



Spring burndown weed control options in sunflower

**Brian Jenks
North Dakota State University**

Kochia burndown options in Sunflower

- **Glyphosate**
- **Aim**
- **Spartan Charge**
- **Gramoxone**

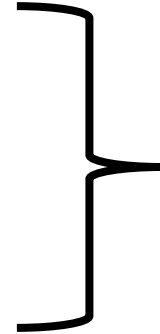
Group 14 Herbicides

Aim

Sharpen

Vida

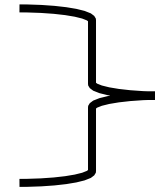
Reviton



**Burndown
herbicides**

Spartan products

Valor

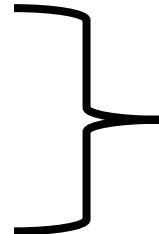


**Soil-applied
herbicides
(residual)**

Flexstar

Cobra

Ultra Blazer



**Foliar soybean
herbicides**

Aim 1 and 2 oz
with AMS + MSO

6 DAT

Kochia sprayed
at 2-2.5"

3 reps



2X

1X

Susceptible

Minot

Berthold

Mandan

Mott

Kochia control with Aim

Resistant

Susceptible



Photo: 6 DAT

Planted/Sprayed
Feb 22

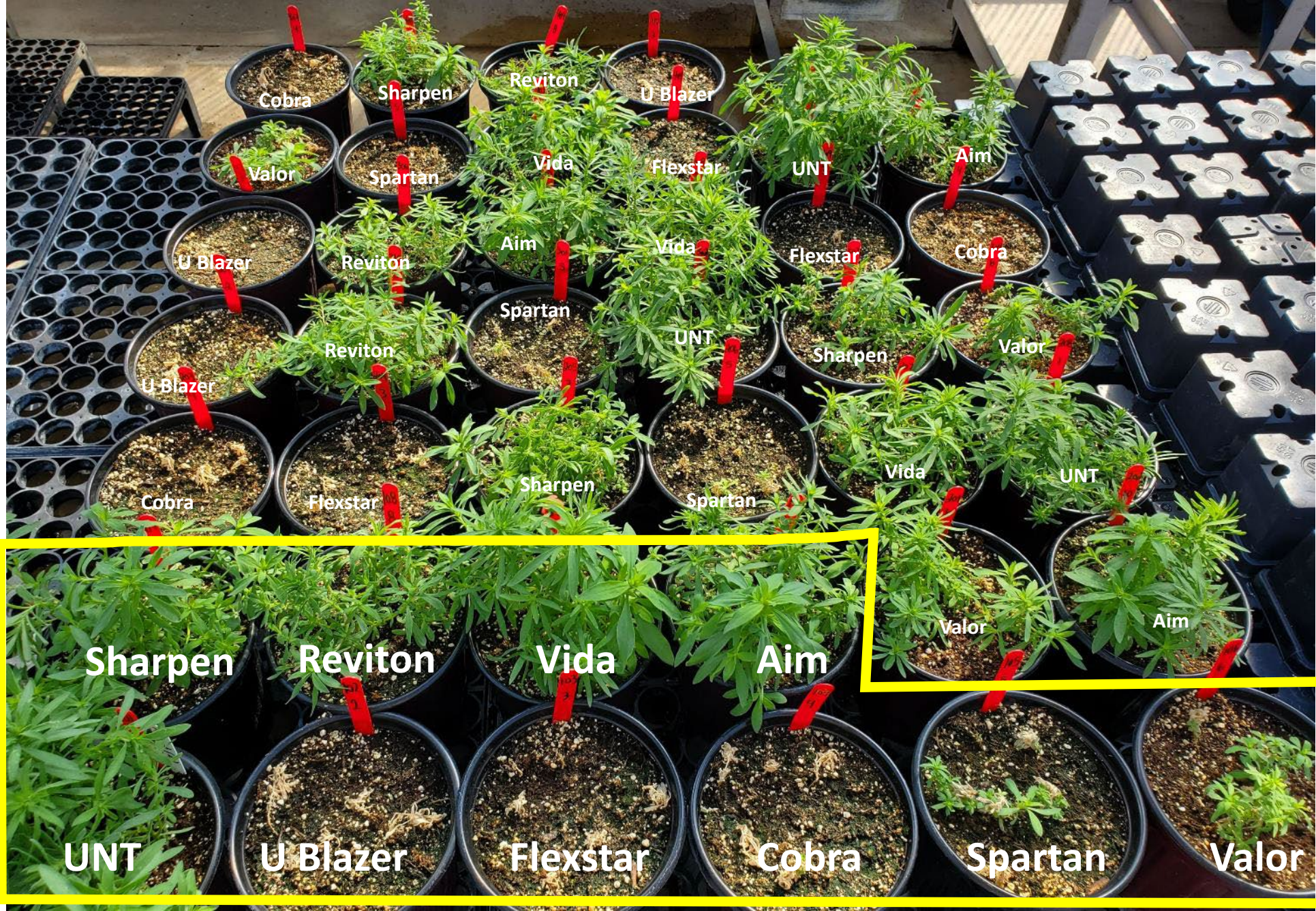
Photo: 20 DAT

3 reps



1. Mott
2. Mandan
3. Berthold
4. Minot
5. Mohall-F
6. Mohall-I
7. Susceptible

Minot





waterhemp, go out to the field, identify one individual and collect two leaf samples from



Label/Submit Samples



Results for pigweed 1-2 weeks. Kochia, longer.

**prepaid envelope that will be sent to the
National AG Genotyping Center for us to**

How to proceed with kochia?

- **Group 14 resistance is not everywhere, but need to monitor for it**
- **Use different burndown products where possible**
 - **Sharpen, Aim**
 - **Roundup**
 - **Gramoxone**
 - **Dicamba (where appropriate)**
- **Monitor effectiveness 3-7 DAT**
- **If you see poor control, send leaves in for testing**
- **Use Metribuzin PRE (soybean, dry pea, lentil)**
- **Good options in corn, wheat**
- **Spray small kochia**

Spring weed burndown options for sunflower (2023)

Treatment	Rate	Weed Control					
		Kochia		Lambsquarters		Yellow foxtail	
		-----%-----		-----%-----		-----%-----	
Untreated							
Glyph + Spartan Charge ^{ab}	20 oz + 5 oz						
Liberty ^a	29 oz						
Reglone ^c	1.5 pt						
Gramoxone ^c	2 pt						
Elevore ^b	1 oz						
Piixaro ^b	6 oz						
LSD (0.05)							

^a Treatments applied with AMS (2.5 gal/100 gal)

^b Treatments applied with MSO (1 %)

^c Treatments applied with NIS (0.5 %)

Treatments applied May 30

Kochia: 1-4" (average 3")

Lambsquarters: 1-7" (average 4")

Yellow foxtail: 2"

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Bromoxynil	1 pt						
Bromoxynil + Armezon^{ab}	1 pt + 0.25 oz						
Bromoxynil + Armezon^{ab}	1 pt + 0.5 oz						
Spart + Brom + Armezon^{ab}	4 oz + 1 pt + 0.5 oz						
LSD (0.05)							

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		6-Jun	20-Jun	6-Jun	20-Jun	6-Jun	20-Jun
		-----%-----		-----%-----		-----%-----	
Untreated		0	0	0	0	0	0
Glyph + Spartan Charge ^{ab}	20 oz + 5 oz	57	48	99	99	99	98

^a *Treatments applied with AMS (2.5 gal/100 gal)*
^b *Treatments applied with MSO (1 %)*
^c *Treatments applied with NIS (0.5 %)*

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Untreated		0	0	0	0	0	0
Glyph + Spartan Charge ^{ab}	20 oz + 5 oz	57	48	99	99	99	98
Liberty ^a	29 oz	99	99	99	99	98	94

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Untreated		0	0	0	0	0	0
Glyph + Spartan Charge ^{ab}	20 oz + 5 oz	57	48	99	99	99	98
Liberty ^a	29 oz	99	99	99	99	98	94
Reglone ^c	1.5 pt	84	83	45	42	60	23

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Untreated		0	0	0	0	0	0
Glyph + Spartan Charge ^{ab}	20 oz + 5 oz	57	48	99	99	99	98
Liberty ^a	29 oz	99	99	99	99	98	94
Reglone ^c	1.5 pt	84	83	45	42	60	23
Gramoxone ^c	2 pt	99	99	99	99	97	93

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		-----%-----		-----%-----		-----%-----	
Untreated		0	0	0	0	0	0
Glyph + Spartan Charge ^{ab}	20 oz + 5 oz	57	48	99	99	99	98
Liberty ^a	29 oz	99	99	99	99	98	94
Reglone ^c	1.5 pt	84	83	45	42	60	23
Gramoxone	2 pt	99	99	99	99	97	93
Elevore ^b	1 oz	42	40	90	95	0	0

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		-----%-----		-----%-----		-----%-----	
Untreated		0	0	0	0	0	0
Glyph + Spartan Charge ^{ab}	20 oz + 5 oz	57	48	99	99	99	98
Liberty ^a	29 oz	99	99	99	99	98	94
Reglone ^c	1.5 pt	84	83	45	42	60	23
Gramoxone	2 pt	99	99	99	99	97	93
Elevore ^b	1 oz	42	40	90	95	0	0
Pixxaro ^b	6 oz	73	73	91	95	0	0
LSD (0.05)		7.1	7.7	4.5	5.5	4.8	10.3

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		Kochia		Lambsquarters		Yellow foxtail	
		6-Jun	20-Jun	6-Jun	20-Jun	6-Jun	20-Jun
		-----%-----		-----%-----		-----%-----	
Bromoxynil	1 pt	75	79	99	98	0	0

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^c Treatments applied with NIS (0.5 %)

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		Kochia		Lambsquarters		Yellow foxtail	
		6-Jun	20-Jun	6-Jun	20-Jun	6-Jun	20-Jun
		-----%-----	-----%-----	-----%-----	-----%-----	-----%-----	-----%-----
Bromoxynil	1 pt	75	79	99	98	0	0
Bromoxynil + Armezon ^{ab}	1 pt + 0.25 oz	98	94	99	99	64	50

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		6-Jun	20-Jun	6-Jun	20-Jun	6-Jun	20-Jun
		-----%-----		-----%-----		-----%-----	
Bromoxynil	1 pt	75	79	99	98	0	0
Bromoxynil + Armezon^{ab}	1 pt + 0.25 oz	98	94	99	99	64	50
Bromoxynil + Armezon^{ab}	1 pt + 0.5 oz	97	97	99	99	78	68

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^c Treatments applied with NIS (0.5 %)

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		6-Jun	20-Jun	6-Jun	20-Jun	6-Jun	20-Jun
		-----%-----		-----%-----		-----%-----	
Bromoxynil	1 pt	75	79	99	98	0	0
Bromoxynil + Armezon ^{ab}	1 pt + 0.25 oz	98	94	99	99	64	50
Bromoxynil + Armezon ^{ab}	1 pt + 0.5 oz	97	97	99	99	78	68
Spart + Brom + Armezon ^{ab}	4 oz + 1 pt + 0.5 oz	96	96	99	99	74	65
LSD (0.05)		7.1	7.7	4.5	5.5	4.8	10.3

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^b Treatments applied with MSO (1 %)

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Treatments applied May 30

Kochia: 1-4" (average 3")

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Yellow foxtail: 2"

Spring weed burndown options for sunflower (2023)

Treatment	Rate	Sunflower injury		
		19-Jun	3-Jul	13-Jul
		-----%-----		
Untreated				
Glyphosate + Spartan Charge	20 oz + 5 oz			
Liberty	29 oz			
Reglone + Spartan + Metribuzin	1.5 pt + 4 oz + 6 oz			
Gramoxone + Spartan + Metribuzin + Dual	2 pt+4 oz+6oz+1.67 pt			
Elevore	1 oz			
Pixxaro	6 oz			
Bromoxynil	1 pt			
Bromoxynil + Armezon	1 pt + 0.25 oz			
Bromoxynil + Armezon	1 pt + 0.5 oz			
Spartan + Bromoxynil + Armezon	4 oz + 1 pt + 0.5 oz			
LSD (0.05)				

*Treatments applied PRE June 6

Rainfall: June 22 (0.47"); June 28 (0.20"); July 19 (0.39")

Spring weed burndown options for sunflower (2023)

Treatment	Rate	Sunflower injury		
		19-Jun	3-Jul	13-Jul
		-----%-----		
Untreated		0	0	0
Glyphosate + Spartan Charge	20 oz + 5 oz	0	0	0
Liberty	29 oz	0	0	0
Reglone + Spartan + Metribuzin	1.5 pt + 4 oz + 6 oz	0	0	0
Gramoxone + Spartan + Metribuzin + Dual	2 pt+4 oz+6oz+1.67 pt	0	0	0
Elevore	1 oz	0	0	0
Pixxaro	6 oz	0	0	0
Bromoxynil	1 pt	0	0	0
Bromoxynil + Armezon	1 pt + 0.25 oz	0	0	0
Bromoxynil + Armezon	1 pt + 0.5 oz	0	0	0
Spartan + Bromoxynil + Armezon	4 oz + 1 pt + 0.5 oz	0	0	0
LSD (0.05)		NS	NS	NS

*Treatments applied PRE June 6

Rainfall: June 22 (0.47"); June 28 (0.20"); July 19 (0.39")

Spring weed burndown options for sunflower (2024)

Treatment	Rate	Sunflower injury		
		11-Jun	22-Jun	4-Jul
		-----%-----		
Untreated		0	0	0
Glyphosate + Spartan Charge ^{bc}	20 oz + 5 oz	0	1	0
Glyphosate + Spartan Charge + Metribuzin ^{bc}	20 oz + 5 oz + 6 oz	0	55	57
Liberty ^c				
Reglone ^d				
Gramoxone ^d				
Elevore ^b				
Pixxaro ^b				
Bromoxynil	1 pt	0	0	0
Bromoxynil + Armezon ^{bc}	1 pt + 0.25 oz	0	0	0
Bromoxynil + Armezon ^{bc}	1 pt + 0.5 oz	0	0	0
LSD (0.05)		NS	6.8	7.4

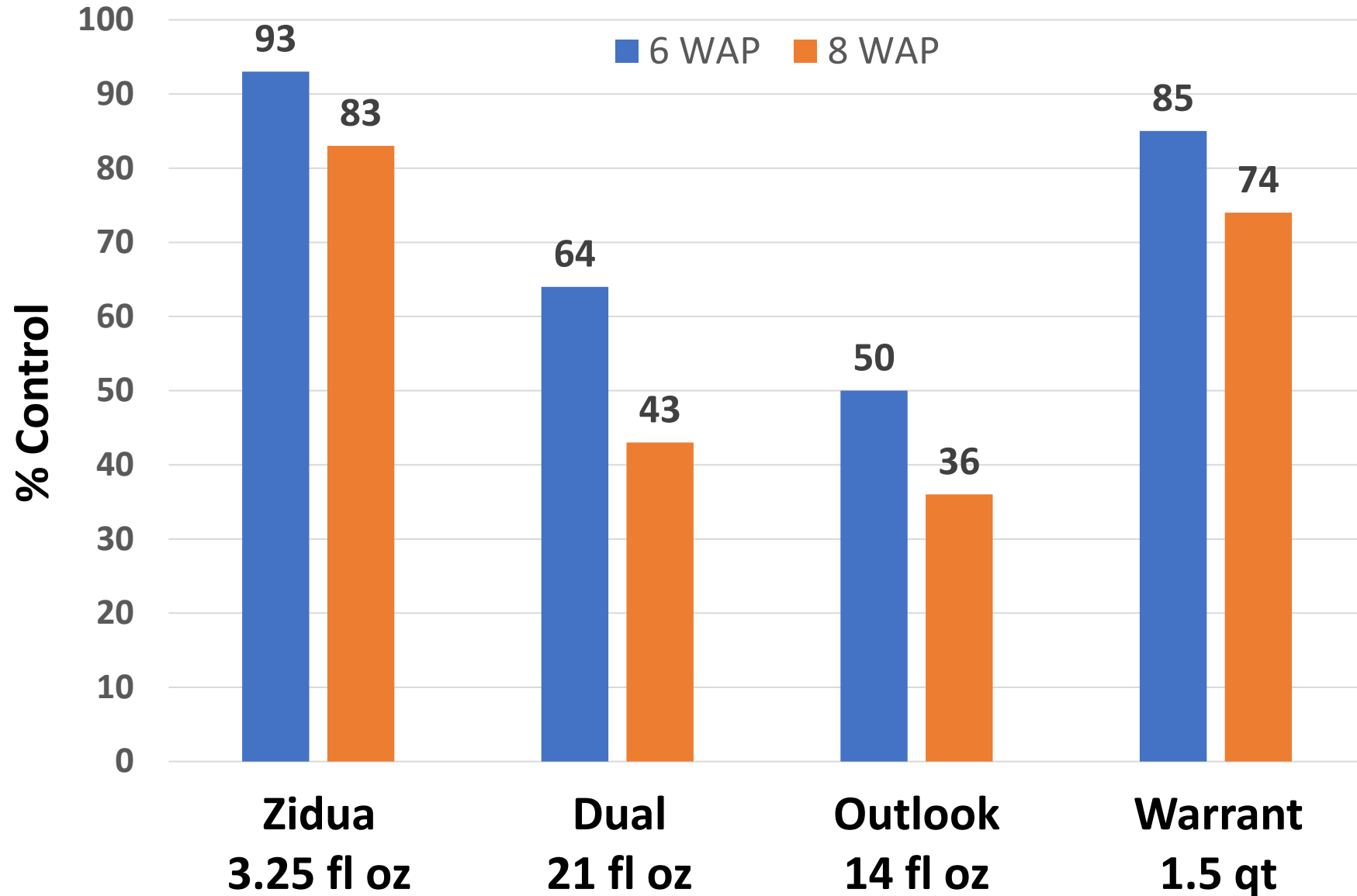
Where do we go from here?

- Companies review data, determine whether to support
- Residue studies: Company in-house vs IR-4

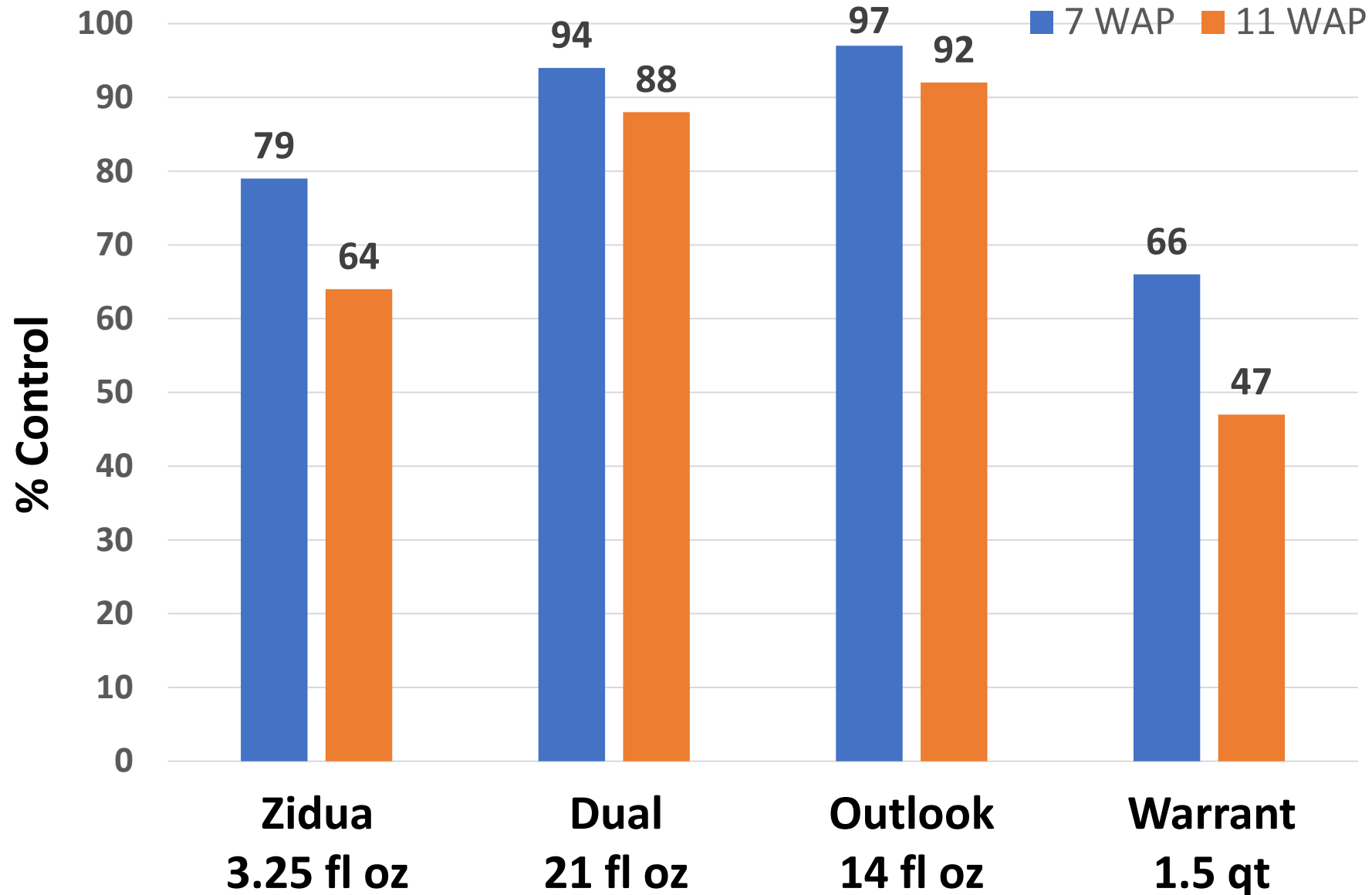
Spring burndown weed control with Gramoxone tank mixes

Treatment	Weed Control ^{de}									
	Colq		Koch		Grft		Shep		Canola	
	4-Jun	22-Jun	4-Jun	22-Jun	4-Jun	22-Jun	4-Jun	22-Jun	4-Jun	22-Jun
	-----%-----		-----%-----		-----%-----		-----%-----		-----%-----	
Gram ^a	91	70	99	99	96	75	94	78	99	73
Gram + Sharpen ^b	99	87								
Gram+ Brom ^a										
Gram + Metri ^a	99	99			99	88	99	97	99	99
Gram + Tough ^a										
Gram + Aff BS ^c	96	90					97	93	99	90
Gram + Dicamba ^a	96	94								
Gram + 2,4-D ^a	99	81							99	86
LSD (0.05)	3.3	7.4	0.3	0.5	1.5	3.9	1.9	7.2	1.5	4.9

Waterhemp Control – Fargo 2024



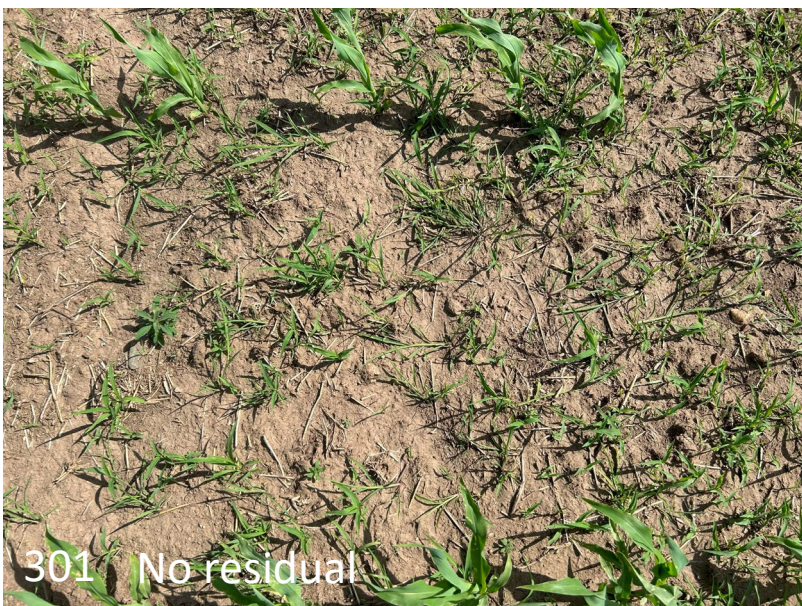
Green Foxtail Control – Minot 2024



Rep 3

Set 1

28 DAT



Rep 3
Set 1

34 DAT



Rep 3
Set 1

42 DAT



Rep 3
Set 1

48 DAT

