Herbicide and Adjuvant Tank Mixes With Glyphosate For Weed Control

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Introduction

- **All glyphosate labels recommend the addition of ammonium sulfate (AMS)**
  - **Ties up cations that could interact with the glyphosate molecule**
  - **Lowers spray solution pH**
- **Several products (AMS replacements) are available to applicators**

Objectives

- **Evaluate AMS and AMS replacements on glyphosate efficacy**
- **Evaluate the effect of carfentrazone and 2,4-D formulations on glyphosate efficacy**

Methods

- **Experiments were established, three near Manhattan and two near Garden City, Kansas**
- **All control rating are based on visual evaluations 2 wk (Garden City) or 4 wk (Manhattan) after application.**

Materials & Methods

- **Manhattan, 3 experiments**
- **Spray Volume: 15 gpa**
- **Water Hardness: 103 mg/L Total Hardness as $CaCO_3$ ~6 grains/gal**
- **Application:** **7/1, 7/1** **7/12/05**
  - **Velvetleaf:** **6-10”** **6-12”**
  - **Sorghum:** **18”** **16”**
  - **Corn:** **24”** **20”**
  - **Sunflower:** **12-18”** **12-16”**
  - **Crabgrass** **2-4”** **--**

Materials & Methods

- **Garden City, 2 experiments**
- **Spray Volume: 10 gpa**
- **Water Hardness: 140 mg/L Hardness as $CaCO_3$ ~8 gr/gal**
- **Application:**

	Experiment 1	Experiment 2
	7/18/05, 70F, 78% RH	7/22/05, 68 F, 82% RH
Palmer amaranth:	2 to 6-in	3 to 8-in
vol. wheat:	3.5 to 4-lf	4 to 4.5-lf

Results

- **AMS replacement evaluations**

Weed control with ammonium sulfate replacements and glyphosate evaluated 2 WAT, Garden City (Experiment 1).

Treatment	Rate	PAAM	VWHT
		------- (% control) -------	
Roundup WMax +:	**0.38 lb ae**	**74**	**100**
N PAK AMS	**5% v/v**	**97**	**100**
Class Act NG	**2.5% v/v**	**90**	**100**
Alliance	**1.25% v/v**	**89**	**100**
Choice	**0.5% v/v**	**60**	**100**
Request	**0.5% v/v**	**74**	**100**
Destiny	**2.5% v/v**	**85**	**100**
Guardian	**0.25% v/v**	**72**	**100**
LSD (0.05)		**7**	**NS**

Weed control with glyphosate plus AMS replacement adjuvants at 4 WAT, Manhattan, KS (Experiment 2).

Treatment	Rate	Velvet-leaf	Sorghum	Corn	Sun-flower
		----------(% control)----------			
Roundup WMax +:	0.28 lb ae	40	70	67	90
AMS	2 % w/w	78	95	98	97
Class Act NG	2.5% v/v	65	95	98	97
Alliance	1.25% v/v	60	93	93	97
Choice	0.5% v/v	40	75	67	92
Request	0.5% v/v	47	77	78	97
Speedway	0.5% v/v	52	75	73	97
Blendmaster	1% v/v	53	82	85	98
US 500	0.25% v/v	43	72	77	92
Citron	2.2 lb/100G	47	77	75	95
N-Tank	0.5% v/v	75	95	98	100
LSD (5%)		9	9	7	6

Weed control with glyphosate plus AMS replacement adjuvants at 4 WAT, Manhattan, KS (Experiment 3).

Treatment	Rate	Velvet-leaf	Sorghum	Corn	Sun-flower
		----------(% control)----------			
Roundup WMax +:	0.28 lb ae	40	60	52	73
AMS	2 % w/w	77	90	83	92
Class Act NG	2.5% v/v	72	90	82	90
Alliance	1.25% v/v	65	83	77	90
Choice	0.5% v/v	30	47	42	60
Request	0.5% v/v	37	58	50	75
Speedway	0.5% v/v	42	50	50	85
Blendmaster	1% v/v	43	57	53	80
US 500	0.25% v/v	33	50	47	70
Citron	2.2 lb/100G	37	40	40	78
N-Tank	0.5% v/v	62	68	67	90
LSD (5%)		7	9	7	7

Roundup WeatherMax
0.28 oz ae

Roundup WeatherMax + AMS
0.28 oz + 2 % w/w (17 lb/100 gal)

Roundup WeatherMax + Class Act NG
0.28 oz + 2.5 % v/v

Roundup WeatherMax + Alliance 0.28 oz + 1.25 % v/v

Roundup WeatherMax + Choice
0.28 oz + 0.5% v/v

Roundup WeatherMax + Request 0.28 oz + 0.5 % v/v

Roundup WeatherMax + Citron
0.28 oz + 2.2 lb/100 gal

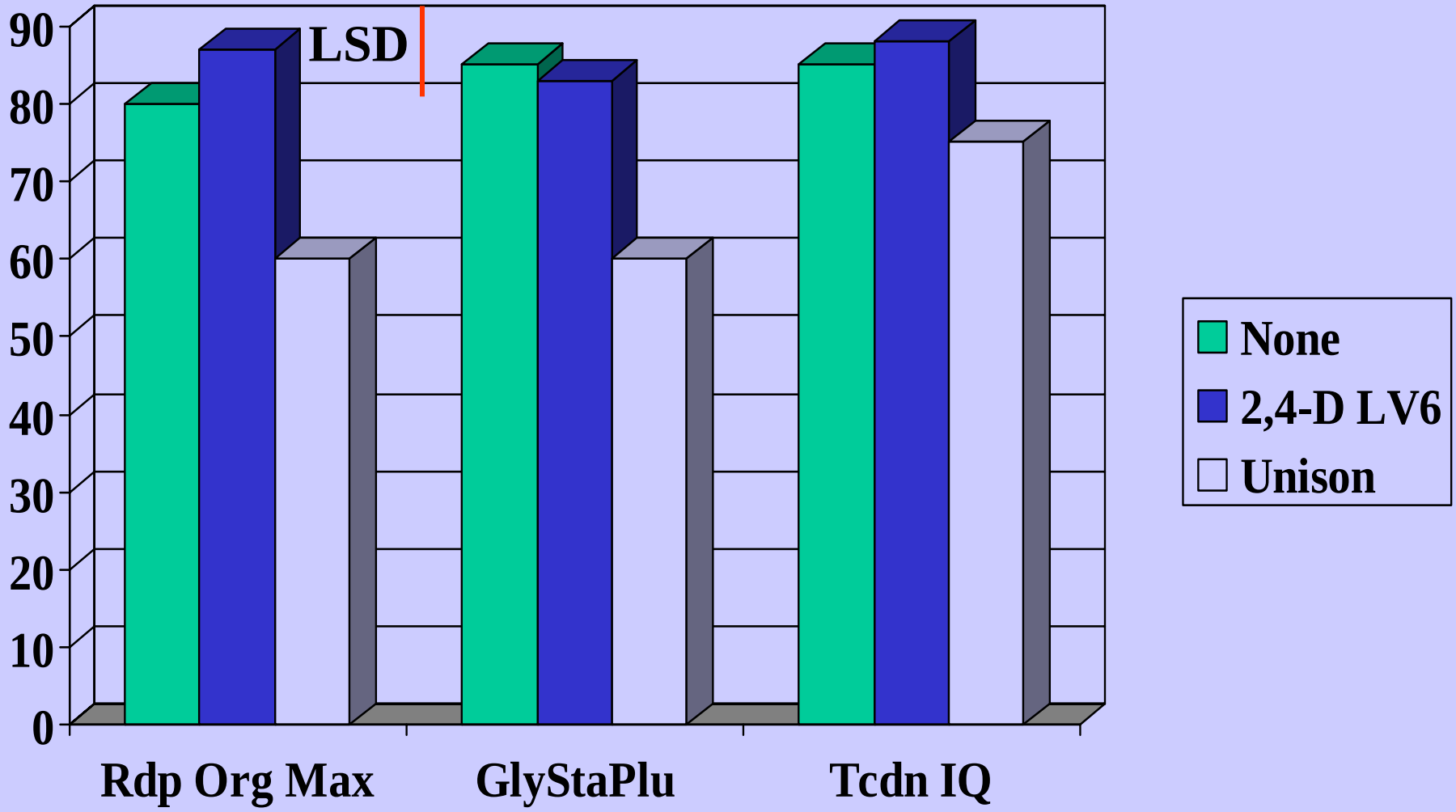
Results

- **Effect of carfentrazone and 2,4-D formulations on glyphosate**

Weed control with adjuvants, glyphosate and carfentrazone (Experiment 2).

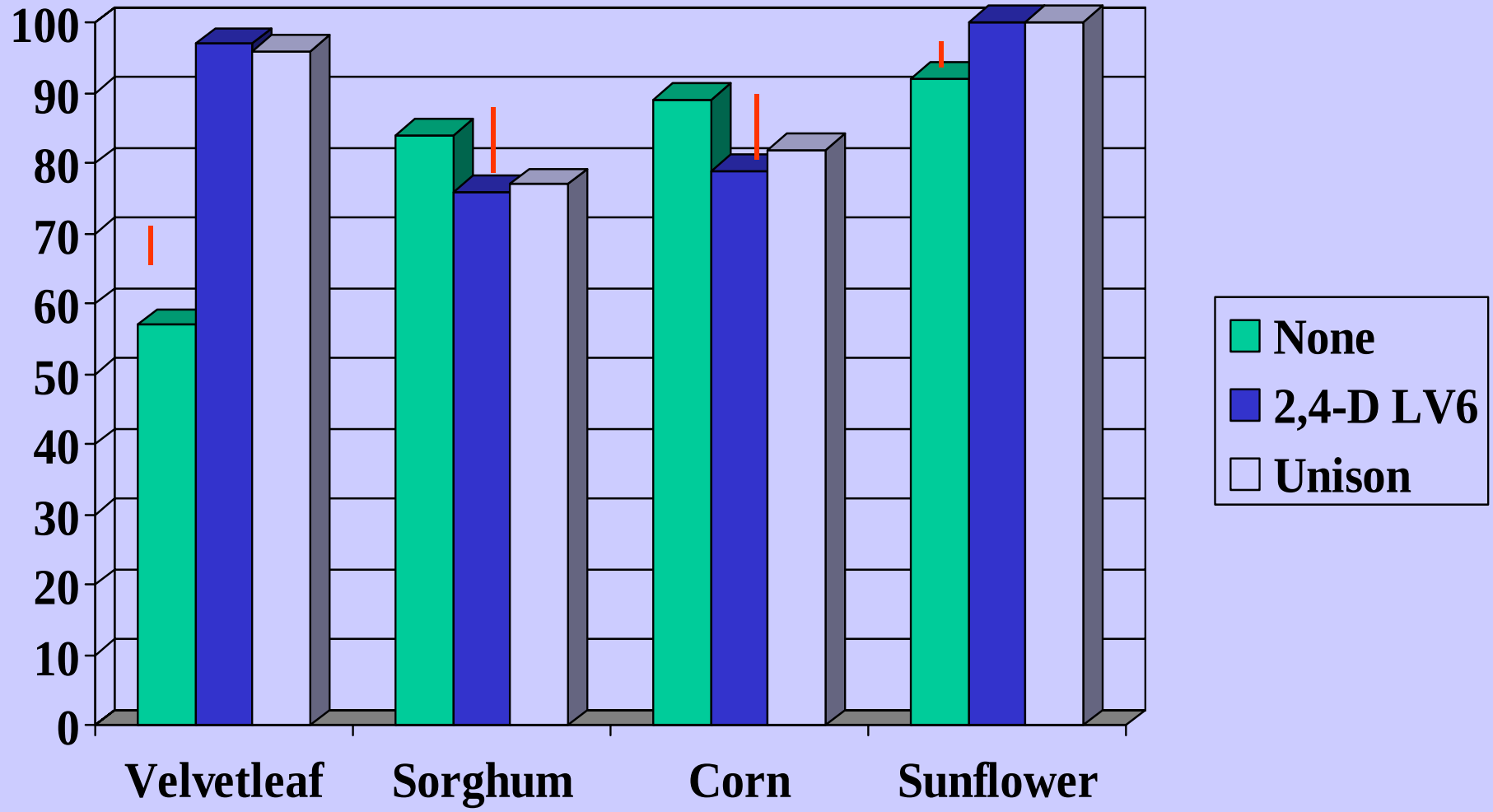
Cornerstone	Rate	PAAM	VWHT
		------- (% control) -------	
Cornerstone +	0.28 lb ae	76	76
Aim EW	0.007 lb	80	61
Preference	0.25% v/v	78	76
Aim EW + Pref	0.007lb+0.25%	79	61
Pref+Interlock	0.25%+4 oz	78	82
LSD (5%)		NS	11

Glyphosate, Class Act NG, and 2,4-D tank mixes for large crabgrass control, Manhattan Exp1.



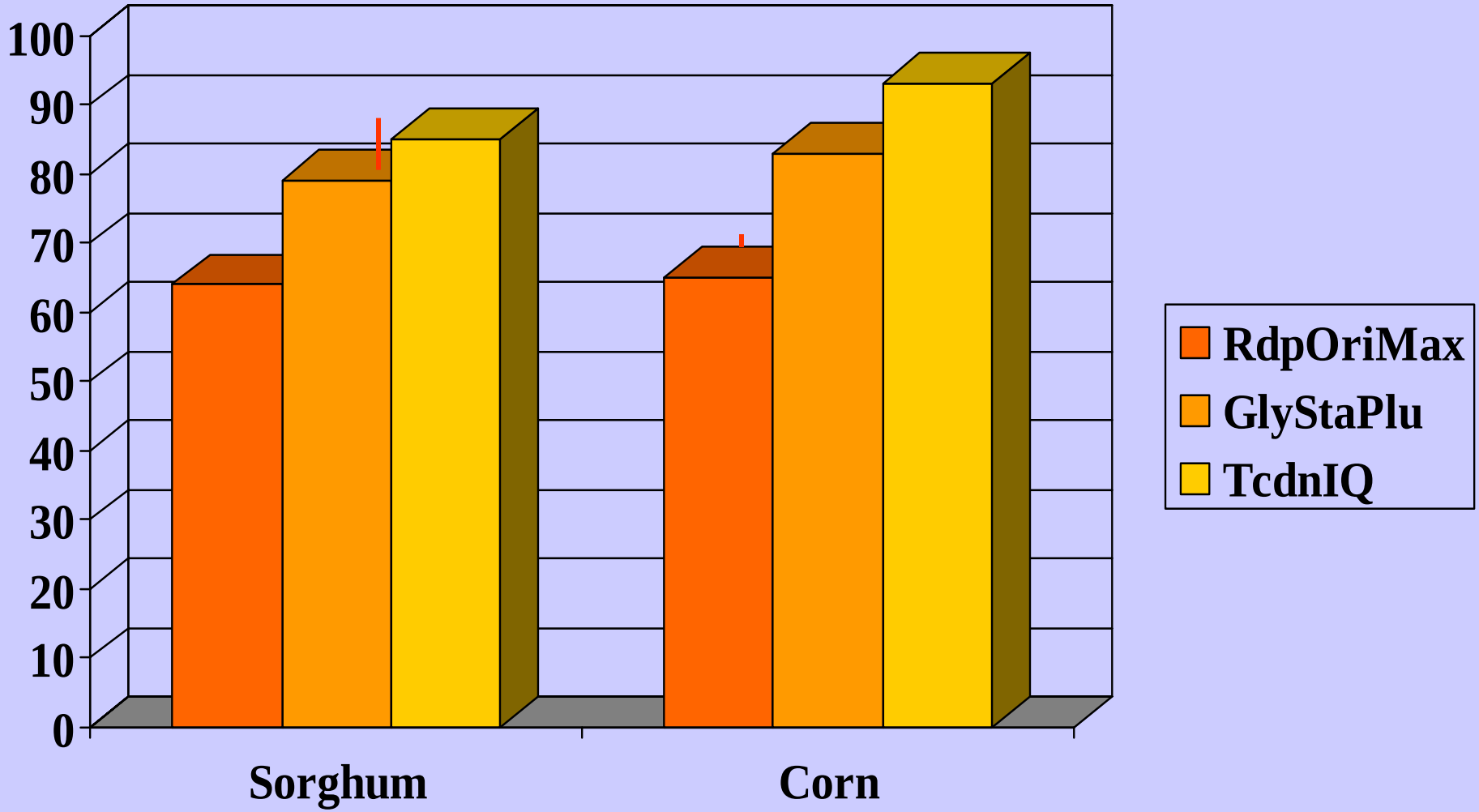
Glyphosate at 0.28 lb ae/a + Class Act NG 2.5% v/v

Glyphosate, Class Act NG, and 2,4-D tank mixes for weed control, Manhattan Experiment 1.



Glyphosate at 0.28 lb ae/a + Class Act NG 2.5% v/v

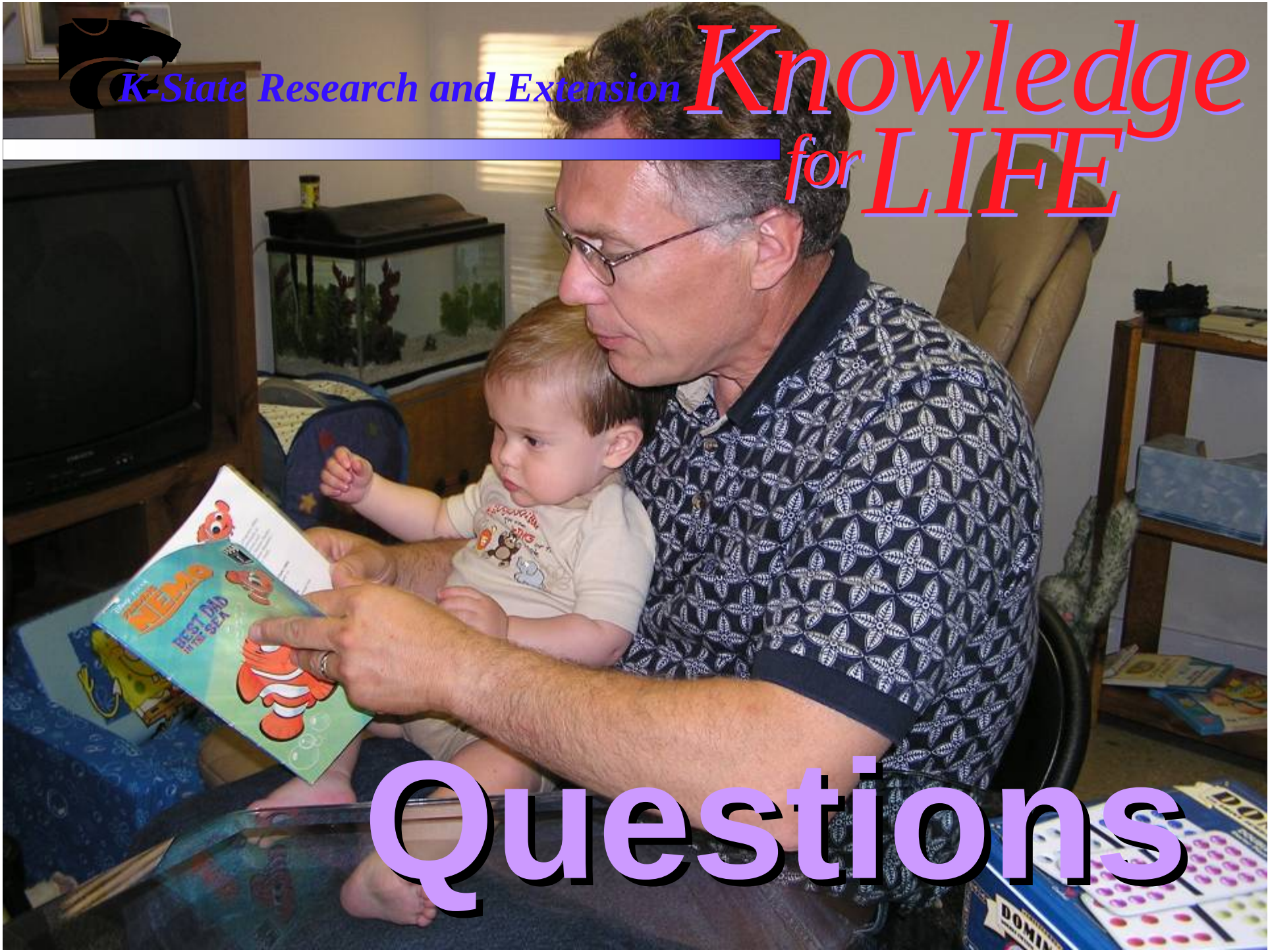
Glyphosate, Class Act NG, and 2,4-D tank mixes for weed control, Manhattan Experiment 1.



Glyphosate at 0.28 lb ae/a + Class Act NG 2.5% v/v

Summary

- **The addition of AMS to glyphosate enhanced weed control compared to glyphosate applied alone.**
- **Choice, Request, Speedway, Blendmaster, US 500, and Citron tank mixed with glyphosate did not provide equal control to glyphosate+AMS.**
- **Class Act NG, Alliance, and N-Tank provided similar control to AMS when added to glyphosate.**
- **The addition of carfentrazone reduced volunteer wheat control with glyphosate.**
- **The addition of Unison antagonized grass control while all 2,4-D formulations increase broadleaf weed control with glyphosate.**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