

# Rice Weed Control 2019

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# Review of 2018

- Grassiest crop in a long time
- Residuals did not get activated
- Hot, dry conditions led to reduced POST activity
- Some folks made a poor decision to not spray EPOST
- Large grass at flood
- Poor performance from several herbicides
- >\$150 spent on weed control was common
- What happened with Loyant?



# Loyant Issues in 2018

Off-target movement



Varietal sensitivity

Lack of performance



Barnyardgrass

Rice



# Loyant

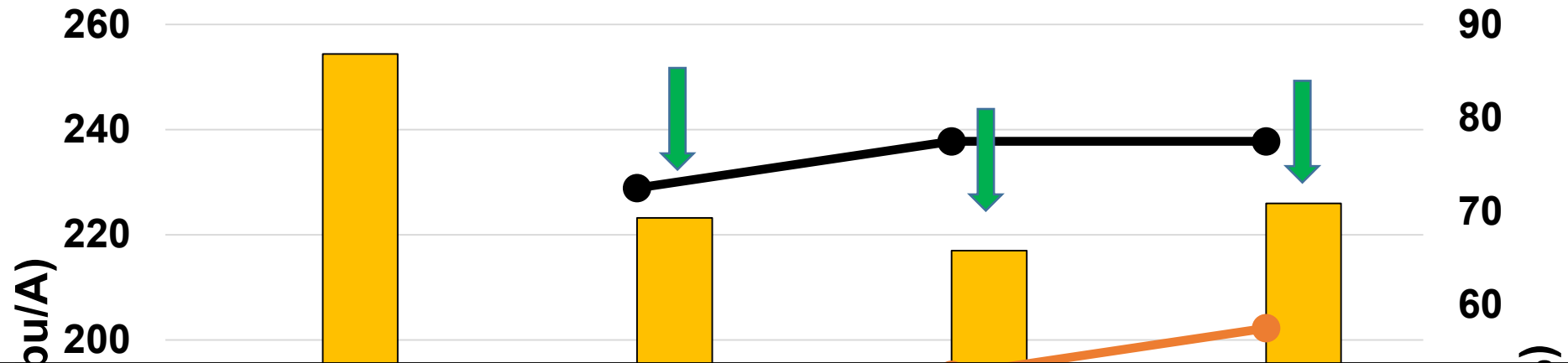




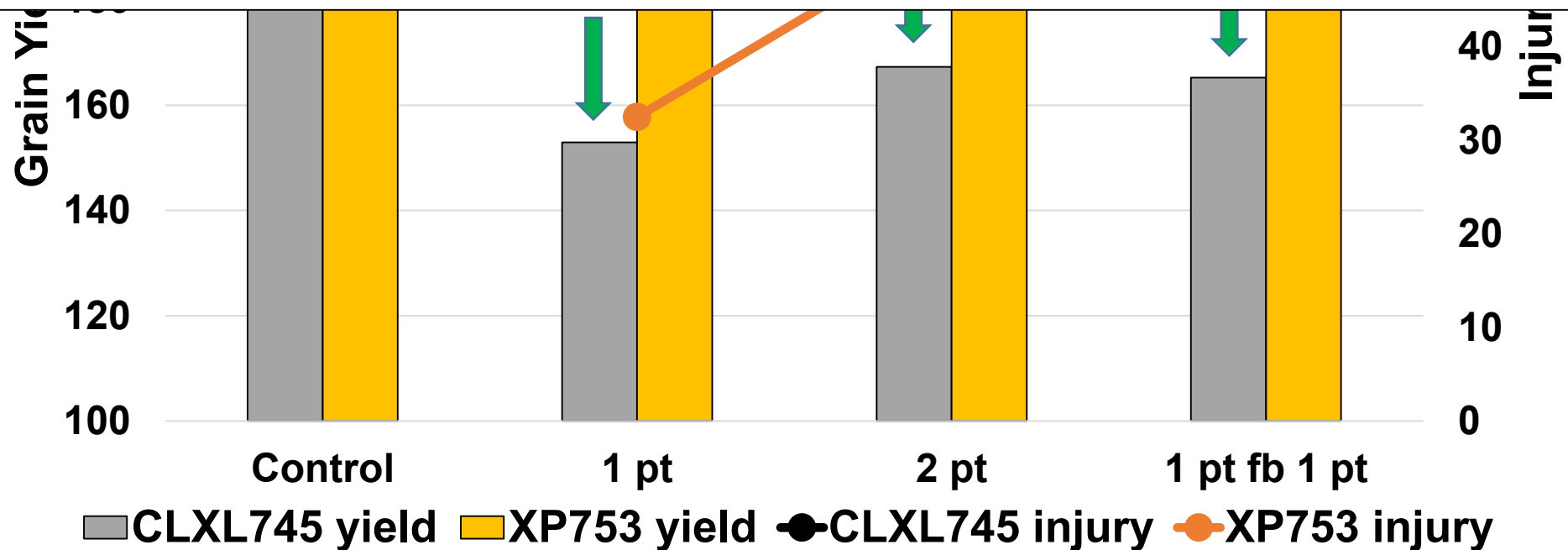
# Loyant 2016 Crop Tolerance

All treatments are  
Loyant at listed rate +  
0.5 pt/A MSO

## 4-6 If application Grain Yield & Injury Ratings



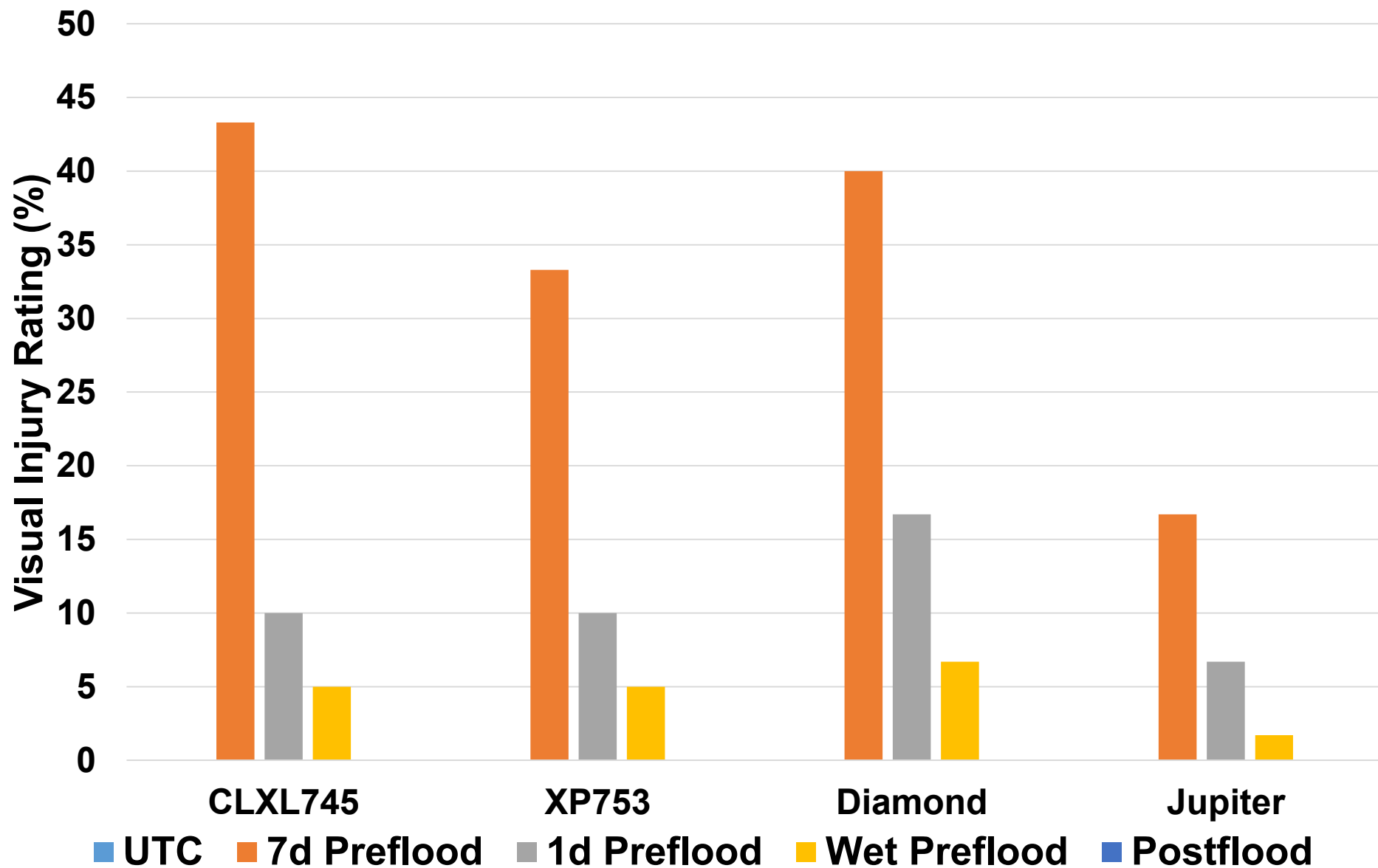
Approximately 30 bu/A yield loss across hybrid rice cultivars





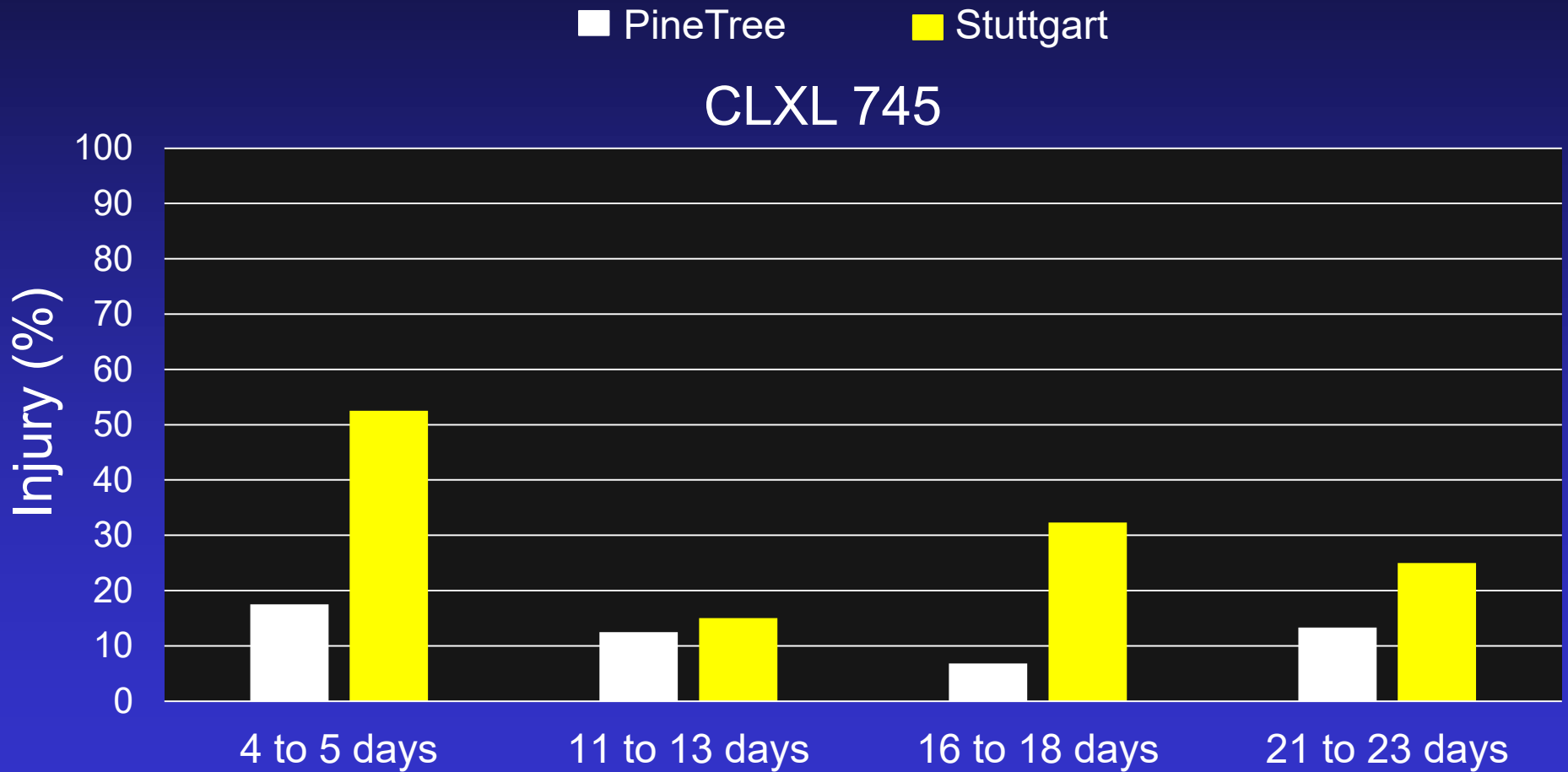
# Loyant 2018 Soil Condition & Timing

## Injury 15 DA-A



All treatments refer to Loyant applied at 1 pt/A + 0.5 pt/A MSO.

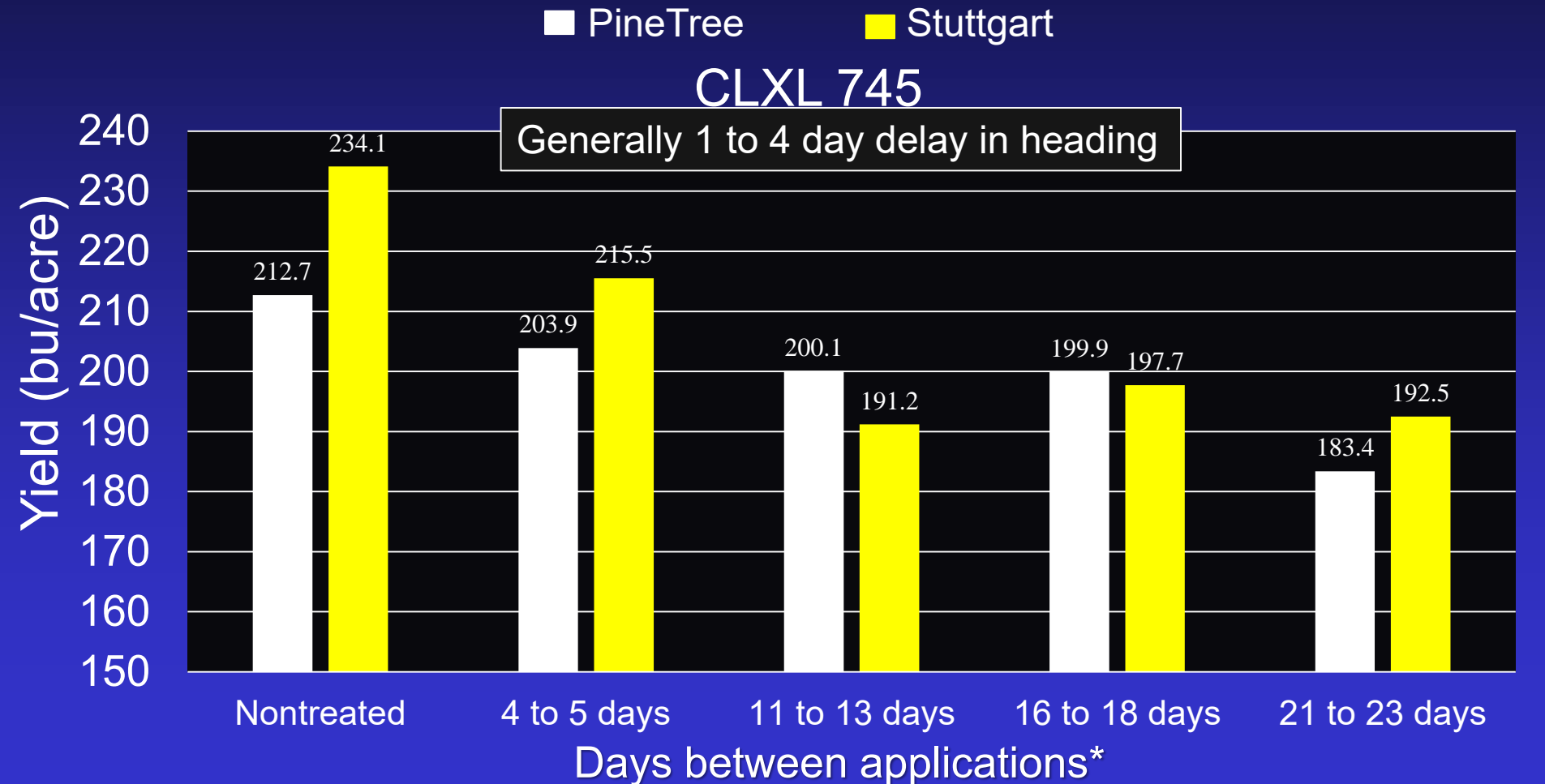
# Rice Injury from Sequential Loyant Applications



\* Initial application to 2-leaf rice

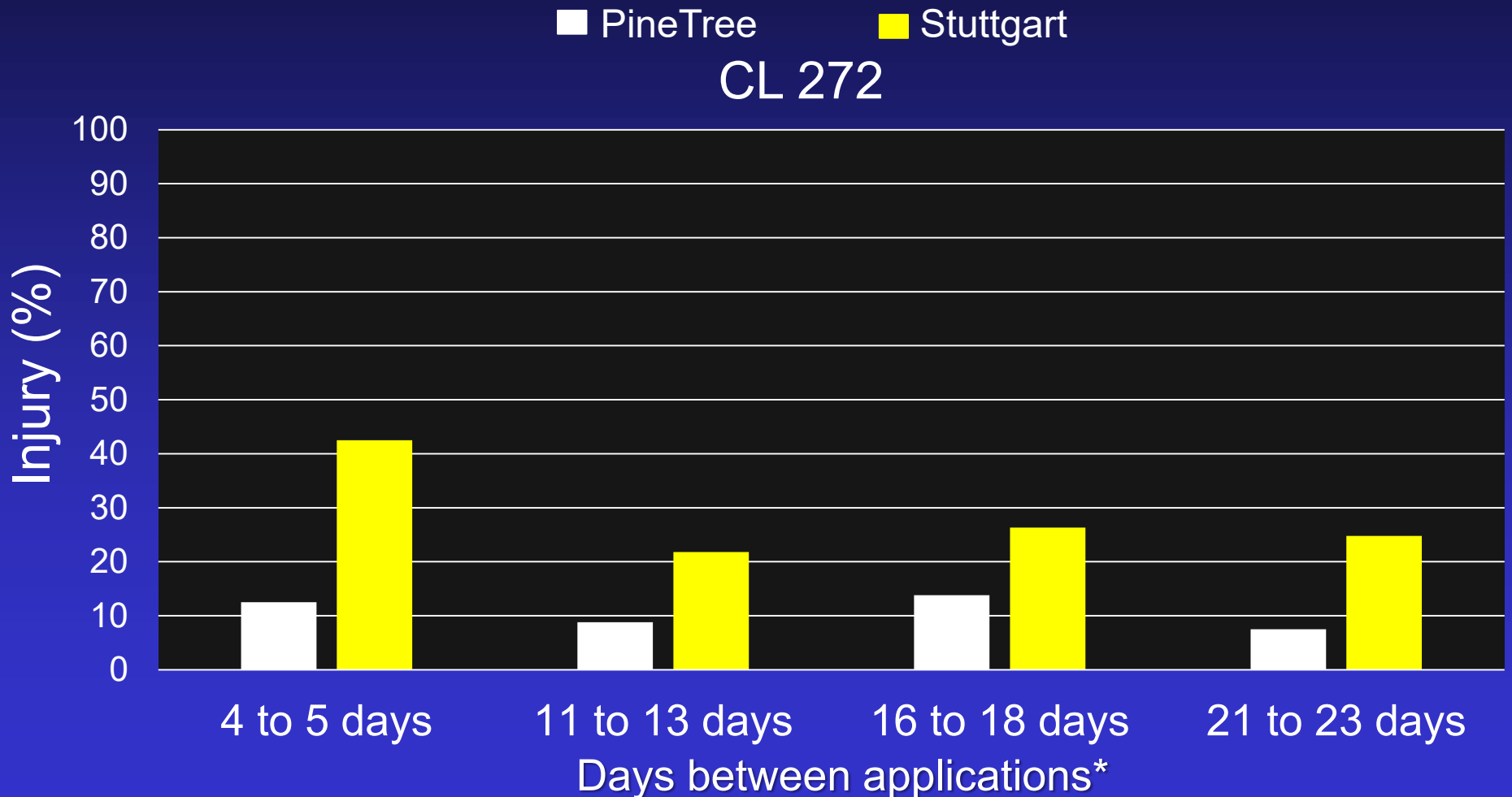


# Rice Yield following Sequential Loyant Applications



\* Initial application to 2-leaf rice

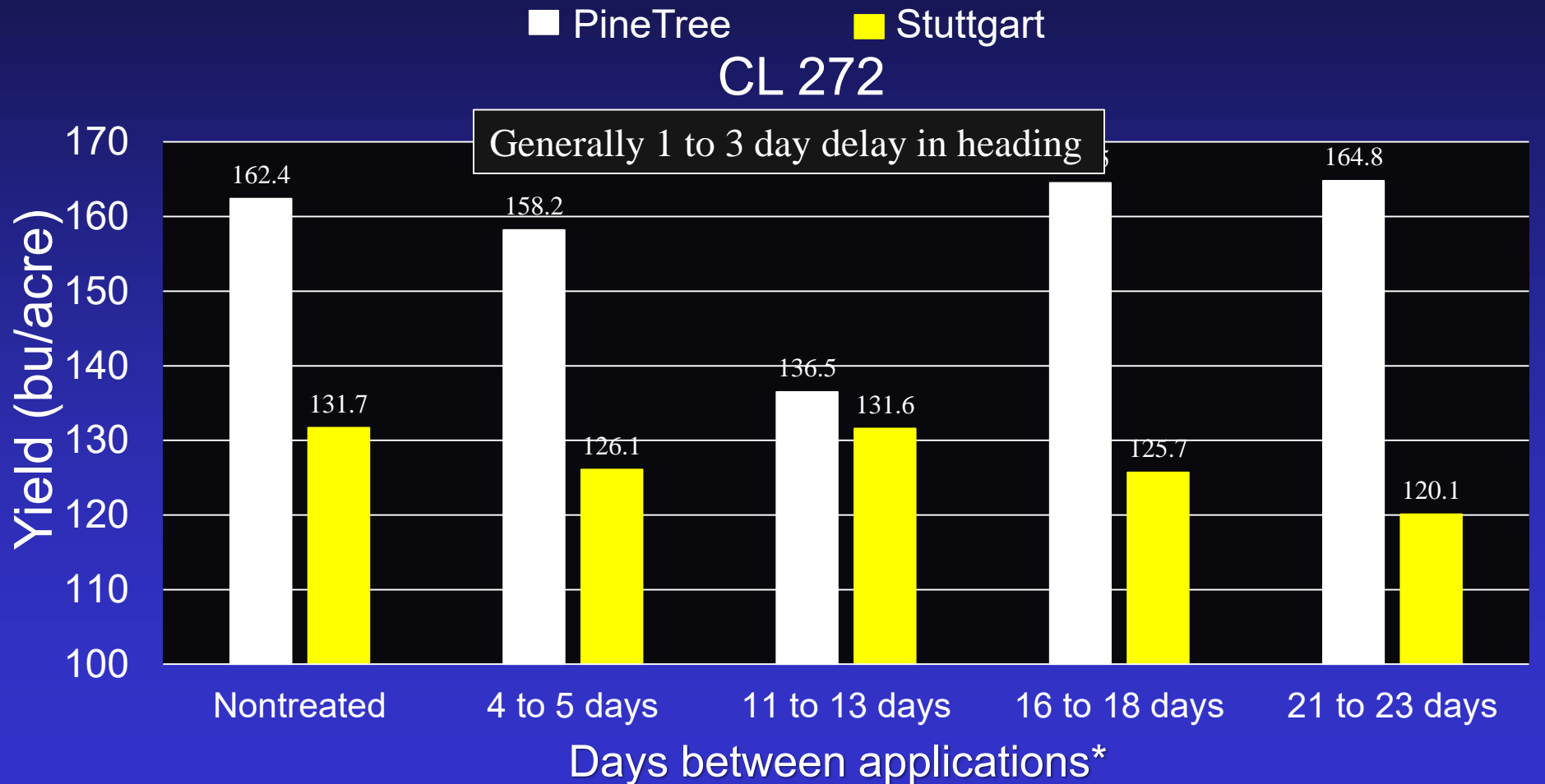
# Rice Injury from Sequential Loyant Applications



\* Initial application to 2-leaf rice



# Rice Yield following Sequential Loyant Applications



\* Initial application to 2-leaf rice







# Loyant Label

## Application Rates and Weeds Controlled or Suppressed

At a rate of 16 fl oz/acre (1 pint/acre) the following weeds are either controlled

Common Name	Maximum Growth Stage
barnyardgrass <sup>1</sup>	3 tiller
broadleaf signalgrass <sup>1</sup>	5 leaf
junglerice <sup>1</sup>	3 tiller
tighthead sprangletop	2 tiller
rice flatsedge <sup>1</sup>	6 leaf
purple nutsedge <sup>1,2</sup>	5 leaf
yellow nutsedge <sup>1,2</sup>	5 leaf
Smallflower umbrellasedge <sup>1</sup>	6 leaf
alligatorweed	12" runners
Ammannia (red stem)	8"



# Why variability in Loyant control?

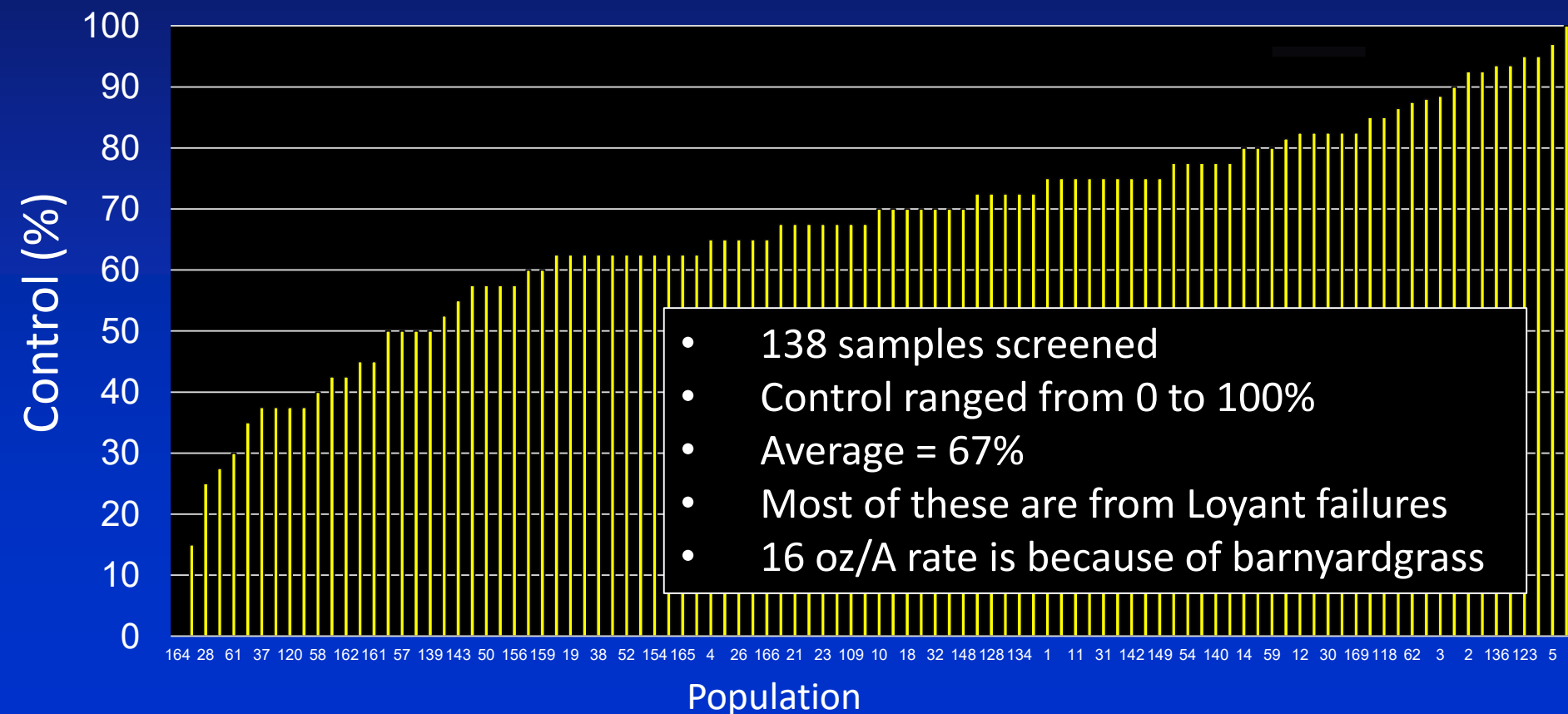
- Barnyardgrass too big and high populations?
  - Used as rescue?
- Soil moisture?
  - Time till flood matters
- Coverage
  - Failures with both ground and air applications
- Tank-mixtures/antagonism
- Are some populations more tolerant than others?



# Barnyardgrass Screening Samples (Response to Loyant)

14 days after 4-leaf application

■ Loyant (1X)









# Loyant on Barnyardgrass

- Lower than expected control of some barnyardgrass populations was observed in the field last summer and again this winter in the greenhouse
- Size of plants and growing conditions in the greenhouse were optimized for Loyant activity
- Further research is underway to characterize this variability among populations and the cause for reduced sensitivity

# What do we know and hypothesize about Loyant on barnyardgrass?

- There are quinclorac-, propanil-, and imazethapyr-resistant accessions that are sensitive to Loyant
- Unlikely that propanil resistance (elevated aryl acylamidase) is linked to variability in control with Loyant
- Unlikely that quinclorac is being metabolized
- Could metabolic resistance to imazethapyr lead to a similar response with Loyant?

# Barnyardgrass Screening

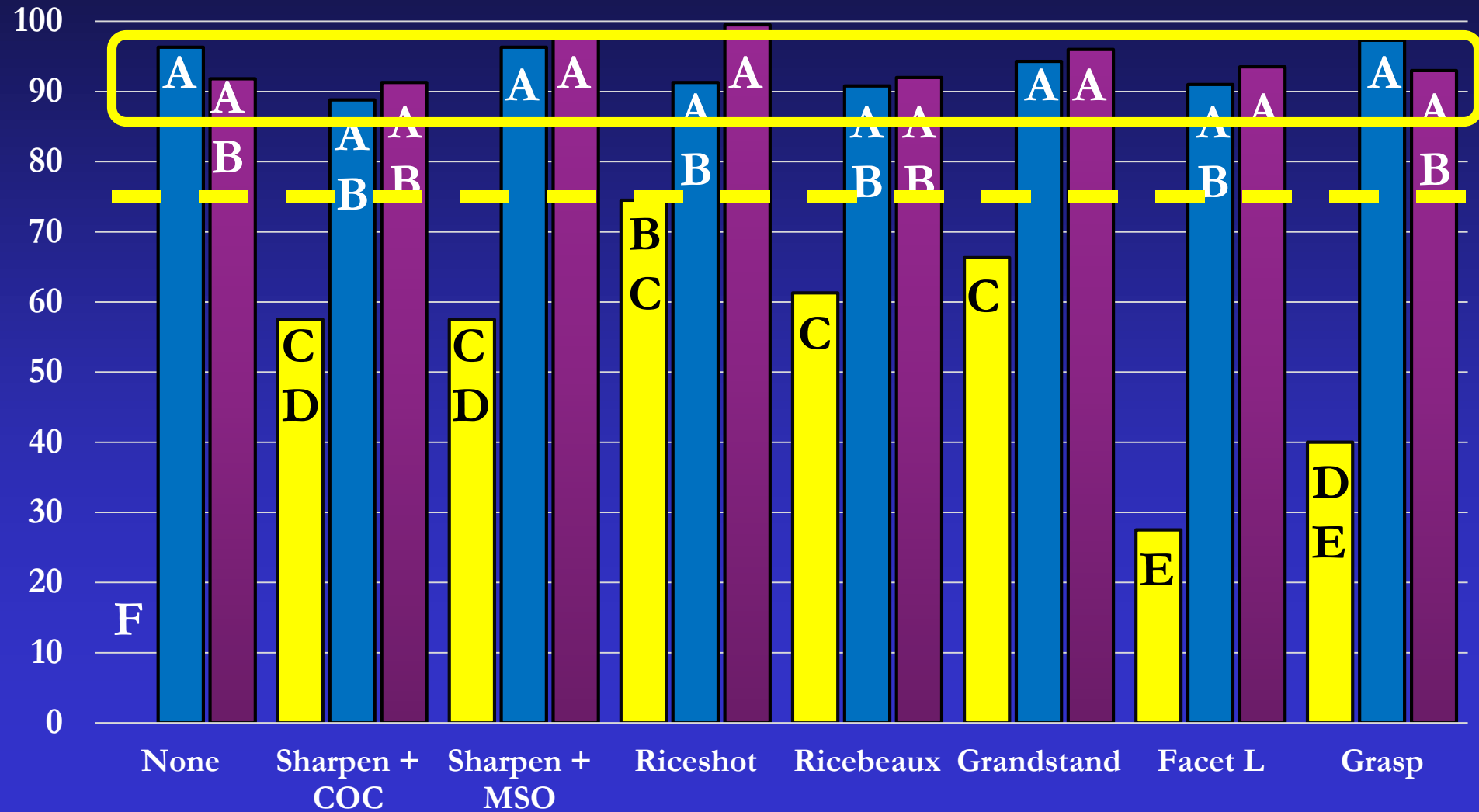
- About 5% of samples did not contain enough seed
- About 15% of samples would not germinate
- Sizeable increase in resistance to all herbicides evaluated, except clomazone
  - Results are scary
  - Approximately 10% of samples had four-way resistance (5-way found in a 2017 sample)
- Some samples showed slight reduction in glyphosate sensitivity (1/2X rate)



# Comparison of Loyant and 2,4-D for levee weed control

Palmer amaranth control 3 weeks after application

■ none ■ Loyant ■ 2,4-D





Loyant  
3 weeks after treatment



2,4-D  
3 weeks after treatment



Grasp  
3 weeks after treatment

# Comparison of Loyant and Enlist One for levee weed control

- Treatments that did not contain Loyant or 2,4-D were ineffective
- Loyant-containing treatments were similar to 2,4-D containing treatments
- The addition of other herbicide to Loyant or 2,4-D did not further improve control



# Row Rice

- 2018 – 100,000 acres
- Increased weed control costs
- Flushing is no longer an option for activation of PRE
- Broadleaves will move up on the most wanted list!
- Similar to levee weed control
- Flood not there as weed barrier








Command 17 oz PRE



Command 17 oz +  
Sharpen 2 oz PRE



## 4 weeks after late-postemergence application- Marianna



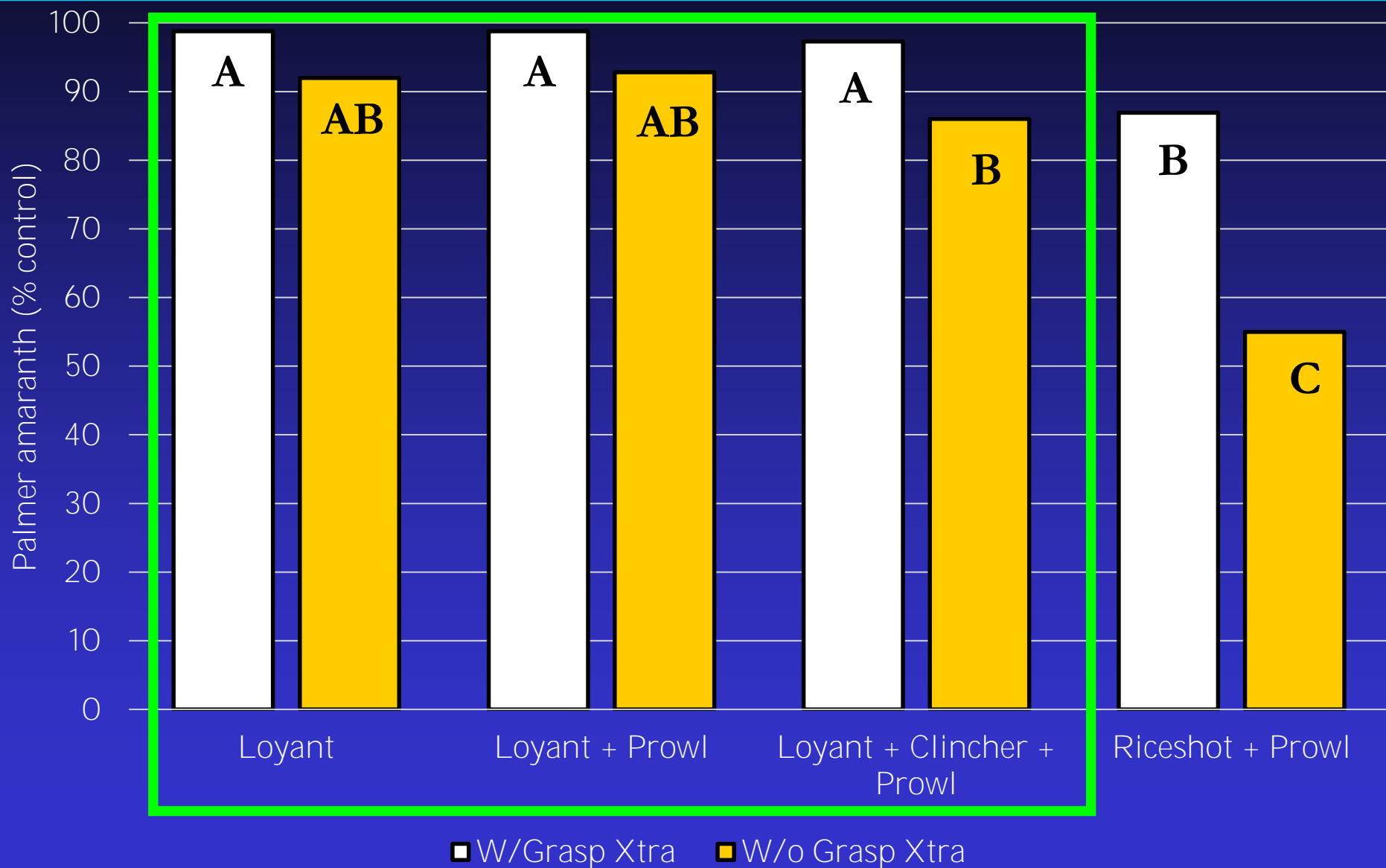
Command + Facet L fb  
Ricestar HT fb  
Loyant + Prowl fb  
Grasp

Non-treated check





# Control 4 weeks after LPOST



# Row Rice Summary

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- Row-rice weed control will likely cost more \$\$
  - Hybrid rice w/low population leaves room for weeds
- Plant early to reduce weed competition early
- Load up on Residuals up front: Command +
  - Sharpen or Facet L, or both
  - Prowl + Bolero delayed PRE
- Add residuals early POST, split Command or Prowl
- Watch moisture levels for POST grass control
  - Clearfield/ Newpath fits well for grass control with added residual

# Row Rice Summary

- Likely two applications for pigweed/broadleaves
  - No great residuals POST for pigweed control
- Loyant fits well & works best as part of a herbicide program – needs moisture for grass control
  - >95% Palmer amaranth control 4 WAT
- Propanil + Grandstand or Grasp Xtra in late POST
  - 2,4-D in counties where restrictions allow
- POST grass – Facet, Regiment, Newpath, Clincher, Ricestar or Provisia
- Irrigate to optimize POST grass control
- Timely applications will be key to success
- Less crop response, at least in areas not flooded



Cleanest plots had more than two residual applications (PRE & EPOST) in 2018...If they were activated.





# Untreated 2018





# Command FB Loyant 2018





# Obey FB Loyant 2018





# Command FB Obey FB Loyant 2018





# Obey FB Command FB Loyant





# What about benzobicyclon?

- Rouge and Rouge Plus
- 2020-2021
- Postflood only
- Broad-spectrum activity
- Excellent on sprangletop, aquatics, annual sedge
- Activity on barnyardgrass, sedges and weedy rice
- Ideally suited for zero grade



# Weedy Rice Control with Benzobicyclon

Stuttgart - 6 weeks after treatment



**Nontreated**



**Benzobicyclon**





# Weedy Rice Control with Benzobicyclon

Colt - 7 weeks after treatment



**Nontreated**



**Benzobicyclon**



# 1X Rate of Benzobicyclon

8 days after treatment

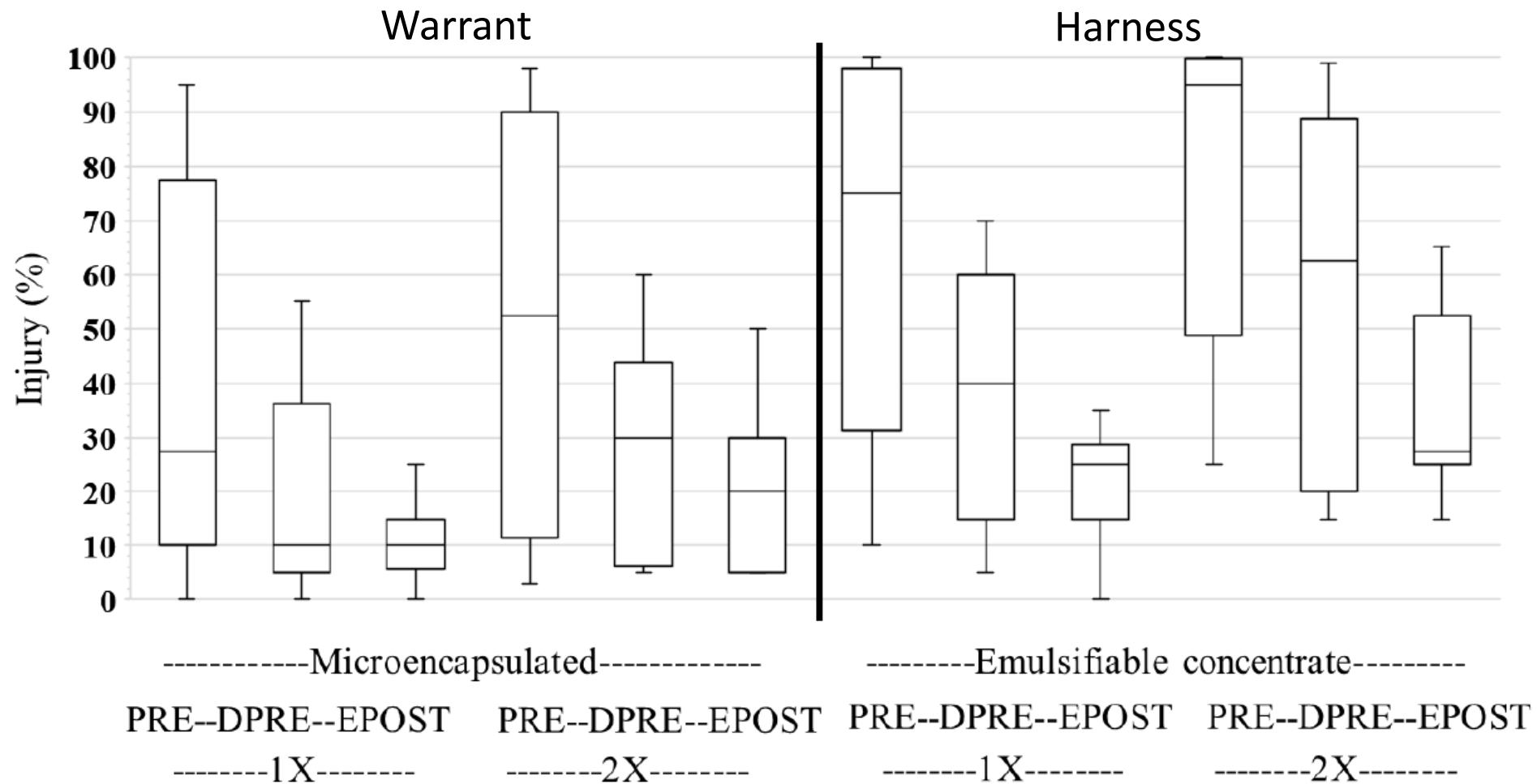


- Some populations of weedy rice are more sensitive than others
- Addition of MSO will improve control (may increase risk for injury)
- Control will increase as flood depth increases
- Tolerance mechanism is **partially** associated with size at application
- Control improves with length of time water is held

# What about Warrant, Dual, and Zidua on rice?

- They are not labeled!
- They can cause injury!
- They may show up in rice residue!
- If someone does apply these in season and it shows up in rice at checkpoints....It will be devastating to ALL Arkansas Rice Industry!!!
- Do not apply off-label products!





- Rice is more tolerant to Warrant than Harness
- Rice tolerance increases as application is delayed
- Injury often increases when rainfall occurs soon after application
- Tolerance when tank-mixing with other rice herbicides is not well understood
- **There is no label for use of Warrant in rice!!!!**
- Bayer (formerly Monsanto) has shown no interest in labeling Warrant in rice



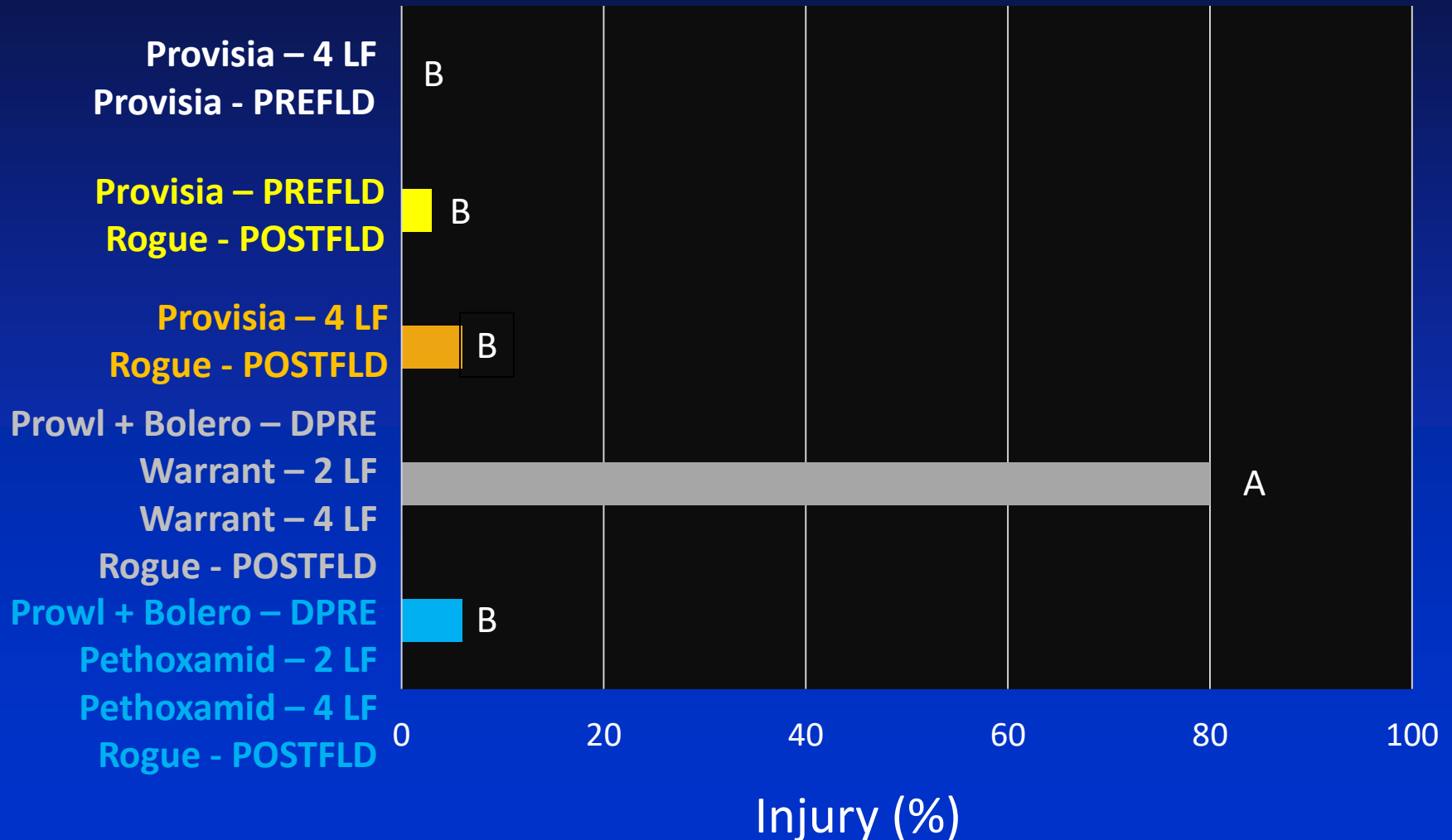








# Late-Season Rice Injury (Provisia Trial)



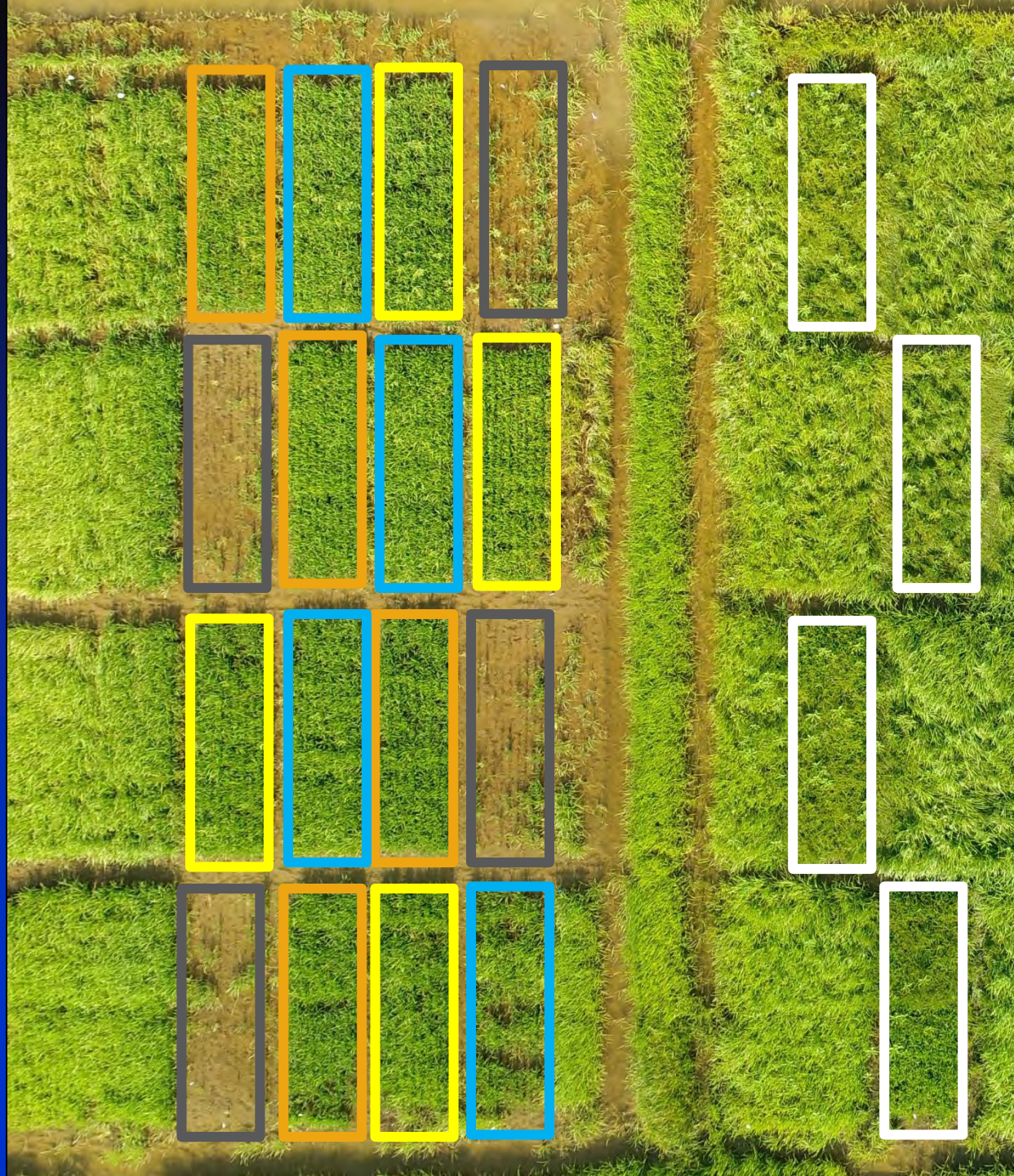
**Provisia – 4 LF**  
**Provisia - PREFLD**

**Provisia – 4 LF**  
**Rogue - POSTFLD**

**Provisia – PREFLD**  
**Rogue - POSTFLD**


**Prowl + Bolero – DPRE**  
**Warrant – 2 LF**  
**Warrant – 4 LF**  
**Rogue - POSTFLD**

**Prowl + Bolero – DPRE**  
**Pethoxamid – 2 LF**  
**Pethoxamid – 4 LF**  
**Rogue - POSTFLD**





# Fall-applied Herbicides for Weedy Rice Control



An aerial photograph of a rectangular rice field divided into several plots by narrow dirt paths. The plots are filled with green rice plants. The field is bordered by a dirt road at the top and a grassy area at the bottom. A white vertical line is visible on the left edge of the field.

Zidua  
(5 oz/A)

Warrant  
(2.5 pt/A)  
Warrant  
(5 pt/A)

Warrant  
(2.5 pt/A)

Zidua  
(5 oz/A)

Warrant  
(5 pt/A)



# Fall-applied Herbicides for Weedy Rice Control

Zidua  
(5 oz/A)

Warrant  
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Warrant  
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Zidua  
(5 oz/A)

Warrant  
(5 pt/A)







- FullPage™ Rice - RiceTec (similar to Clearfield technology)
  - Tolerant to Preface (Imazethapyr) – Adama
  - Tolerant to Postscript (Imazamox) - Adama
- Rice tolerance is better than Clearfield hybrid and is comparable to inbred (4X tolerance)
  - 4 varieties for 2019, but RT7521 may be most prevalent
- Newpath and Beyond cannot be used on Fullpage!



- 20,000 acres in 2018; 25,000 acres in 2019
- Barnyardgrass and “weedy” rice control was generally excellent
- Plan for a three-pass system (PRE, EPOST, Preflood)
- Use a good residual upfront for best results – similar to CL
- 15.5 fl oz/A twice, add COC provided best control
- Apply Nitrogen and then Preflood application
- No tank-mixes preflood
- May need a postflood application for sedges or broadleaves



# Thoughts for 2019

- Protect Command! Resistance increasing
  - Command plus Facet (Obey) PRE
  - Command PRE; Prowl + Bolero Delayed PRE
- Overlap residuals: Follow PRE or Delayed PRE app. With another residual (Command, Facet, Prowl, Bolero)
- Include Provisia into a rotation if possible
- Rotate problem fields into soybean for 2 years and prevent barnyardgrass seed production
- There are no silver bullets for barnyardgrass. Timely applications will lead to success.
- Use caution with Loyant

# Loyant in 2019

- Strong need in furrow-irrigated rice
- Extreme caution should be used if applying to hybrid
  - Injury has been observed on medium grain and Diamond
- Dry, hot conditions during and after application will increase injury
- Use screening results to make an informed decision about barnyardgrass
- Use as part of a program with residuals applied PRE & EPOST
- Consider tank-mixing with Clincher, Ricestar, or Regiment, especially if grass is larger than 2- to 3-leaf
- Recommend downwind setback from soybean:
  - 0.25 miles by ground; 1.0 miles by air



# Barnyardgrass Management in Rice

- Planned three pass system (technology does not matter)
  - Preemergence or Delayed preemergence
  - Early postemergence
  - Preflood
- Know what **WILL** or **WILL NOT** work (screening)
- Kill it before it comes up!
- If it comes up, you will spend more money
  - Difficulty with timely applications
  - Complete resistance to quinclorac postemergence



# Questions?

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