



Potential Causes of Suspected Herbicide Resistance

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On-Farm BYG Control Study

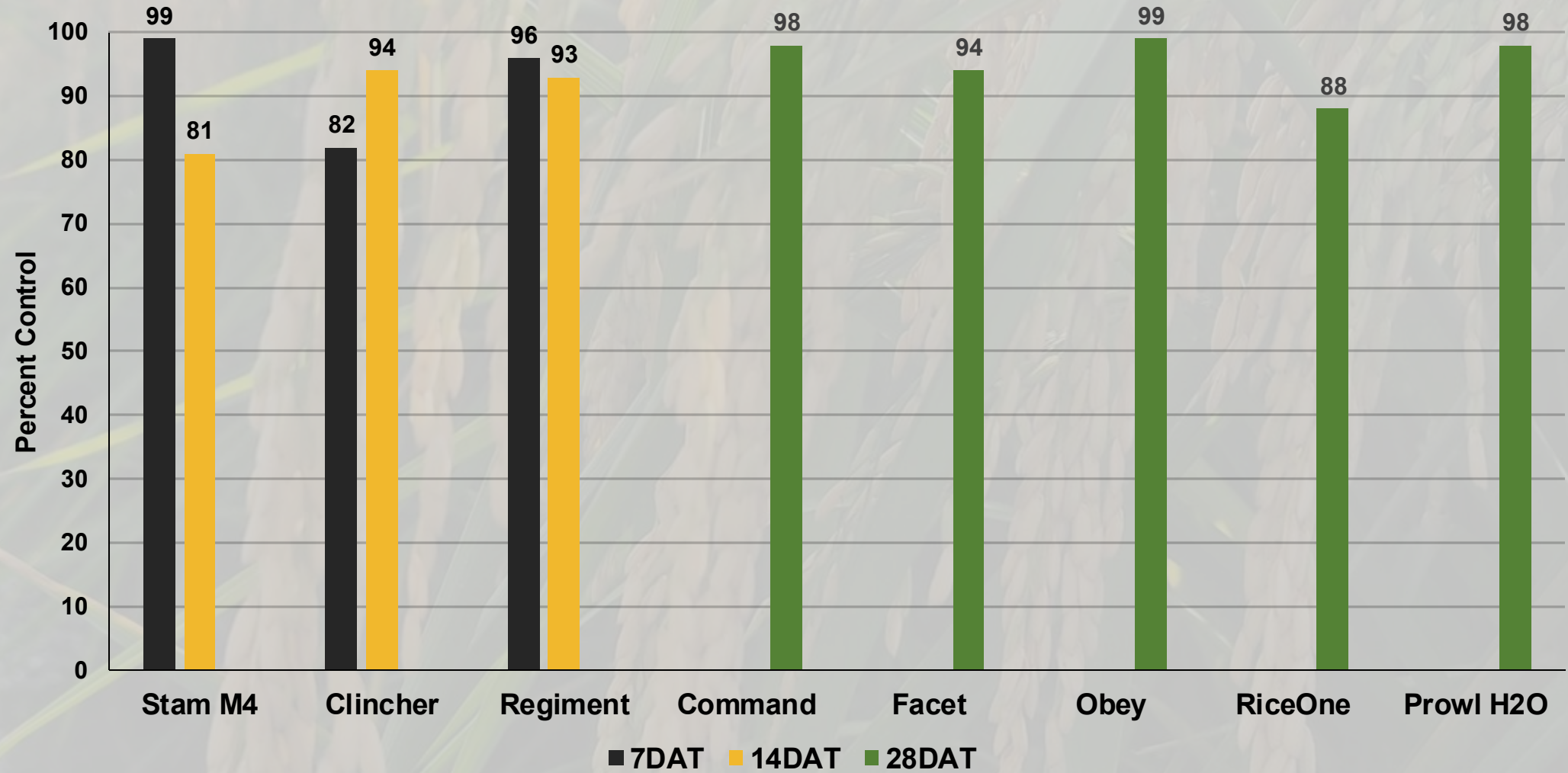
- **Two on-farm locations in 2023**
 - Only one survived the season
- **Troublesome population near Rives, MO**
- **Small-plot RCB with 4 replications**
- **Application: 15 gal/a with TeeJet AIXR 110015 nozzles**
 - **Bowman Mudmaster equipped with a compressed air multi-boom**

BYG Study Treatments

Product	Timing	Rate	Manufacturer
Command	PRE	24 oz/a	FMC
Facet	PRE	43 oz/a	BASF
Obey	PRE	51.3 oz/a	FMC
Prowl H2O	Delay-PRE	2 pt/a	BASF
RiceOne	Delay-PRE	50 oz/a	UPL
Stam M4	POST (pre-flood)	6 qt/a	UPL
Clincher	POST (pre-flood)	15 oz/a	Corteva
Regiment	POST (pre-flood)	1 oz/a	Valent

3 oz of Sharpen applied to every plot PRE to prevent broadleaf emergence

Barnyardgrass Control



Back to the Drawing Board with Resistance

Is resistance really our issue?

Is there something else that could be negatively impacting efficacy?



Managing resistance in barnyardgrass

Extension weed scientist gave recommendations for controlling barnyardgrass in rice production.



Alaina Dismukes
January 27, 2021

🕒 3 Min Read



For controlling barnyardgrass, pre-emergence, residual herbicides overlapped 14 to 21 days later with another round of residual herbicides are required. Also, make sure there is enough moisture to help guarantee activation. TOMMY BUTTS



From a survey taken in Arkansas in the fall of 2020, 86% of respondents said they sighted resistant barnyardgrass in their rice fields. Widespread resistance from commonly used herbicides makes this weed hard to manage.



Cu

41°F
Overcast

[See Deta](#)

BROUGHT TO YOU
BY

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How interest r

State of Confirmed Barnyardgrass Resistance

Year	State	Actives
1990	Arkansas	propanil
1999	Arkansas	propanil, quinclorac
2008	Arkansas	clomazone
2000	California	cyhalofop-butyl, fenoxaprop-ethyl, thiobencarb/benthiocarb, molinate
1995	Louisiana	propanil
1998	Louisiana	quinclorac
2013	Louisiana	imazethapyr
2011	Mississippi	fenoxaprop-ethyl, imazethapyr, propanil, quinclorac, imazamox
1994	Missouri	propanil
1991	Texas	propanil

Heap 2024, International Survey of Herbicide Resistant Weeds <https://www.weedscience.org/Home.aspx>

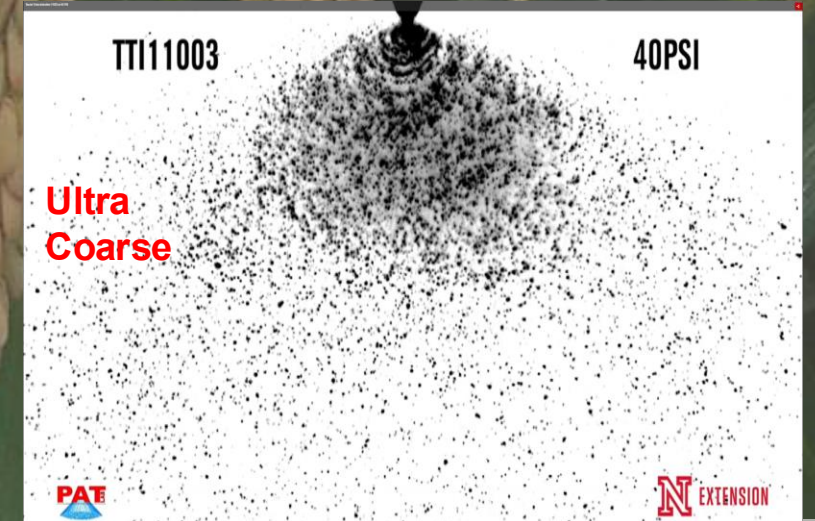
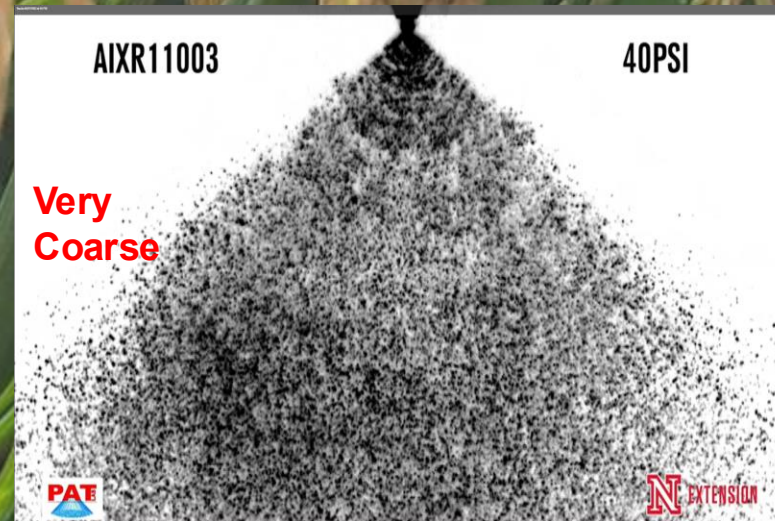
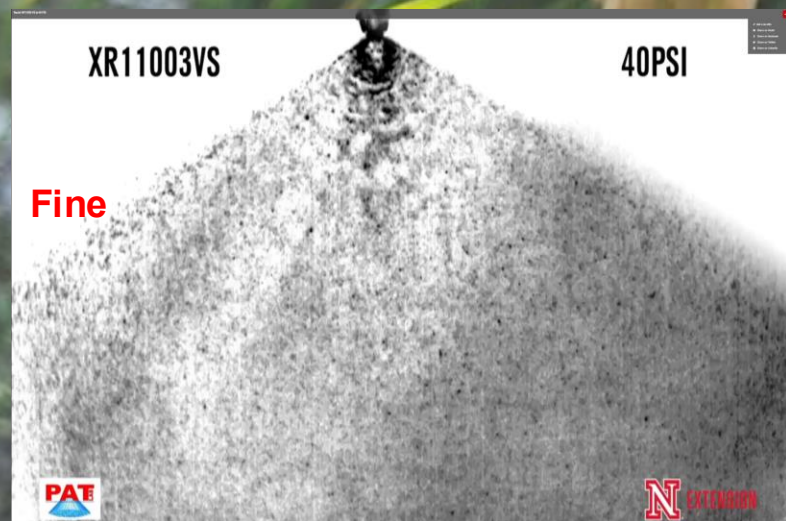




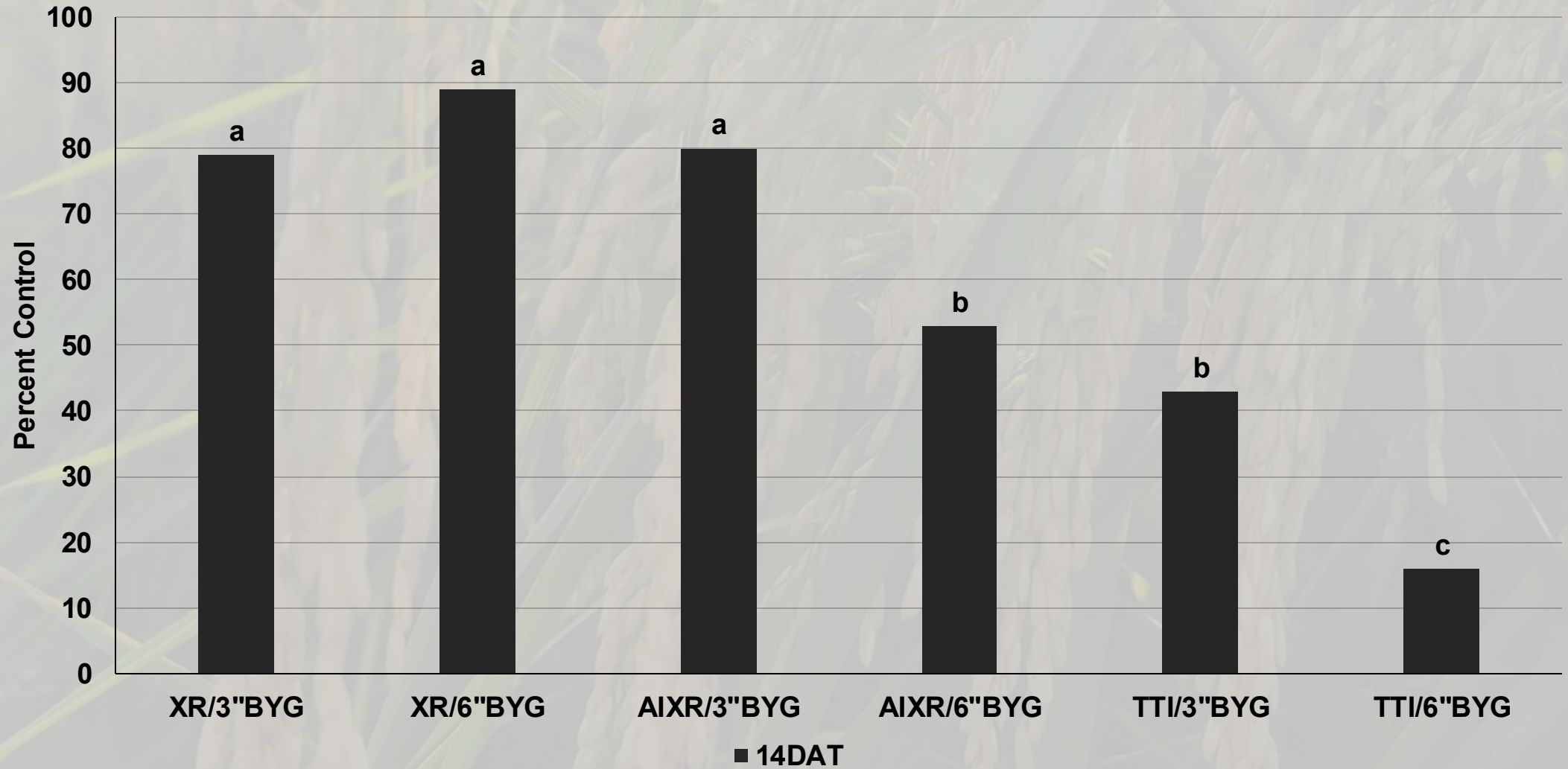


Effect of Spray Quality on BYG Efficacy?

- Small-Plot RCB Study with 4 replications
- Applied Stam 4M with:
 - 3 nozzles: TeeJet XR11002, TeeJet AIXR11002, TeeJet TTI11002
 - 2 BYG sizes: 3" and 6"



BYG Response to Nozzle and GPA



Effect of Spray Quality on Pigweed Efficacy

GROUND APPLICATION

- Apply early when weeds are small with directed rates as identified in the Rate Tables for each crop.
- Use nozzles and pressure that generate a MEDIUM to COARSE size spray droplet. NOTE: Weed control with very coarse, extremely coarse or ultra-coarse nozzles will not provide adequate coverage and will cause unsatisfactory weed control.
- Apply LIBERTY 280 SL HERBICIDE in a minimum of 15 gallons of water per acre. Increase to 20 gallons of water per acre if dense weed canopy exists.
- Apply at ground speed of less than 15 mph to attain adequate coverage.
- Apply when wind speeds are between 2 mph and 10 mph. DO NOT apply when winds are gusty, or when conditions will favor movement of spray particles off the desired spray target. See the *Spray Drift Management* section of this label for additional information on proper application of LIBERTY 280 SL HERBICIDE.
- **Do not use flood jet nozzles, controlled droplet application equipment, or air-assisted spray equipment.**

AERIAL APPLICATION

- Apply early when weeds are small with directed rates as identified in the Rate Tables.
- Use nozzles and pressure that generate a MEDIUM to COARSE size spray droplet. NOTE: Weed control with very coarse, extremely coarse or ultra-coarse nozzles will not provide adequate coverage and will cause unsatisfactory weed control.
- Apply LIBERTY 280 SL HERBICIDE in a minimum of 10 gallons of water per acre.
- See the *Spray Drift Management* section of this label for additional information on proper application of LIBERTY 280 SL HERBICIDE.
- **Do not use flood jet nozzles, controlled droplet application equipment, or air-assisted spray equipment.**



Similar Study at MSU

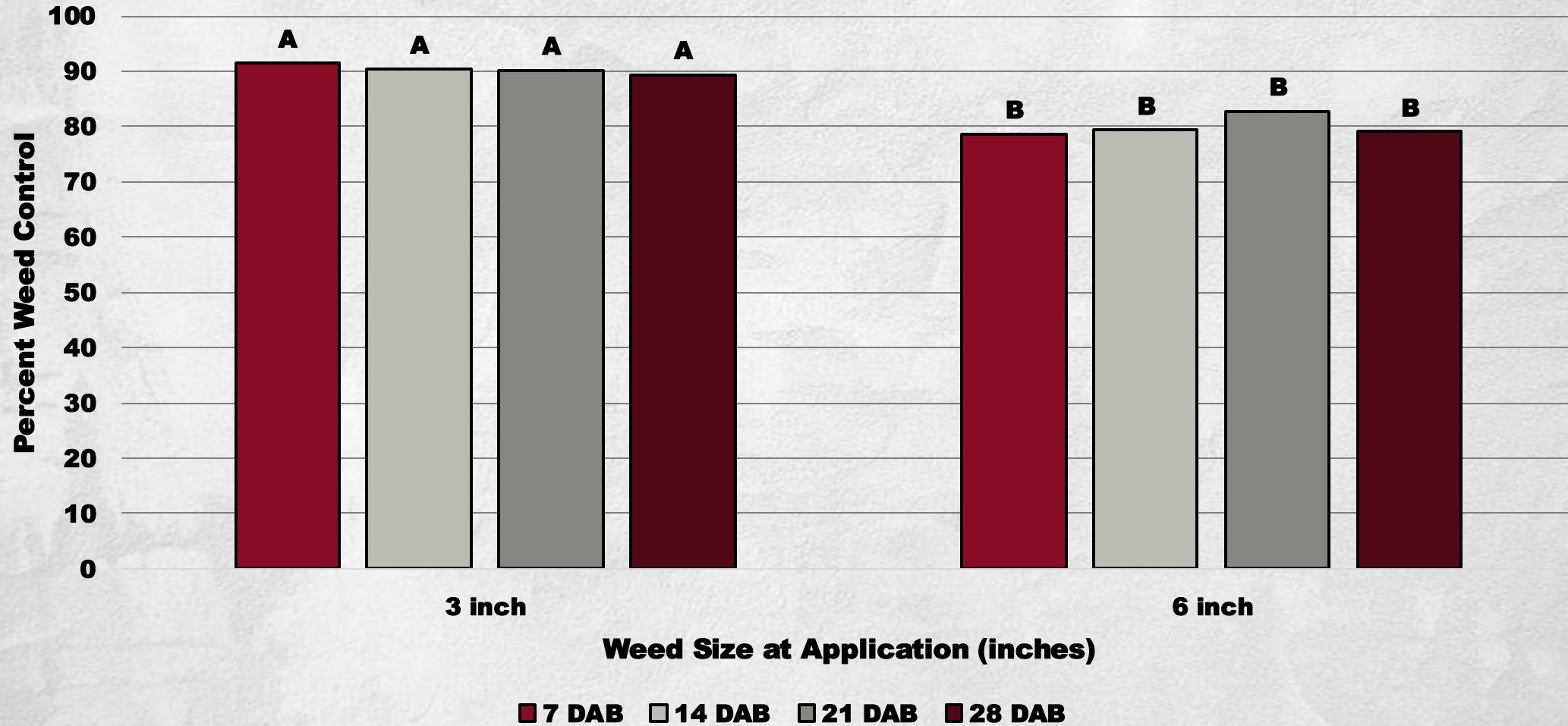
Liberty applied to waterhemp at 29 oz/a

- Design: Factorial arrangement of treatments in a RCB**
 - weed size (3 inch and 6 inch)**
 - carrier volume (10 and 15 gal/A)**



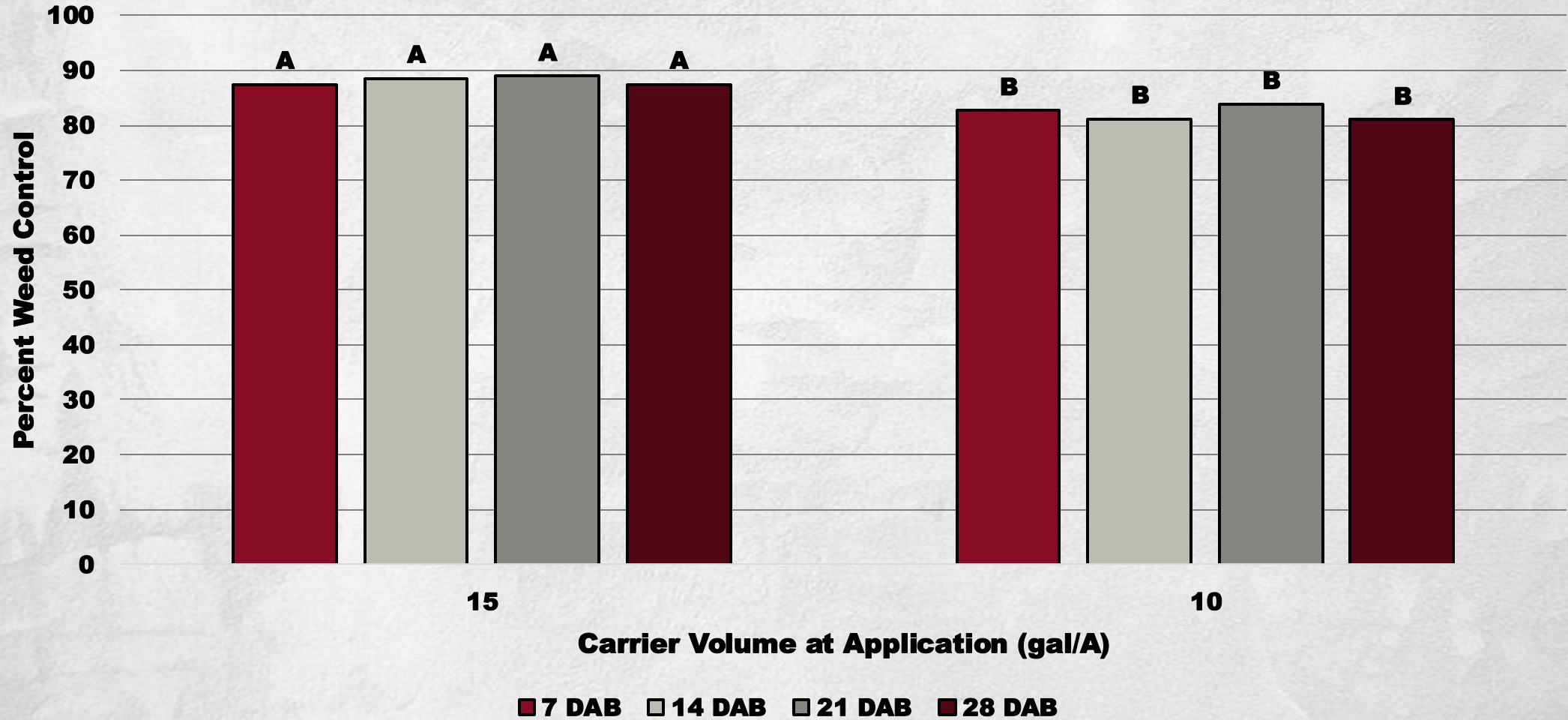
Results

Weed Control Response to Weed Size at Application



Results

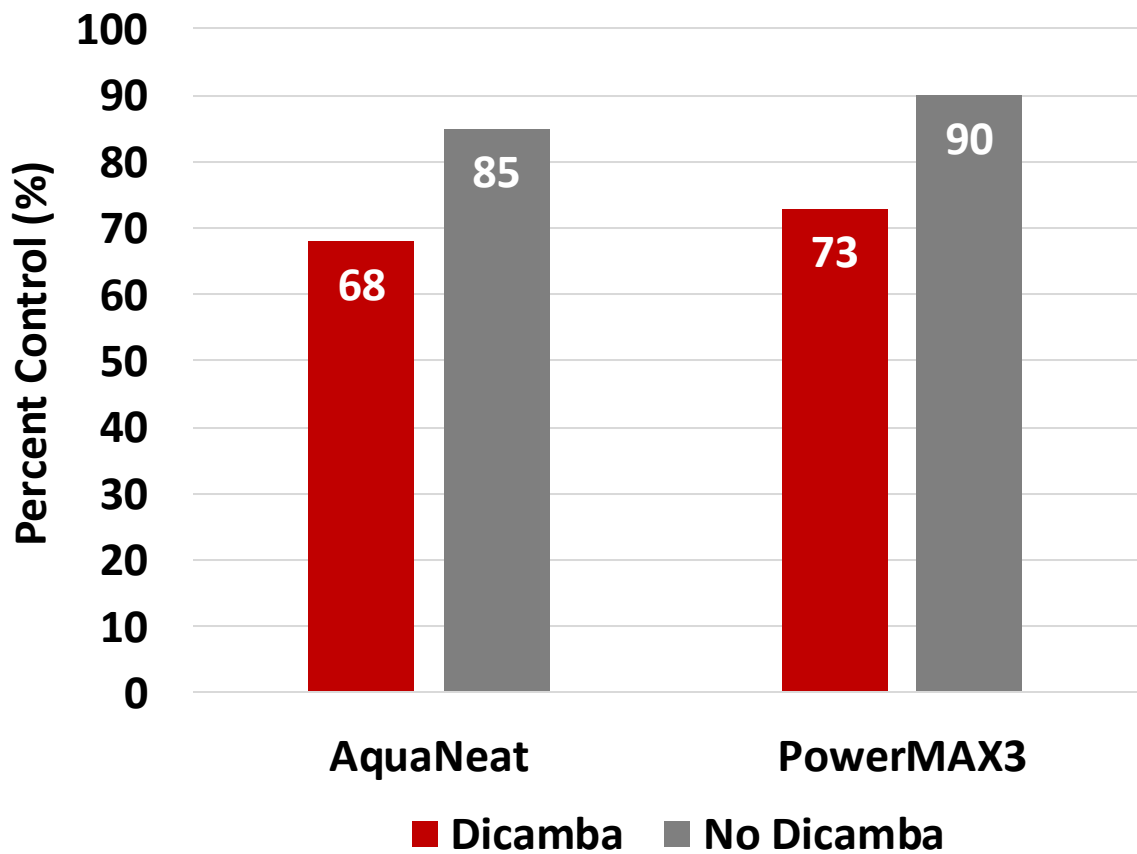
Weed Control Response to Carrier Volume at Application





Effect of Dicamba, Adjuvant, and Nozzle Type on Glyphosate Efficacy

Texas millet Control 21 DAT
Glyphosate by Dicamba



AquaNeat + Dicamba

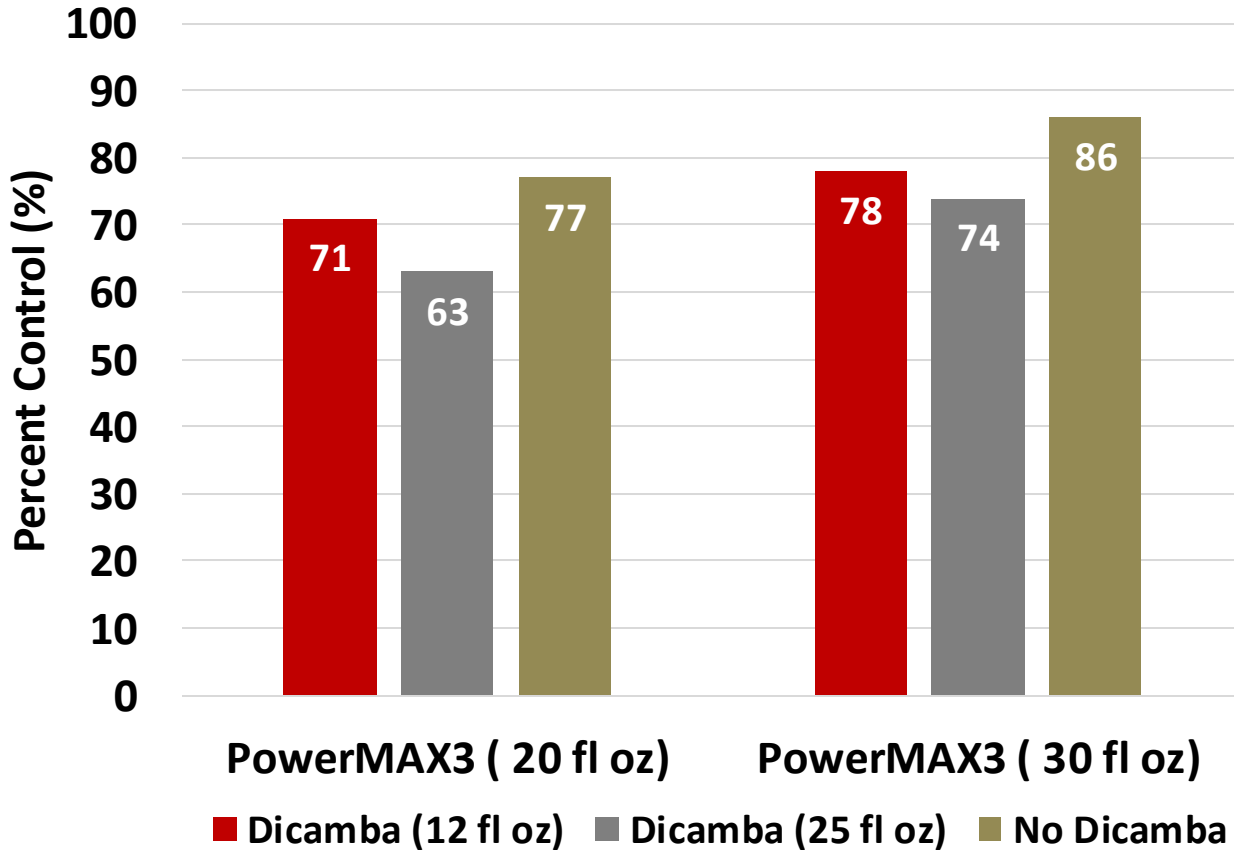


AquaNeat/No Dicamba

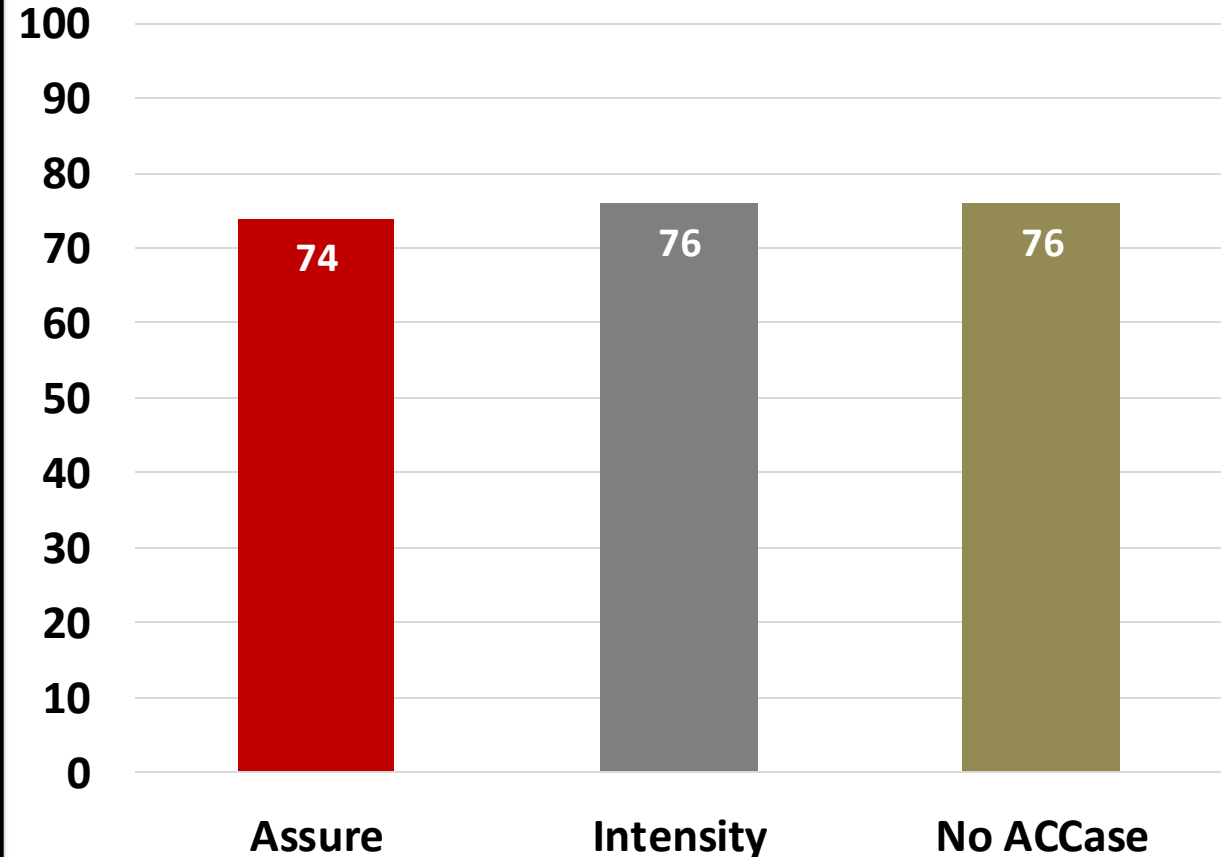


Effect of Dicamba on Glyphosate Tank Mixtures

**Texas millet Control 21 DAT
Averaged Over ACCase Herbicides**



**Texas millet Control 21 DAT
Averaged Over Glyphosate and Dicamba**

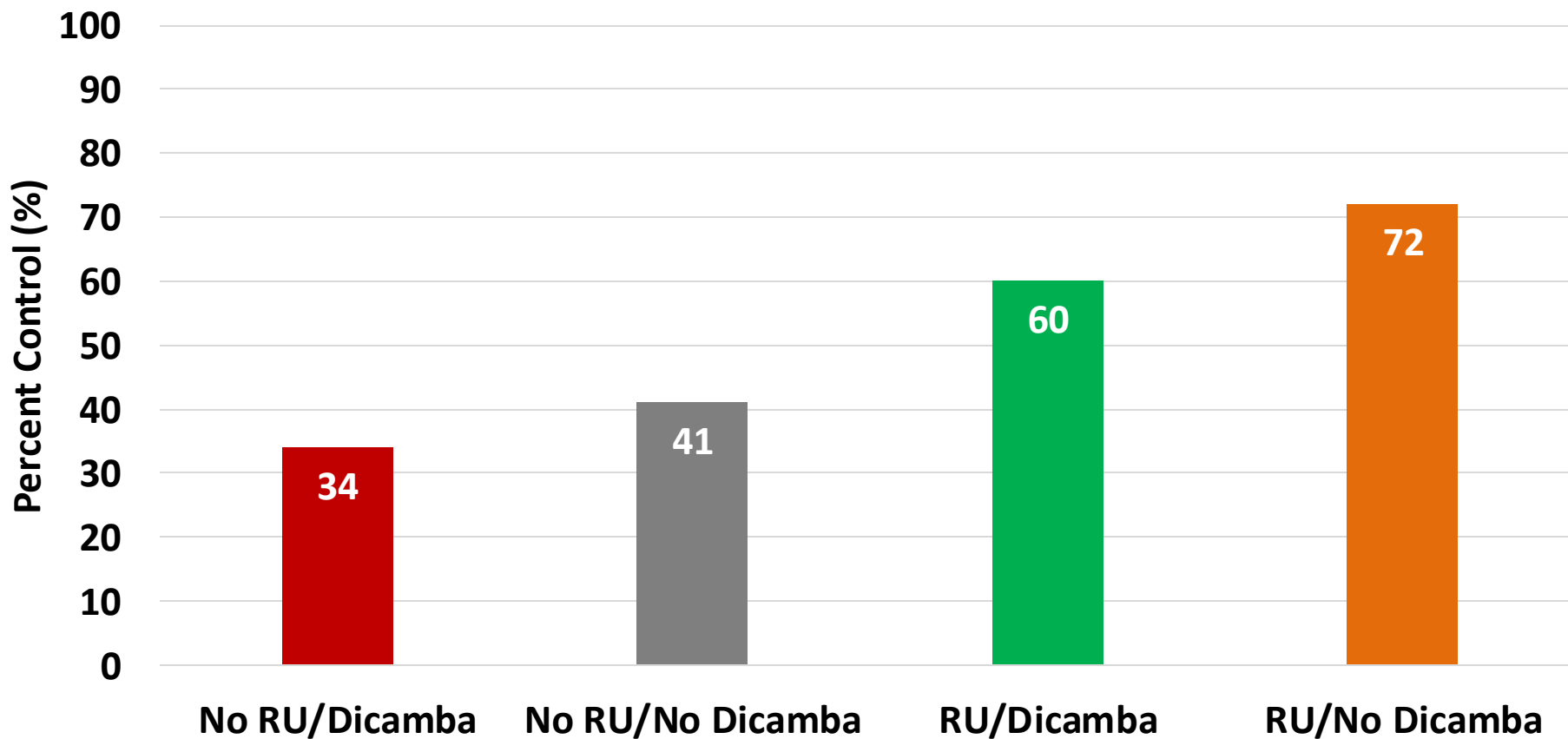


Improving Grass Control With Liberty Tank Mixtures

Texas millet Control 21 DAT
Averaged Over Herbicide Combinations

**Herbicide Combinations
Evaluated**

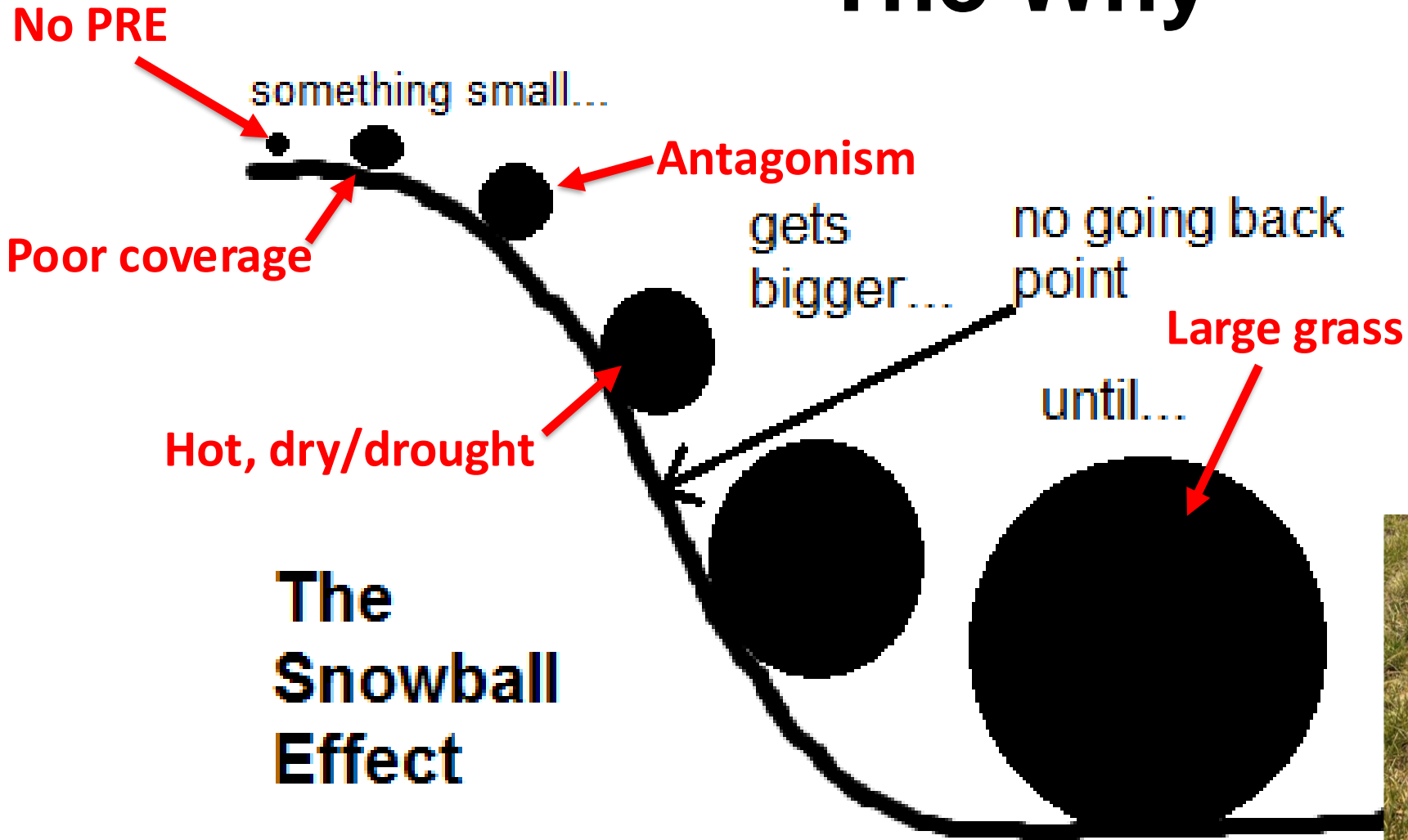
- 1) Assure II
- 2) Assure II + Liberty
- 3) Liberty
- 4) Zalo (formulation of Assure II + Liberty)



Take Home Points

- **Control of troublesome weed populations is going to be meticulous where best success will come from perfect conditions**
 - **Use appropriate nozzles**
 - **Spray at small weed sizes**
 - **Overlap residuals**
 - **FOLLOW ALL LABEL INSTRUCTIONS!**
 - **Just because the label says you can mix chemistries, doesn't mean you should**

The Why



The
Snowball
Effect

BAM!



Acknowledgements

- **MU Soil and Cropping Systems Program**
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Contact and Questions?



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