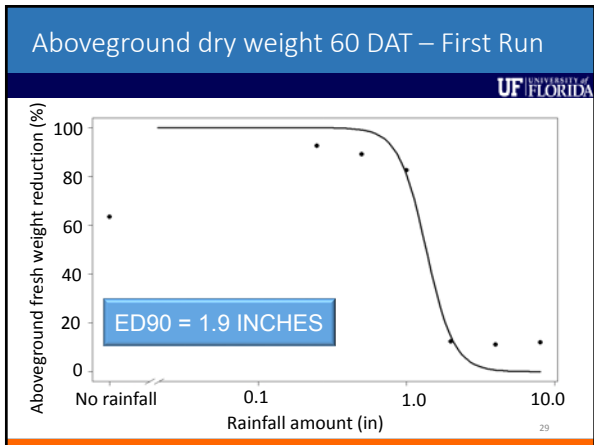
Greenhouse Preliminary Study

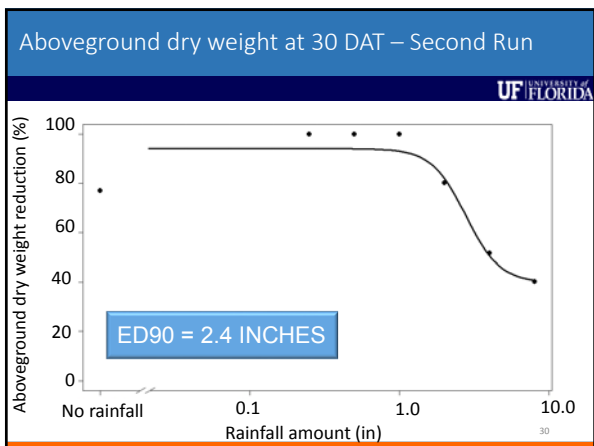
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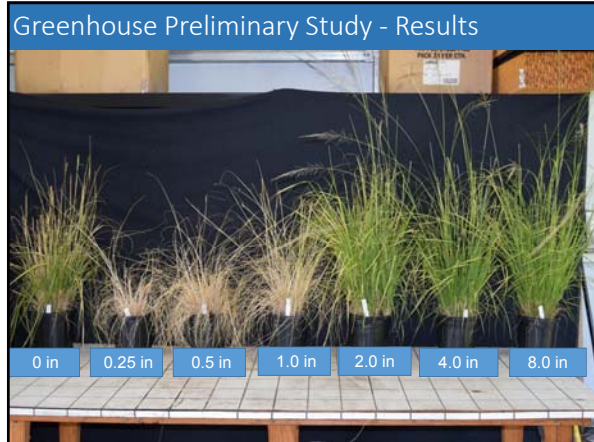
- ❖ Conducted twice at the RCREC at Ona, in 2016.
- ❖ Plants collected at site, stems separated and transplanted into pots.



- ❖ Soil was collected from the field at site and is classified as Placid Fine sand.











Field Study – Material & Methods

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- ❖ An old bahiagrass pasture, but completely infested with giant smutgrass at present.




A photograph showing a field of green grass with a white marker or stake in the foreground.



A photograph showing a person operating a tractor in a field of green grass.

- ❖ The soil present at the research site is classified as Placid Fine sand, same used in the greenhouse trial.

Field Study – Material & Methods




Factor	Levels
Hexazinone rate	0.50 and 1.00 lb ai/acre
Application timing	19 weekly applications (started on April 22 th and ended on August 26 th)


❖ Rainfall was recorded every week and then correlated with % visual control.

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Field Study – Material & Methods



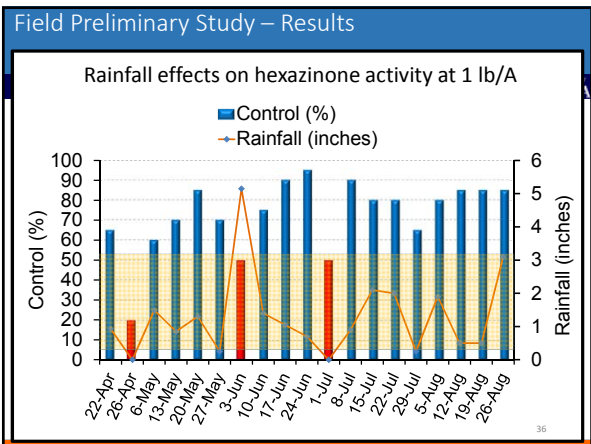
- Visual % control at 30 DAT.



Day of application



30 days after application



Conclusions

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- The rainfall amount after hexazinone application appears to significantly impact the efficiency of hexazinone on the control of giant smutgrass in south FL.
- Rainfall amounts between 0.25 – 3.0 inches within the first seven days after application resulted in acceptable levels of control most of the time.

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Future Research

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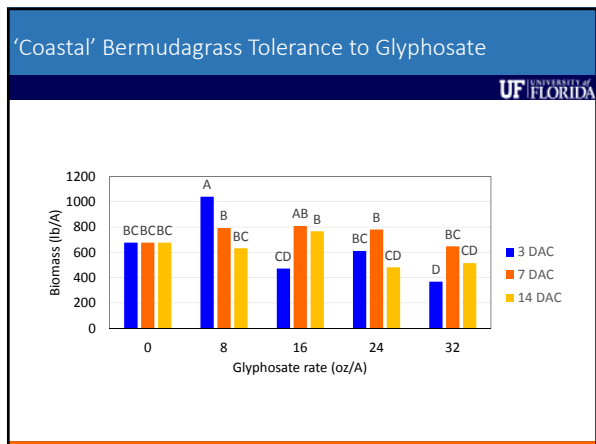
- Additional rainfall studies (greenhouse and field)
- Impact of fire, grazing, and hexazinone
- Optimizing glyphosate & hexazinone rates using a roto-wiper

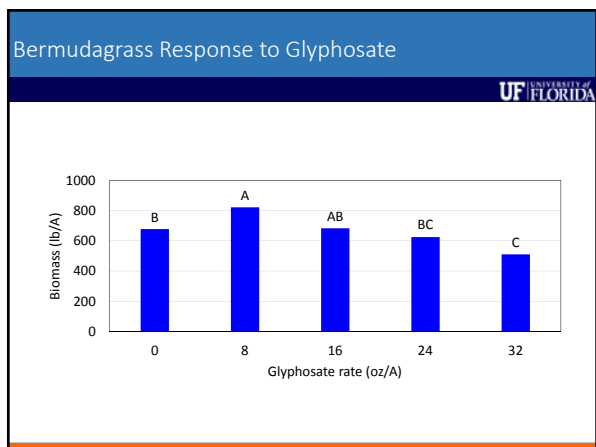


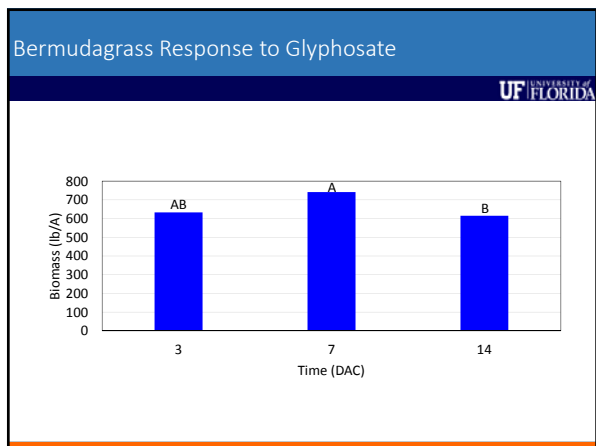
Grass Weeds in Bermudagrass

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Future Research



- Bermudagrass cultivar response to glyphosate
 - 'Jiggs' and 'Coastal'
 - Visual injury, biomass, and quality
- Bahiagrass cultivar response to glyphosate
 - 'Pensacola' and 'Argentine'
 - Visual injury, reduction in stand, and regrowth
- Vaseygrass and guineagrass response to glyphosate, imazapic (Impose), and nicosulfuron + metsulfuron-methyl (Pastora) under greenhouse & field conditions
 - Visual injury, reduction in stand, and regrowth
