



Tolpyralate Efficacy and Utility in Sweet Corn and Other Vegetable Crops

ED PEACHEY

Horticulture Department



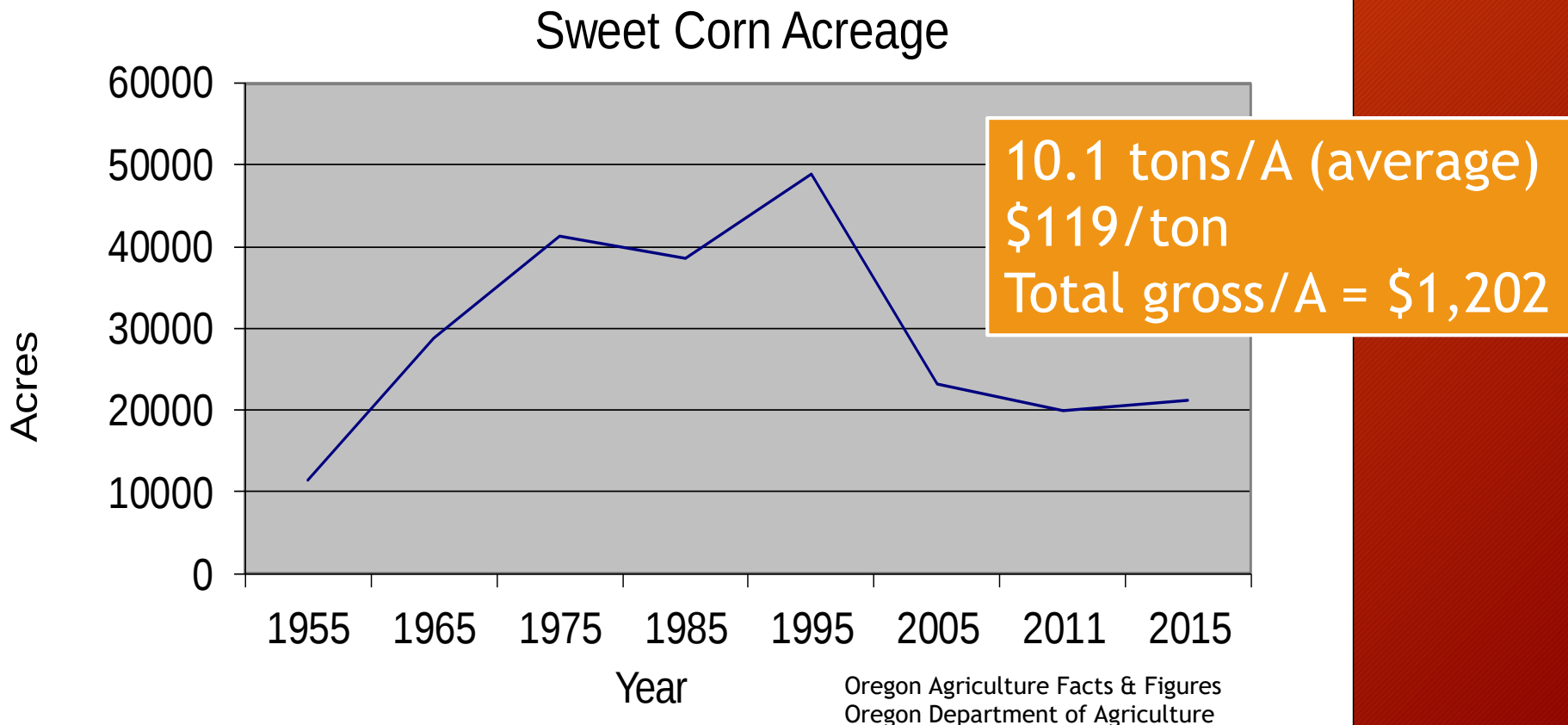
Tolpyralate Efficacy and Utility

- ✓ Background, Oregon corn
- ✓ What is tolpyralate?
- ✓ Crop safety
- ✓ Weed control
- ✓ Carry over, one specific case
- ✓ Other uses

Market forces and sweet corn

- ✓ Cost of production
- ✓ Payout < \$100/ton in some cases
- ✓ Triazine resistance
- ✓ Non-transgenic (Pacific Rim markets)
- ✓ MRL's (limited use of Laudis)

Trends in Sweet Corn Production in OR

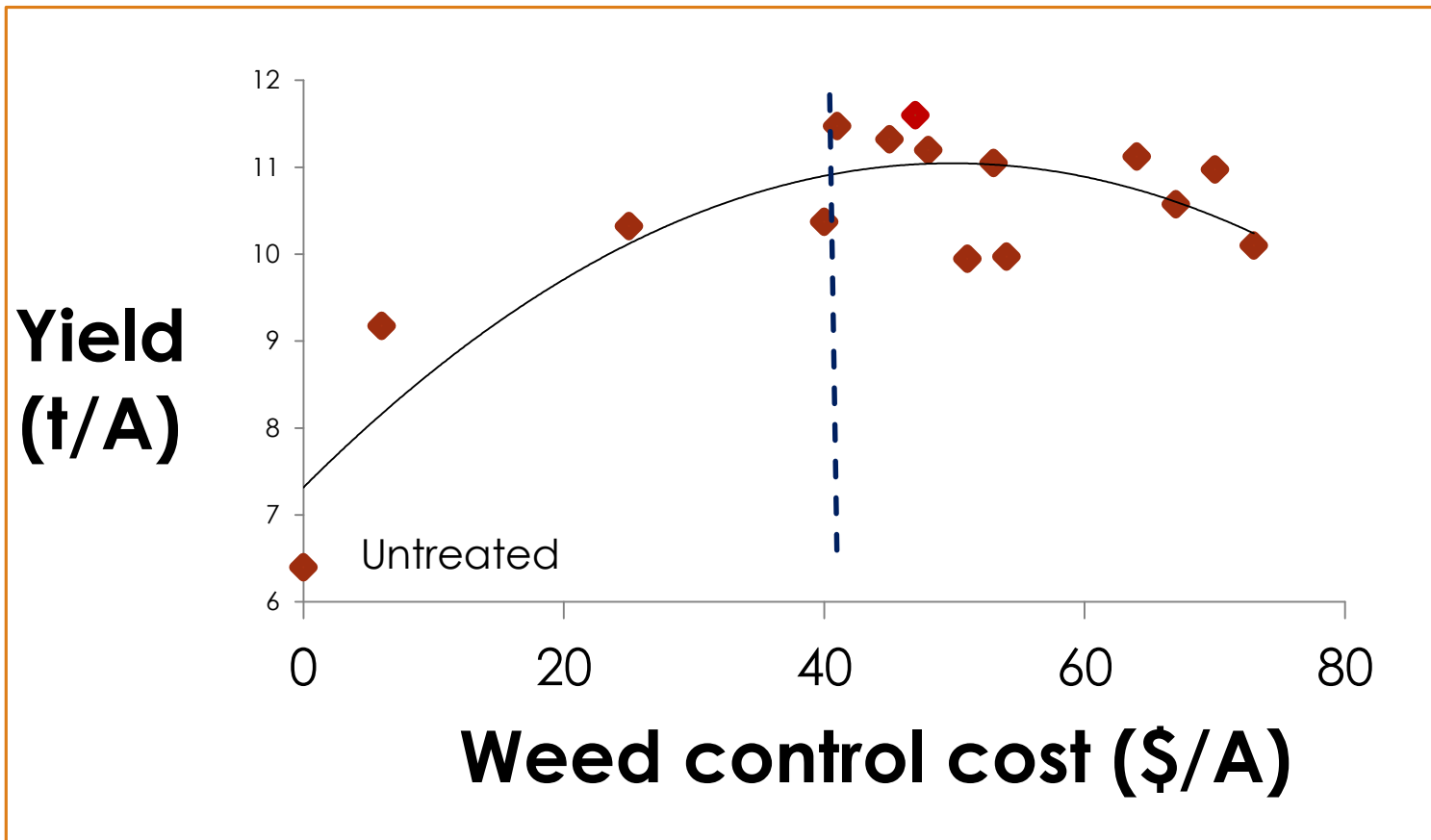


Sweet Corn

Cost of Weed Control vs Yield

Lebanon, OR, 2013

(Wild proso millet, triazine resistant lambsquarters)



Arslan, Williams II et al. 2016. Performance of Weed Management Systems without Atrazine in North American Processing Sweet Corn

Group 27: HPPD Inhibitors



Mesotrione (Callisto)

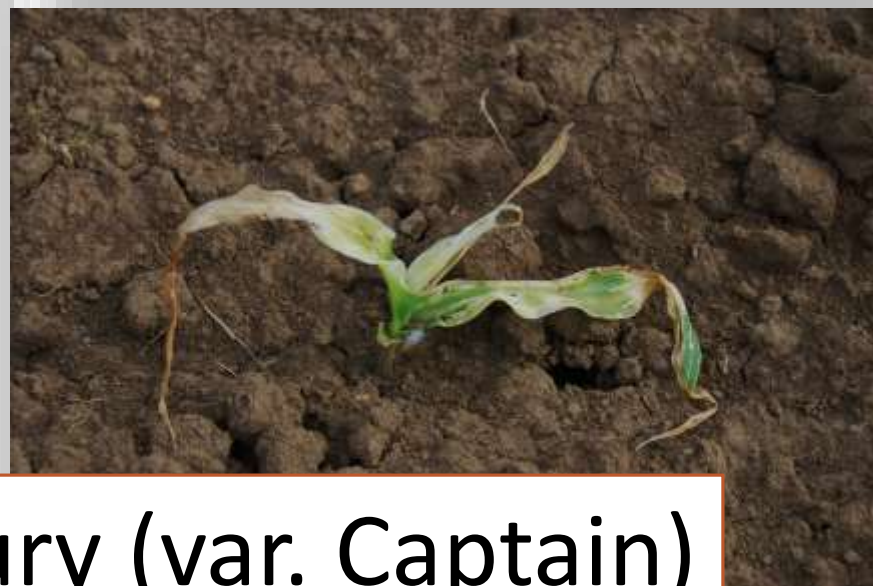
Tembotrione (Laudis)

- Whitens corn sometimes
- var. Captain (SU) sensitive

Topramezone (Impact)



Var. Merit +
mesotrione



Tembotrione injury (var. Captain)

2012

HPPD herbicides (Group 27)

Impact, Laudis

- + Good control of **wild proso millet**
- **Soil residual** needed in many cases



Topramezone + Atrazine $\frac{1}{2}$ pt (applied at V4-5)



Tolpyralate

Code number: SL-573

Trade names: Brucia, Shieldex, Ashitaka

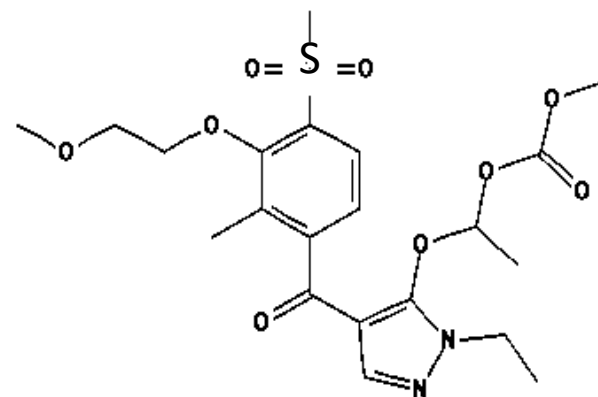
Ishihara Sangyo Kaisha, Ltd. (ISK)

Benzopyrazole

HPPD inhibitor: Group 27

Solubility 26.5 ppm (@ 20 C);

- topramezone solubility 15,000



Research questions

How does tolpyralate compare to other HPPD herbicides?

- Crop Safety
- Efficacy
 - On-pass control
- Carry over (interseeding)
- Other vegetable crops



CROP RESPONSE

2012-13: Corn response to tolpyralate

Tolpyralate rates:

- 0.018, 0.027, 0.035, 0.053, 0.071 lb ai/A
(2/3 oz/A) (3.9 oz/A)

Lorsban ($\pm$),

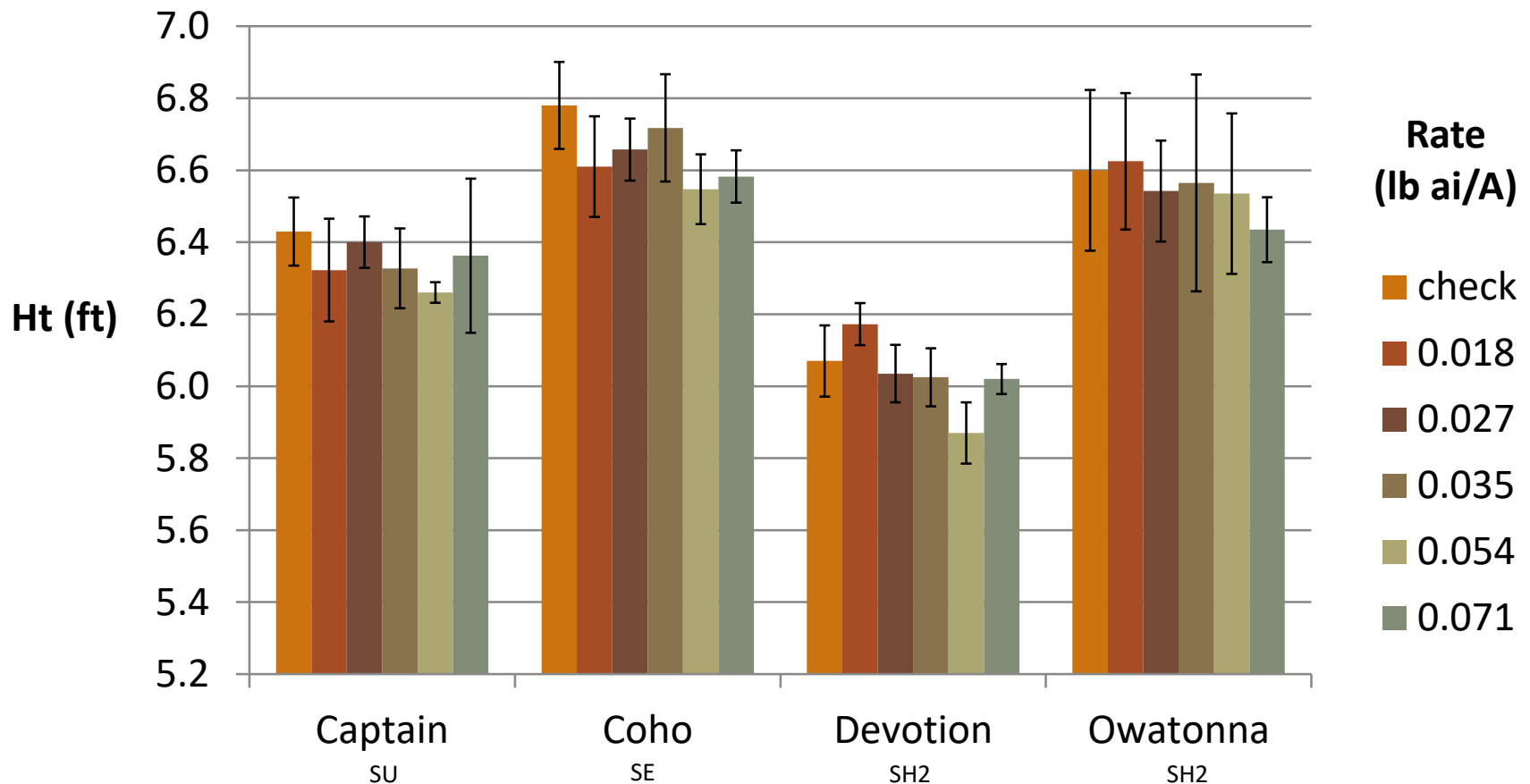
Dimethenamid-P + Atrazine PRE (2013)

8 Varieties

Corn varieties tested 2012-13

Variety	Genetics	Year tested	Company
GSS 1477	SH2	2012	Rogers
Basin R	SH2	2012	Seminis
Devotion	SH2 (white)	2013	Seminis
Owatonna	SH2	2013	Harris Moran
Coho	SE	2012, 2013	Harris Moran
SC 1263	SU	2012	Seminis
Jubilee	SU	2012	Rogers
Captain	SU	2012, 2013	Snowy River Seeds

2013: Tolpyralate



Weed control

2013 Var. Owatonna SH2



Topramezone + MSO + UAN
8.0 t/A (se $\pm$ 0.39)



Tolpyralate + MSO
8.4 t/A (se + 0.75)

2014: Effect of adjuvants on efficacy

Vars:

Captain, Owatonna, GSS1477

Planted:

May 22, $\pm$ chlorpyrifos T-band

Herbicides applied:

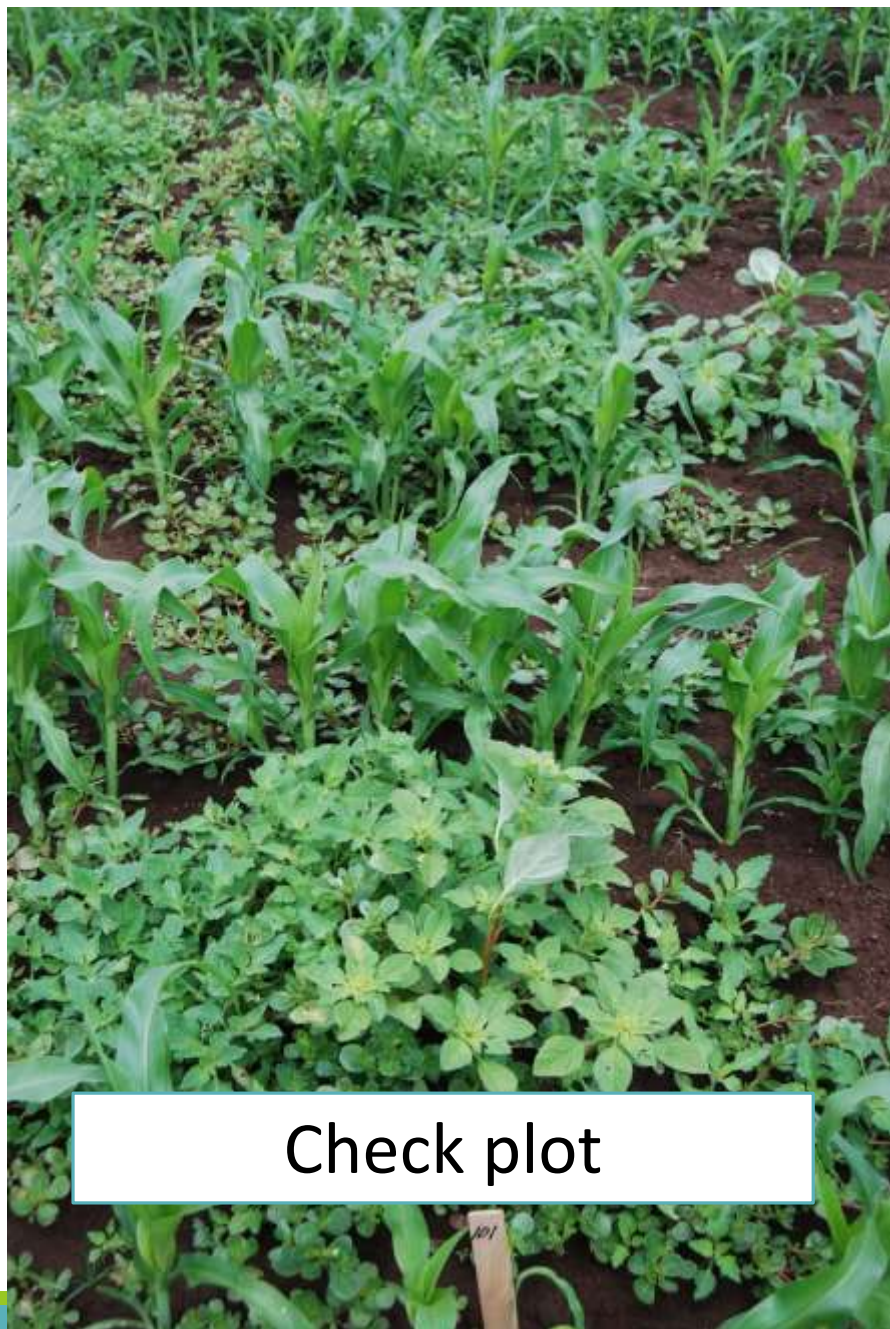
June 12

Injury and weed control:

3, 7, 15, 30 DAT

	Surfactant	Nitrogen	Timing	Rate <i>lbs ai/A</i>
1	Untreated	-	-	
2	No surfactant	-	V3	0.027
3	No surfactant	-	V3	0.054
4	MSO 0.5%	-	V3	0.027
5	MSO 0.5%	-	V3	0.054
6	MSO 0.5%	UAN 2.5%	V3	0.027
7	MSO 0.5%	UAN 2.5%	V3	0.054
8	COC 1%	-	V3	0.027
9	COC 1%	-	V3	0.054
10	COC 1%	UAN 2.5%	V3	0.027
11	COC 1%	UAN 2.5%	V3	0.054
12	Mesotrione + COC 1%	UAN 2.5%	V3	0.094





Check plot



Mesotrione + COC + UAN

Control of common purslane with tolpyralate



Not treated



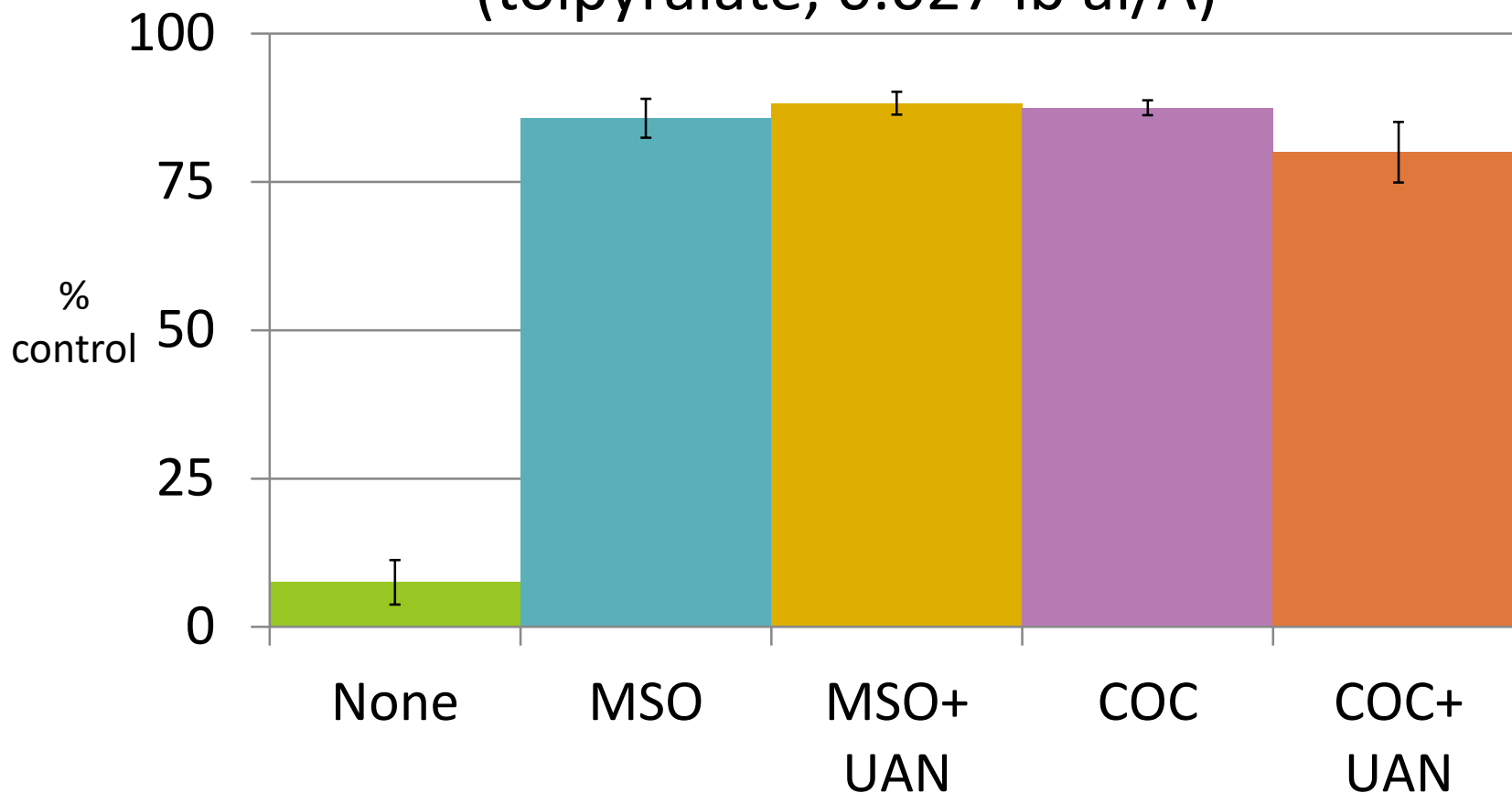
No adjuvants



+ 1% MSO + 2.5% UAN

Common purslane control

(tolpyralate, 0.027 lb ai/A)



Mesotrione (0.094) + UAN + MSO = 0% control

Field Performance

2016: Junction City, OR



HPPD (tolpy, tembo, topram)

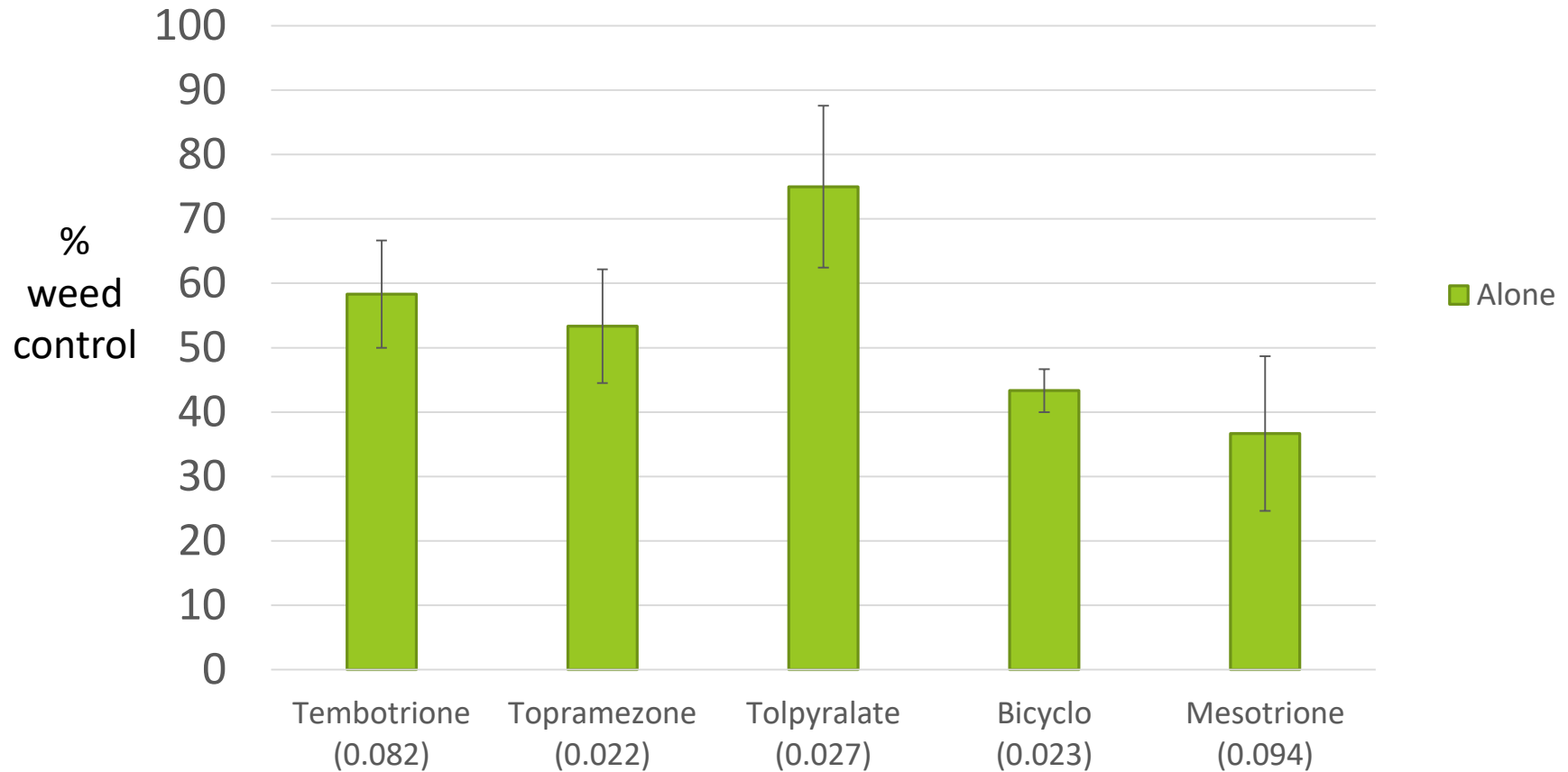
HPPD +Atrazine

HPPD + Atrazine+ dimethenamid-
p

Chenopodium album
Amaranthus retroflexus
Panicum miliaceum

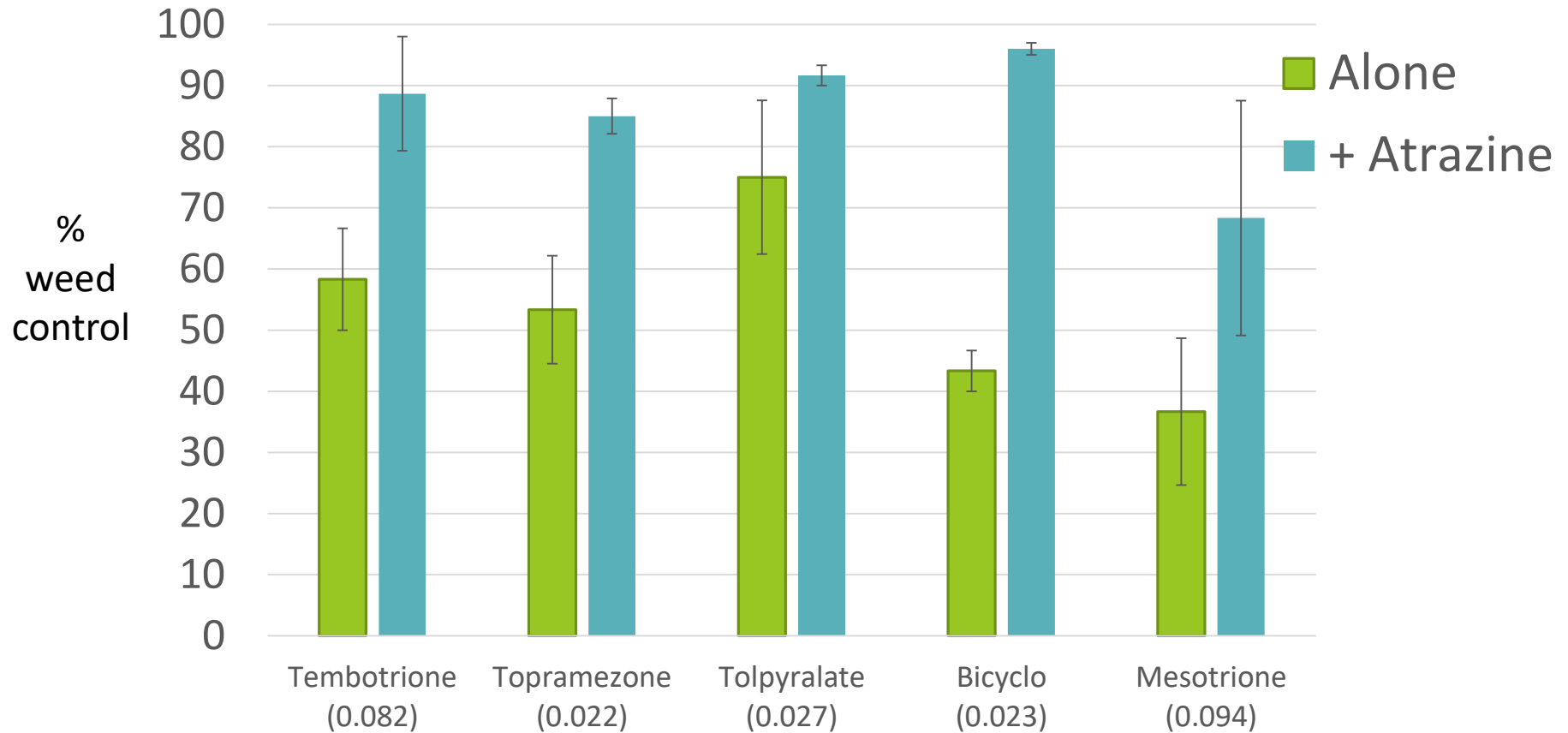
Weed control, var. Jubilee (SH2)

2016



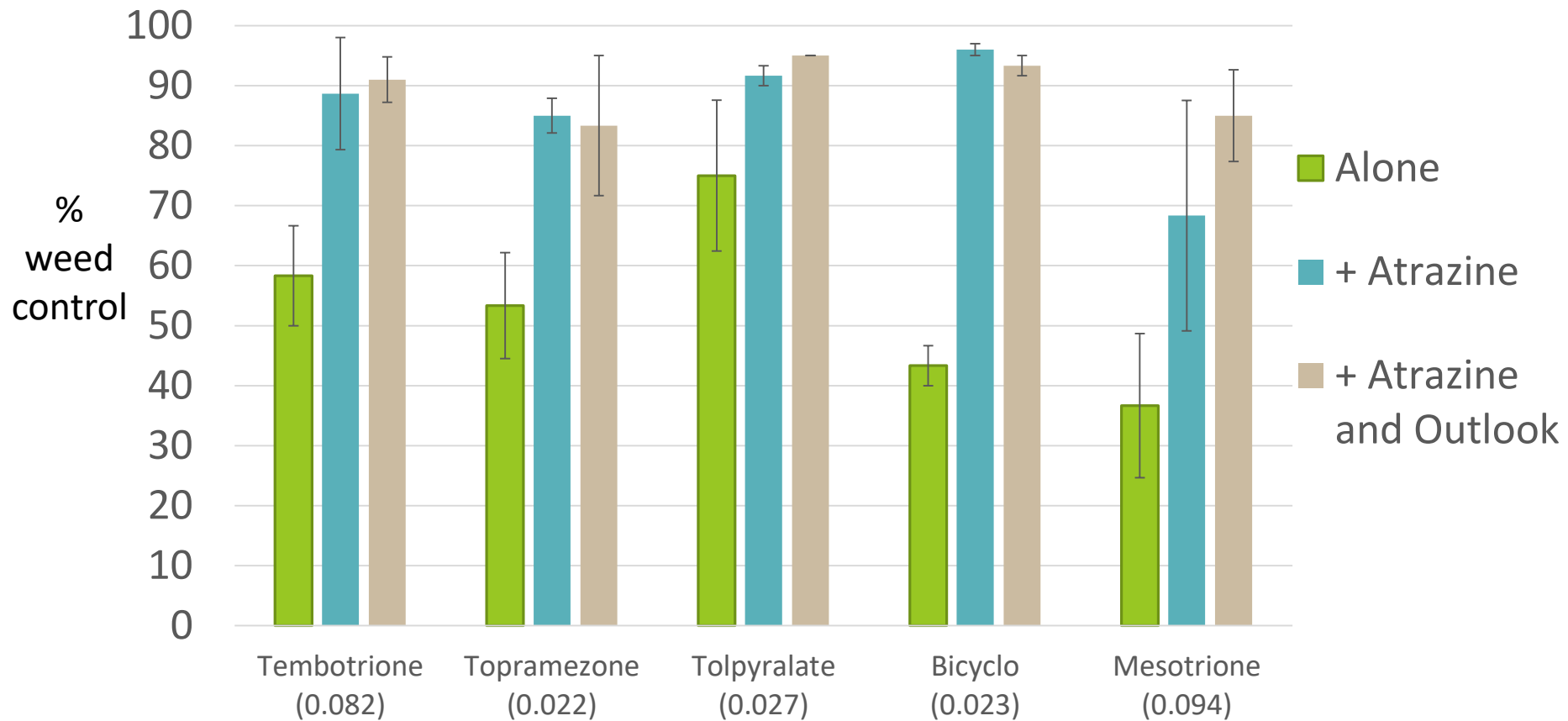
Weed control, var. Jubilee (SH2)

2016



Weed control, var. Jubilee (SH2)

2016



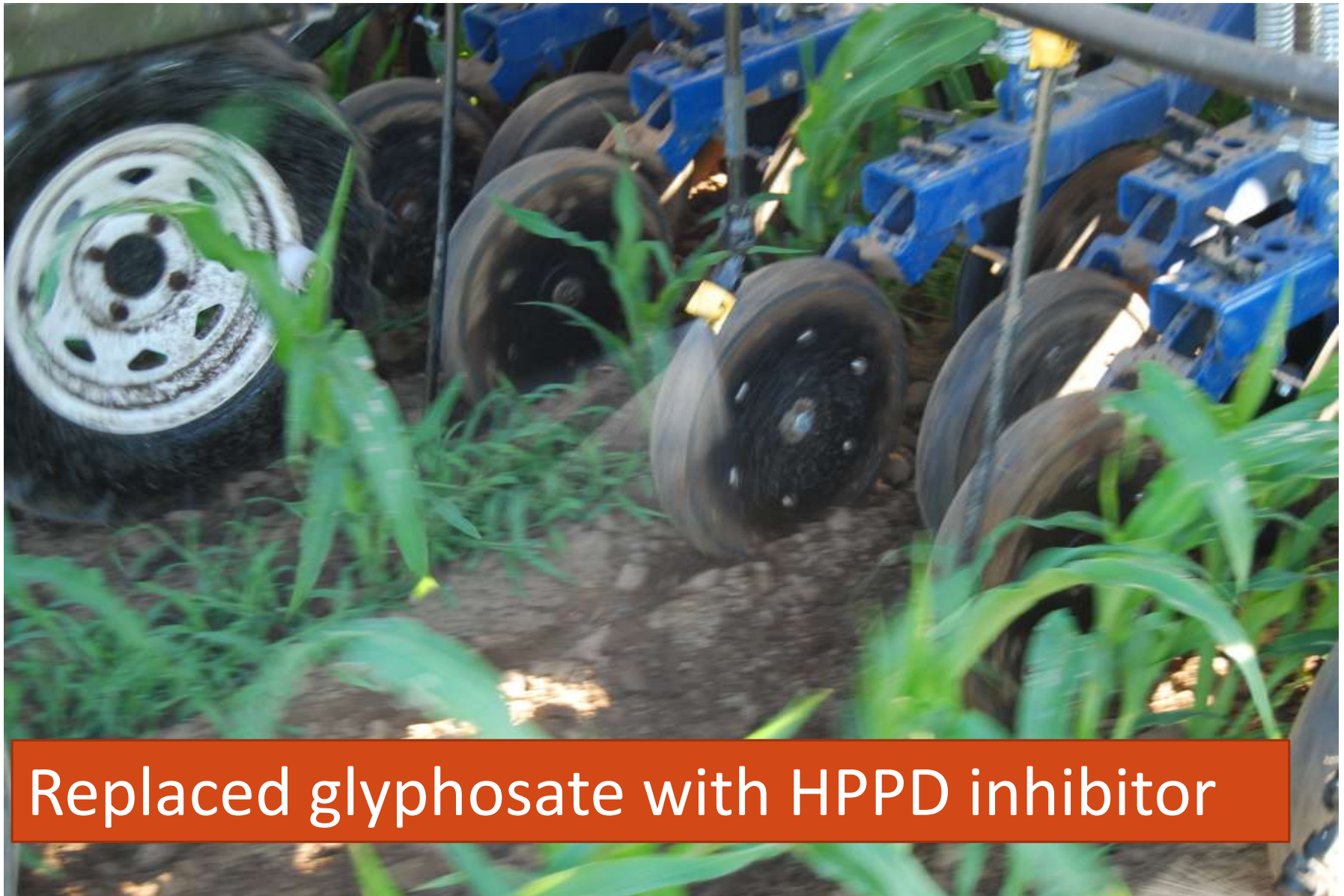
Carryover potential of tolpyralate



Tall fescue +
crimson clover

Planted July 7
Picture November 4

Implication for interseeding



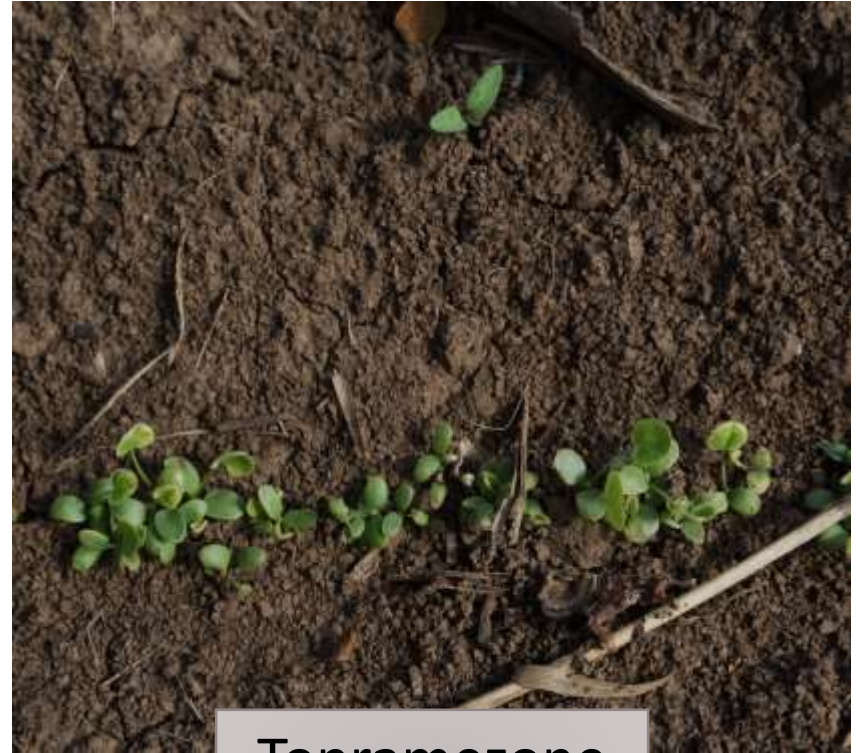
Replaced glyphosate with HPPD inhibitor

HPPD inhibitor injury to red clover

Applied post-plant surface

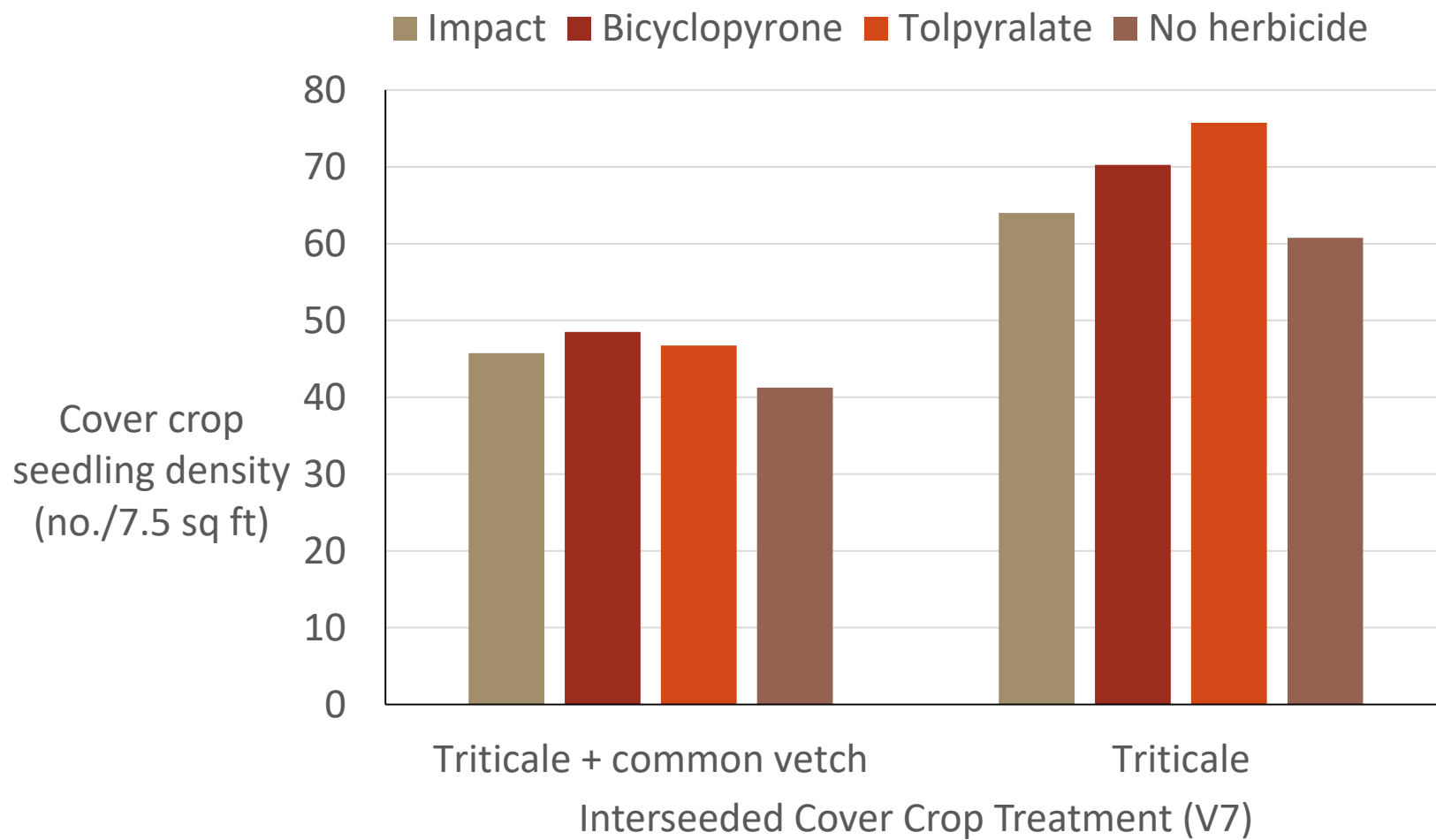


Tembotrione
(1/2x)
0.041 lb ai/A



Topramezone
(2x)
0.054 lb ai/A

Cover Crop Seedling Density



Sweet Corn Summary

Corn crop safety very good

Weed control

- Common purslane control moderate to good without atrazine
- Good proso millet control

Will this product help with MRL issues?

Potential Uses of Tolpyralate in Other Crops

Screening Trial, Aurora (2015)

- ❖ 30 crops
- ❖ 21 herbicides
- ❖ 17 genus in
- ❖ 8 botanical families

Alliaceae	Onions
Apiaceae	Cilantro
Asteraceae	lettuce, endive
Boraginaceae	Phacelia
Brassicaceae	Alyssum
Chenopodiaceae	Beets
Cucurbitaceae	Cucumbers
Papaveraceae	Poppy



Brassica crops



Cucurbits

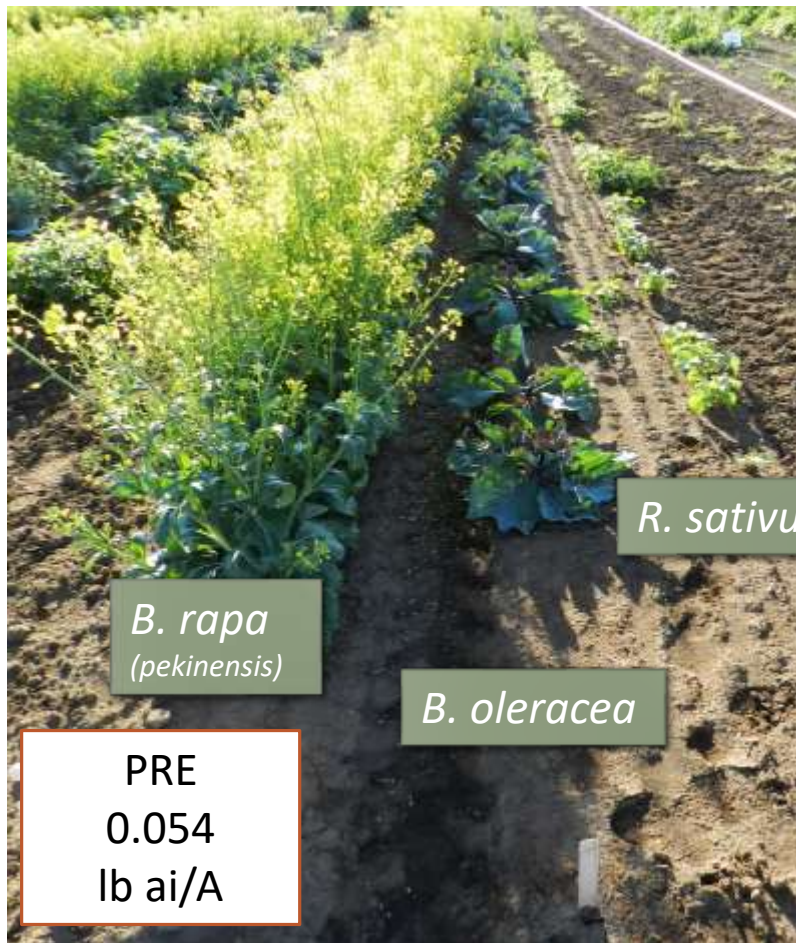


Vegetable and flower crop tolerance to tolpyralate, 2015

Vegetable	Genus	Species	Timing and Rate	
			<i>1-4 (4=no injury)</i>	
			PRE	POST
			0.039	0.027
Green onions	<i>Allium</i>	<i>cepum</i>	3.0	2.3
Knob onion	<i>Allium</i>	<i>cepum</i>	3.3	2.0
Swiss chard	<i>Beta</i>	<i>vulgaris</i>	3.0	0.3
Broccoli raab	<i>Brassica</i>	<i>ruvo</i>	4.0	0.7
Ch. cabbage	<i>Brassica</i>	<i>rapa (pekinensis)</i>	4.0	0.3
Mustard spinach	<i>Brassica</i>	<i>juncea</i>	3.0	1.7
Kale	<i>Brassica</i>	<i>oleraceae</i>	3.0	0.7
Turnip top greens	<i>Brassica</i>	<i>rapa</i>	3.7	0.7
Broccoli	<i>Brassica</i>	<i>oleraceae</i>	3.0	0.3
Rutabaga	<i>Brassica</i>	<i>napus</i>	3.0	1.0
Kohlrabi	<i>Brassica</i>	<i>oleraceae</i>	3.7	1.0
Turnip	<i>Brassica</i>	<i>rapa</i>	3.3	1.7
Cilantro	<i>Coriandrum</i>	<i>sativum</i>	3.3	1.0
Cucumber	<i>Cucumis</i>	<i>sativus</i>	4.0	0.7
Zucchini	<i>Cucurbita</i>	<i>pepo</i>	4.0	1.7
Carrot	<i>Daucus</i>	<i>carota</i>	3.0	1.0
Radish	<i>Rhaphanus</i>	<i>sativus</i>	4.0	1.0

Brassica Crops

2016



Carrots

2016



PRE
0.027
lb ai/A



POST
0.054
lb ai/A

44% yield
reduction

Thank you!

