Mississippi State Report

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Irrigation Update

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Irrigation Strategies

1. Traditional Flood Method

2. Alternate Wetting & Drying (AWD)

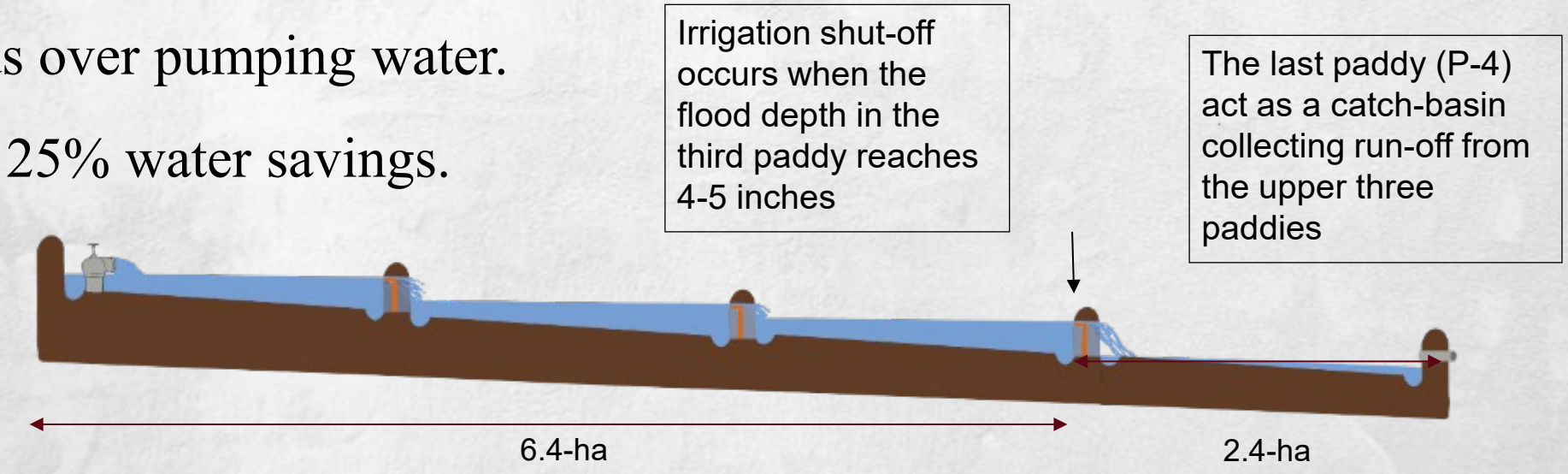
3. Multiple Inlet Rice Irrigation (MIRI)

4. Furrow-Irrigated Rice (FIR)

Rice Irrigation Modeling

Early Cascade Rice Irrigation Shutoff (ECIS)

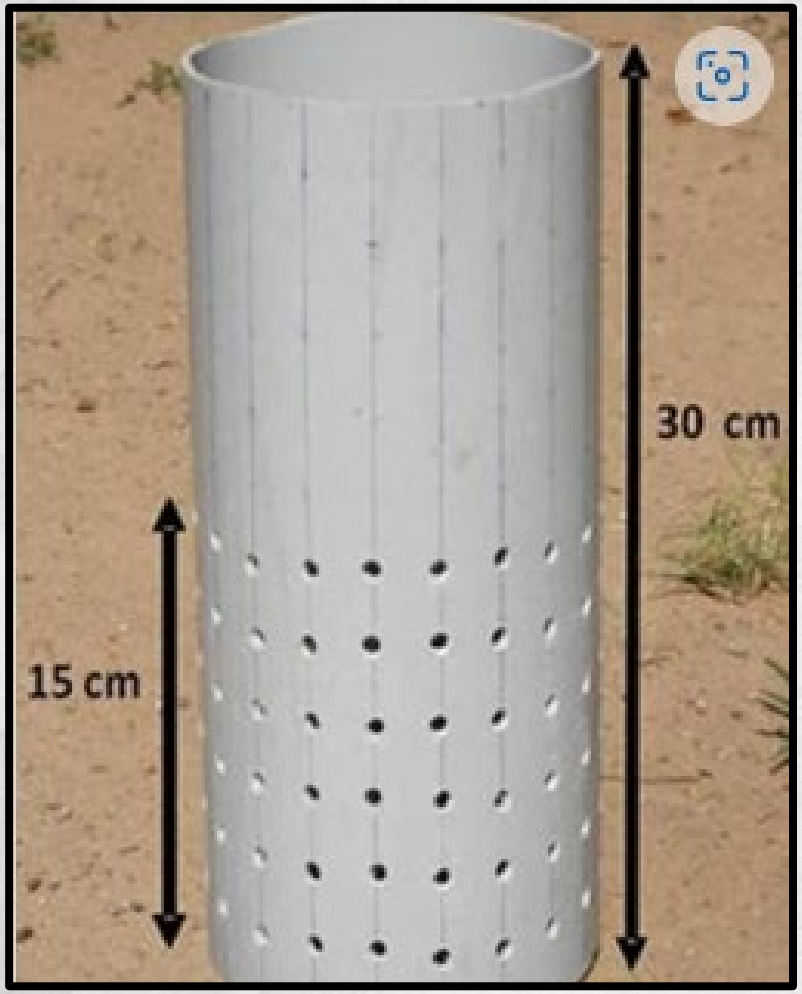
- Last paddy acts as a catch-basin to collect runoff from upper paddies.
- Uses water depth ultrasonic sensor in next to last paddy to determine water level depths.
- Avoids over pumping water.
- Up to 25% water savings.



Alternate Wetting & Drying (AWD)

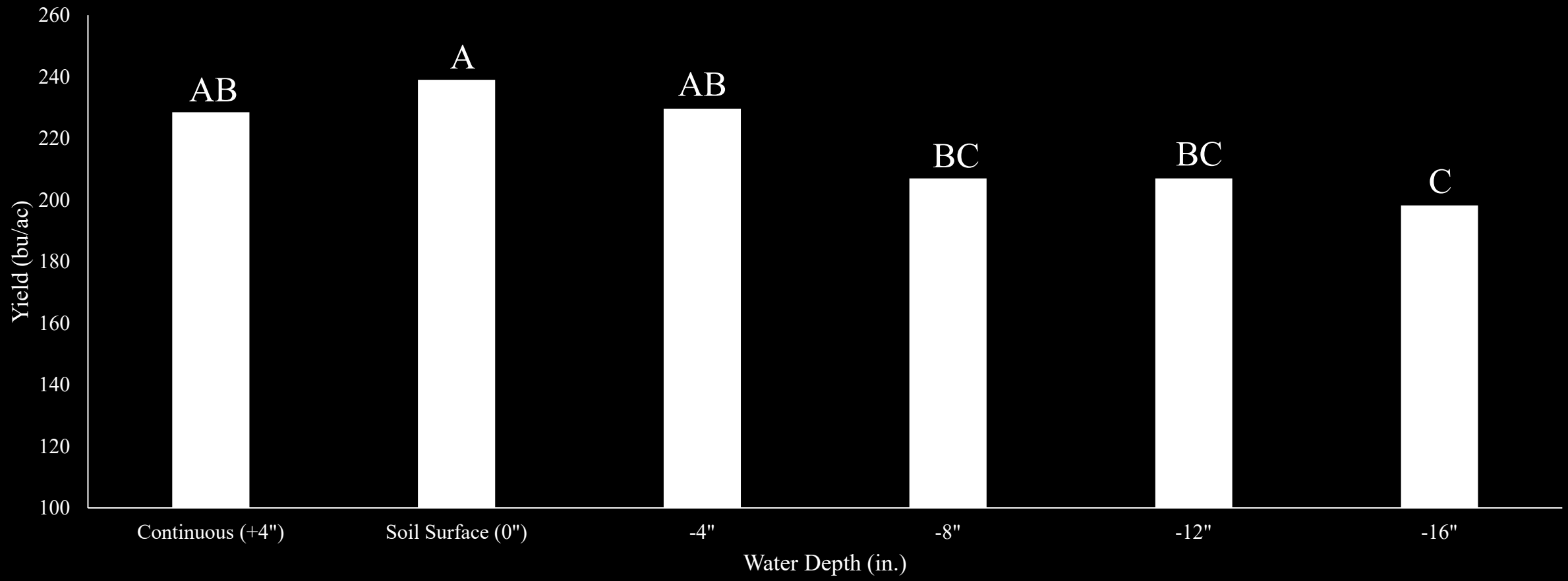
- Field is allowed to recede until soil surface is visible before field is reflooded.
- Timing & frequency depends on growth stage, irrigation capacity & capability, & risk tolerance.
- Initiate flood after first fertilizer application (4 – to – 5 leaf growth stage).

RISER MSI-AWD Rice Management



RISER

Rice Yield by Water Depth



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Using ultrasonic water (US) level sensor for AWD flood management and documentation

- Use field-specific decline rate to determine the length of time to hold initial flood.

- Use field-specific fill rate to determine time it will take an irrigation system to reestablish a flood.

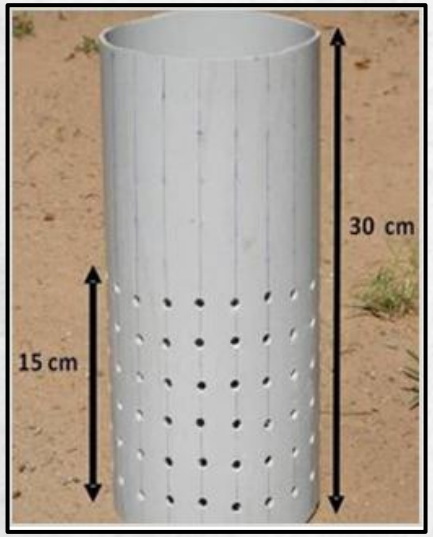
Study Set-Up

Experimental Design: RCB; 4 treatments, replicated 3 times

- Trt. 1: Irrigating everyday
- Trt. 2: Irrigating every 3 days
- Trt. 3: Irrigating every 5 days
- Trt. 4: Irrigating every 7 days

Data Collection Tools

Pani-Pipes®



Precision King AgSense Sensors

WaterMark® Soil Moisture Sensors®

Flowmeter

Rice Grain Yield Data Collection

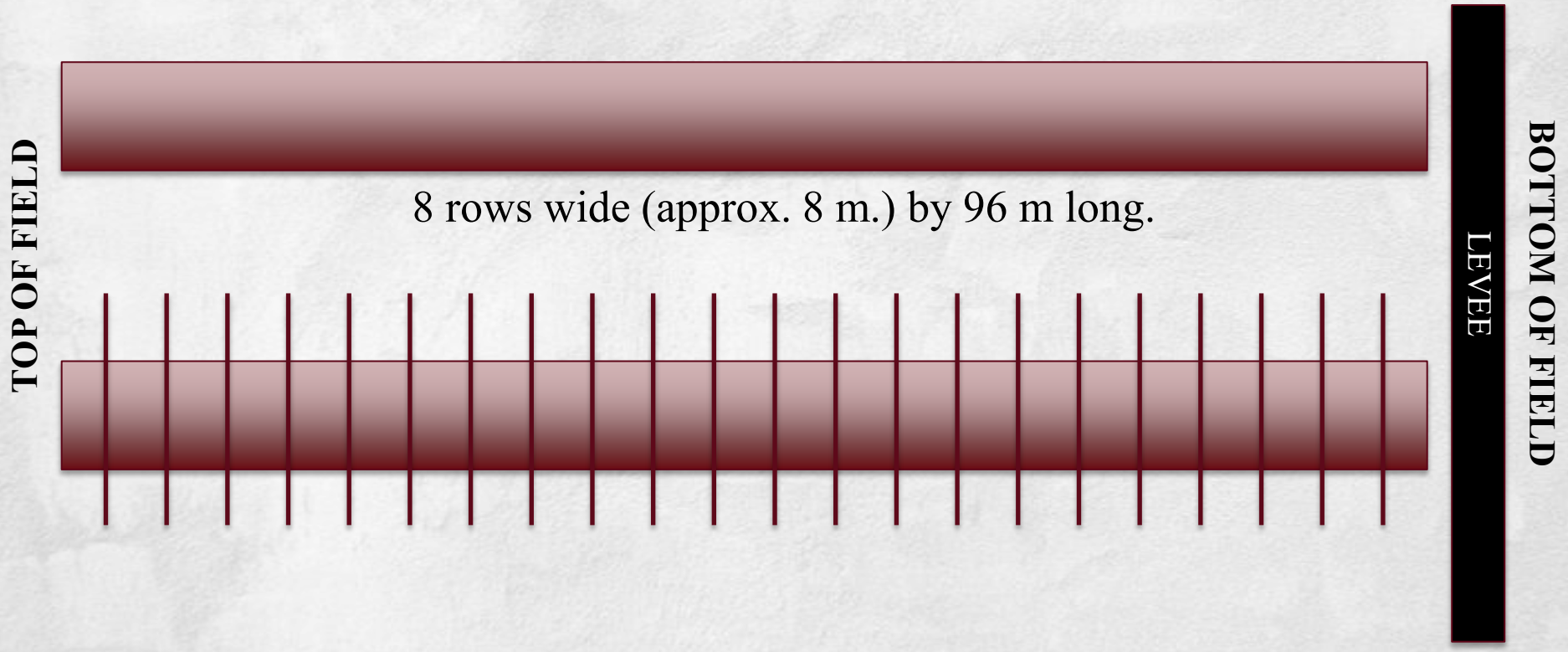


Table. Total water usage (acre-inch) in 2022 and 2023 for each irrigation frequency treatment.

TRT	2022	2023
EVERYDAY	37.24	33.34
3 DAYS	21.81	21.36
5 DAYS	17.25	13.38
7 DAYS	11.89	10.82

Table. Average rice grain yields (bu ac^{-1}) in 2021, 2022, and 2023 for each irrigation frequency treatment.

TRT	2021	2022	2023
EVERYDAY	152 a	158 a	180 a
3 DAYS	144 b	146 a	164 ba
5 DAYS	143 b	147 a	149 bc
7 DAYS	140 c	157 a	144 c

Table 5. 2021, 2022, 2023 combined average rice grain yield for the top, middle, and bottom zones of each irrigation frequency treatment; A) Everyday, B) Every 3 Days, C) Every 5 Days & D) Every 7 Days. Numbers followed by the same letter are not significantly different at α = 0.05.

A.

Everyday Treatment	
Zone	**Yield**
Bottom	175 a
Middle	166 b
Top	149 c

B.

Every 3 Days	
Zone	**Yield**
Bottom	161 a
Middle	153 b
Top	144 b

C.

Every 5 Days	
Zone	**Yield**
Middle	151 a
Bottom	148 ba
Top	143 b

D.

Every 7 Days	
Zone	**Yield**
Bottom	151 a
Middle	147 ba
Top	143 b

Tailwater Recovery On-Farm

•Continuous-flow system that returns water to the top of the field constantly, ensuring available water to help simplify irrigation management in row rice.

•Patented tailwater recovery irrigation uses less water than common flooded-field rice

•Recycles about 90% of the water in the system.


WORLD DRIVE 4X

Pathology Update

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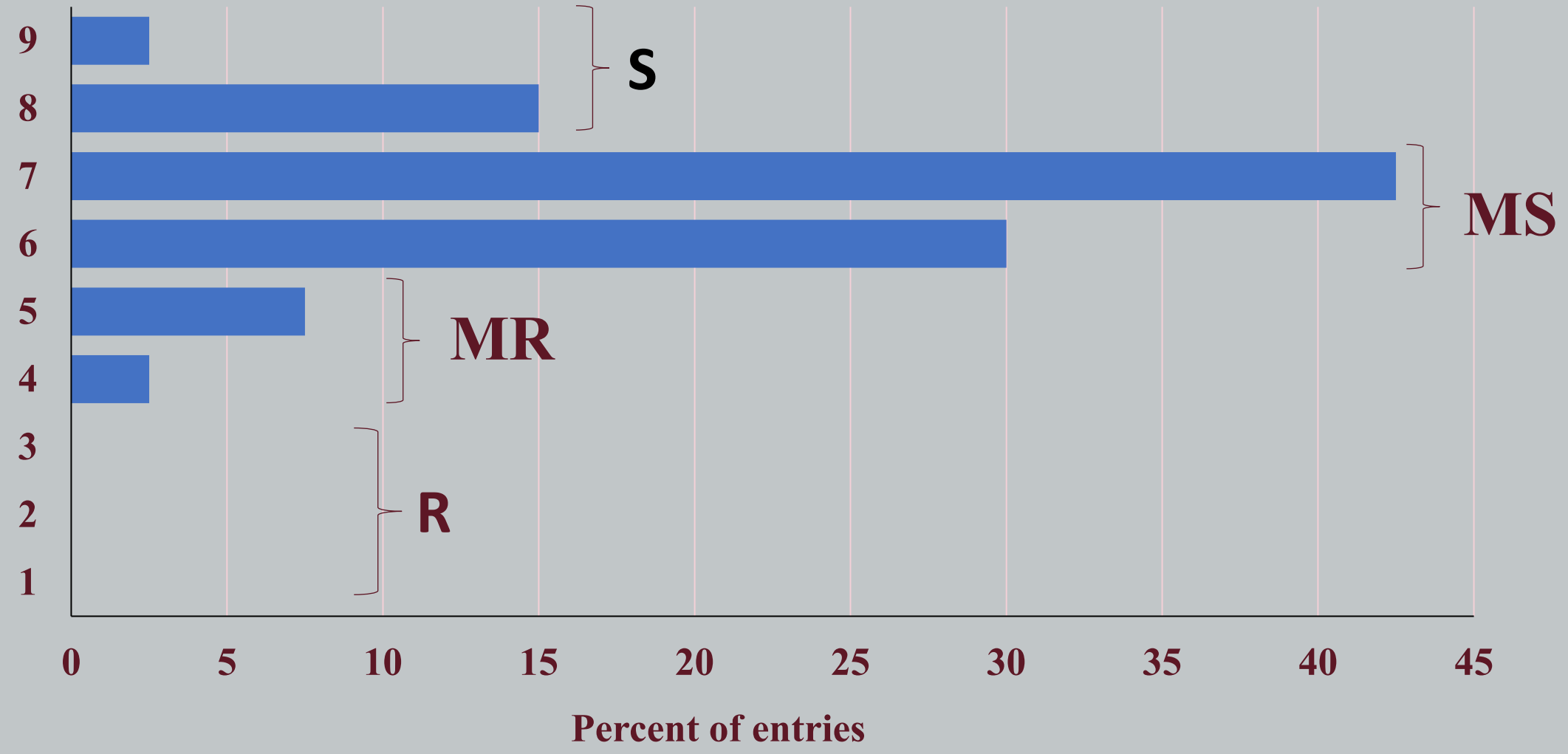
RECAP - 2024 MS Rice Disease Summary

- Sheath blight – remains our number one disease concern, annually
  - Severe in some specific varieties, but less than year's past
  - Row rice concerns?

- Leaf blast/neck blast
  - MUCH less regular than past years

- Kernel smut
  - Based on my experience, much less frequent than years past, but still a lot of questions
    - Monitor fertility inputs in areas with a history of the disease

Sheath blight severity of URRN entries (n=40)



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Entomology Update

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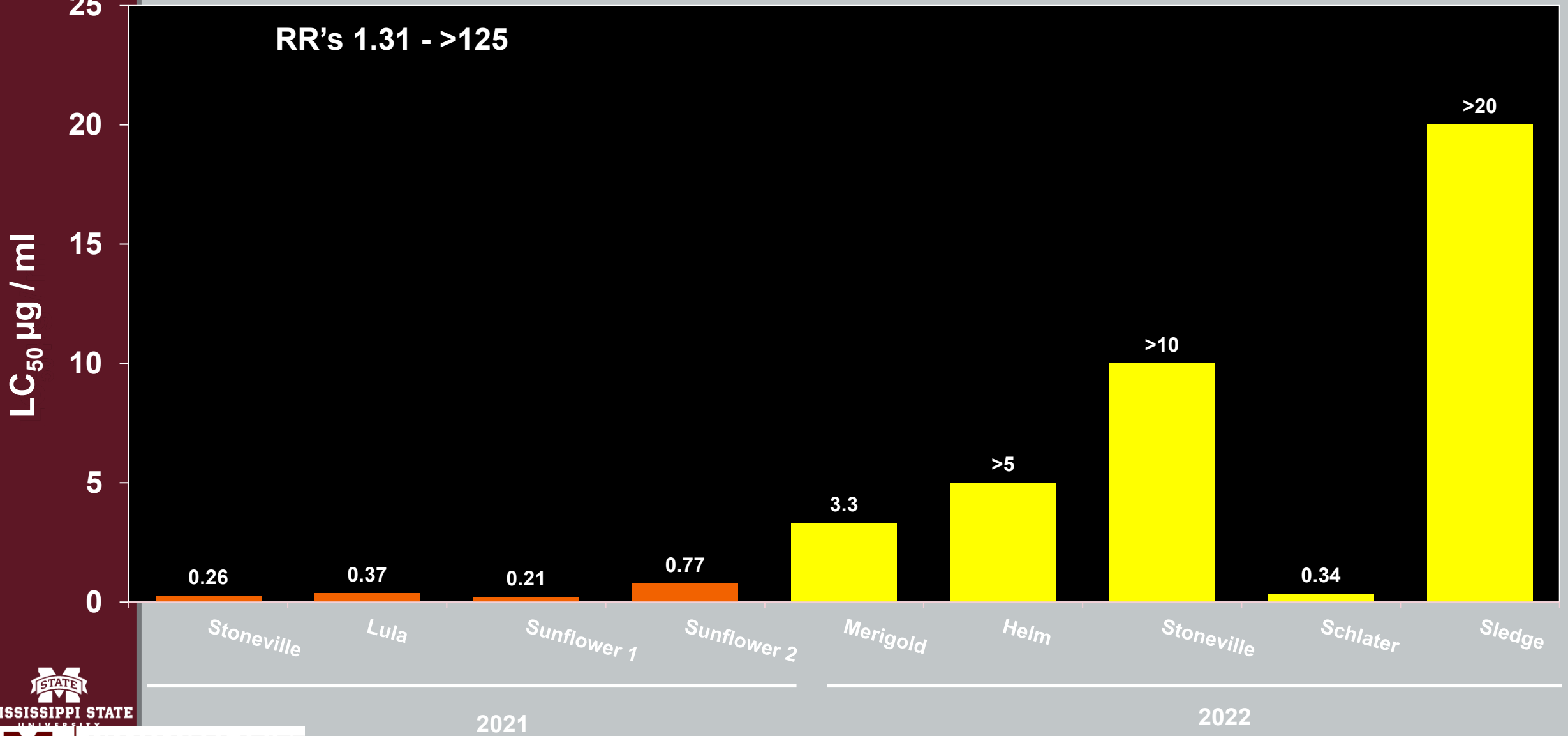
Rice Stink Bug Response to Lambda Cyhalothrin



RR based on 2012 MS LC_{50} (0.16) from Audra Cross

MJL 2024

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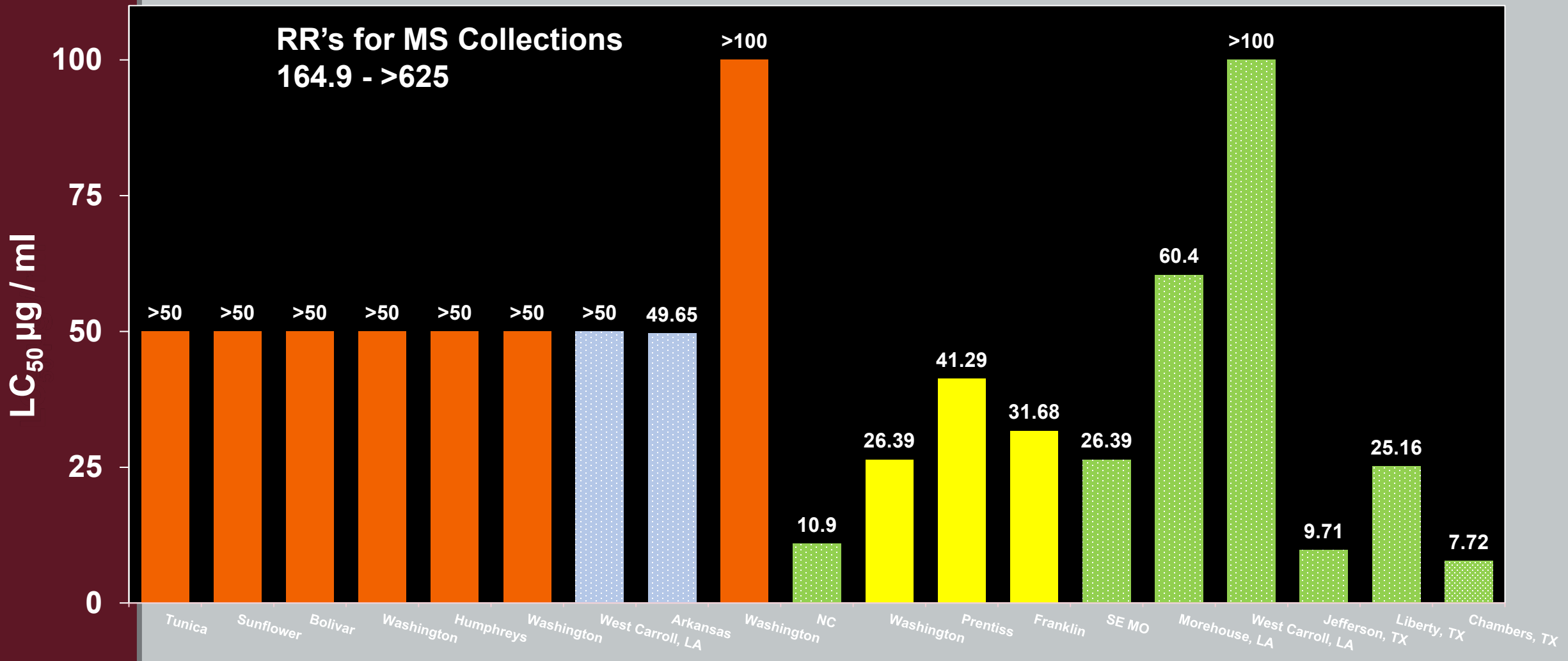
Rice Stink Bug Response to Lambda Cyhalothrin



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MJL 2024

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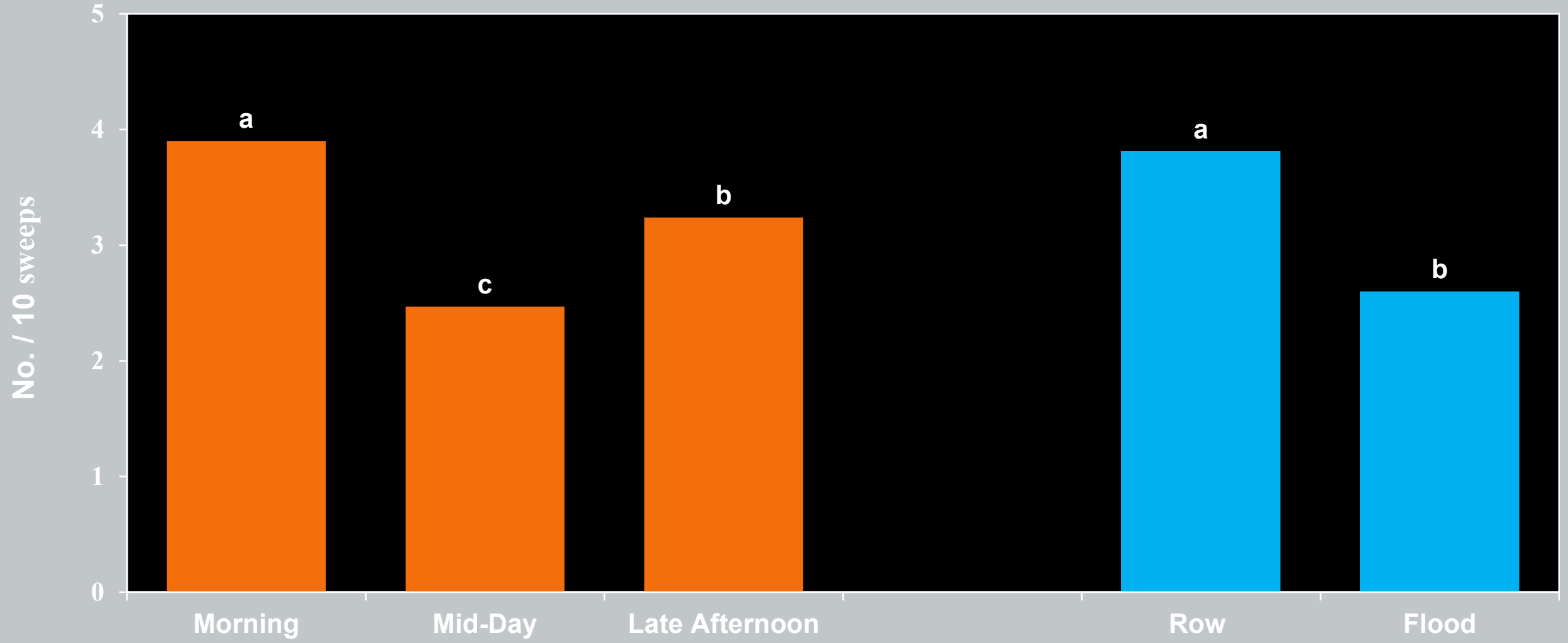
Rice Stink Bug Sampling - Total



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MJL 22-24

Weed Control Update

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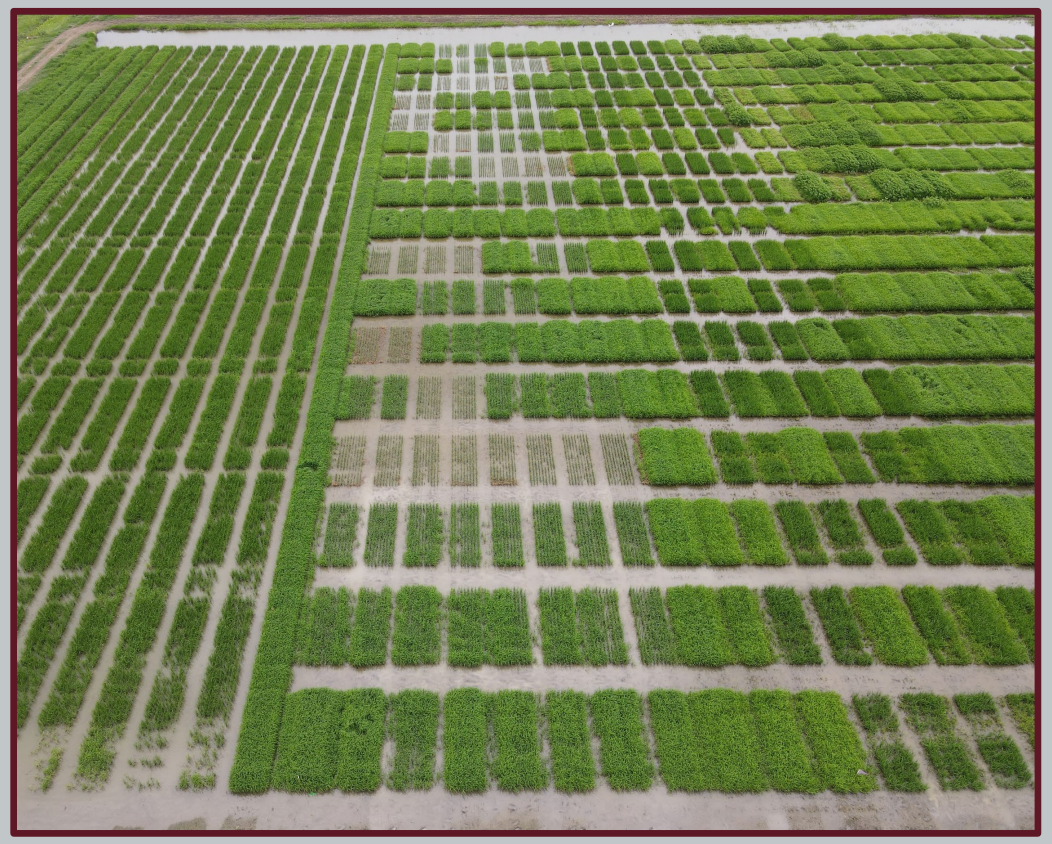
2024 Weed Control Issues

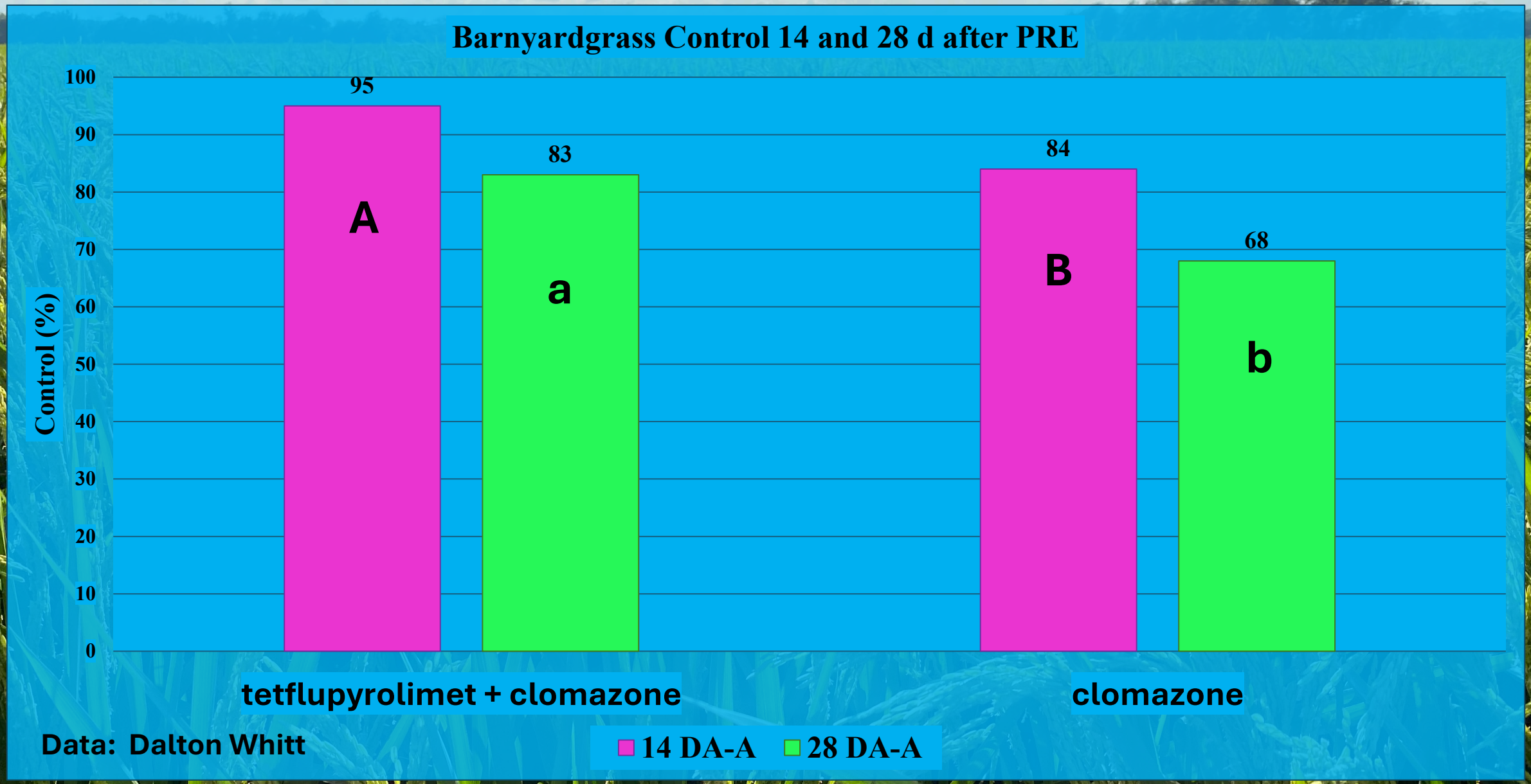
- Herbicide regulations (ESA, paraquat, dicamba)
- Poor grass control
- Weed management in furrow-irrigated rice
- Off-target herbicide movement
- Tank contamination/misapplication



Tetflupyrolimet

- **Manufacturer:** FMC Corporation
- **Registration:** TBD
- **Use rate:** TBD
- **Timings:** PRE or POST
- **Targets:** Primary—annual grasses
  Secondary—some broadleaf species and sedges

Weed Control



Data: Dalton Whitt

Objective 1: Results

tetflupyrolimet + clomazone

clomazone alone

ROXY RPS

- **Rice:** Non-GMO rice developed at CA Rice Experiment Station
- **Herbicide:** Oxyfluorfen (Historically sold as Goal 2XL)
- **Formulation:** 3L
- **Use rate:** TBD; 1.25 to 2 PT/A
- **Timings:** Delayed PRE
- **Targets:** Primary—annual grasses
  Secondary—some broadleaf species and aquatics

ROXY RPS

Nontreated

Oxyfluorfen + Gambit

Oxyfluorfen + Command

Command + Sharpen

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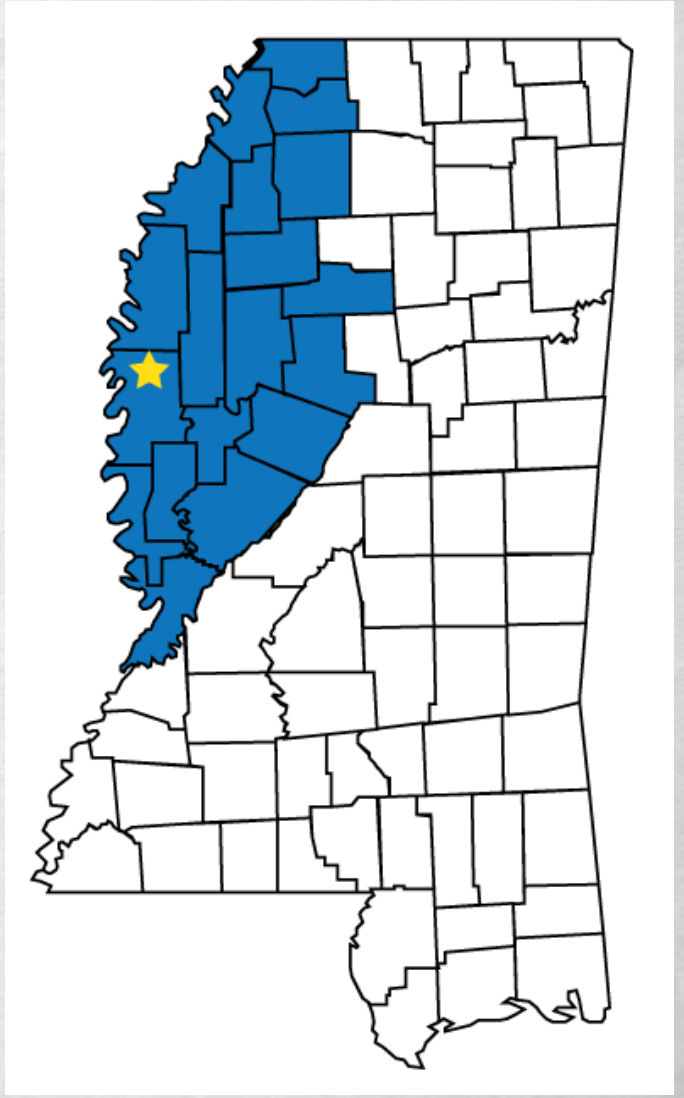
Mississippi Rice Acres

- 161,000 planted rice acres in 2024.
- 157,000 harvested rice acres in 2024.
- Up almost 30% from 2023.
- Projected to increase to 200,000 acres of rice in MS in 2025.
- All rice in Mississippi grown in Delta Region.

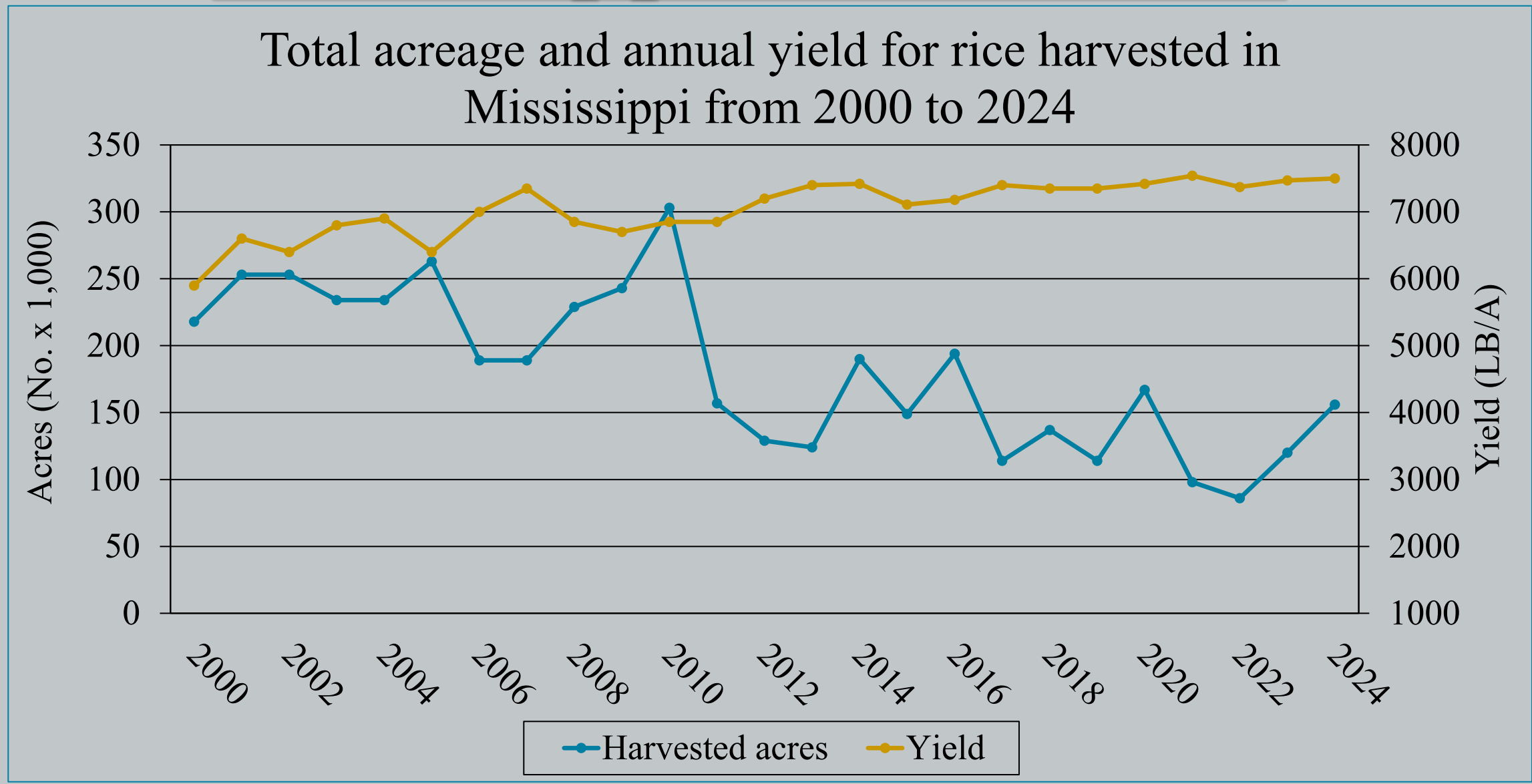


Mississippi Rice Acres

Table 1. Mississippi County Rice Acres 2022 vs 2023

County	2022	2023	Change
Bolivar	23,500.02	27,412.12	3,912.10
Coahoma	4,481.51	9,440.62	4,959.11
DeSoto	769.78	1,887.45	1,117.67
Grenada	232.99	54.66	(178.33)
Holmes	154.18	417.17	262.99
Humphreys	397.54	2,731.34	2,333.80
Issaquena	271.11	368.21	97.10
Leflore	4,792.56	5,564.63	772.07
Panola	5,759.36	6,128.27	368.91
Quitman	6,772.75	9,705.66	2,932.91
Sunflower	8,179.45	11,141.59	2,962.14
Tallahatchie	4,967.04	7,363.57	2,396.53
Tate	947.94	801.54	(146.40)
Tunica	18,671.02	31,724.94	13,053.92
Washington	4,668.70	4,895.62	226.92
Total	84,565.95	119,637.39	**35,071.44**

Mississippi Rice Trends



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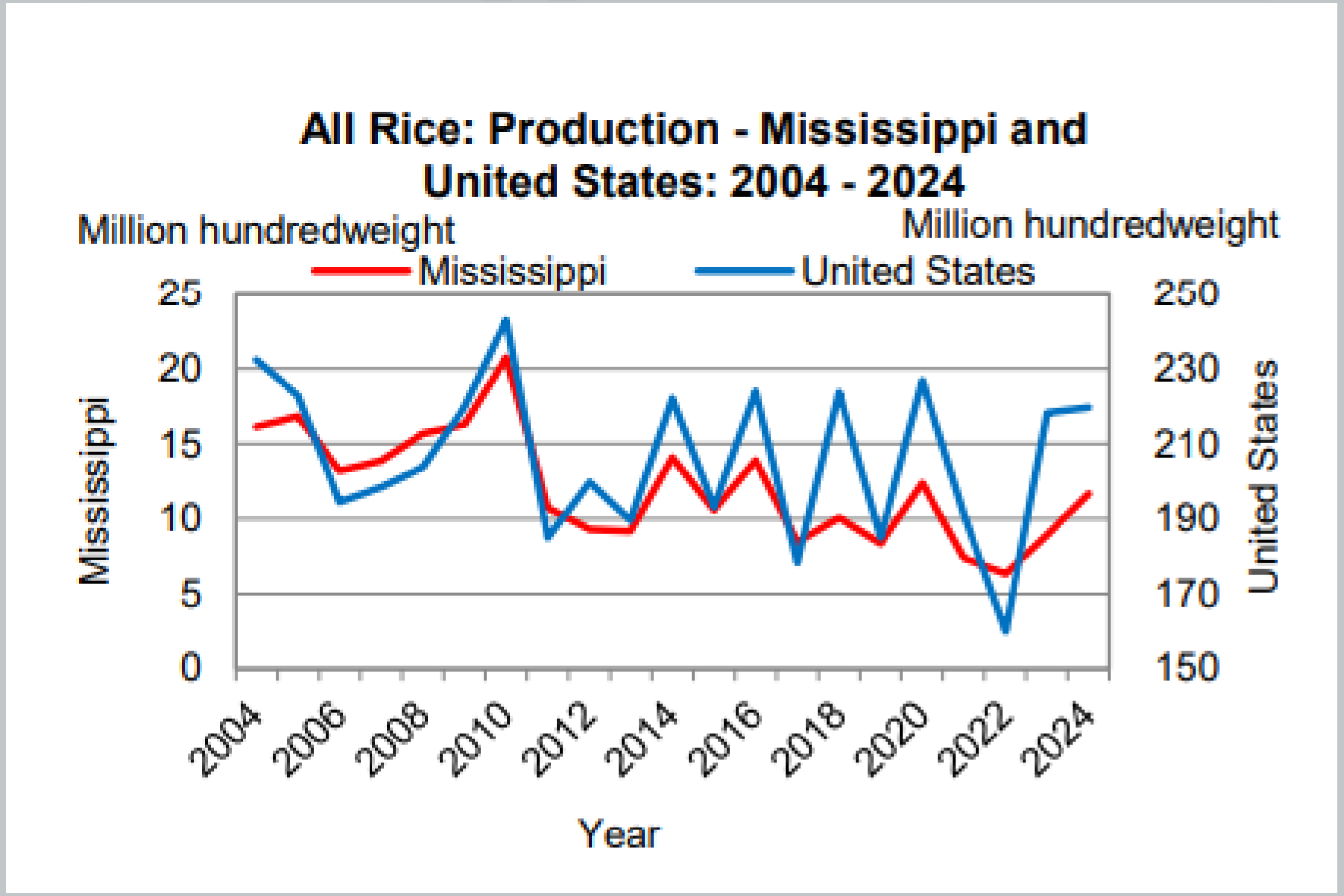

MSU Rice Cost of Production Estimates – 2025 Crop Year

- MSU produces yearly Enterprise and Planning budgets using MSU Budget Generator

- Survey Mississippi companies to determine costs of herbicide, pesticide, fertilizer, equipment, etc
  - Survey August-October

- Multidisciplinary team develops budgets based on common production practices/recommendations

MSU Rice Cost of Production Estimates – 2025 Crop Year

- Rice budgets for conventional, conventional hybrid, Clearfield, Fullpage hybrid and Provisia types.

- Budgets for irrigation systems
  - contour levee, straight levee, straight levee multi-inlet, and zero grade systems.
  - 20 different rice budgets

- Costs will vary for each producer

- Available at agecon.msstate.edu

Questions?