Crop Production Clinics

Improving Weed Control for Dryland Cropping Systems

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Session Goals

At the end of this session, participants will:

- understand how to improve herbicide applications in wheat stubble;
- be introduced to the impact of droplet size on deposition on leaf surfaces;
- and know which soil applied herbicides are best suited for kochia control;

Droplet Retention on Soybean Leaves as Influenced by Nozzle Type, Application Pressure, and Adjuvant

- **54 Treatments**
  - ✓ Spray mixture (6 mixtures)
  - ✓ Nozzle type (3 nozzle types)
  - ✓ Pressure (3 pressures)

Trial Factors

Adjuvants	Nozzle type	Pressure
		-- PSI --
Crop oil	XR110025	20
Drift agent	AIXR110025	37.5
Methylated seed oil	TTI110025	50
Non-ionic surfactant		
Silicone		
No adjuvant		

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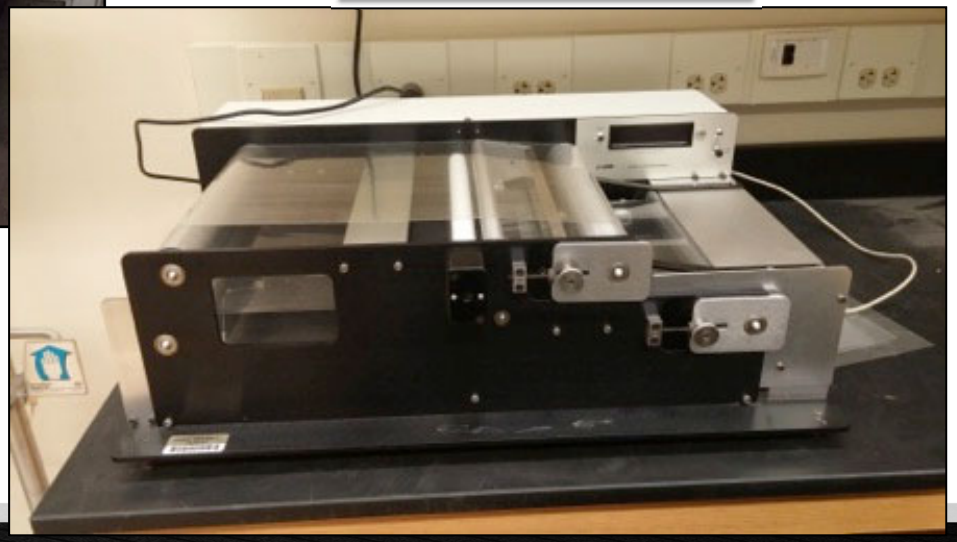
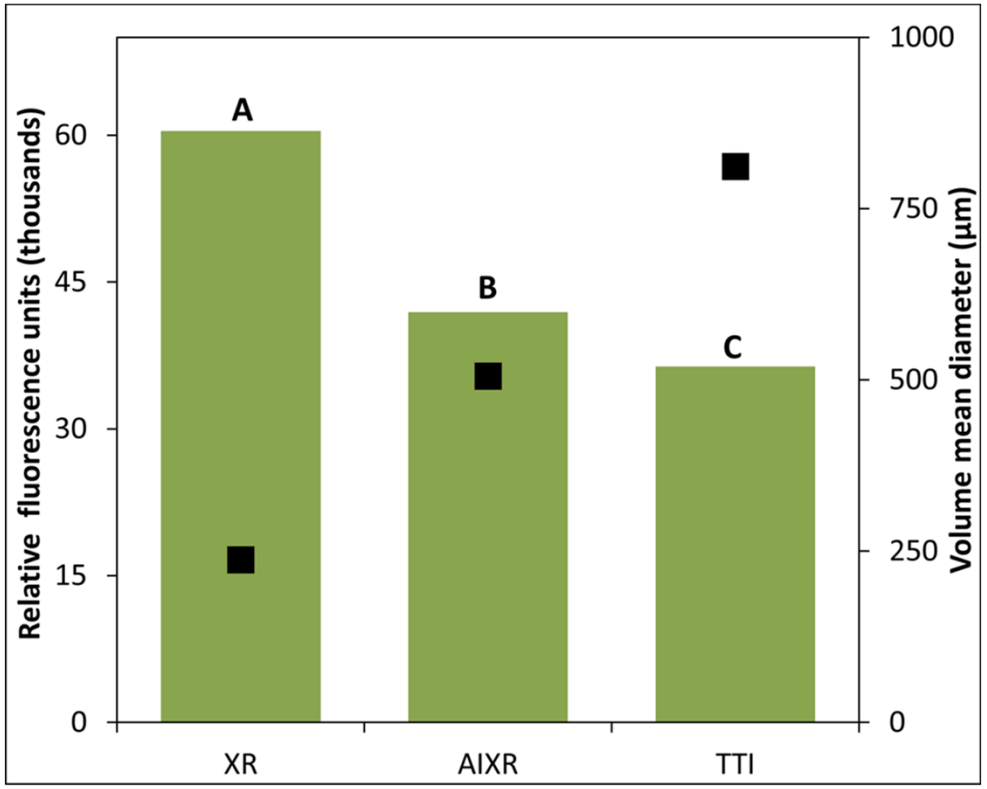
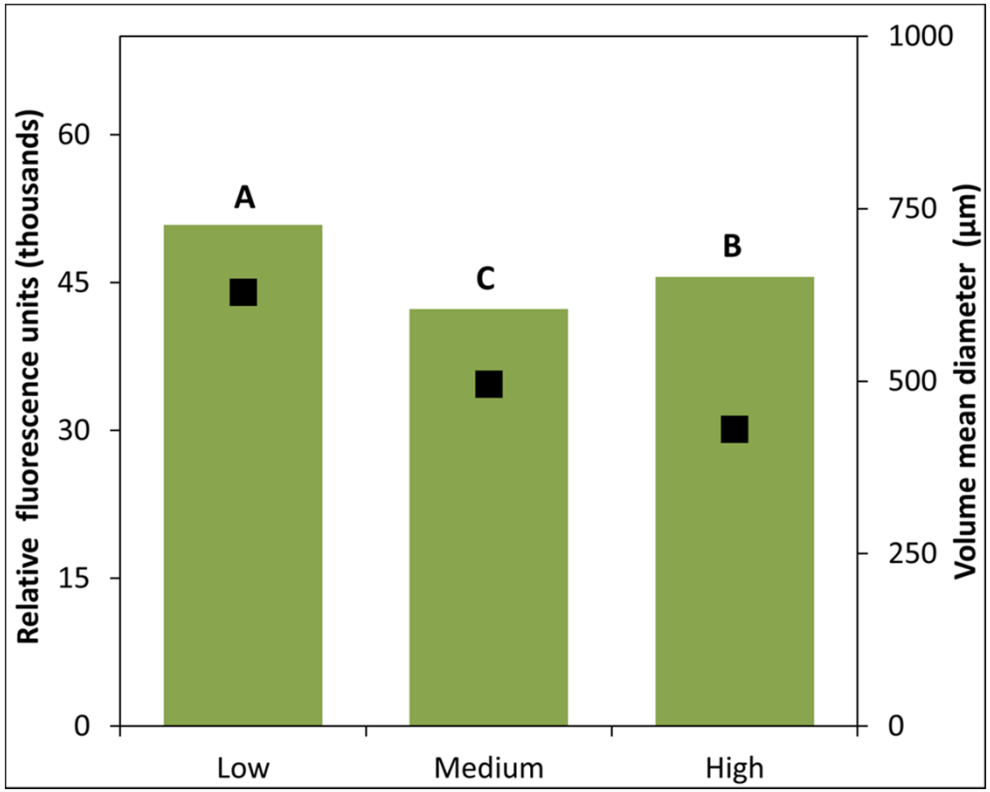
Methods



Results


Relative fluorescence units (thousands)
Volume mean diameter (µm)
0
15
30
45
60
0
250
500
750
1000
A
B
C
XR
AIXR
TTI


Relative fluorescence units (thousands)
Volume mean diameter (µm)
0
15
30
45
60
0
250
500
750
1000
A
C
B
Low
Medium
High

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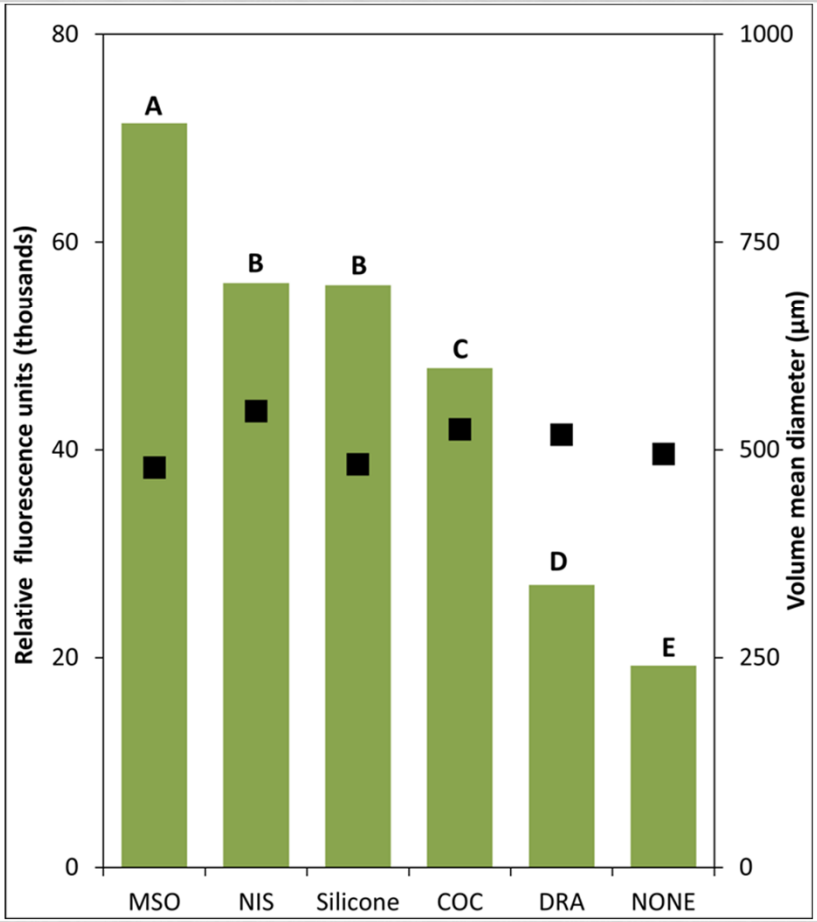
Results

- Applying dicamba using nozzles that produce large droplets can reduce the amount of spray retained on the leaf surface.
- The addition of every adjuvant used in this study increased the amount of dicamba retained on the leaf surface.
- Careful nozzle and pressure selection, in addition to using an appropriate adjuvant, can increase the amount of dicamba that is retained on the leaf surface.



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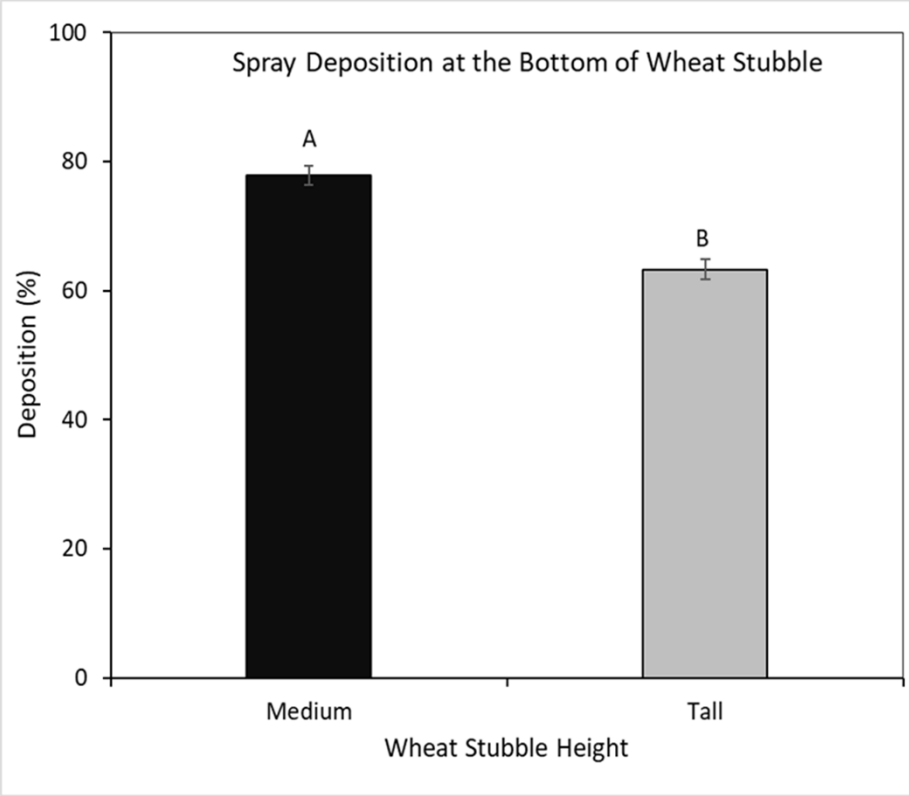
Herbicide Spray Deposition in Wheat Stubble as Affected by Nozzle Type and Application Direction

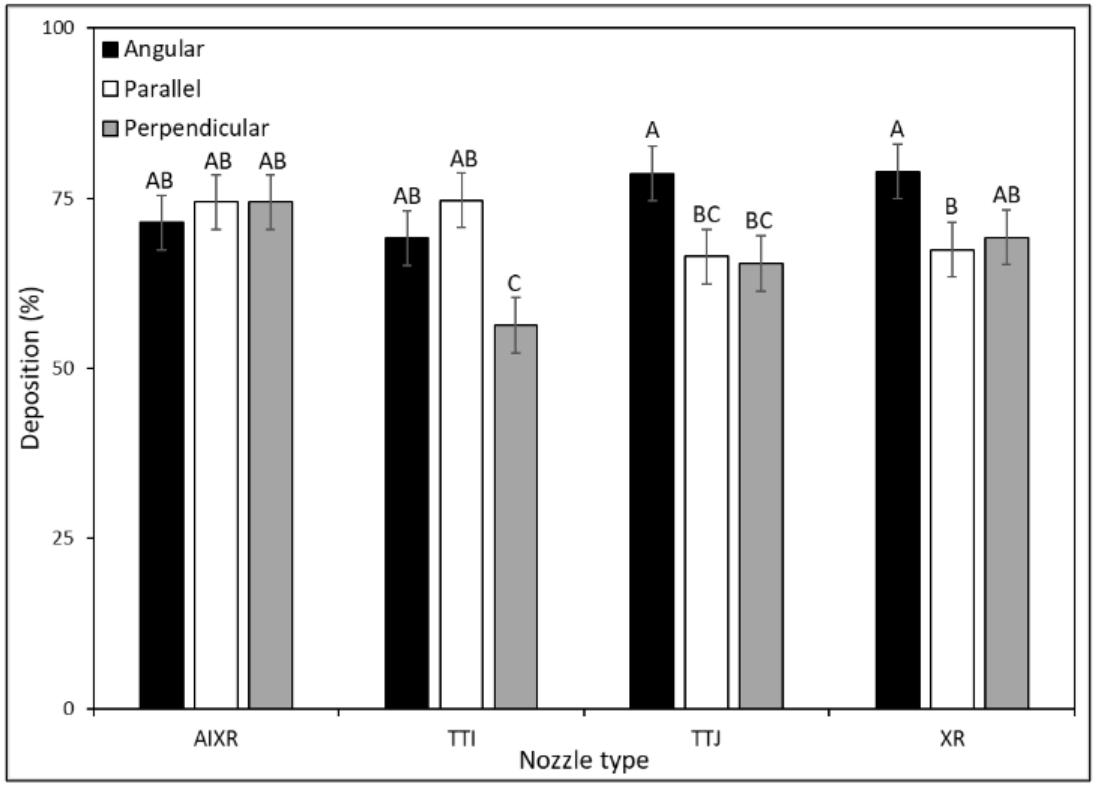
Treatments	Levels
Application Direction to the Wheat Row	Parallel
	Angular
	Perpendicular
Stubble Height	Tall (> 70 cm)
	Medium (35 cm)
	No-stubble
Nozzle Type	AIXR 11004
	TTI 11004
	XR 11004
	TTJ 11004

Results



- Taller stubble reduced spray deposition 37% in tall stubble and 23% in medium height stubble

Results



- The AIXR nozzle demonstrated consistent spray deposition regardless of application direction
- The angular direction of travel was also the most effect at increasing spray depostion

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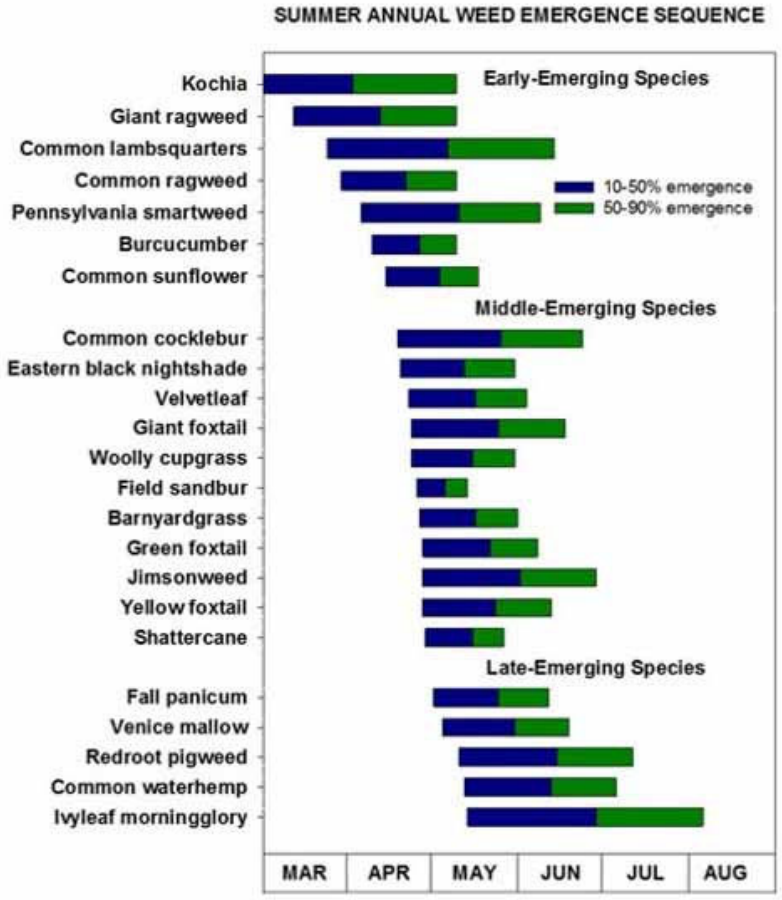
Pre-emergent Herbicides for Improved Control of Kochia in Chemical Fallow

Kochia

Kochia has become a major weed problem in Western Nebraska

March 9, 2016 at North Platte



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Pre-emergent Herbicides for Improved Control of Kochia in Chemical Fallow
Single Active Ingredient Treatment List

Treatment	Timing	Active Ingredient	Rate (lb ai/ac)	Product	Rate (oz/ac)	MOA
1	*na*	*check, no PRE*	*na*	*na*	*na*	*na*
2		atrazine	0.5	Atrazine 4L	16	5
3		metribuzin	0.25	Dimetric 75DF	5.3	5
4	*fall*	sulfentrazone	0.14	Spartan Charge	5.5	14
5		flumioxazin	0.06	Valor SX	2	14
6		isoxaflutole	0.06	Scoparia	2	27
7		mesotrione	0.25	Callisto	8	27
8		atrazine	0.5	Atrazine 4L	16	5
9		metribuzin	0.25	Dimetric 75DF	5.3	5
10	*spring*	sulfentrazone	0.16	Spartan Charge	5.5	14
11		flumioxazin	0.06	Valor SX	2	14
12		isoxaflutole	0.08	Scoparia	2	27
13		dicamba	0.5	Banvel	16	4

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Pre-emergent Herbicides for Improved Control of Kochia in Chemical Fallow
2-Mode-of-Action Active Tank Mixes Treatment List

Treatment	Timing	Active Ingredient	Rate (lb ai/ac)	Products	MOA
1	*na*	*check, no PRE*	*na*	*na*	*na*
2		sulfentrazone + metribuzin	0.14 + 0.25	Spartan Charge + Dimetric 75DF	14 + 5
3		sulfentrazone + atrazine	0.14 + 0.5	Spartan Charge + Atrazine 4L	14 + 5
4	*late fall*	flumioxazin + metribuzin	0.06 + 0.25	Valor SX + Dimetric 75DF	14 + 5
5		flumioxazin + atrazine	0.06 + 0.5	Valor SX + Atrazine 4L	14 + 5
6		isoxaflutole + metribuzin	0.06 + 0.25	Scoparia + Dimetric 75DF	27 + 5
7		isoxaflutole + atrazine	0.06 + 0.5	Scoparia + Atrazine 4L	27 + 5
8		sulfentrazone + metribuzin	0.14 + 0.25	Spartan Charge + Dimetric 75DF	14 + 5
9		sulfentrazone + atrazine	0.14+ 0.5	Spartan Charge + Atrazine 4L	14 + 5
10	*early spring*	flumioxazin + metribuzin	0.06 + 0.25	Valor SX + Dimetric 75DF	14 + 5
11		flumioxazin + atrazine	0.06 + 0.5	Valor SX + Atrazine 4L	14 + 5
12		isoxaflutole + metribuzin	0.06 + 0.25	Scoparia + Dimetric 75DF	27 + 5
13		isoxaflutole + atrazine	0.06 + 0.5	Scoparia + Atrazine 4L	27 + 5

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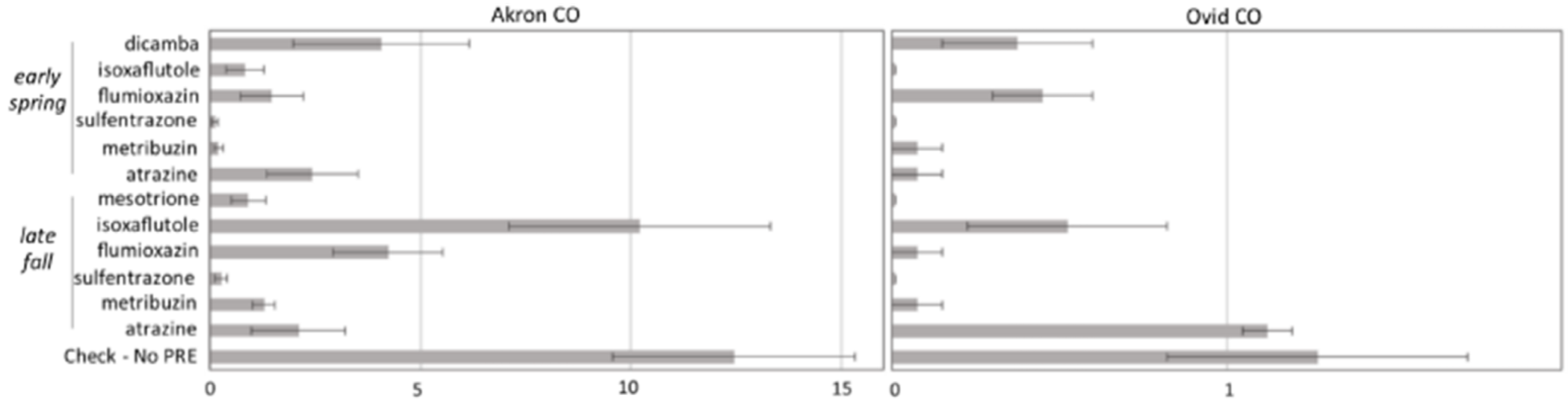
Pre-emergent Herbicides for Improved Control of Kochia in Chemical Fallow With Single Active Ingredient



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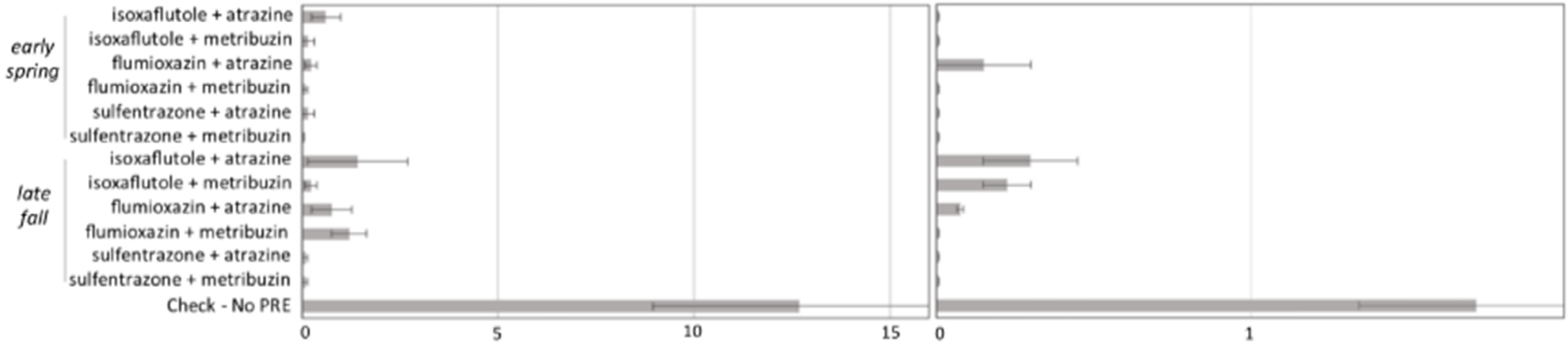
Pre-emergent Herbicides for Improved Control of Kochia in Chemical Fallow with 2-Mode-of-Action Active Tank Mixes



Take Home Points

- Think about how to best get a spray droplet to the target and that it stays
- Consider using pre-emergent herbicides to gain the upper hand with kochia

Acknowledgements

- Luana Simao and John Spring who conducted research presented in this presentation

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