SJV Small Grains Weed Mgmt. Issue

Nick Clark, CCA, Agronomy & Nutrient Mgmt. Farm Advisor – UC Cooperative Extension in Tulare, Kings & Fresno Counties. neclark@ucanr.edu; 559-852-2788

September 29, 2022, @ Kearney REC, Parlier, CA

2022 SJV Alfalfa and Forage Field Day

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Outline

- SJV Small Grain Production
- Weed Problems & Solutions
- Chickweed in SJV Small Grains

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Small Grain Production

Statistics from the San Joaquin Valley

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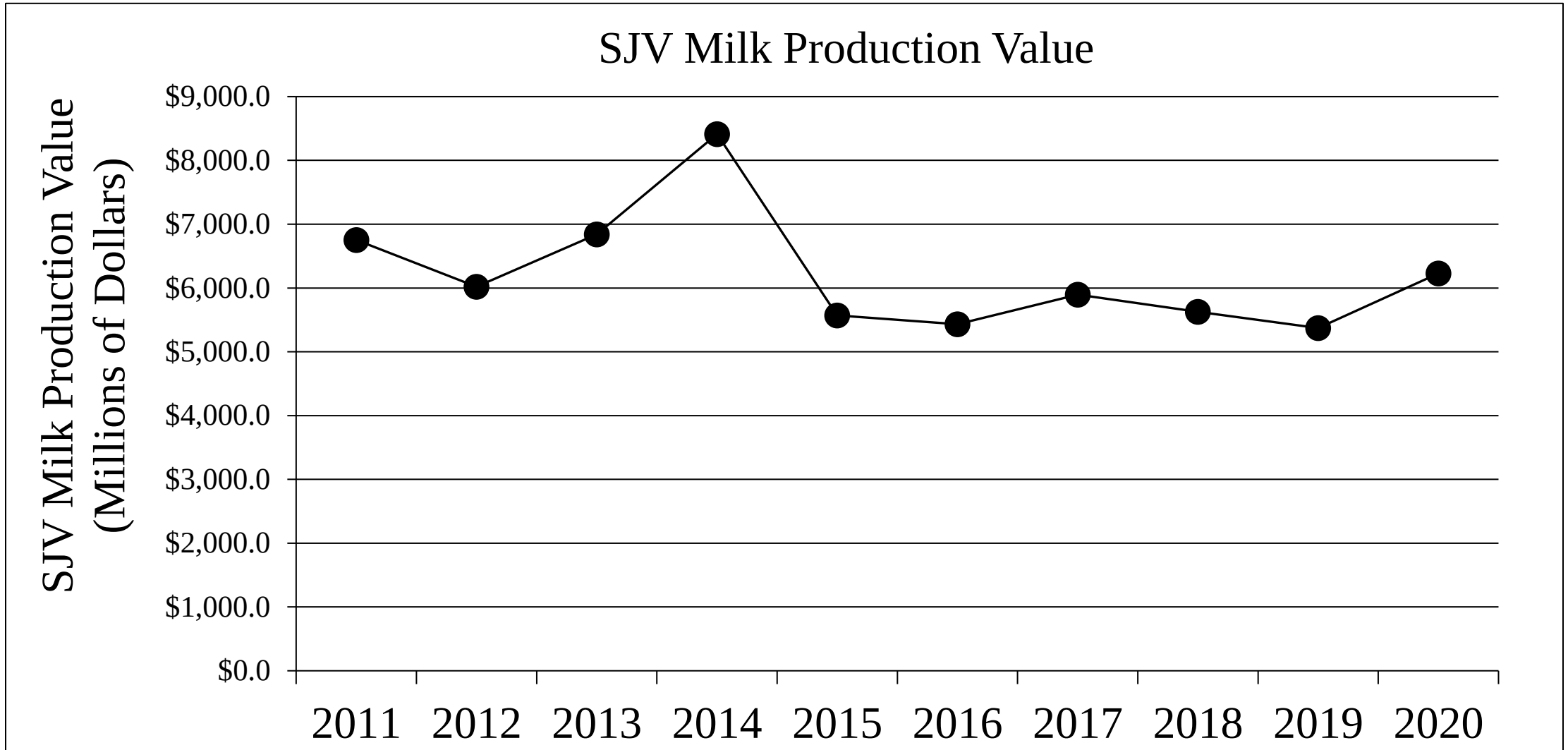
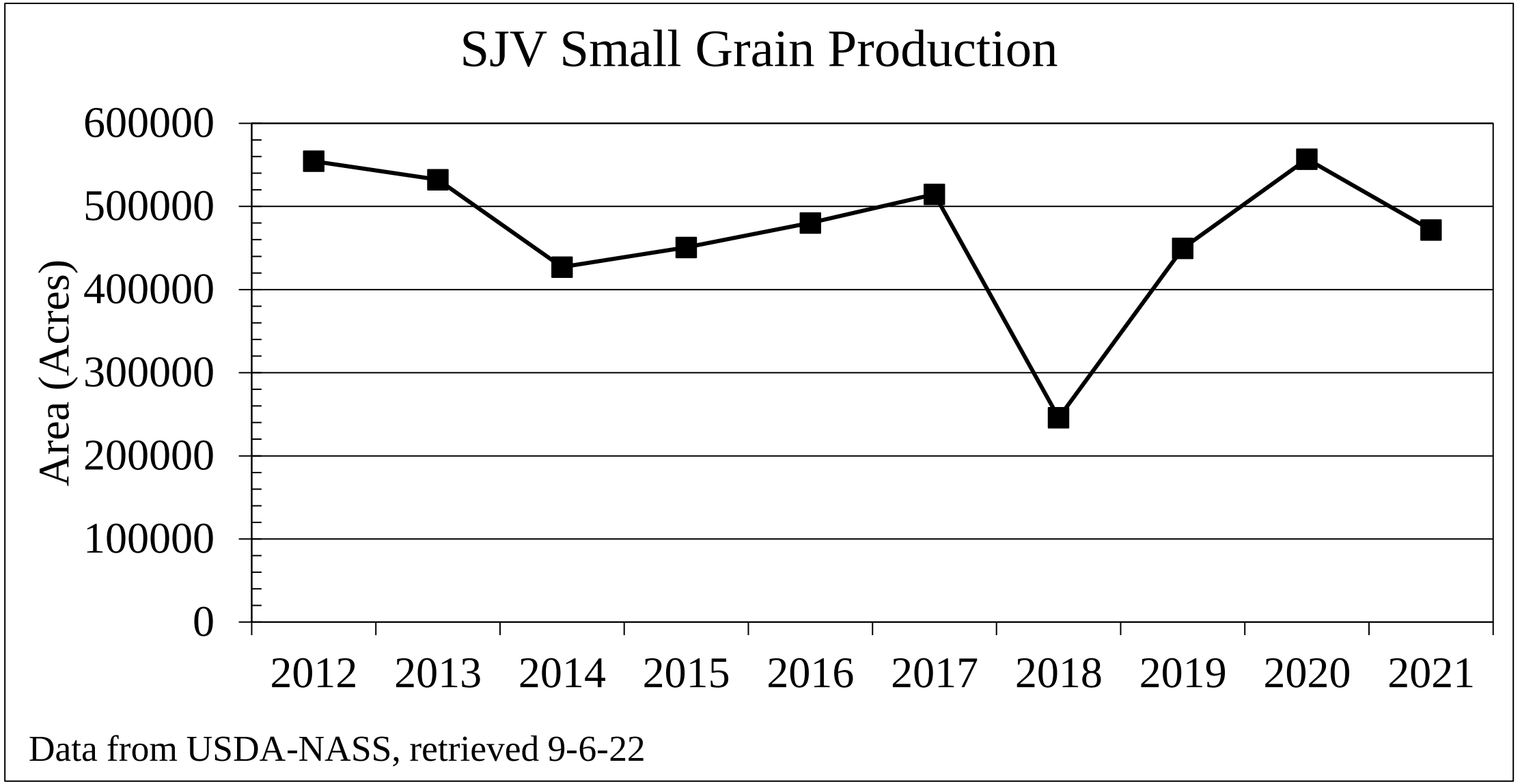
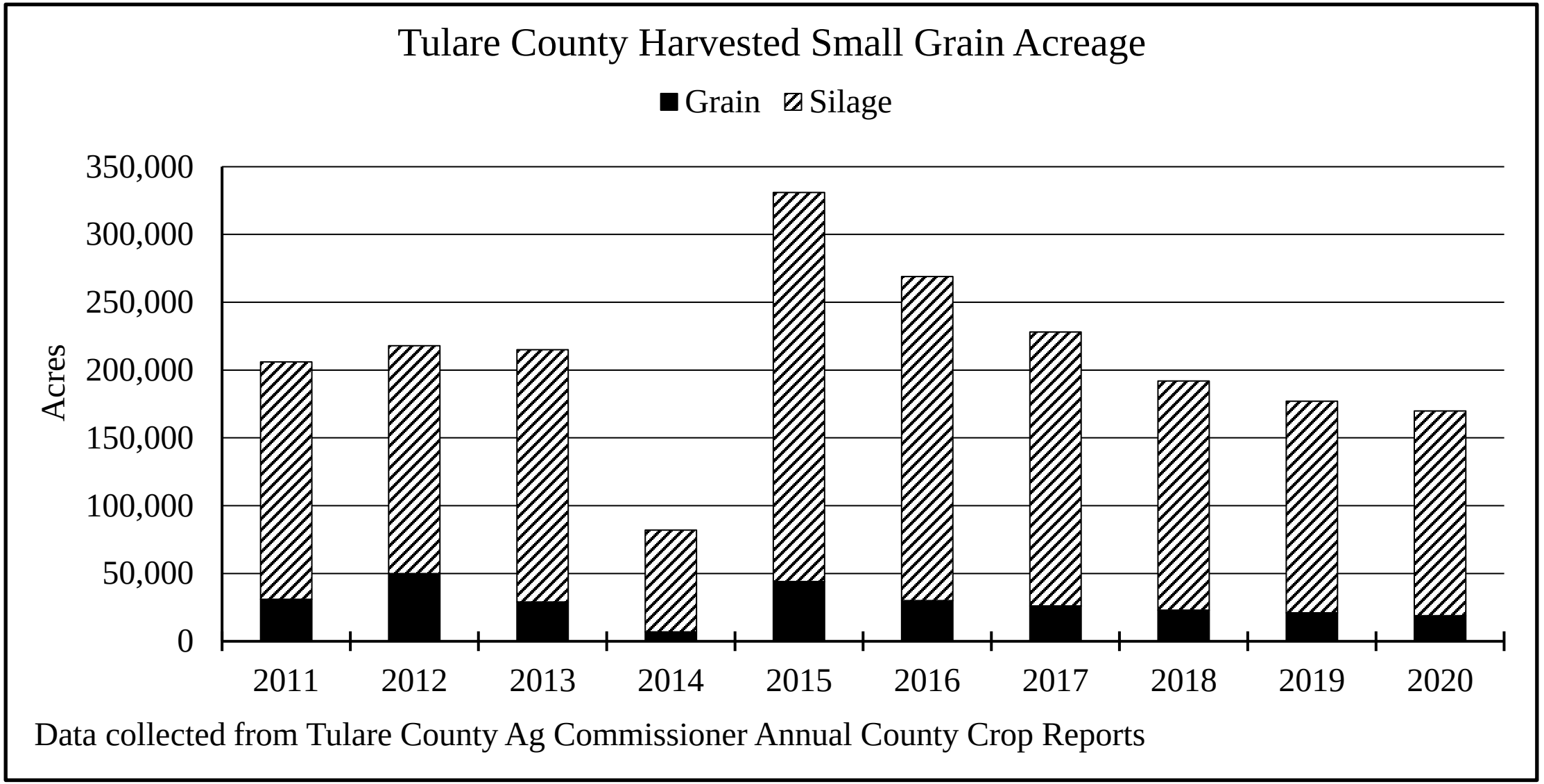


Data collected from the County Ag Commissioners' Annual County Crop Reports


SJV Small Grain Production
Area (Acres)
600000
500000
400000
300000
200000
100000
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Data from USDA-NASS, retrieved 9-6-22


Tulare County Harvested Small Grain Acreage
Grain
Silage
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Acres
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Data collected from Tulare County Ag Commissioner Annual County Crop Reports

Weed Problems in SJV Small Grains

From informal interviews with PCA's
& tech reps

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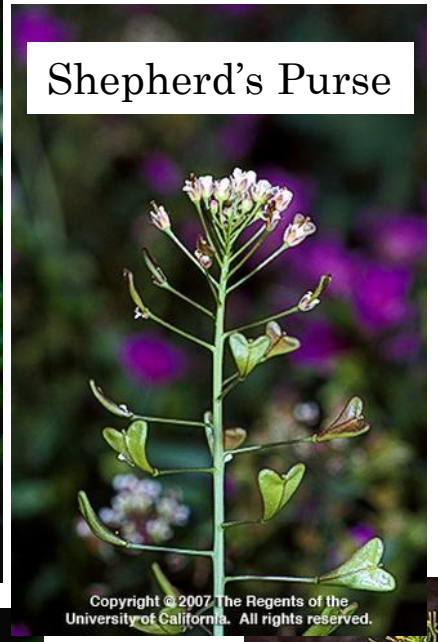
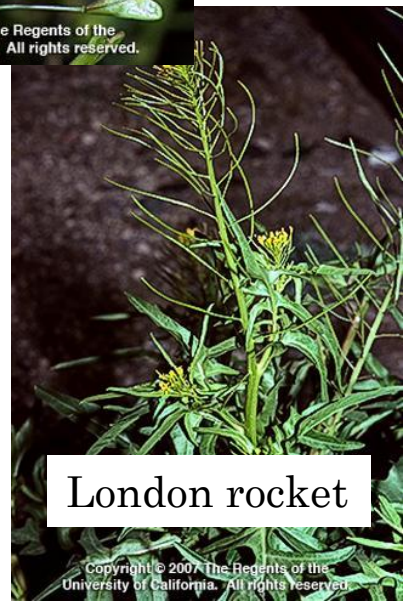
Weeds commonly found in SJV small grains – informal interviews





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Recent CA research

California Wheat Commission

1240 Commerce Ave., Woodland CA 95776* (530) 661-1292 * FAX: (530) 661-1332

PROJECT TITLE: **Weed Management in California Wheat 2013-2014**

Project Leaders
Steve Wright

Link to study (http://cawheat.org/uploads/resources/719/wheatcommissionweed_report2014.pdf)

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Table 4. Common Chickweed (*Stellaria media*) % Control

Treatments	Rate/A	7 DAT	14 DAT	21 DAT	28 DAT	36 DAT
1. Express + MCPA Amine + Axial + NIS	0.25 oz + 1 pt + 16.4 floz + 0.25%	0	3	23	56	96
2. Express + MCPA Amine + Axial + NIS	0.5 oz + 1 pt + 16.4 floz + 0.25%	0	5	19	45	96
3. Express + MCPA Amine + Axial	0.25 oz + 1 pt + 16.4 floz	0	6	25	80	99
4. Express + MCPA Amine + Axial	0.5 oz + 1 pt + 16.4 floz	0	4	23	60	96
5. Express + MCPA Amine + Axial + NIS	0.25 oz + 12 floz + 16.4 floz + 0.25%	0	4	16	61	93
6. Express + MCPA Amine + Axial + NIS	0.5 oz + 12 floz + 16.4 floz + 0.25%	0	4	19	50	99
7. Express + MCPA Amine + Axial	0.25 oz + 12 floz + 16.4 floz	0	5	33	54	99
8. Express + MCPA Amine + Axial	0.5 oz + 12 floz + 16.4 floz	0	4	18	44	91
9. Express + 2,4-D + Axial + NIS	0.25 oz + 1 pt + 16.4 floz + 0.25%	0	6	33	60	94
10. Express + 2,4-D + Axial + NIS	0.5 oz + 1 pt + 16.4 floz + 0.25%	0	8	35	68	94
11. Express + 2,4-D + Axial	0.25 oz + 1 pt + 16.4 floz	0	7	26	78	98
12. Express + 2,4-D + Axial	0.5 oz + 1 pt + 16.4 floz	0	4	25	49	95
13. Express + 2,4-D + Axial + NIS	0.25 oz + 12 floz + 16.4 floz + 0.25%	0	5	26	59	98
14. Express + 2,4-D + Axial + NIS	0.5 oz + 12 floz + 16.4 floz + 0.25%	0	7	25	56	90
15. Express + 2,4-D + Axial	0.25 oz + 12 floz + 16.4 floz	0	4	29	61	96
16. Express + 2,4-D + Axial	0.5 oz + 12 floz + 16.4 floz	0	6	25	71	96
17. Express + Clarity + Axial + NIS	0.25 oz + 4 floz + 16.4 floz + 0.25%	0	4	20	54	94
18. Express + Clarity + Axial + NIS	0.5 oz + 4 floz + 16.4 floz + 0.25%	0	5	26	60	93
19. Express + Clarity + Axial	0.25 oz + 4 floz + 16.4 floz	0	5	28	43	95
20. Express + Clarity + Axial	0.5 oz + 4 floz + 16.4 floz	0	1	21	51	96
21. UTC	-----	0	0	0	0	0

Other weeds evaluated by Steve Wright in the same study

- Italian ryegrass
- Shepherd's purse
- Burning nettle
- Swinecress

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What about dairy manure?

- Corrals = 21,755 seed/ton manure
- Liquid separate = 15,872 seed/ton manure. **Why?**
- Dry cows had more viable weed seed than lactating cows. **Why?**
- Compost longer than 6-8 weeks, deeper piles, supplement moisture
- Focus especially on dry cows

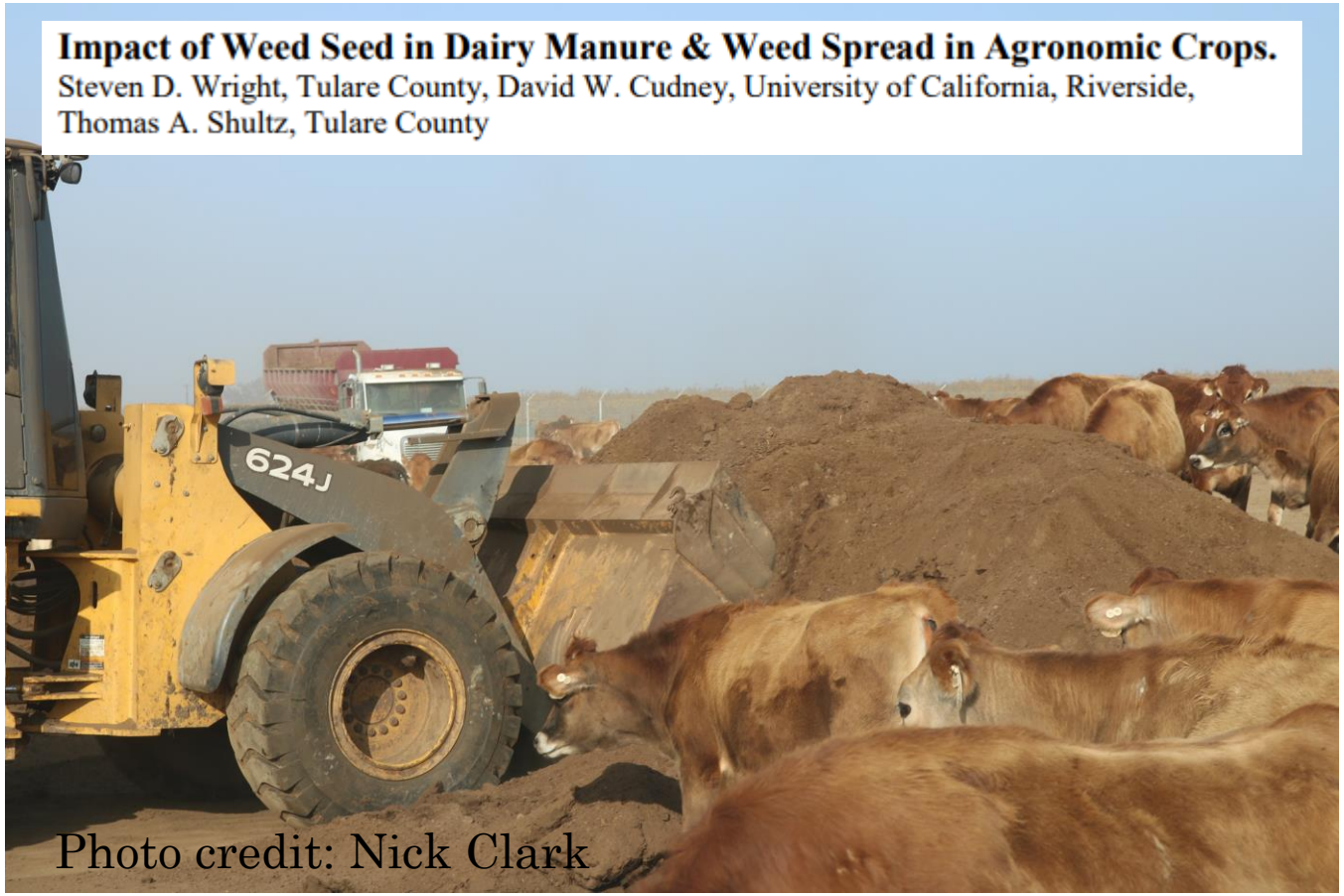

Photo credit: Nick Clark

Link to study (https://www.cwss.org/uploaded/media_pdf/1494-3J_Wright_CWSS2015_Impact of Weed Seed in Dairy Manure & Weed Spread in Agronomic Crops.pdf)

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Common Chickweed

An emerging problem in SJV small grains?

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Acknowledging support and collaboration

- Fresno State
  - **Dr. Anil Shrestha**
  - **Dr. Kate Waselkov**
  - **Paola Villicana**
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  - Kelsey Galvan
- UCCE
  - **Walter Martinez**
  - **Dr. Brad Hanson**
  - **Dr. Mark Lundy**
  - Jose Dias
  - Konrad Mathesius
  - Pahoua Yang
  - Ruben Chavez
- Industry
  - Colt Ellis, Simplot Grower Solutions
  - Pedro Hernandez, Nichino America
  - Brian Gogue, Helena Agri-Enterprises
  - FMC Corporation
  - Corteva Agriscience
  - Bayer Crop Science

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What PCA's reported

- 2-3 years in a row
- Chickweed escapes
- Pyroxsulam (Simplicity)
- Tribenuron (Express)

What UC and CSU checked

- Environmental conditions
- Other weeds present
- Unsprayed areas in field
- Application records
- Modified efficacy test, 2021
- GH bioassay, 2022



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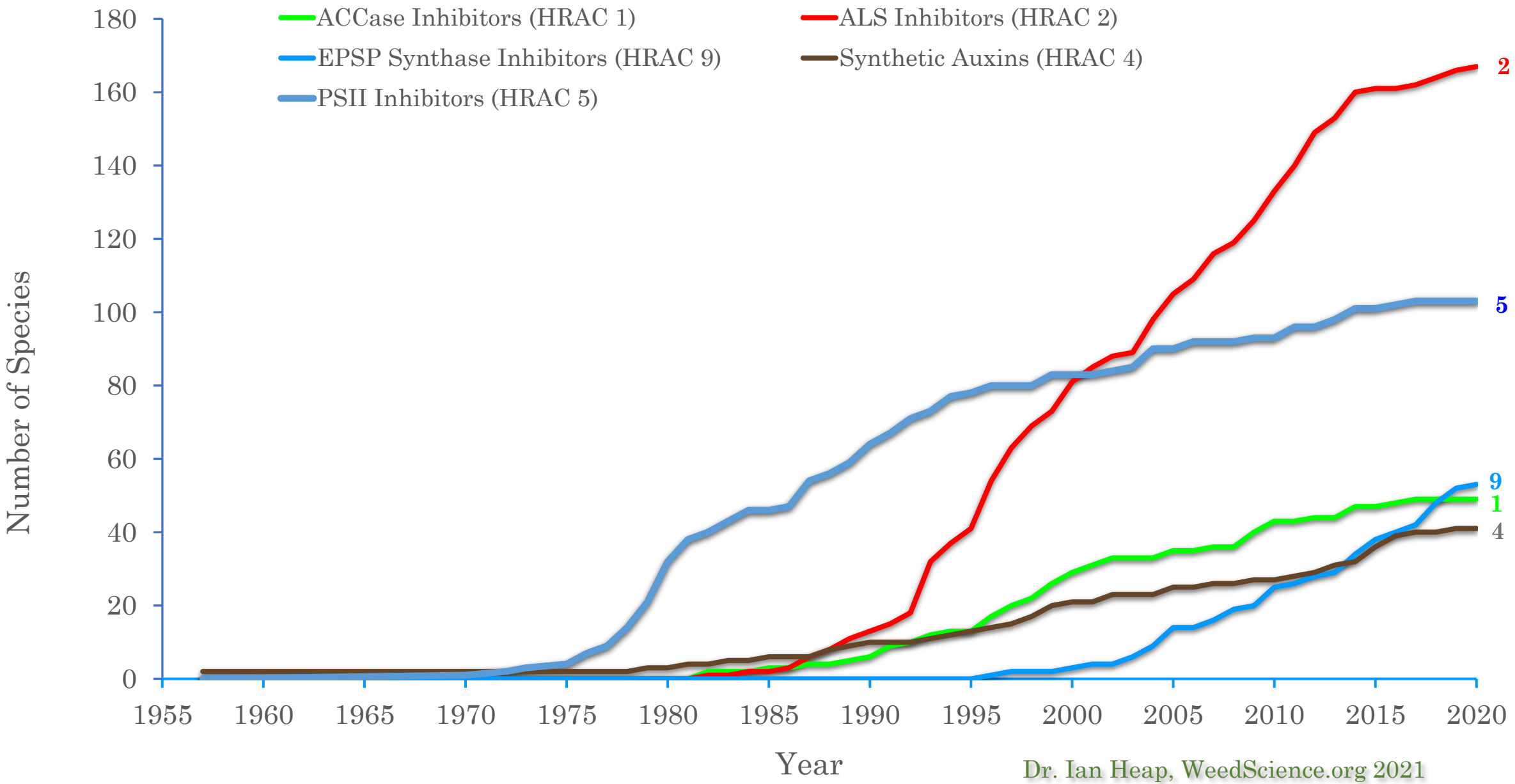
Common Chickweed herbicide resistance reports in North America

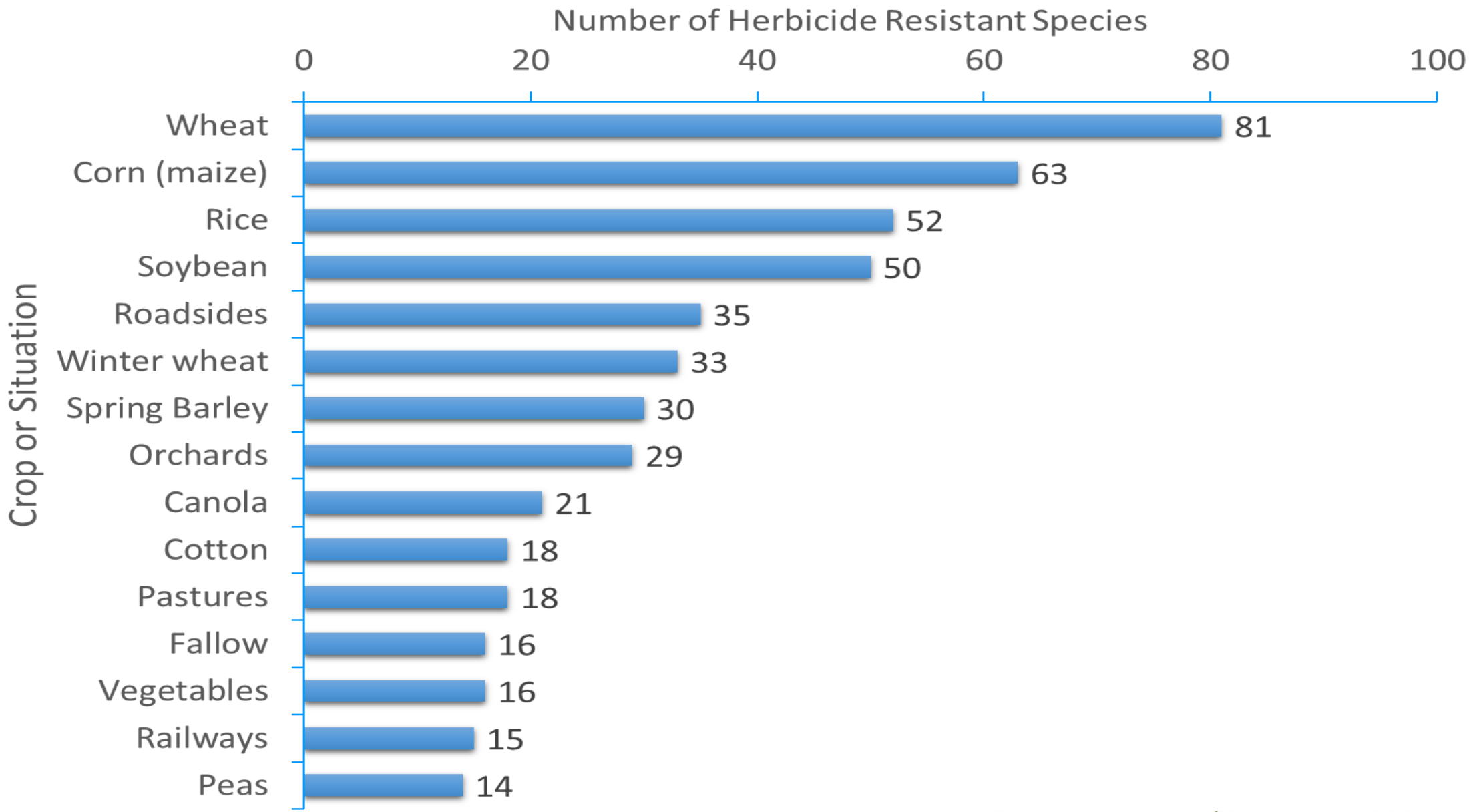
Country Province/State	Year	Crops	Active Ingredients	Sites of Action
US-Kentucky	2013	Wheat	chlorsulfuron, flucarbazone, thifensulfuron, tribenuron	ALS inhibitors
US-Delaware	2012	Wheat	thifensulfuron, tribenuron	ALS inhibitors
US-Pennsylvania	2010	Alfalfa, Spring Barley, and Wheat	pyroxsulam, thifensulfuron, tribenuron	ALS inhibitors
US-Maryland	2009	Wheat	chlorsulfuron, mesosulfuron, thifensulfuron, tribenuron	ALS inhibitors
Canada-Manitoba	2008	Peas	thifensulfuron, tribenuron	ALS inhibitors
US-Virginia	2008	Wheat	thifensulfuron	ALS inhibitors
Canada-Saskatchewan	2005	Spring Barley, and Wheat	thifensulfuron, tribenuron	ALS inhibitors
Canada-Alberta	1988	Cereals and Wheat	chlorsulfuron, ethametsulfuron, imazamethabenz, metsulfuron, sulfometuron, thifensulfuron	ALS inhibitors

Number Resistant Species for Several Herbicide Sites of Action (HRAC Codes)



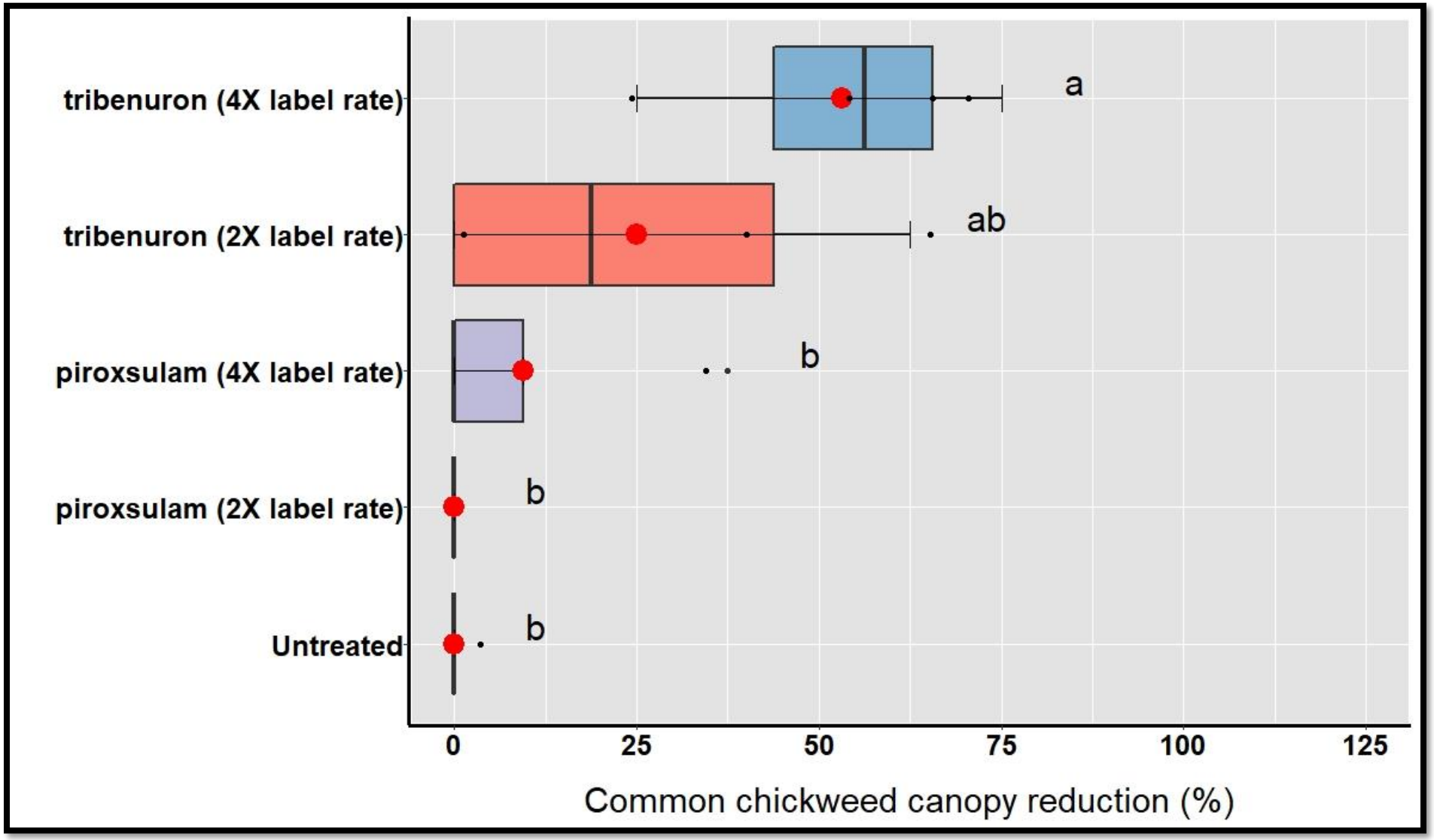
Dr. Ian Heap, WeedScience.org 2021

Number of Herbicide-Resistant Species by Crop



Early work to rule out herbicide resistance

Effect of herbicides on chickweed in wheat



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Couldn’t rule out resistance – to the greenhouse: Round 1

Simplicity – UTC

PCA identified field 2
(suspected resistant)

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(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Simplicity – 0.5 X

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Simplicity – 1X

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Simplicity – 2X

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Simplicity – 4X

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Simplicity – 8X

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Express – UTC

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Express – 0.5X

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)

Express – 1X

PCA identified field 2
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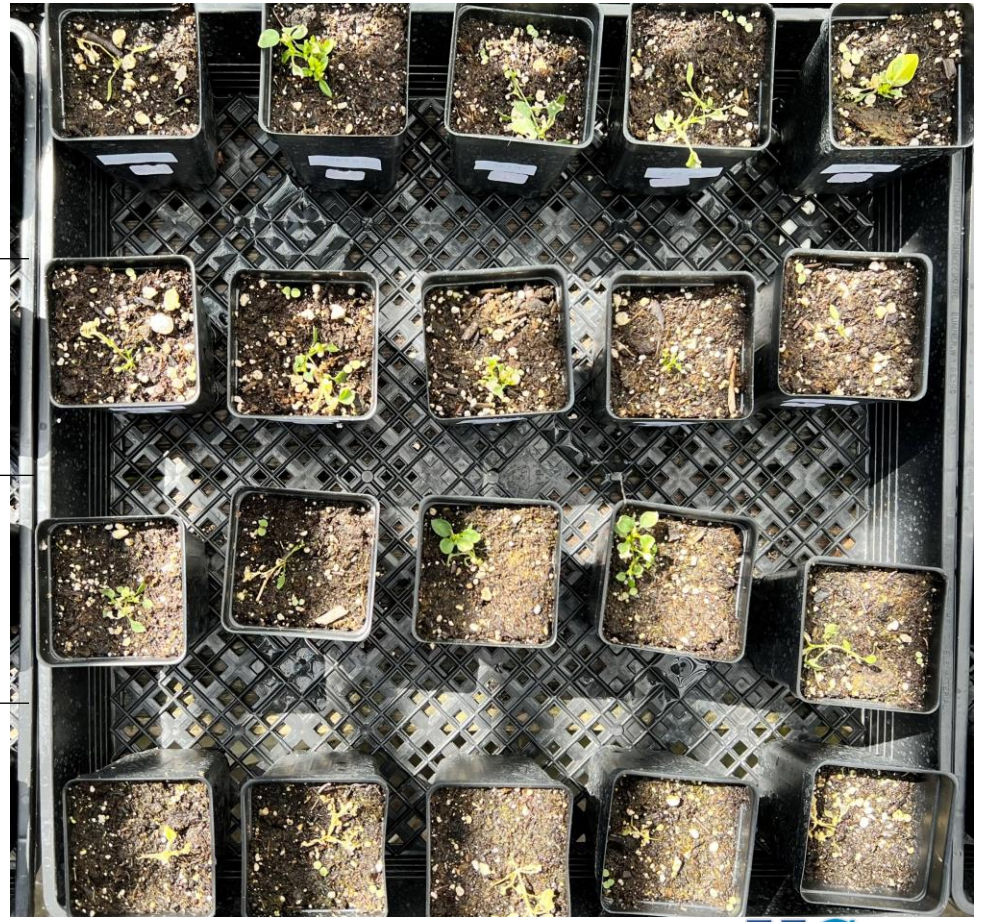

Express – 4X

PCA identified field 2
(suspected resistant)

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Organic control
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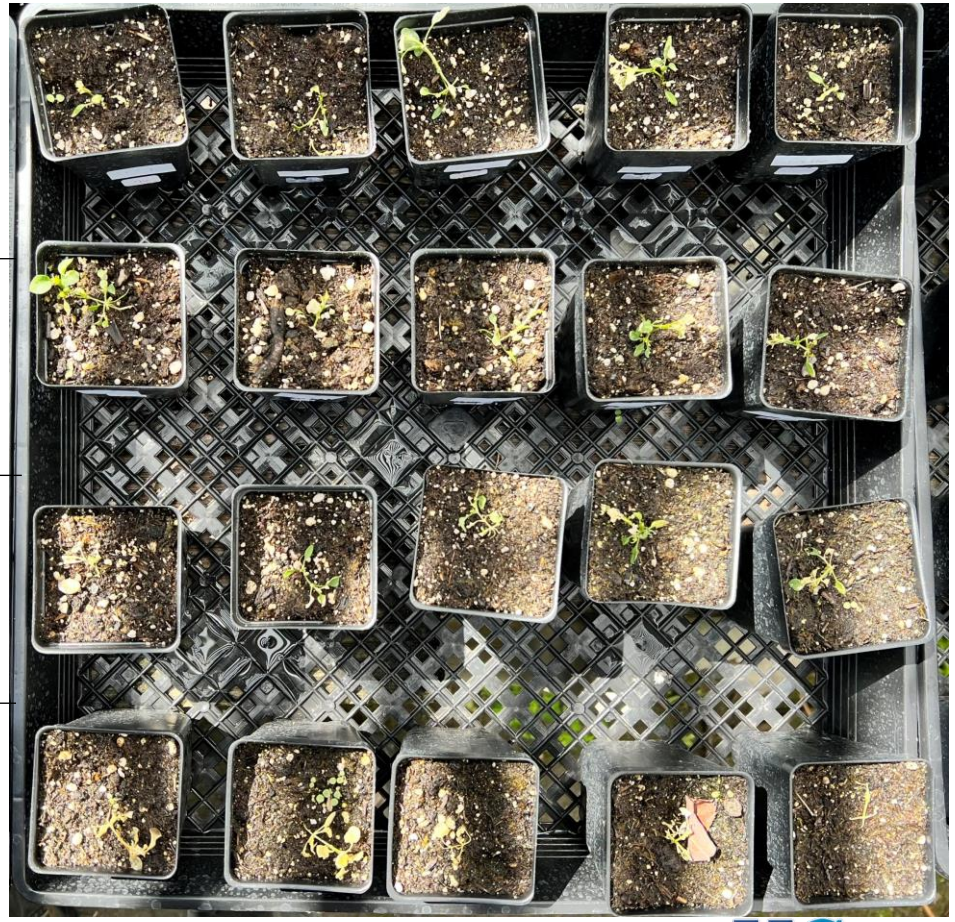


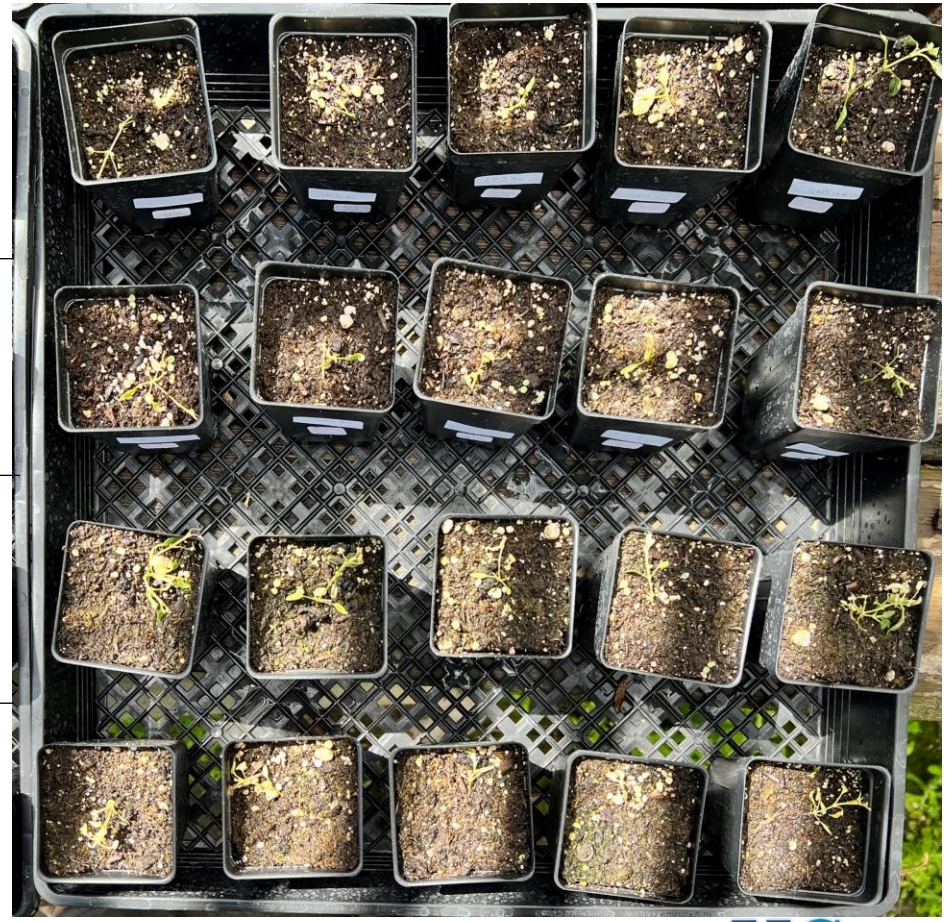
Express – 8X

PCA identified field 2
(suspected resistant)

PCA identified field 2
(suspected resistant)

PCA identified field 1
(suspected resistant)

Organic control
(ALS susceptible)



Mortality & Reproduction

Location	Herbicide	Rate	Mortality w1	Mortality w2	Mortality w3	Mortality w4	Flower
Organic	Express	0x	0%	0%	0%	0%	100%
		0.5x	0%	0%	90%	100%	0%
		1x	0%	0%	90%	100%	0%
		2x	0%	0%	90%	100%	0%
		4x	0%	0%	94%	100%	0%
		8x	0%	0%	90%	100%	0%
	Simplicty	0x	0%	0%	0%	0%	80%
		0.5x	0%	0%	10%	100%	20%
		1x	0%	0%	90%	100%	40%
		2x	0%	0%	90%	100%	40%
		4x	0%	0%	90%	100%	60%
		8x	0%	0%	90%	100%	0%
Escape	Express	0x	0%	0%	0%	0%	100%
		0.5x	0%	0%	9%	45%	40%
		1x	0%	0%	1%	26%	73%
		2x	0%	0%	0%	64%	47%
		4x	0%	0%	7%	86%	20%
		8x	0%	0%	9%	98%	0%
	Simplicty	0x	0%	0%	0%	0%	93%
		0.5x	0%	0%	0%	0%	100%
		1x	0%	0%	0%	0%	100%
		2x	0%	0%	0%	0%	100%
		4x	0%	0%	0%	0%	100%
		8x	0%	0%	0%	0%	100%

28 days after treatment – Osprey (too late for control!)

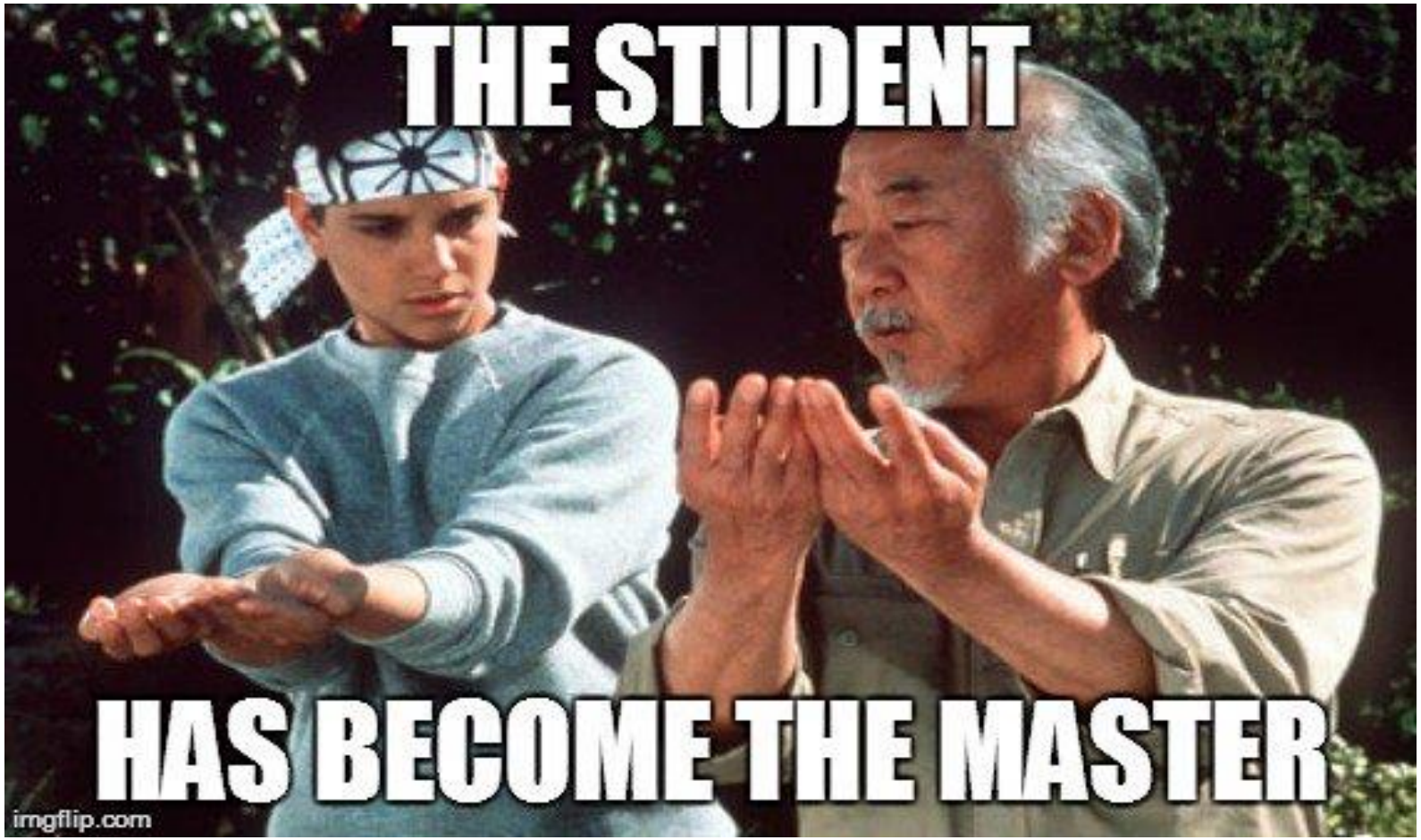
BMP's for weed control reminder

- Stand establishment & crop vigor
- Application timing for conditions
- Correct weed and crop stage
- Coverage
- Tank mix partners for broad spectrum of weeds & improving efficacy of tough weeds
- Label rates to zap tough weeds
- Rotate chemistry

AI's still CA registered for wheat with noted activity on chickweed – **Check the label**

Over the top post-emergence	Pre-crop or –weed emergence
2,4-D	Glyphosate
Dicamba	Flumioxazin
Pyraflufen	Pendimethalin
Diuron	Trifluralin
Bromoxynil	Saflufenacil
MCPA	

My question to you:
What should come next?



THANK YOU

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