



**Rogue[®] SC Herbicide: Best
Management Practices and
Herbicide Programs for
Successful Weed Control in
Southern Rice**

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Rogue® SC Herbicide Overview

- Benzobicyclon = active ingredient in Rogue Herbicide
 - HPPD inhibiting mode of action (WSSA group 27 herbicide)
 - Rogue is the only HPPD inhibiting herbicide registered for use on rice grown in the Southern US
 - Rogue is broad spectrum, controlling/suppressing many key broadleaves, grasses, aquatics and annual sedge species in rice
 - Labeled for use on water-seeded and dry-seeded rice
 - Use Rate: 8.4 – 12.6 oz/Acre; MSO 1% v/v recommended
 - Approved for aerial (min. 5 gpa), ground rig (min. 10 gpa), and fertilizer impregnation applications
 - 60 day PHI
- **Rogue is ONLY active in flood water, and has NO herbicidal activity when applied to soil or plant foliage**
 - Specifically created for use in rice
 - Has **NO** fit in any other crop
- **Rogue is an aquatic herbicide with pre-emergence and post-emergence activity**

Rogue[®] SC will perform best on zero grade or straight levee fields with side inlet irrigation, where deep water can be held for the duration of the rice crop.

Weeds Controlled/Suppressed When Rogue SC is Applied Prior to the Reproductive Stage of the Target Weed

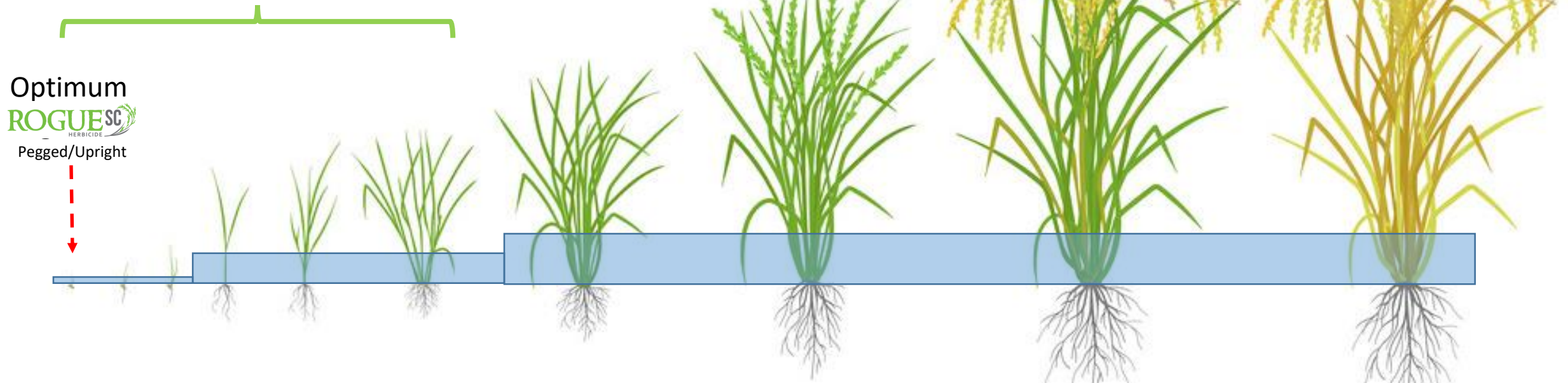
Weeds Controlled		Weeds Suppressed	
Ducksalad	Smallflower Umbrella Sedge	Barnyardgrass*,***	Nealley's Sprangletop
Globe Fringerush	Amazon Sprangletop	California Arrowhead*	Weedy Rice*,***
Pickerelweed*	Bearded Sprangletop	Crabgrass*	White-Margined Sedge
Rice Flatsedge	Red Sprangletop	Gooseweed**	Yellow Nutsedge*
Ricefield Bulrush	Water Hyssop**	*Must be below the water line at time of application **Controlled/supressed prior to weed emergence ***Cannot exceed 2 leaf growth stage at time of application	
Roundleaf Mudplantain**			

- Rice Cutgrass, Dayflower suppression

ROGUE^{SC} (Water-seeded Rice)

*8.4 – 12.6 oz/Acre with a MSO/MSO blend @ 1 % v/v

ROGUE^{SC} App. Window
(pegged) – 2T Rice (60 PHI)



- Utilize clomazone prior to permanent flood - Grasses
- Tank-mix w/ Gambit® or Permit Plus® - Broadleaves & YNS
 - Redstem
- Weedy rice Control
 - With a growth differential less than planted rice

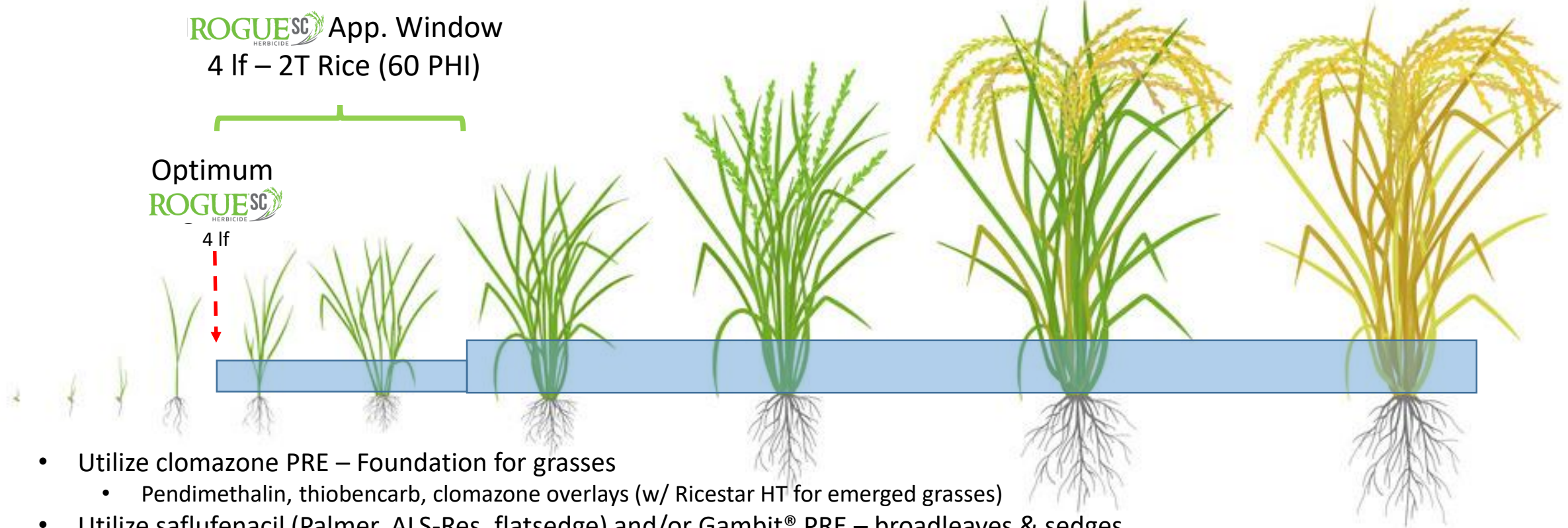
- Flood level should be as deep as the rice crop will tolerate without submerging
- 50% of weed should be submerged at application for optimum control
- **No water movement for 5 days following application**
- Do not let soil dry following application
- High rates of nitrogen following application on larger weeds can reduce activity



(Dry-seeded, Delayed Flood Rice)

*8.4 – 12.6 oz/Acre with a MSO/MSO blend @ 1 % v/v

ROGUE SC App. Window
4 lf – 2T Rice (60 PHI)



- Utilize clomazone PRE – Foundation for grasses
 - Pendimethalin, thiobencarb, clomazone overlays (w/ Ricestar HT for emerged grasses)
- Utilize saflufenacil (Palmer, ALS-Res. flatsedge) and/or Gambit® PRE – broadleaves & sedges
- POST-FLOOD Tank-mix:
 - Gambit® or Permit Plus® - Broadleaves (*Redstem) & YNS
 - Bentazon/propanil for larger ALS-Res. annual sedges and white-margined sedge
 - For barnyardgrass not submerged (Ricestar® HT, bispyribac, penoxsulam, cyhalofop)
 - Ricestar® HT for large sprangletop
- Weedy rice Control:
 - **Rogue complements effective weedy rice control programs (Provisia®/Max-Ace® or Clearfield®/FullPage®) and provides a second mode of action for resistance management**



Suppressing Weedy Rice with Rogue SC

Rogue complements an effective weedy rice control program

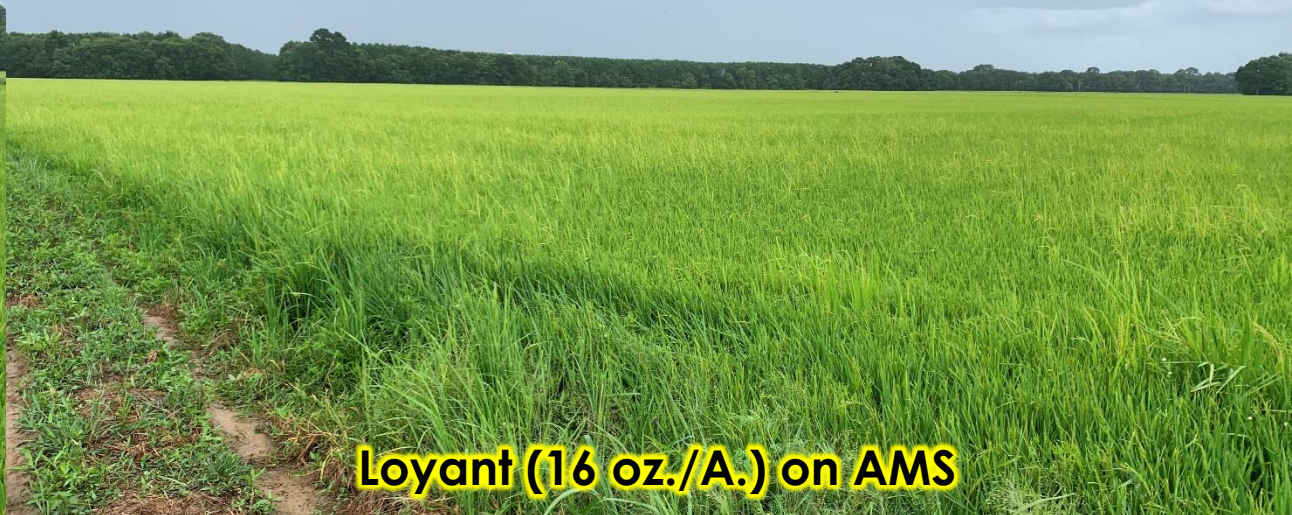
Do NOT expect 100% control of weedy rice

- 3 Factors Will Determine the Level of Weedy Rice Suppression in Your Fields
 - 1. Weedy rice germinating in the soil versus on top of the soil.
 - 2. Growth stage of the weedy rice at the time of Rogue application.
 - Rogue® SC must be applied before weedy rice is beyond the 2 leaf growth stage
 - If your cultivated rice and weedy rice are at the same growth stage, Rogue won't work!
 - 3. Weedy rice fully submerged in the flood water at the time of the Rogue application.
- A 4th Factor – Genetics of your weedy rice population
 - Approximately 25% of weedy rice populations have natural sensitivity to Rogue based on their genetics (lack the HIS1 gene).

Grower: Michael Fruge Consultants: B.D. Fontenot and John Ed Hundley
Target: Weedy rice (1 – 2 leaf stage) Cultivated rice (3 – 4 leaf stage)
2020 E.U.P.



Rogue 10.9 oz./A. on AMS



Loyant (16 oz./A.) on AMS



Alternative Application Methods

- Alternative methods of application to improve delivery into the delayed flood systems
 - Drip application (Need more studies)
 - Multiple inlet injection (Poly-pipe)
 - Aerial straight stream
 - Fertilizer coated
- Future testing planned to improve management recommendations

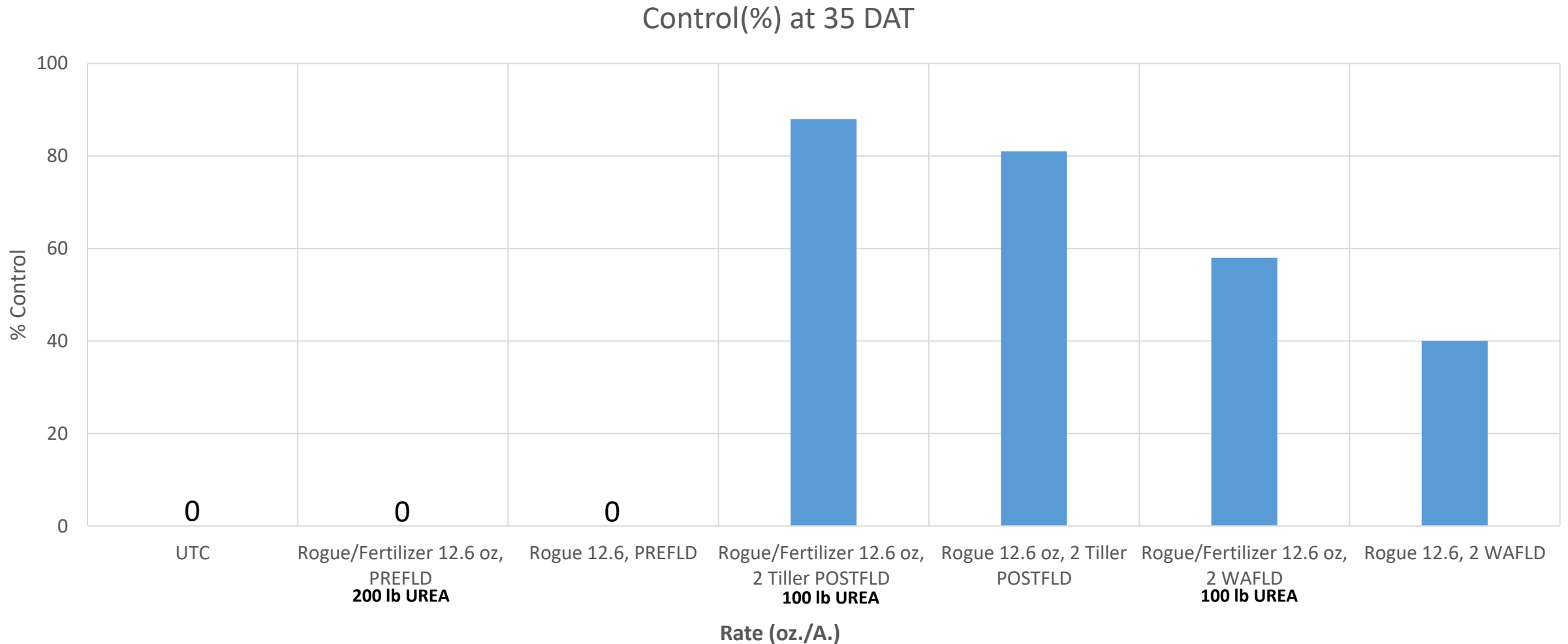




Weed control inconsistencies in later stage rice due to canopy closure led to label revisions that limit applications to the 2 tiller rice stage



Evaluation of Rogue® SC Spray vs Urea Coated on Amazon Sprangletop at PREFLD, 2 Tiller POSTFLD, 2 WAFLD



*Dr. Tommy Butts, UADA, Lonoke, AR



Summary

- Rogue SC is an excellent fit for southern US rice production, especially for water-seeded rice.
- Delayed flooded rice fields, including precision leveled levee fields and zero-graded fields, can utilize Rogue SC; but need a plan developed in advance.
 - Flood earlier
 - Utilize tank-mixtures for larger or more aggressive weeds
 - Reduced rates of tank-mix partners could improve the economics
- Alternative methods of Rogue SC application can be of value to producers
 - Future evaluations are needed to adjust and improve the use
 - Split applications could be of value and require further evaluation
- Safety from Rogue SC off-target deposition is a “win”, especially with aerial applicators



**Evaluation of Rogue Herbicide
for Prevention, Treatment or
Control of Sheath Blight
(*Rhizoctonia solani*) on Rice**



Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice – How did we get here?

- Prior to 2021, Rogue herbicide was used in fungicide trial bays to prevent infestation of the bays with aquatic weeds, namely ducksalad and arrowhead.
- It was noted that sheath blight inoculum was not effective at inducing disease where Rogue had been applied ahead of the inoculum.
- A glasshouse trial was initiated to evaluate the effect of Rogue on sheath blight.
- Two rates of Rogue (12.6 and 25.2 oz./A.) were applied to the water surface of container-grown rice via pipette. *Rhizoctonia solani* inoculum (field trial inoculation rate) was applied to the water surface immediately after application of Rogue.

Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice

Results:

- At 12 DAT, the untreated check exhibited a high degree of severity (5.8 on a scale of 0 – 9).
- Both rates of Rogue resulted in a significant reduction in infection severity, with no significant difference noted between the two rates of Rogue.
- These results confirmed the field observations that Rogue inhibits infection of *R. solani* (sheath blight) on rice.
- A provisional patent (*Methods of controlling causal agents of sheath blight in rice*) was submitted by Gowan in February 2022.

Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice

- Dr. Yeshi Wamishe (Univ. of Arkansas System, Division of Agriculture, RREC, Stuttgart, AR)
- Objective: The primary objective of this protocol was to evaluate Rogue herbicide for preventative control of sheath blight on rice. The secondary objective of this protocol was to determine if Rogue can delay the need for application of sheath blight fungicide programs or complement fungicide programs for sheath blight.
- CL163 rice planted at 104 lb./A. on 4/28/2022, emergence on 5/7/2022
- Rogue applied in 10 gal./A. on 6/10/2022 (Appl. A)
- Inoculum (454 g./plot) applied on 7/1/2022 (21 DATA)
- Fungicides applied in 20 gal./A. on 7/6/2022 (Appl. B)

Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice

Treatments:

1. No Rogue, Inoculated Check
2. No Rogue, Amistar Top (10 oz./A.) (Appl. B)
3. No Rogue, Amistar Top (15 oz./A.) (Appl. B)
4. No Rogue, Elegia (32 oz./A.) (Appl. B)
5. Rogue (8.4 oz./A.) + MSO (1% v/v) (Appl. A), Inoculated Check
6. Rogue (8.4 oz./A.) + MSO (1% v/v) (Appl. A), f/b Amistar Top (10 oz./A.) (Appl. B)
7. Rogue (8.4 oz./A.) + MSO (1% v/v) (Appl. A), f/b Amistar Top (15 oz./A.) (Appl. B)
8. Rogue (8.4 oz./A.) + MSO (1% v/v) (Appl. A), f/b Elegia (32 oz./A.) (Appl. B)
9. Rogue (12.6 oz./A.) + MSO (1% v/v) (Appl. A), Inoculated Check
10. Rogue (12.6 oz./A.) + MSO (1% v/v) (Appl. A), f/b Amistar Top (10 oz./A.) (Appl. B)
11. Rogue (12.6 oz./A.) + MSO (1% v/v) (Appl. A), f/b Amistar Top (15 oz./A.) (Appl. B)
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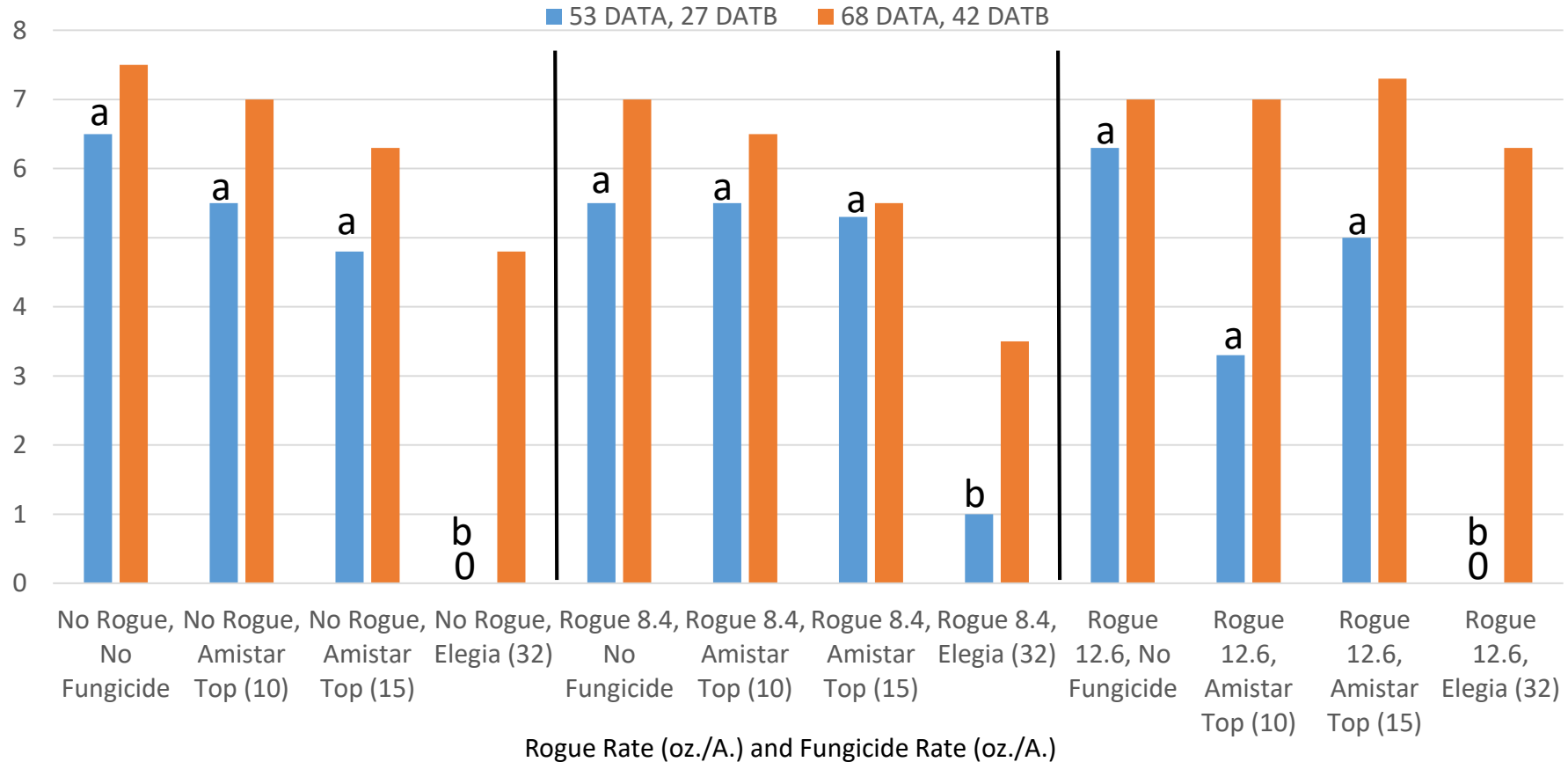
Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice

- Evaluation Parameters:
- Severity is a measure of the primary disease progress (height) on the plants (0 – 9 scale), with 8 indicating disease on the flag leaf.
- Incidence is a measure of the secondary disease progress (plant to plant or leaf to leaf transmission) as a percentage of plants (%) affected.
- Disease index is a measure of the overall disease and combines severity and incidence for an overall measure of disease. The formula is:

$$\frac{\text{Severity (0 – 9) X Incidence (\%)}}{100}$$

Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice

Untransformed Disease Severity (0 – 9)

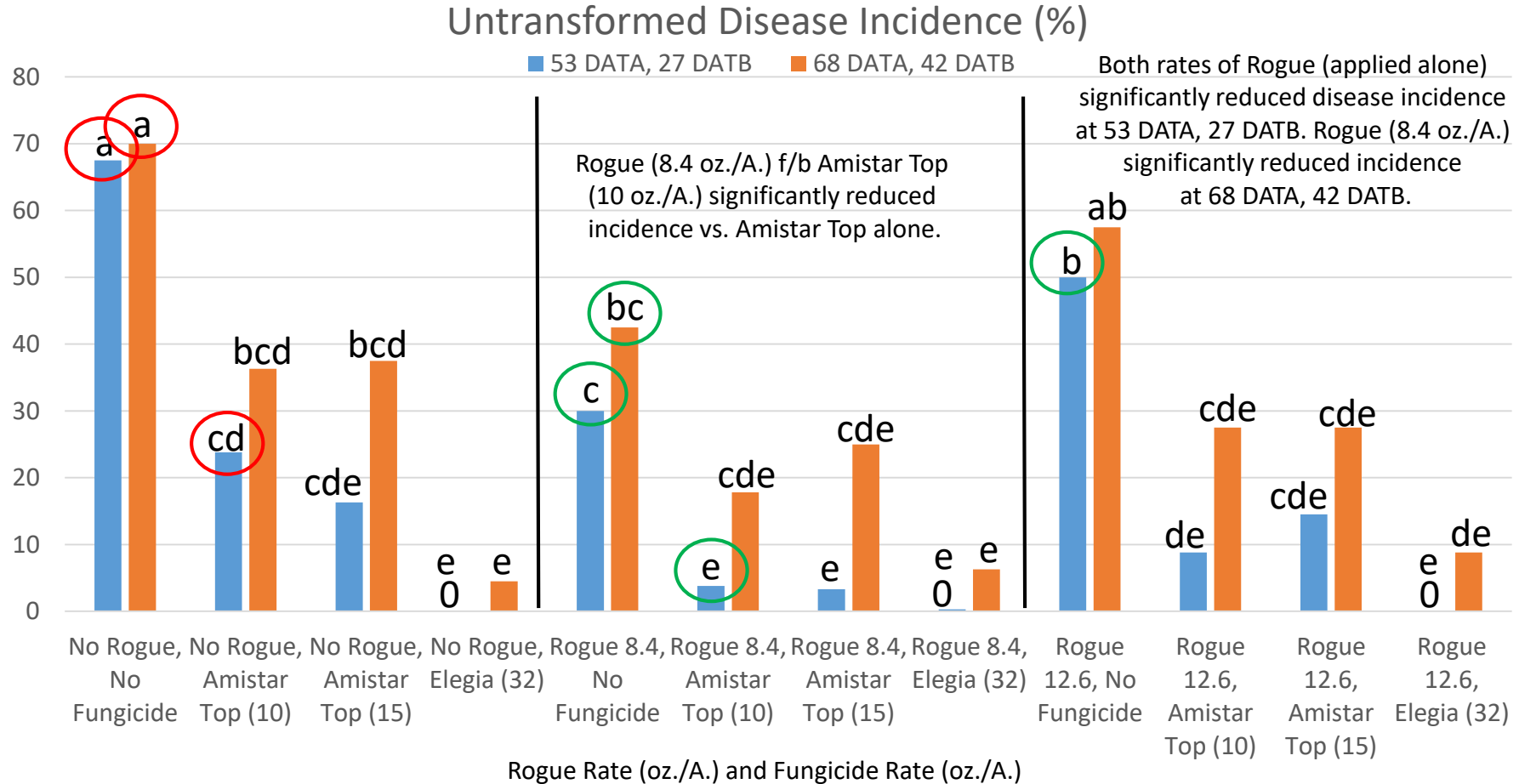


Dr. Yeshi Wamishe, University of Arkansas

Means with the same letter are not significantly different (LSD, P=0.05). Transformation of 68 DATA, 42 DATB data did not result in significant differences.



Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice

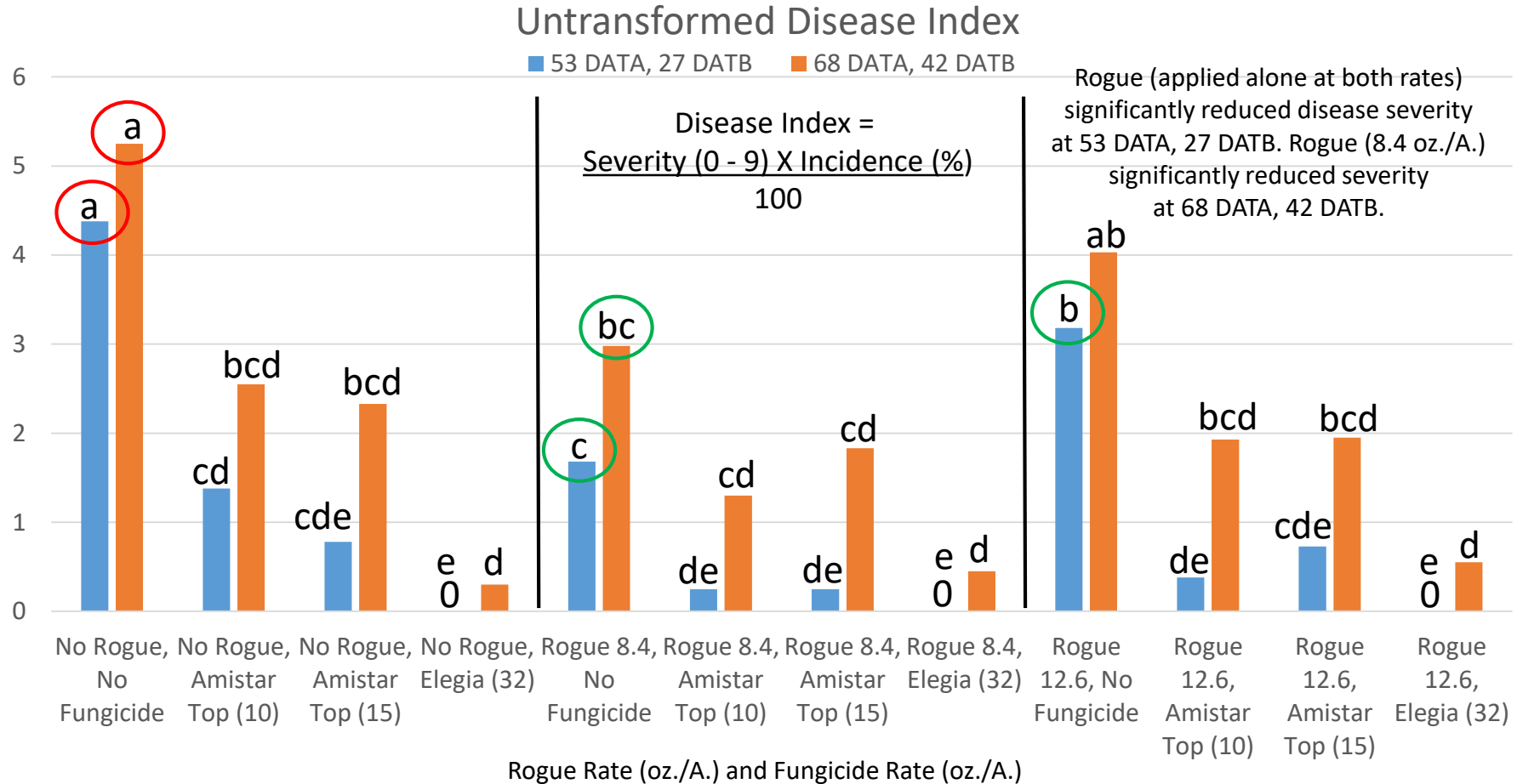


Dr. Yeshi Wamishe, University of Arkansas

Means within DAT with the same letter(s) are not significantly different (LSD, P=0.05)



Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice



Dr. Yeshi Wamishe, University of Arkansas

Means within DAT with the same letter(s) are not significantly different (LSD, P=0.05)



Evaluation of Rogue Herbicide for Control of Sheath Blight (*Rhizoctonia solani*) on Rice

- The growing season was hot and dry and sheath blight disease progress slowed down particularly during the early stages of the trial.
- Conclusion: Rogue had minimal effect against sheath blight severity (primary infection).
- Later in the season, there was “suspicious insensitivity of the sheath blight pathogen isolates to azoxystrobin” that Dr. Wamishe uses repeatedly for artificial inoculation. That is the possible explanation of why Amistar Top showed a high rating at 42 DATB.
- Conclusion: Applied alone, Rogue lowered sheath blight disease progress (leaf to leaf transmission).
- Conclusion: Rogue enhanced the suppression of sheath blight when using Amistar Top at the lower rate (10 oz./A).
- Conclusion: Rogue (8.4 oz./A.) reduced the incidence of sheath blight and that resulted in a reduction in disease index.

History of Rogue Usage in the Mid-South

- Of the 73000+ acres of Rogue-treated rice to date, Gowan staff have not identified a field that required a fungicide application for sheath blight.
- Gowan filed a patent application for prevention, treatment and/or control of sheath blight on rice with Rogue.
- This use is currently not registered. Gowan is evaluating the potential of registering this use for rice.
- Gowan will continue to investigate this with Mid-South rice pathologists, consultants and customers.

Questions

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American Company
THANK YOU!

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**USA**