

# Weed Management in Mississippi

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# Acknowledgment

- ADAMA USA
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- RiceTec
- SePRO Corporation
- Summit Agro
- Syngenta Crop Protection
- Valent USA Corporation



# 2023 Weed Control Issues

- Italian ryegrass control
- “Non-traditional” weed species pre- and/or post-planting
- Poor grass control in all crops
- Weed management in furrow-irrigated rice
- Off-target herbicide movement
- Tank contamination/misapplication



Photo: Will Eubank



# Italian Ryegrass Control



# Italian Ryegrass Control



# Italian Ryegrass Control

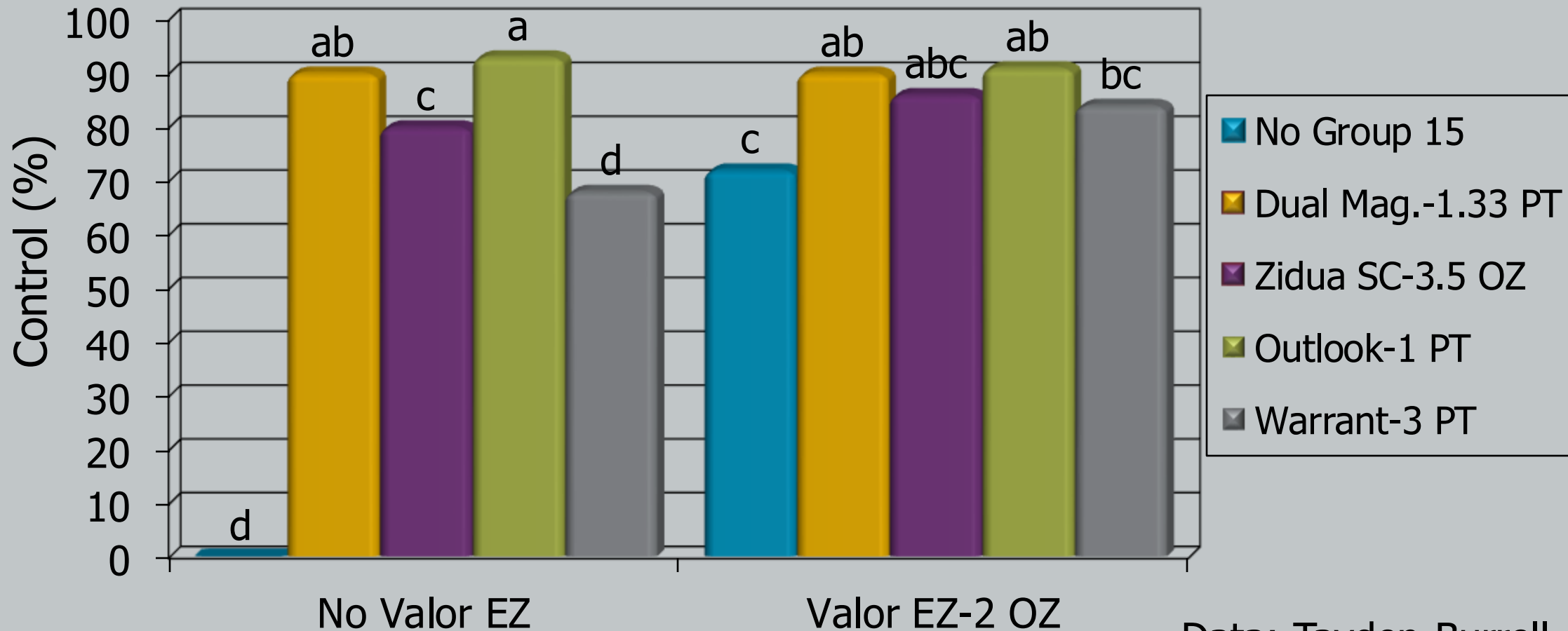


- Too large at time of herbicide application.
- Bad environment...wet, cold, cloudy, and/or frost damage.
- Target plants green but not actively growing.
- Negative interactions with herbicide mixtures.



# Italian Ryegrass Control

Italian ryegrass control 100 d after application of fall-applied residual herbicides in 2022 and 2023

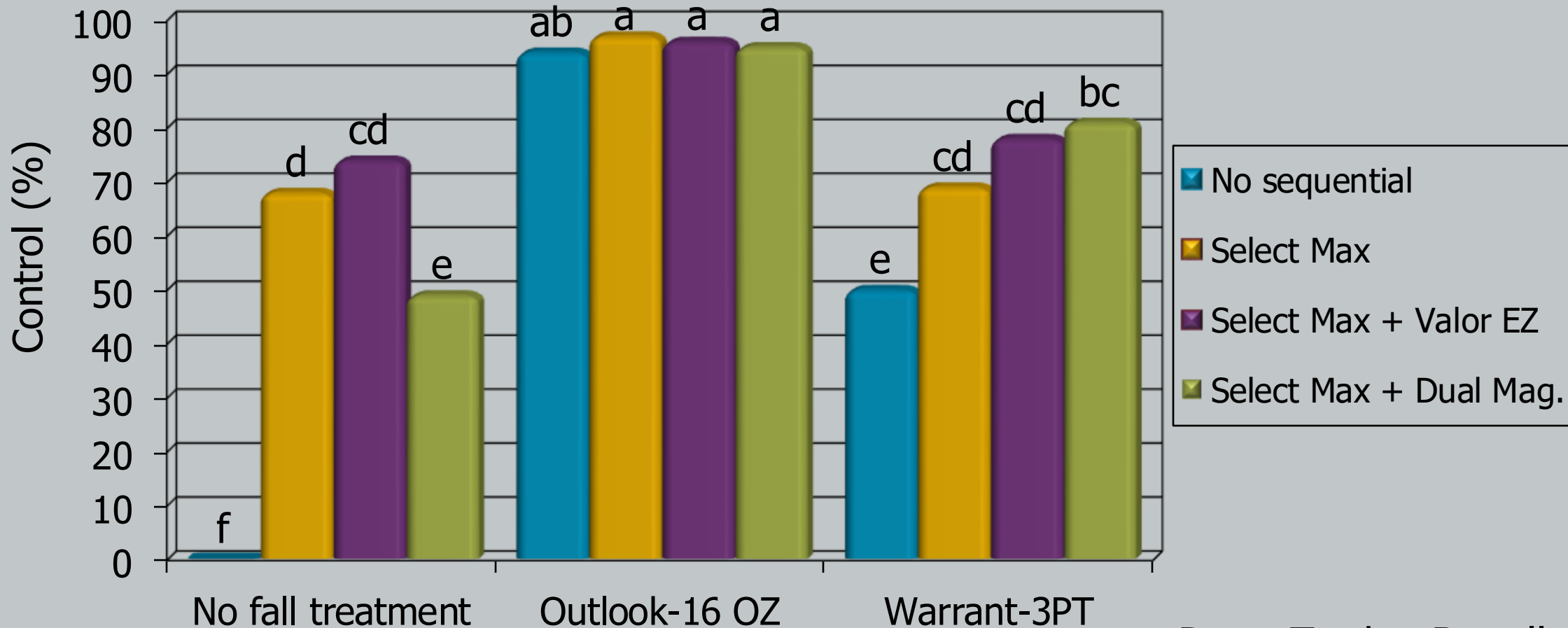


Data: Tayden Burrell



# Italian Ryegrass Control

Italian ryegrass control 35 d after sequential herbicide treatments including residual herbicides in 2022 and 2023



Data: Tayden Burrell



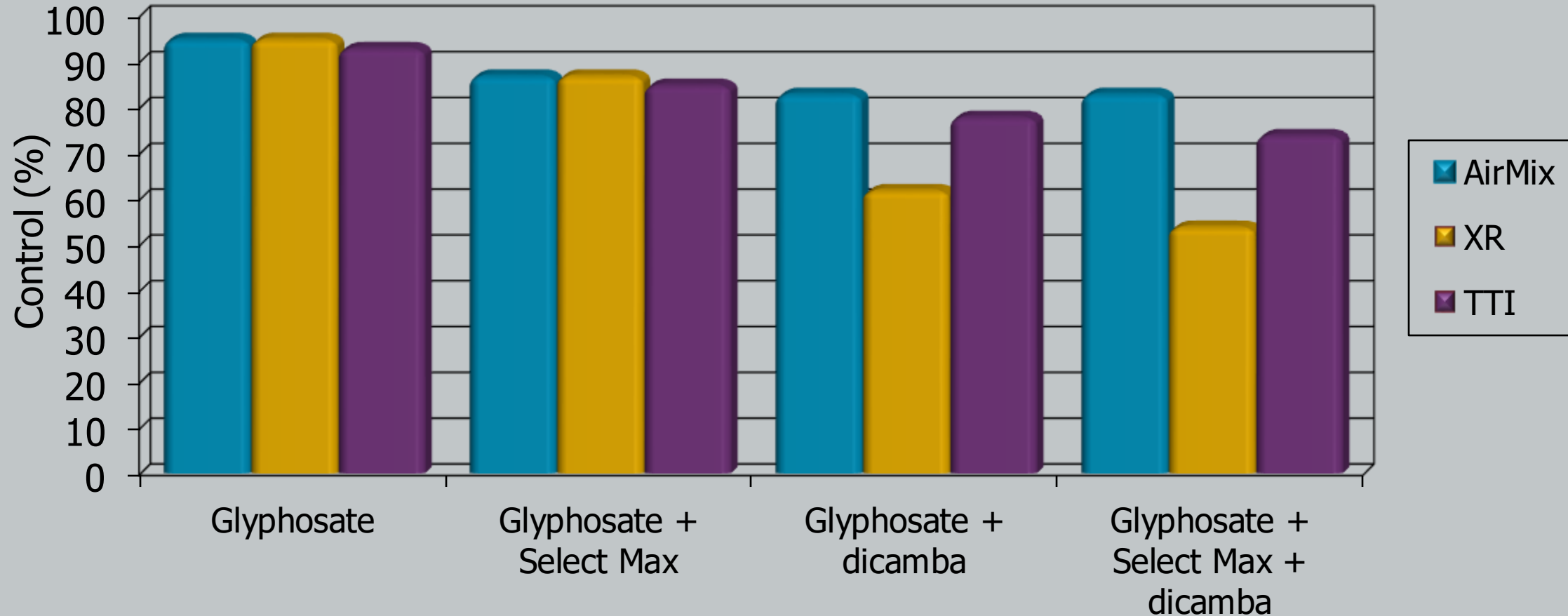


# Summer Annual Grass Control



# Summer Annual Grass Control

Barnyardgrass control 14 d after herbicide treatments applied with different nozzles



Data: Hunter Bowman



# Summer Annual Grass Control



Glyphosate; XR



Glyphosate + Select Max; XR



Glyphosate + dicamba; XR

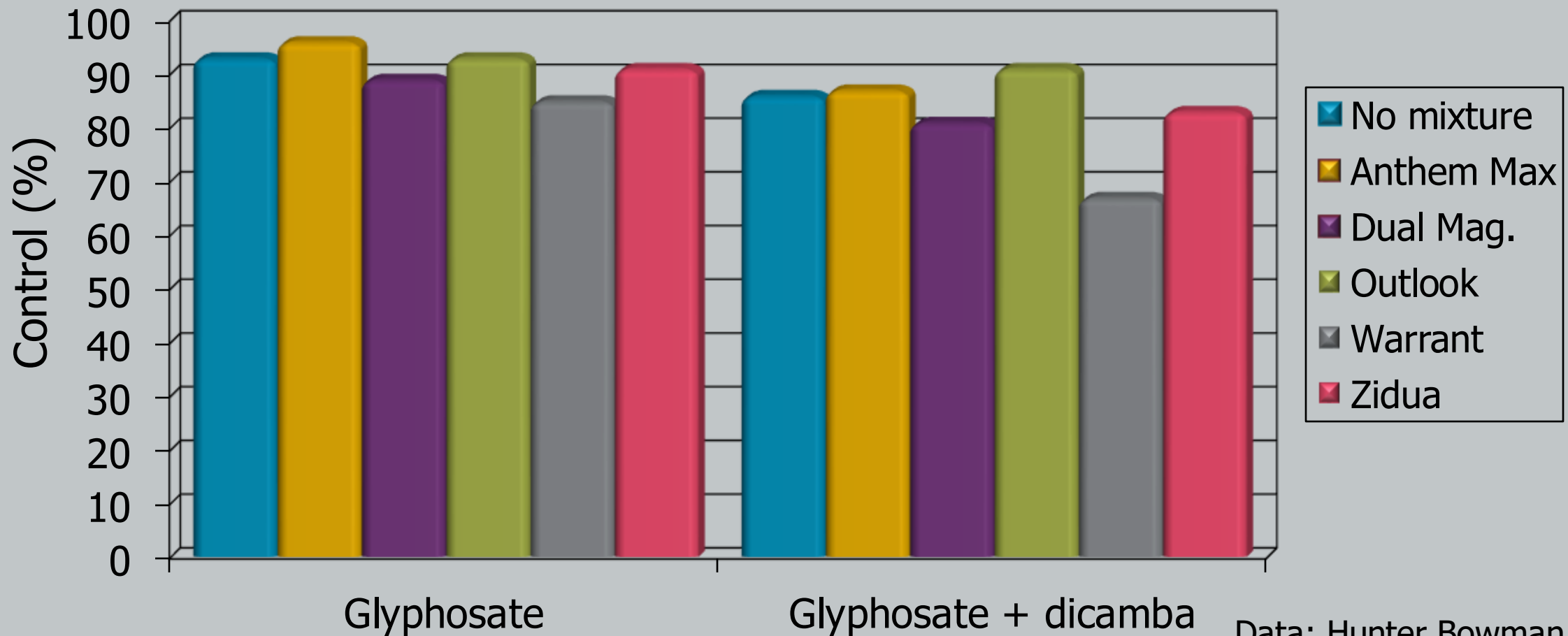


Glyphosate + Select Max + dicamba; XR



# Summer Annual Grass Control

Barnyardgrass control 14 d after application of postemergence treatments mixed with residual herbicides



Data: Hunter Bowman



# Summer Annual Grass Control



Glyphosate + Dual Mag.



Glyphosate + dicamba + Dual Mag.



Glyphosate + Outlook



Glyphosate + dicamba + Outlook



# Goosegrass Control

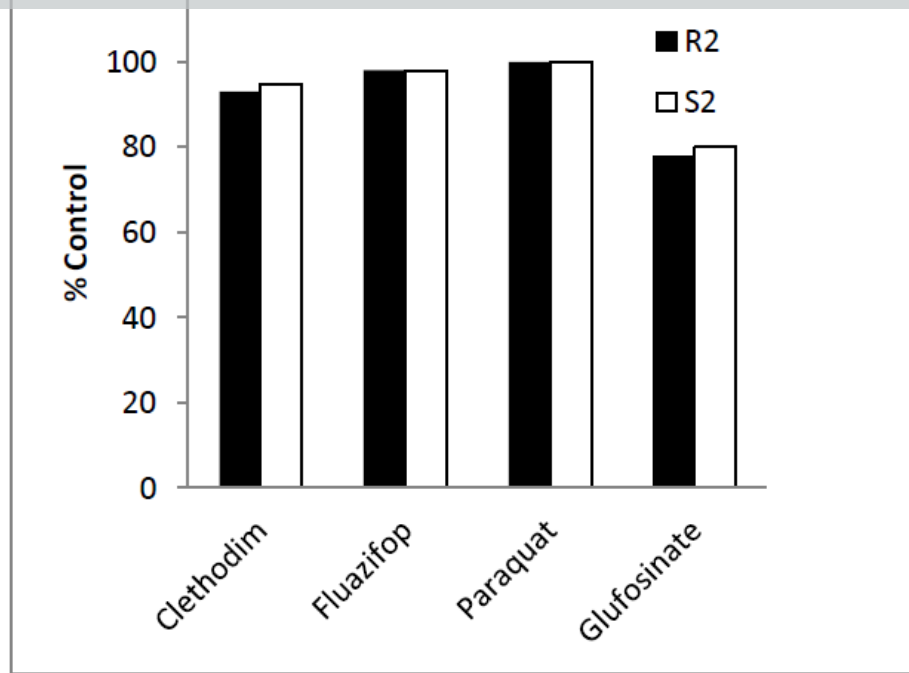


- Glyphosate controlled goosegrass 96 to 100%. (Clewis et al. 2006; Thomas et al. 2006)
- Clethodim controlled goosegrass. (Burke et al. 2004; Vidrine et al. 1995)
- Goosegrass control 52% lower with glufosinate + clethodim compared with clethodim alone. (Burke et al. 2005)



# Goosegrass Control

## Timing: 2- to 3-inch goosegrass



Glyphosate-resistant goosegrass from Mississippi (Molin et al. 2013)

Fusilade DX at 16 FL OZ/A

1 tiller (1 inch)

3 tillers (4 inches)

5 tillers (9 inches)

Table 7. Annual grass control 4 weeks after application of fluazifop and sethoxydim at five plant growth stages in the field.

Growth stage	Herbicide	Rate (kg/ha)	Goose-grass (% control)	Large crabgrass (% control)	Giant foxtail (% control)
Preemergence	Sethoxydim	0.28	0	0	0
	Fluazifop	0.07	0	0	0
		0.14	26	16	16
		0.28	38	28	24
		0.56	79	76	53
LSD (0.05) = 17 <sup>a</sup>					
Pretillering	Sethoxydim	0.28	93	95	99
	Fluazifop	0.07	85	84	79
		0.14	93	94	86
		0.28	100	100	99
		0.56	100	100	100
LSD (0.05) = 9 <sup>a</sup>					
Early tillering	Sethoxydim	0.28	100	98	99
	Fluazifop	0.07	84	55	58
		0.14	100	95	77
		0.28	100	100	97
		0.56	100	100	98
LSD (0.05) = 11 <sup>a</sup>					
Tillering	Sethoxydim	0.28	89	99	94
	Fluazifop	0.07	80	40	38
		0.14	99	65	65
		0.28	100	83	79
		0.56	100	91	90
LSD (0.05) = 18 <sup>a</sup>					
Late tillering	Sethoxydim	0.28	28	69	88
	Fluazifop	0.07	13	7	17
		0.14	67	24	33
		0.28	80	43	89
		0.56	97	58	79
LSD (0.05) = 18 <sup>a</sup>					

Annual grass response to fluazifop (Derr et al. 1985)



# Goosegrass Control



Mon, Oct 30 at 5:13 PM

I was hoping to find something that's not there. The summary is:

1. Goosegrass is hard to kill when it's hot or dry.
2. A lot of crap antagonizes clethodim
3. Don't spray goosegrass when it's got 20 tillers on it.

I could've told you all that when I started chasing that rabbit about 1:00

Mon, Oct 30 at 7:29 PM

Most of the complaints I worked this year ended up being drought or too big at app.



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# Herbicide Performance

## **Efficacy:**

- Efficacy is how well something works if done perfectly.
- Is this treatment capable of killing this target weed under specific or controlled conditions?

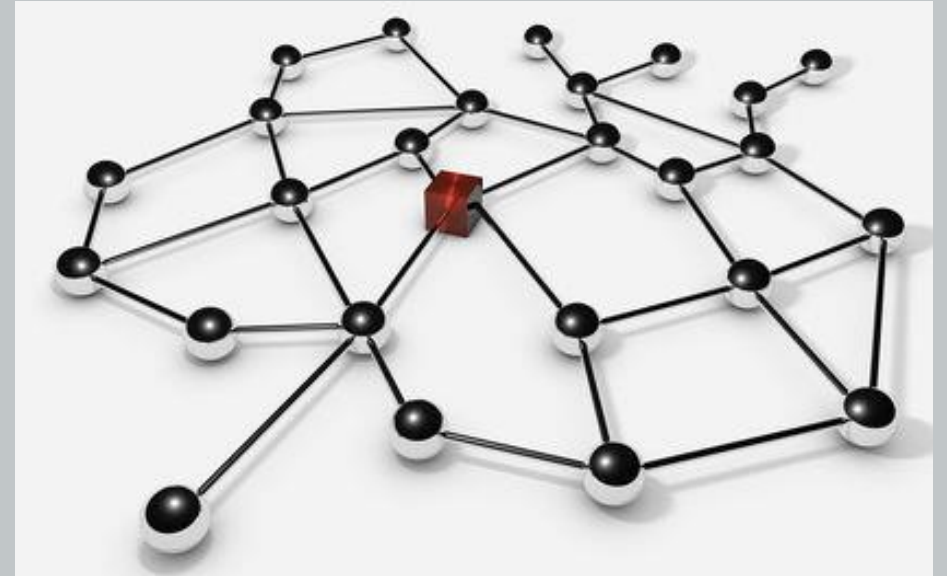
## **Effectiveness:**

- Effectiveness is how well something works based on how it is used.
- Is this treatment capable of killing this target weed across geography under present conditions?



# Complexity Theory

- Complex systems exhibit a hidden order in behavior.
- Theory was founded on attempts to rationalize behavior of large complex systems.
- A complex system has many independent agents interacting in multiple ways.
- **Because a system depends on so many intricate interactions, the number of possible reactions to any given change is infinite.**



# Herbicide Performance

## **Weed factors:**

- Life form
- Morphology
- Size
- Maturity
- Response to stress
- Crop growth rate
- Genetics

## **Environmental factors:**

- Soil/soil moisture
- Temperature
- Wind
- Plant stress
- Rain-free period/rain chance
- Humidity
- Cloud cover

## **Herbicide factors:**

- Cost
- Application rate
- Application method
- Classification
- Selectivity
- Mode of action
- Formulation
- Compatibility

## **Mixing factors:**

- Spray solution
- Mixing order
- Water quality (pH, cations)
- Adjuvants
- Water conditioners
- Drift reducing agents

## **Equipment factors:**

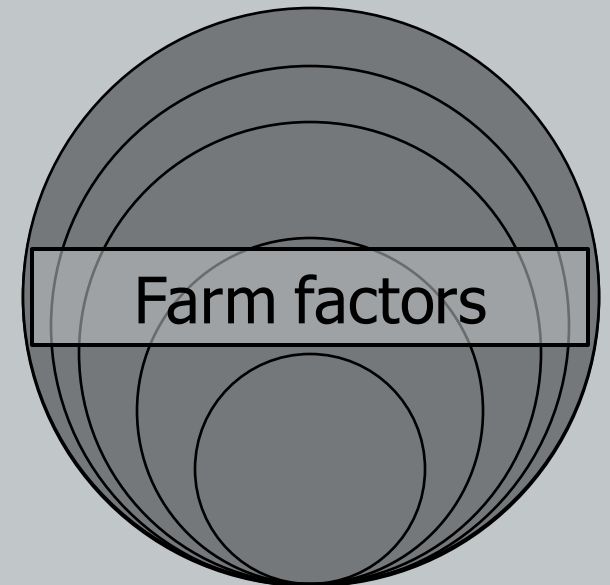
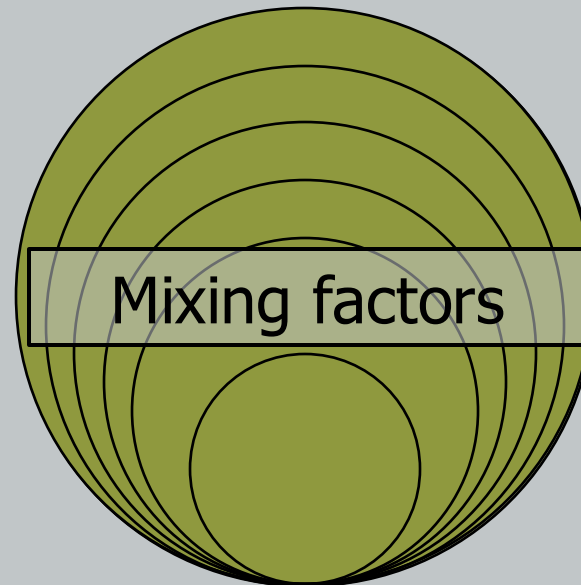
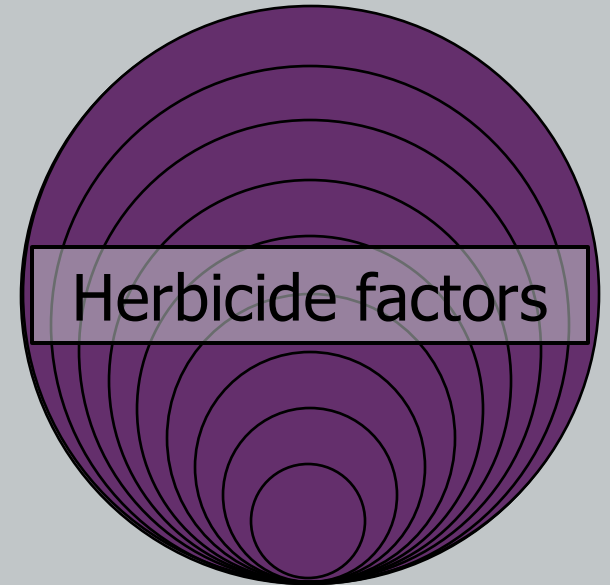
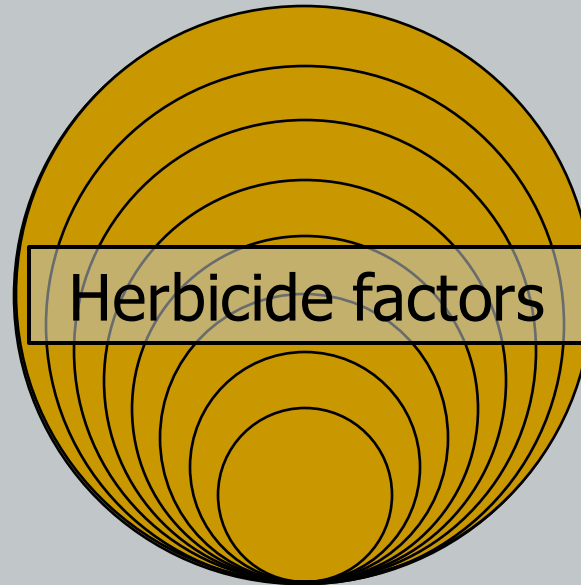
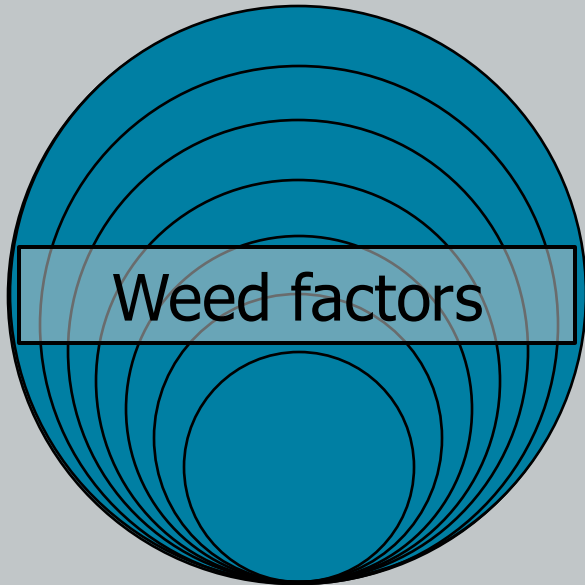
- Calibration
- Pump
- Hoses
- Strainers
- Nozzles
- Speed
- Water volume
- Pressure
- Time of day

## **Farm factors:**

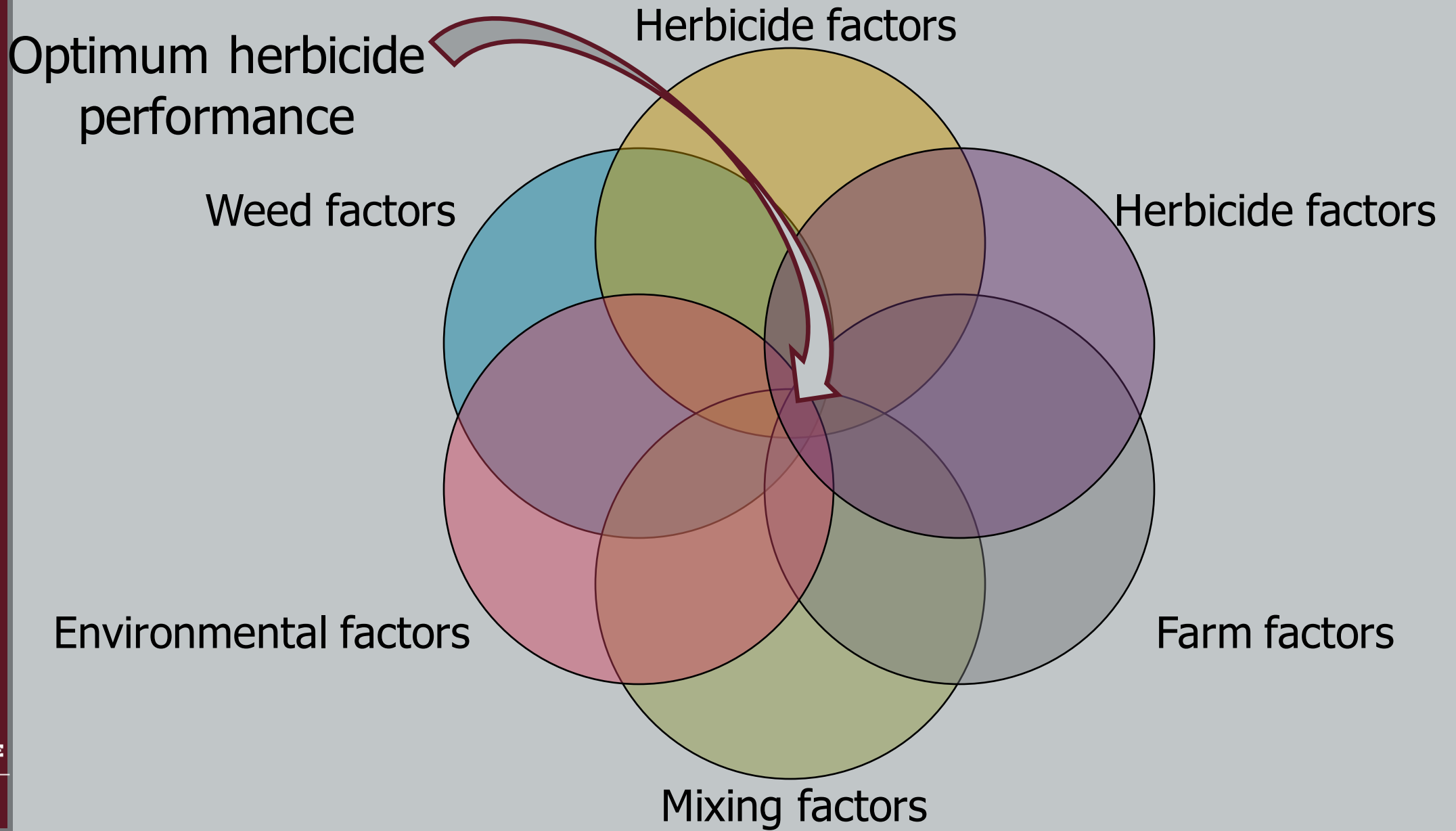
- Equipment resources
- Labor resources
- Farm size
- Farm geography
- Financial status



# Herbicide Performance



# Herbicide Performance



# Points to Consider

## **Italian ryegrass:**

- Italian ryegrass management requires two herbicide applications.
- Outlook **may** add to herbicide choices for Italian ryegrass.
- Exercise caution with herbicide mixtures in early burndown.

## **Summer annual grass:**

- We do not have a grass control problem. We have a grass control condition.
- A problem has a solution. A condition must be managed.
- Grass size at application is absolutely critical to success.
- Exercise caution with herbicide mixtures, especially under stress.



# Questions

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