

Spring burndown weed control options in Sunflower

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Spring burndown weed control options in Sunflower

- Glyphosate (9)
- Spartan Charge (14)
- Aim (14)
- Gramoxone (22)

Group 14-resistant kochia has been identified in more than 50% of North Dakota counties.

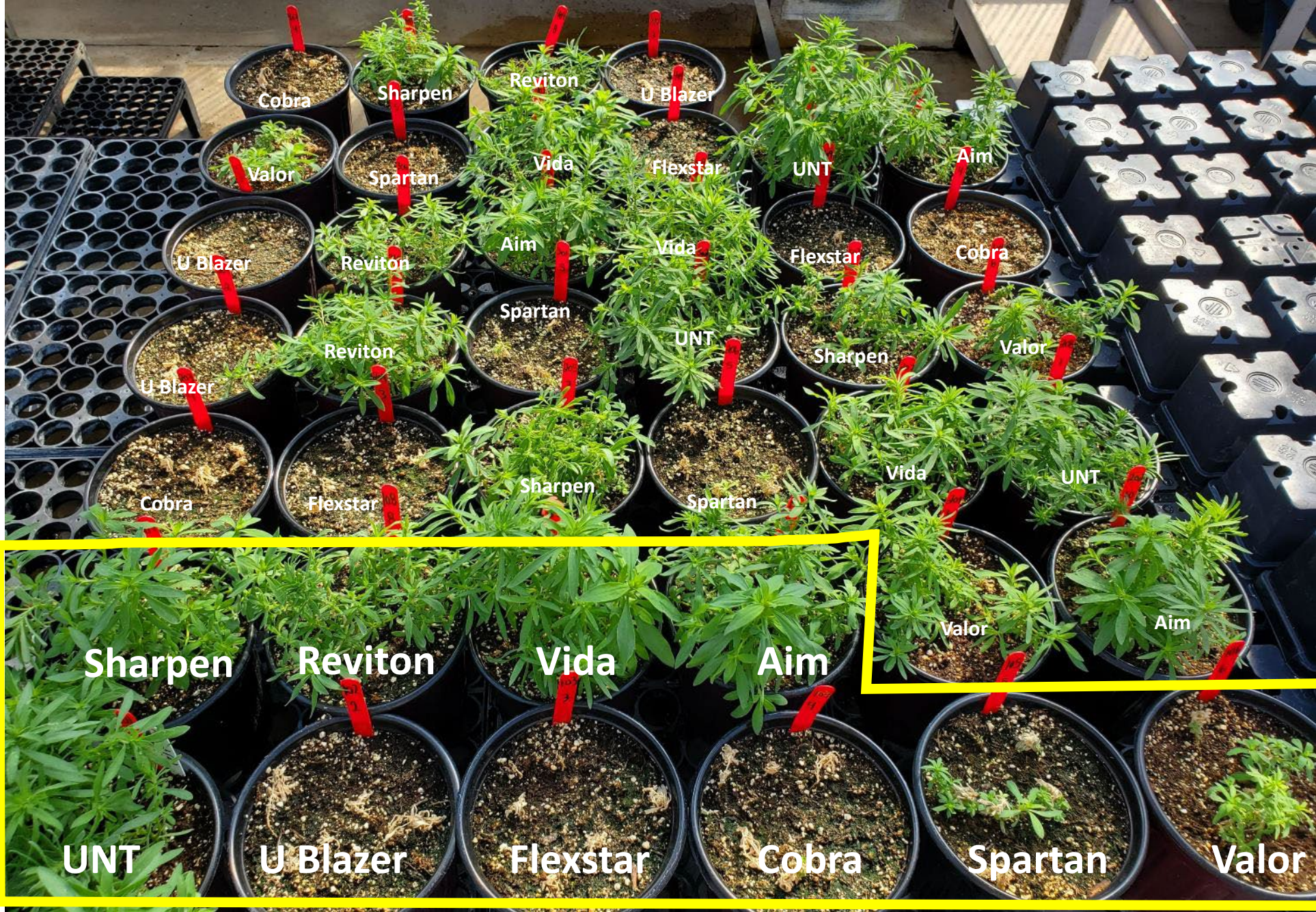
How do we control kochia in a burndown in Sunflower?

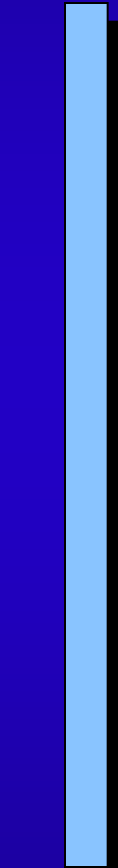
- ~~Glyphosate~~
- ~~Spartan Charge~~
- ~~Aim~~
- Gramoxone

Are there new products that could be used for weed control in sunflower?

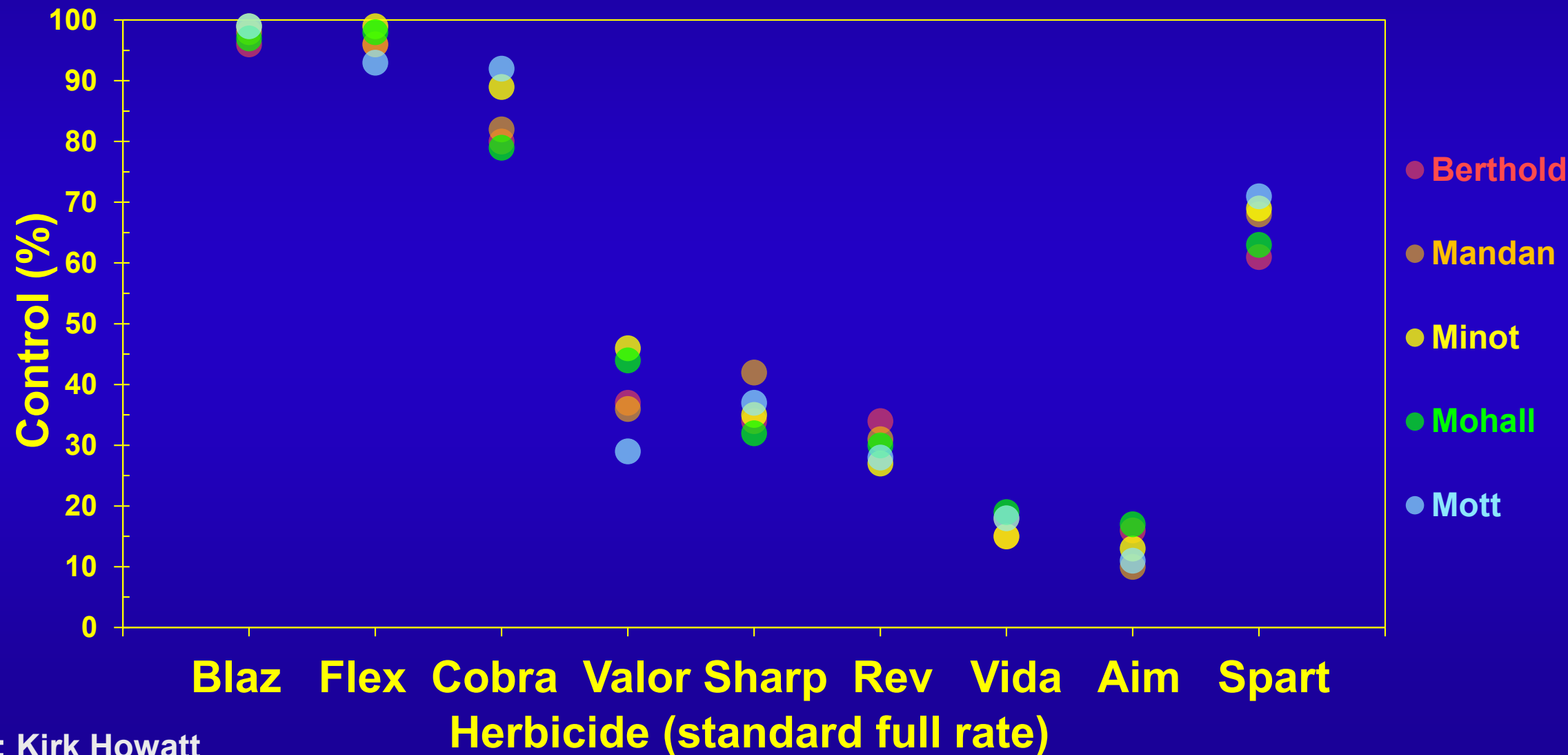
- **A new label takes many years to:**
 - **Collect data on crop tolerance and weed efficacy.**
 - **Meet EPA registration requirements.**
- **Topramezone (27) + Bromoxynil (6)**
 - **Labeled in Canada in front of canola.**
- **Cobra labeled for POST use in soybean still effective on Group 14-R kochia in greenhouse studies.**
- **Tough may be labeled as a burndown product.**

Minot

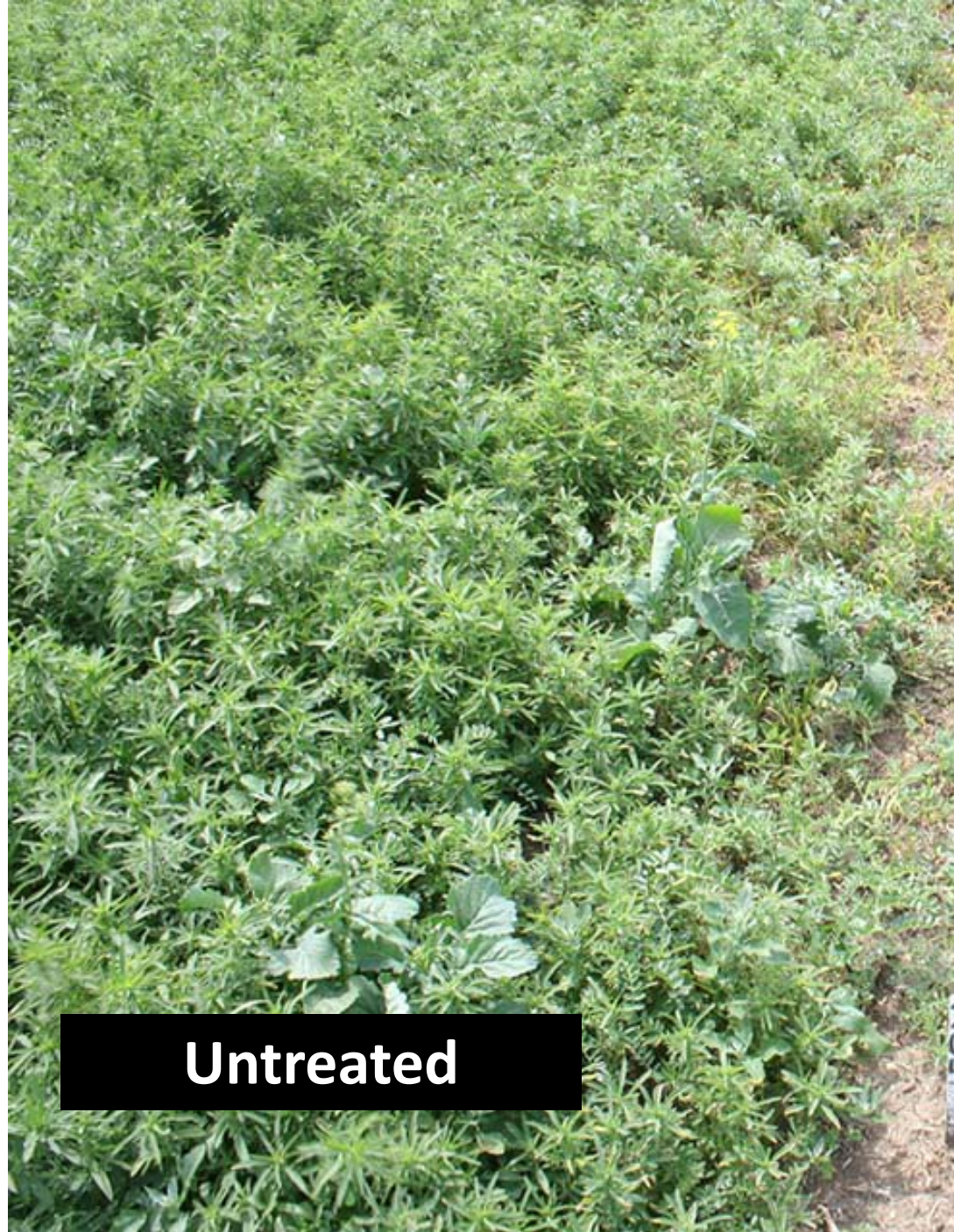




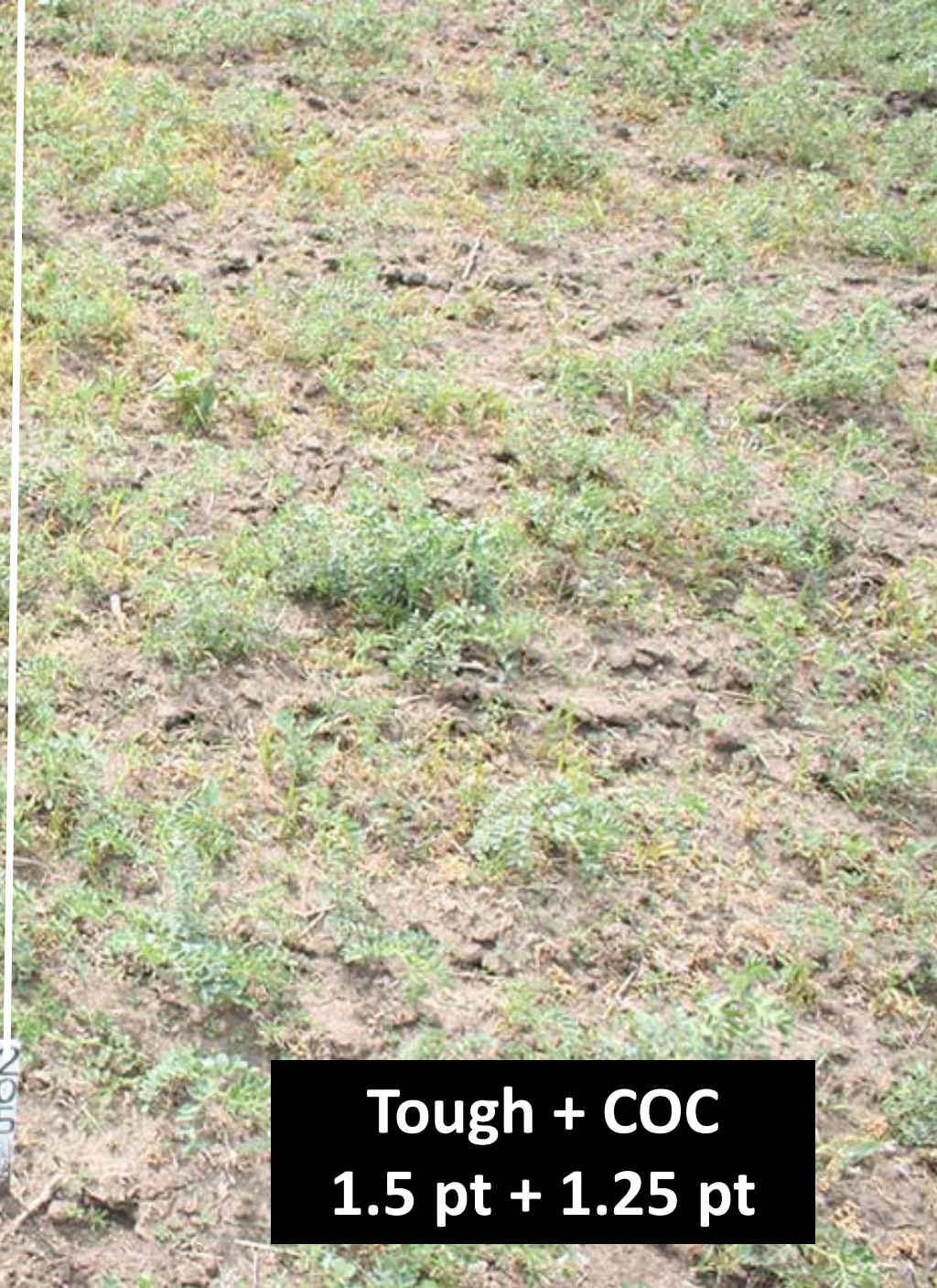
Responses of Five Kochia Lines to PPOs POST



Source: Kirk Howatt



Untreated



Tough + COC
1.5 pt + 1.25 pt

Sunflower tolerance to experimental spring burndown herbicides

Treatment	Rate	Sunflower injury				Yield	Test wt
		Jun 21	Jul 4	Jul 17	Sep 19	Oct 22	Oct 22
		-----%-----				lb/A	lb/bu
Untreated							
Armezon + Bromoxynil	0.25 fl oz + 1 pt						
Armezon + Bromoxynil	0.5 fl oz + 1 pt						
Armezon + Bromoxynil	1 fl oz + 1 pt						
Cobra	12.5 fl oz						
Cobra + Armezon	12.5 fl oz + 0.25 fl oz						
Cobra + Bromoxynil	12.5 fl oz + 1 pt						
Cobra + Tough	12.5 fl oz + 8 fl oz						
Tough + Armezon	8 fl oz + 0.25 fl oz						
Tough + Roundup	8 fl oz + 22 fl oz						
Gram + Spart Ch + Zidua	1.67 pt + 5 oz + 4 oz						
LSD (0.05)							

*Treatments applied June 5, sunflower planted June 6. Received 0.29 inches of rain on June 8.

**All treatments applied with AMS and MSO, except Gramoxone (NIS).

Sunflower tolerance to experimental spring burndown herbicides

Treatment	Rate	Sunflower injury					
		Jun 21	Jul 4	Jul 17	Sep 19		
		-----%-----					
Untreated		0	0	0	0		
Armezon + Bromoxynil	0.25 fl oz + 1 pt	0	0	0	0		
Armezon + Bromoxynil	0.5 fl oz + 1 pt	0	0	0	0		
Armezon + Bromoxynil	1 fl oz + 1 pt	0	0	0	0		
Cobra	12.5 fl oz	12	7	6	0		
Cobra + Armezon	12.5 fl oz + 0.25 fl oz	12	7	6	0		
Cobra + Bromoxynil	12.5 fl oz + 1 pt	12	9	7	0		
Cobra + Tough	12.5 fl oz + 8 fl oz	12	9	7	0		
Tough + Armezon	8 fl oz + 0.25 fl oz	0	0	0	0		
Tough + Roundup	8 fl oz + 22 fl oz	0	0	0	0		
Gram + Spart Ch + Zidua	1.67 pt + 5 oz + 4 oz	0	0	0	0		
LSD (0.05)		1.0	2.3	1.4	NS		

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Sunflower tolerance to experimental spring burndown herbicides

Treatment	Rate	Sunflower injury				Yield	Test wt
		Jun 21	Jul 4	Jul 17	Sep 19	Oct 22	Oct 22
		-----%-----				lb/A	lb/bu
Untreated		0	0	0	0	3022	31.1
Armezon + Bromoxynil	0.25 fl oz + 1 pt	0	0	0	0	3357	30.8
Armezon + Bromoxynil	0.5 fl oz + 1 pt	0	0	0	0	3601	31.4
Armezon + Bromoxynil	1 fl oz + 1 pt	0	0	0	0	3052	31.4
Cobra	12.5 fl oz	12	7	6	0	3392	30.8
Cobra + Armezon	12.5 fl oz + 0.25 fl oz	12	7	6	0	3253	31.1
Cobra + Bromoxynil	12.5 fl oz + 1 pt	12	9	7	0	2911	30.7
Cobra + Tough	12.5 fl oz + 8 fl oz	12	9	7	0	3357	30.7
Tough + Armezon	8 fl oz + 0.25 fl oz	0	0	0	0	3079	30.6
Tough + Roundup	8 fl oz + 22 fl oz	0	0	0	0	3397	31.1
Gram + Spart Ch + Zidua	1.67 pt + 5 oz + 4 oz	0	0	0	0	2809	31.1
LSD (0.05)		1.0	2.3	1.4	NS	NS	NS

*Treatments applied June 5, sunflower planted June 6. Received 0.29 inches of rain on June 8.

**All treatments applied with AMS and MSO, except Gramoxone (NIS).

Spring burndown weed control with experimental herbicides (site 1)

Treatment	Rate	Kochia	Grpw	Colq	Wibw
		-----% control-----			
Untreated		0	0	0	0
Armezon + Bromoxynil	0.25 fl oz + 1 pt	94	77	99	90
Armezon + Bromoxynil	0.5 fl oz + 1 pt	95	85	-	-
Armezon + Bromoxynil	1 fl oz + 1 pt	99	94	-	95
Cobra	12.5 fl oz	71	59	67	43
Cobra + Armezon	12.5 fl oz + 0.25 fl oz	69	63	65	43
Cobra + Bromoxynil	12.5 fl oz + 1 pt	90	55	99	75
Cobra + Tough	12.5 fl oz + 8 fl oz	91	64	83	42
Tough + Armezon	8 fl oz + 0.25 fl oz	81	73	-	35
Tough + Roundup	8 fl oz + 22 fl oz	80	99	99	98
LSD (0.05)		10.6	20.3	3.2	6.2

*Treatments applied May 12, evaluation June 4

**All treatments applied with AMS and MSO

Spring burndown weed control with experimental herbicides (site 2)

Treatment	Rate	Kochia	Grpw	Colq	Wibw
		-----% control-----			
Untreated		0	0	0	0
Armezon + Bromoxynil	0.25 fl oz + 1 pt	95	95	99	94
Armezon + Bromoxynil	0.5 fl oz + 1 pt	97	95	99	92
Armezon + Bromoxynil	1 fl oz + 1 pt	99	99	99	98
Cobra	12.5 fl oz	85	68	33	40
Cobra + Armezon	12.5 fl oz + 0.25 fl oz	94	74	78	38
Cobra + Bromoxynil	12.5 fl oz + 1 pt	92	83	99	99
Cobra + Tough	12.5 fl oz + 8 fl oz	89	71	65	43
Tough + Armezon	8 fl oz + 0.25 fl oz	96	76	97	30
Tough + Roundup	8 fl oz + 22 fl oz	79	99	99	96
LSD (0.05)		9.4	15.2	7.0	14.2

*Treatments applied May 12, evaluation June 5

**All treatments applied with AMS and MSO

Spring burndown weed control with experimental herbicides (site 3)

Treatment	Rate	Kochia	Grpw	Colq	Wibw
		-----% control-----			
Untreated		0	0	0	0
Armezon + Bromoxynil	0.25 fl oz + 1 pt	91	93	98	86
Armezon + Bromoxynil	0.5 fl oz + 1 pt	97	97	99	99
Armezon + Bromoxynil	1 fl oz + 1 pt	99	98	99	95
Cobra	12.5 fl oz	50	26	27	28
Cobra + Armezon	12.5 fl oz + 0.25 fl oz	58	82	50	28
Cobra + Bromoxynil	12.5 fl oz + 1 pt	49	69	85	74
Cobra + Tough	12.5 fl oz + 8 fl oz	38	51	40	31
Tough + Armezon	8 fl oz + 0.25 fl oz	55	80	76	34
Tough + Roundup	8 fl oz + 22 fl oz	47	98	99	96
LSD (0.05)		7.9	2.6	4.3	7.9

*Treatments applied May 24, evaluation June 7

**All treatments applied with AMS and MSO

Spring burndown weed control with experimental herbicides (site 3)

Treatment	Rate	Shpu	Flwe	Coma
		-----% control-----		
Untreated		0	0	0
Armezon + Bromoxynil	0.25 fl oz + 1 pt	94	88	74
Armezon + Bromoxynil	0.5 fl oz + 1 pt	99	85	66
Armezon + Bromoxynil	1 fl oz + 1 pt	99	93	81
Cobra	12.5 fl oz	43	66	21
Cobra + Armezon	12.5 fl oz + 0.25 fl oz	81	42	67
Cobra + Bromoxynil	12.5 fl oz + 1 pt	45	33	27
Cobra + Tough	12.5 fl oz + 8 fl oz	33	33	52
Tough + Armezon	8 fl oz + 0.25 fl oz	84	43	30
Tough + Roundup	8 fl oz + 22 fl oz	93	96	90
LSD (0.05)		9.5	13.8	22.1

*Treatments applied May 24, evaluation June 7

**All treatments applied with AMS and MSO

Spring burndown weed control with experimental herbicides (Hettinger)

Treatment	Rate	Wioa	Wibw	Coma
		-----% control -----		
Untreated		0	0	0
Armezon + Bromoxynil	0.25 fl oz + 1 pt	74	90	84
Armezon + Bromoxynil	0.5 fl oz + 1 pt	77	92	86
Armezon + Bromoxynil	1 fl oz + 1 pt	86	89	89
Cobra	12.5 fl oz	45	56	75
Cobra + Armezon	12.5 fl oz + 0.25 fl oz	61	48	78
Cobra + Bromoxynil	12.5 fl oz + 1 pt	0	63	73
Cobra + Tough	12.5 fl oz + 8 fl oz	38	76	88
Tough + Armezon	8 fl oz + 0.25 fl oz	81	68	78
Tough + Roundup	8 fl oz + 22 fl oz	97	94	92
LSD (0.05)		13.8	15.1	18.7

*Treatments applied May 9, evaluation June 9

**All treatments applied with AMS and MSO

What are the next steps for a label?

- **Bromoxynil: Approved as A priority at 2024 Food Use Workshop**
- **Armezon: Approved as A priority at 2025 Food Use Workshop**
- **2029/2030 label?**