

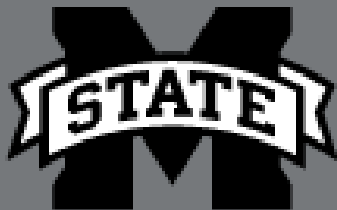
# **Herbicide Application Timing: Effect on Weed Control Efficacy**

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# Acknowledgment

- ADAMA USA
- AMVAC Chemical
- BASF Corporation
- Bayer CropScience
- Corteva Agrisciences
- FMC Corporation
- Gowan Company
- Horizon Ag



- Nichino USA
- Nutrien Ag Solutions
- Pinnacle Agriculture
- Riceco LLC
- Sipcam USA
- Syngenta Crop Protection
- United Phosphorus, Inc.
- Valent USA Corporation



# 2018 Weed Control Issues

- **Weather!!**
- Clethodim-resistant Italian ryegrass
- Off-target herbicide movement  
Clethodim, paraquat, glyphosate, Loyant, dicamba, 2,4-D
- Group 15 herbicide injury in soybean
- Poor grass control in all crops



# 2018 Weather

	Air Temperature	
	Maximum	Minimum
April:		
2018	70	48
10-yr average	77	55
May:		
2018	90	67
10-yr average	82	62



# Trimming Herbicide Costs

- Low commodity prices
- High input costs
- Effective weed control in 2017
- Injury from residual herbicides
- Other budgetary needs



# Efficacy/Selection Pressure



**Glyphosate + Prefix**



**Liberty 280**



**Glyphosate + dicamba**

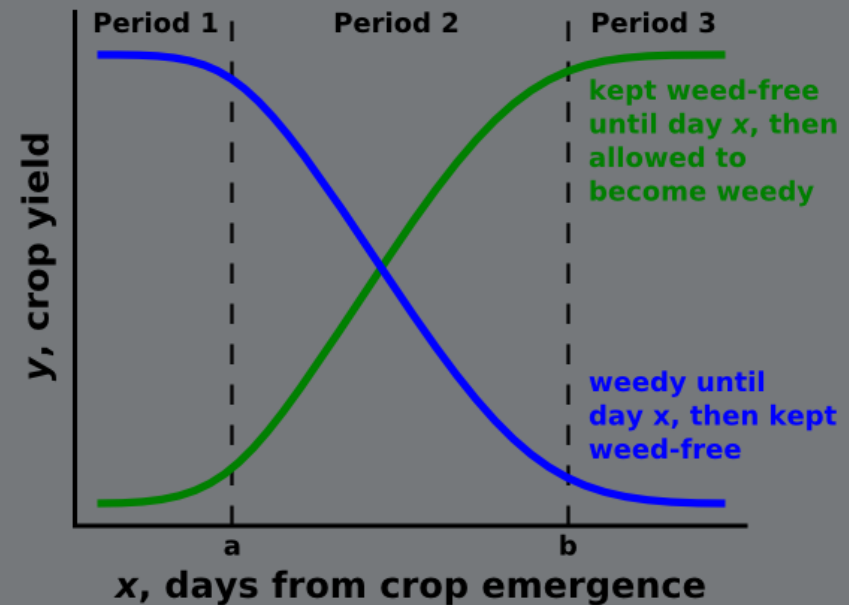


**Glyphosate + 2,4-D**

# Crop-Weed Interactions

## Critical Period of Weed Control:

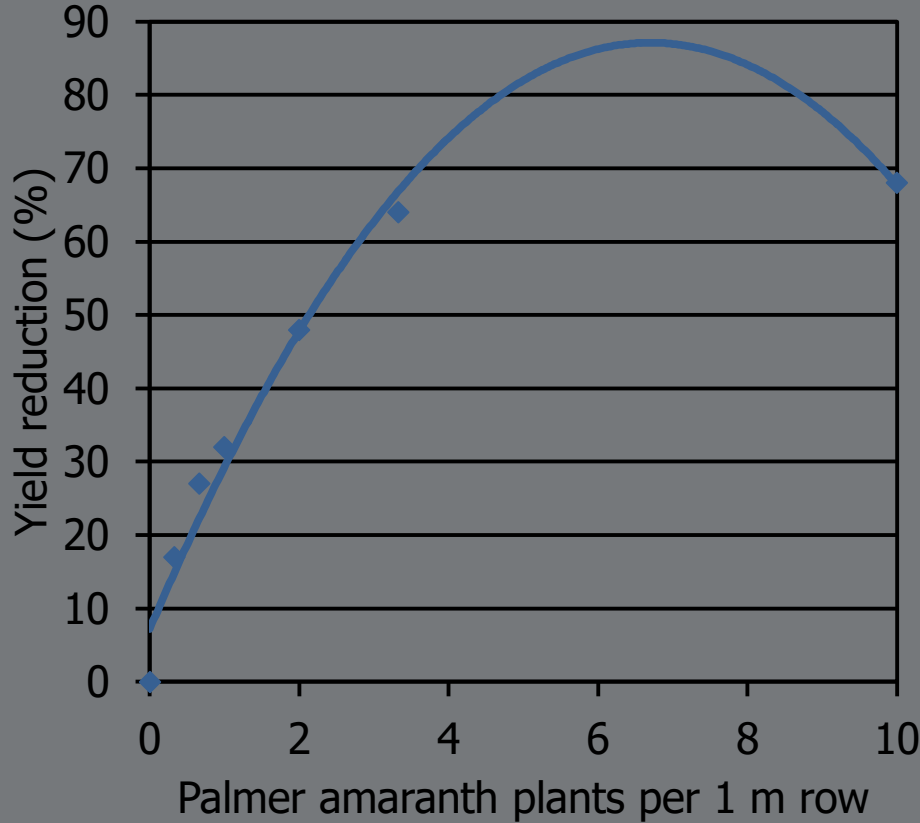
- The period of time in which weed control is necessary to avoid significant yield loss.
- Varies with crop, weed species, weed density, weed emergence timing, and environmental factors.



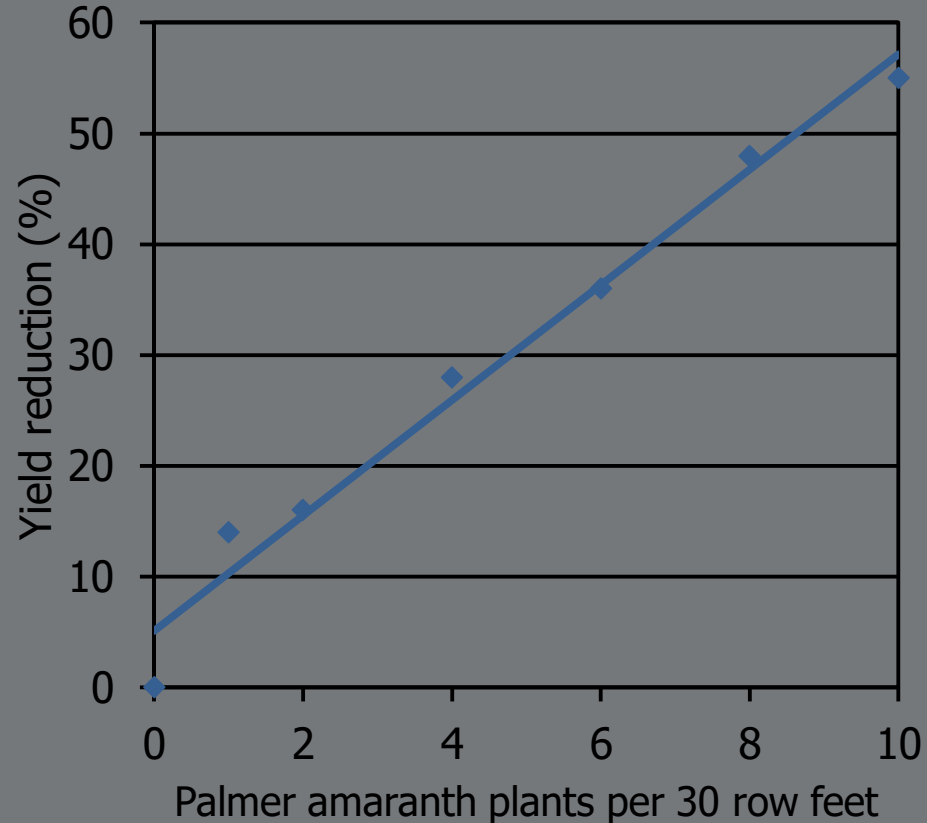
Source: Altieri 1995

# Critical Period of Weed Control

## Soybean and cotton yield loss due to interference from Palmer amaranth



Source: Klingaman and Oliver 1994



Source: Morgan et al. 2001





# Soil Seedbank



# Preplant/PRE Management



Photo: Tom Eubank

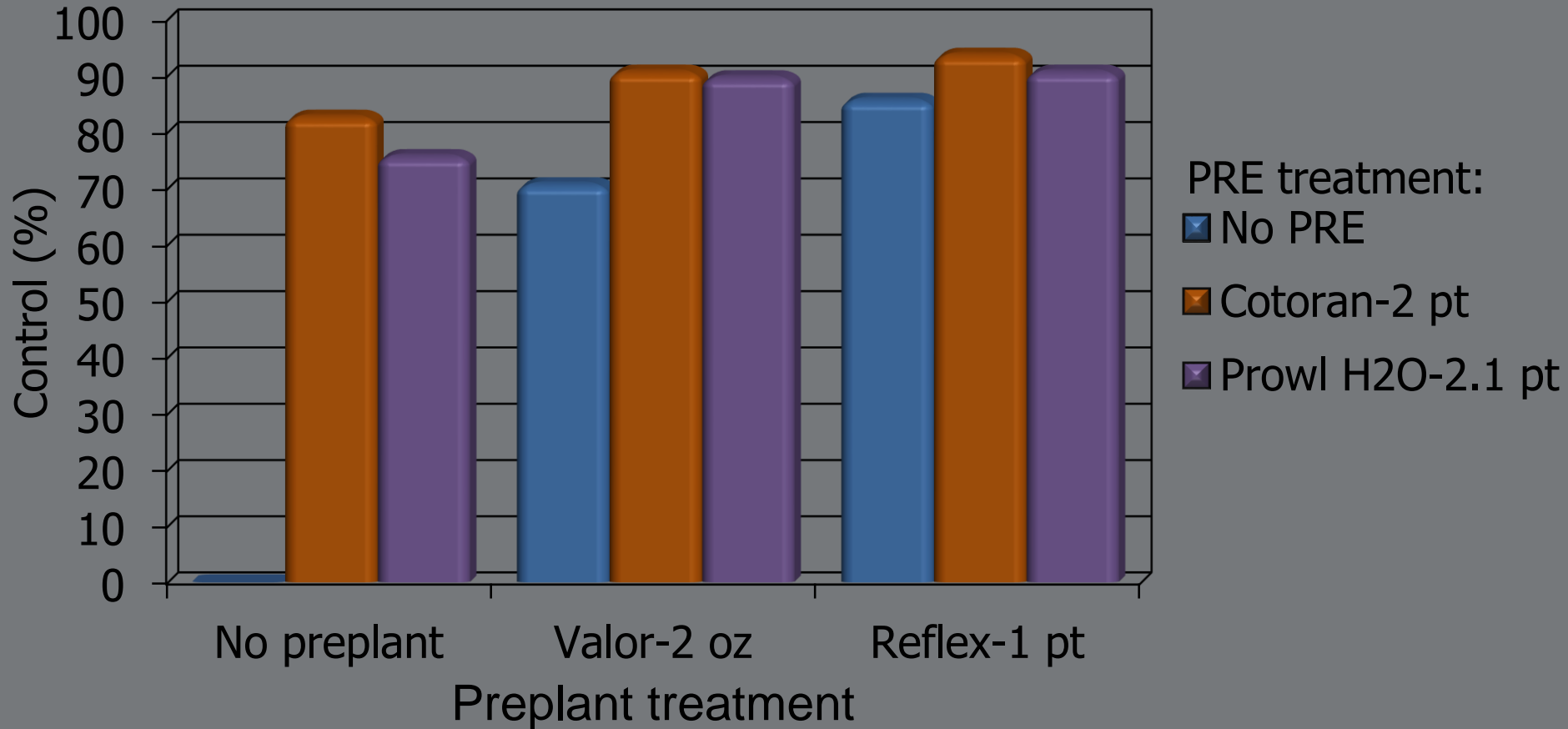


# Preplant/PRE Management



# Preplant/PRE in Cotton

Palmer amaranth control with residual herbicides evaluated 2 weeks after planting



# Preplant/PRE in Cotton



**Nontreated**



**Cotoran PRE**



**Valor 30 d preplant fb Cotoran PRE**

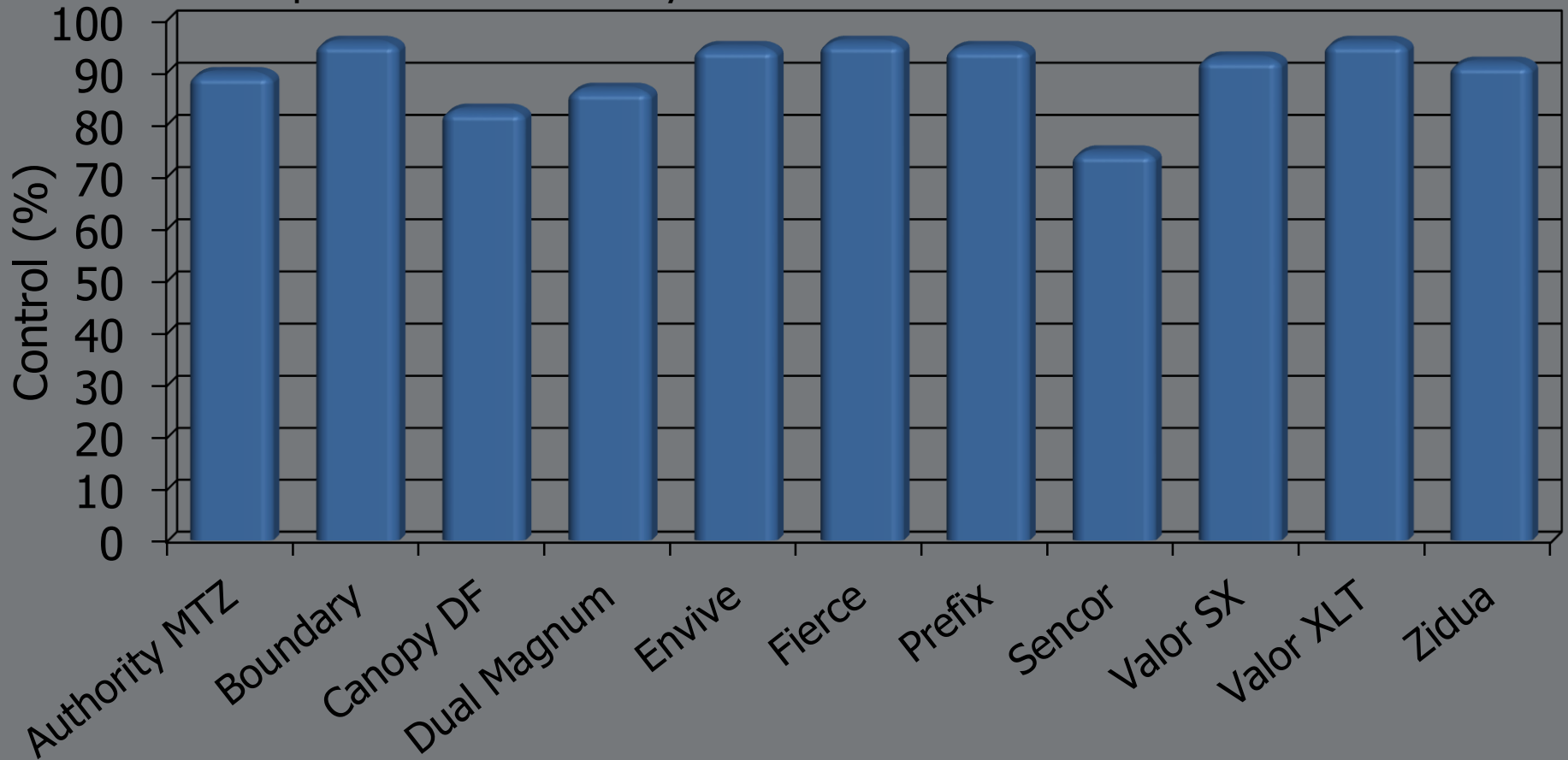


**Reflex 10 d preplant fb Cotoran PRE**

# PRE in Soybean

Palmer amaranth control 28 DAT with residual herbicides applied at soybean planting

\*Data pooled across 6 site years.



# PRE in Soybean



**Nontreated**



**Authority MTZ**



**TriCorr**

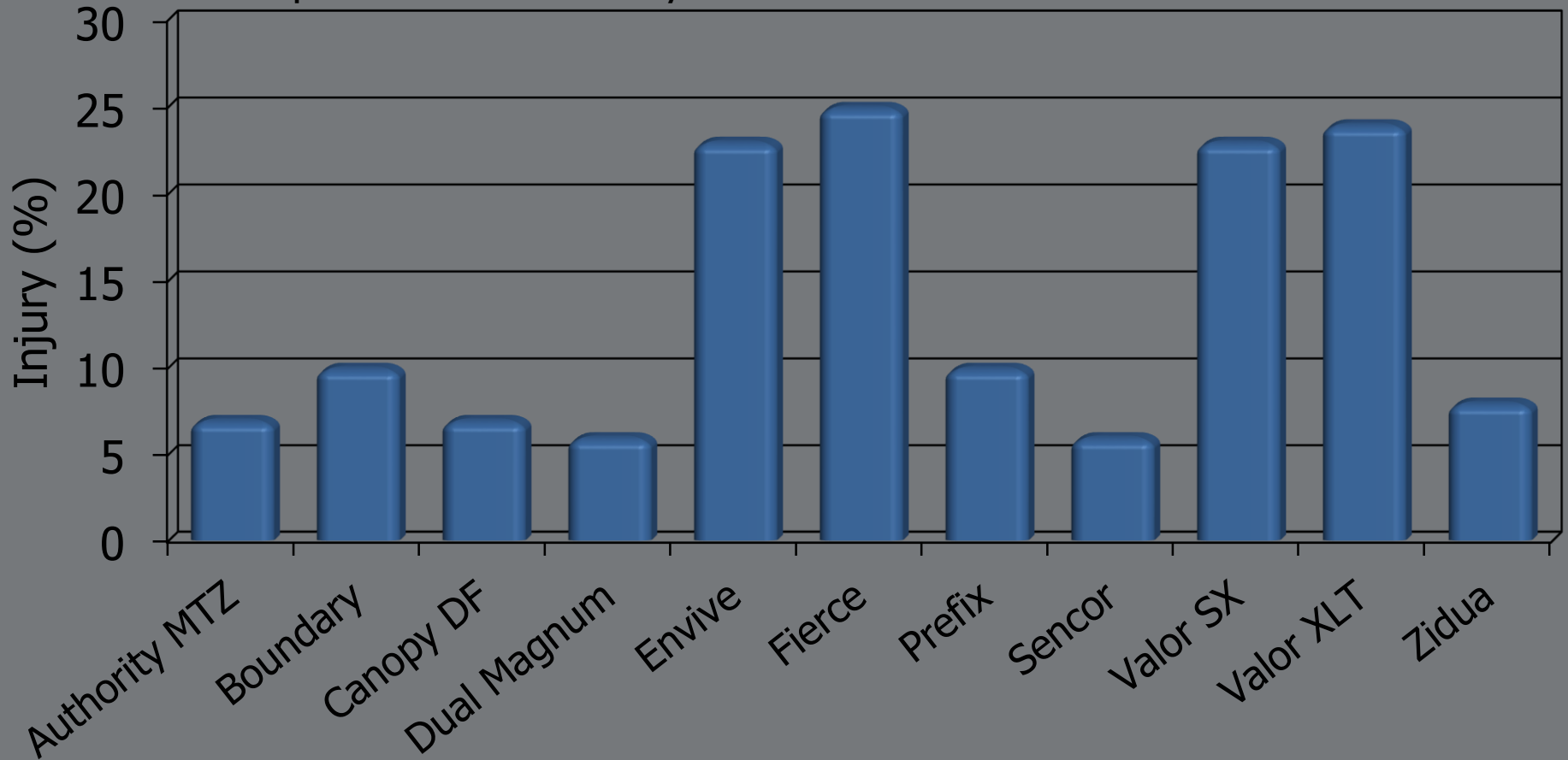


**Boundary**

# PRE in Soybean

## Soybean injury 14 DAT with residual herbicides applied at planting

\*Data pooled across 6 site years.



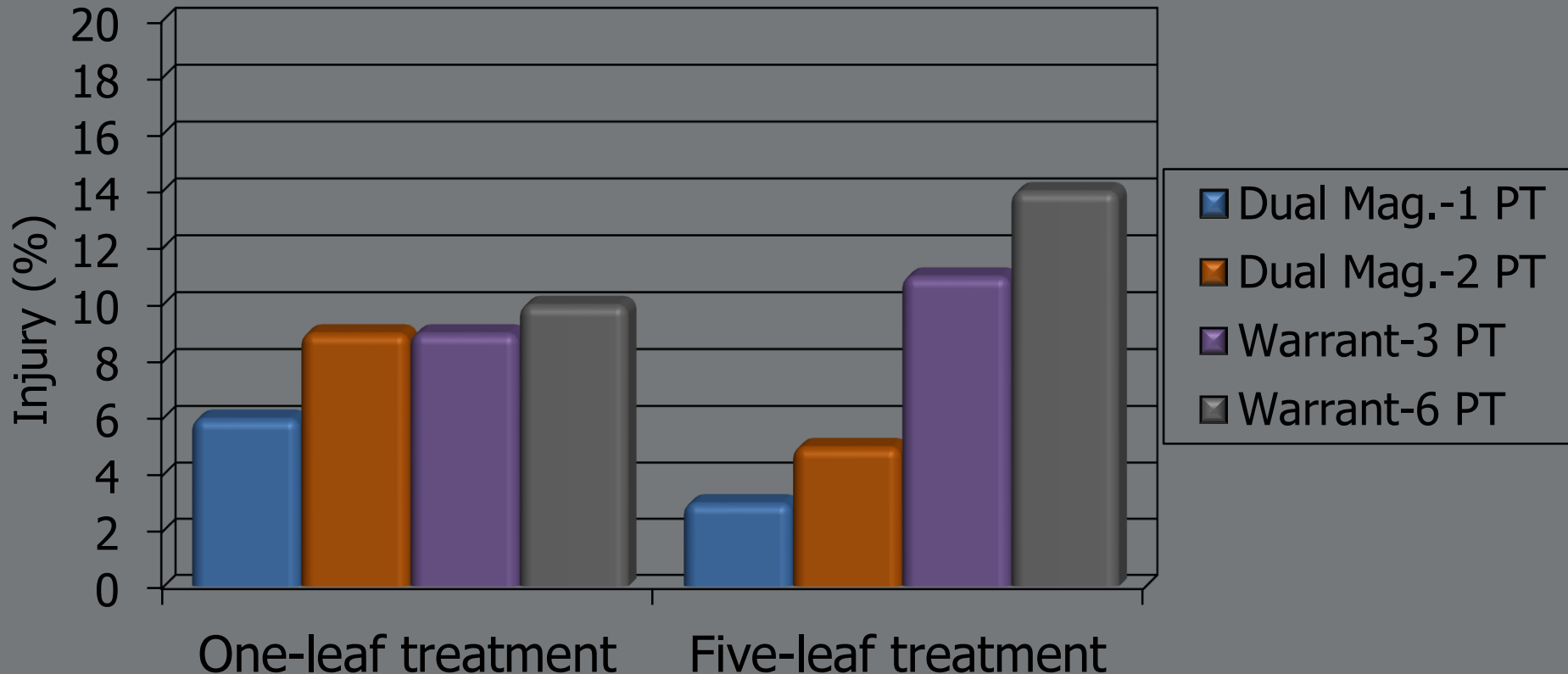


# Group 15 Herbicide Injury



# Group 15 Herbicide Injury

Cotton injury 7 days following applications of Dual Magnum and Warrant in cotton



# Group 15 Herbicide Injury



**Dual Magnum at 1 PT/A**



**Dual Magnum at 2 PT/A**



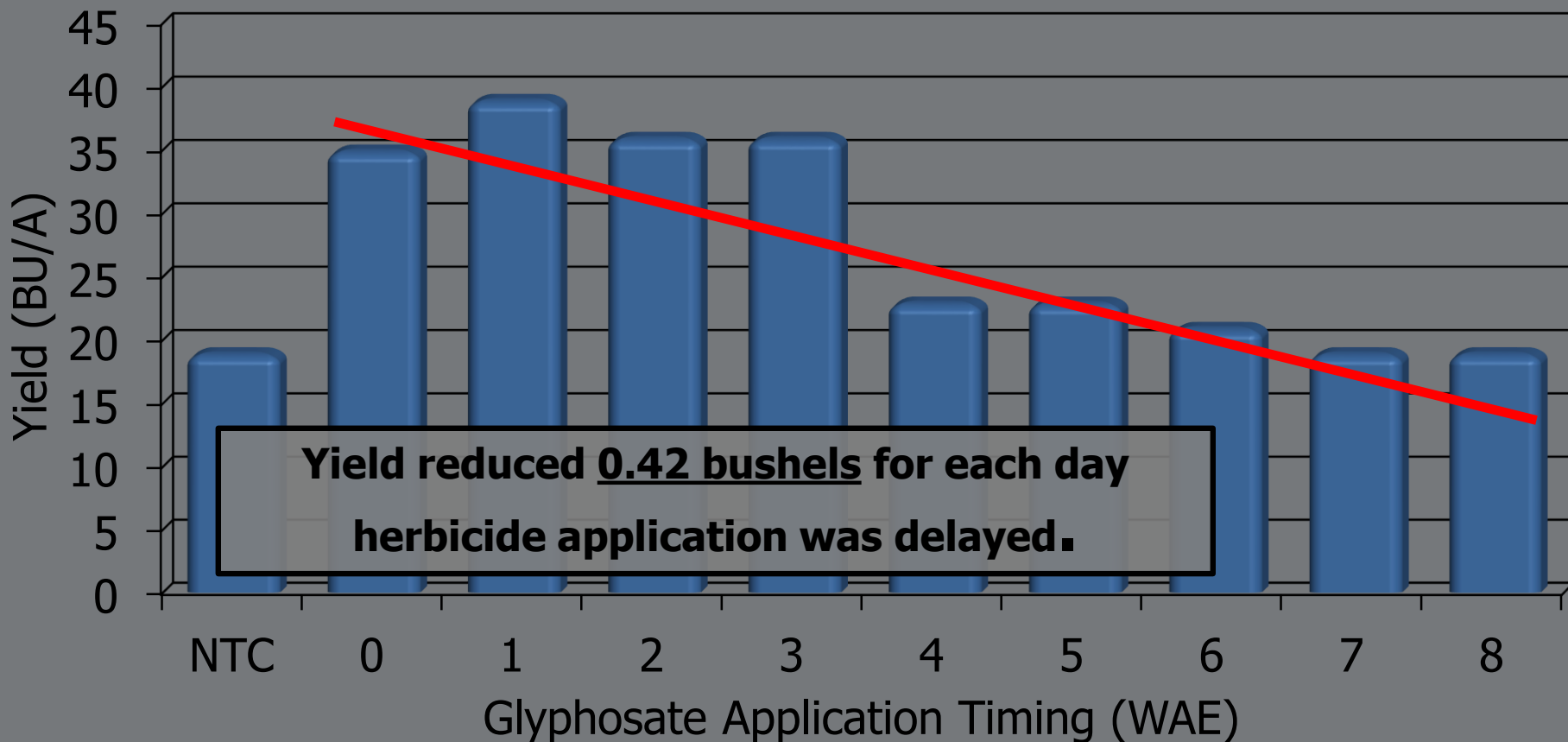
**Warrant at 3 PT/A**



**Warrant at 6 PT/A**

# POST Application Timing

## Soybean yield following glyphosate at different application timings in Crowley, LA



# POST Application Timing

Two applications of Liberty 280 at  
29 OZ/A spaced 1 wk apart



Initiated 2 WAP



Initiated 3 WAP



Initiated 4 WAP

# POST Application Timing



**Nontreated**



**glyphosate + dicamba at V3**



**glyphosate + dicamba at V6**



**Boundary followed by  
glyphosate + dicamba at V3**

# Cost of Palmer Amaranth

Comparison of prices for herbicide programs targeting Palmer amaranth in 2007 and 2018

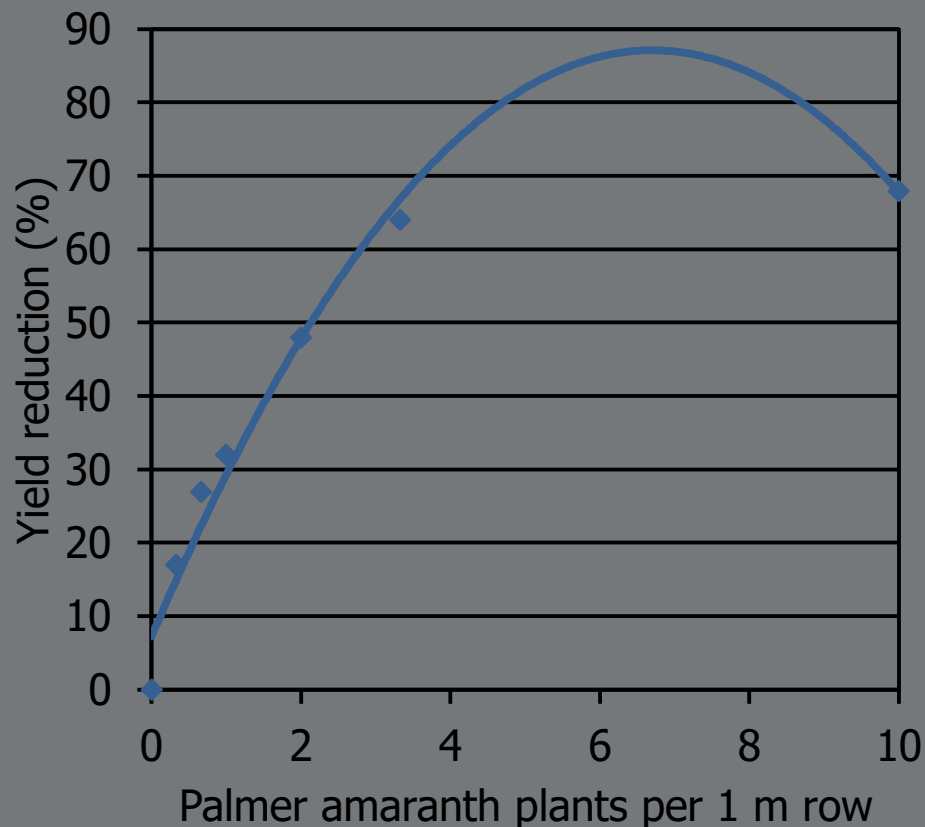
Timing	2007		2018	
	Treatment	Cost	Treatment	Cost
Burndown	Glyphosate + 2,4-D	\$10.56	Glyphosate + 2,4-D + Select Max + Valor SX	\$32.41
PRE	N/A	\$0.00	Paraquat + Boundary	\$29.62
Early-POST	Glyphosate + s-metolachlor	\$19.57	Glyphosate + Engenia + Zidua	\$36.92
Late-POST	Glyphosate	\$5.76	Glyphosate + s-metolachlor	\$19.57
<b>Total</b>		<b>\$35.89</b>		<b>\$118.52</b>

Note: All prices for 2007 and 2018 are from MSU-ES 2019 Soybean Planning Budget.



# Cost of Palmer Amaranth

## Soybean yield loss due to interference from Palmer amaranth



- **15% yield reduction**
- **7.5 BU/A loss on 50 BU/A crop**
- **\$64.50/A gross loss at \$8.60/BU soybean price**

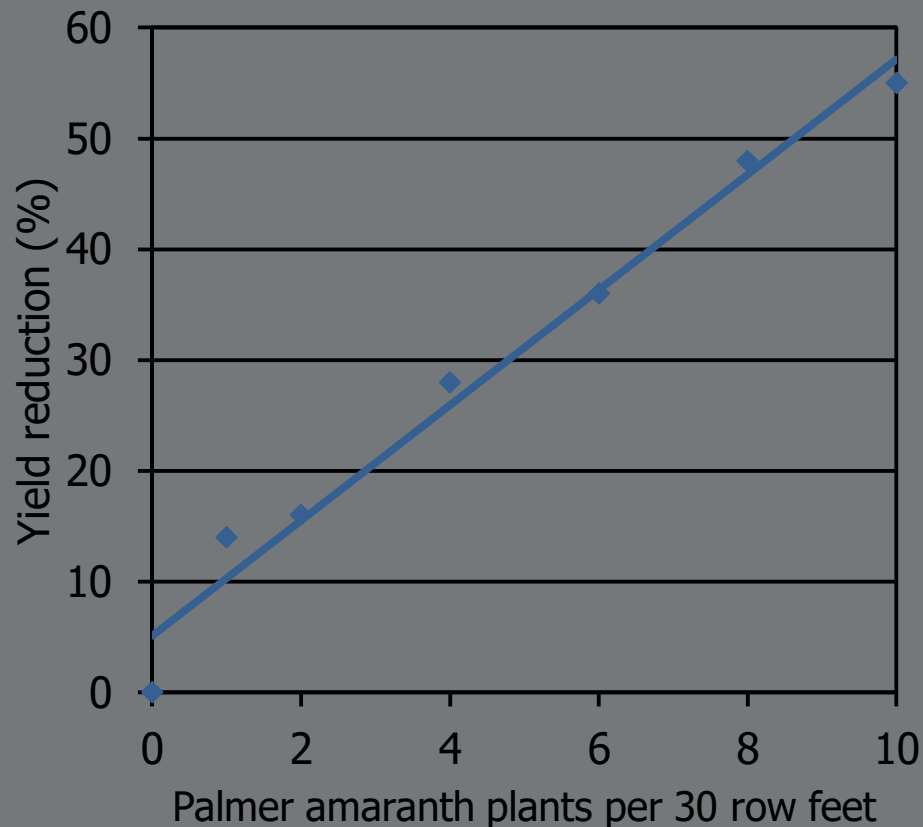




# Cost of Palmer Amaranth

## Cotton yield loss due to interference from Palmer amaranth

- **15% yield reduction**
- **150 lb/A loss on 1,000 lb/A crop**
- **\$114/A gross loss at \$0.76/lb cotton price**





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