Does rimsulfuron herbicide for broomrape also reduce field bindweed?

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UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

Background

- Branched broomrape reappears in California, ca 2018
  - Sept 2012, 80 acres infested in field near Hollister, after > 20 years without tomatoes

"It was a pretty serious infestation," said Richard Smith, farm advisor with the University of California Cooperative Extension. "We collected big garbage bags of branched broomrape from the 70-acre plot where it was discovered. And when we mapped the site, it overlapped almost precisely with the 1980s outbreak."

Farm Progress, 10/5/2012

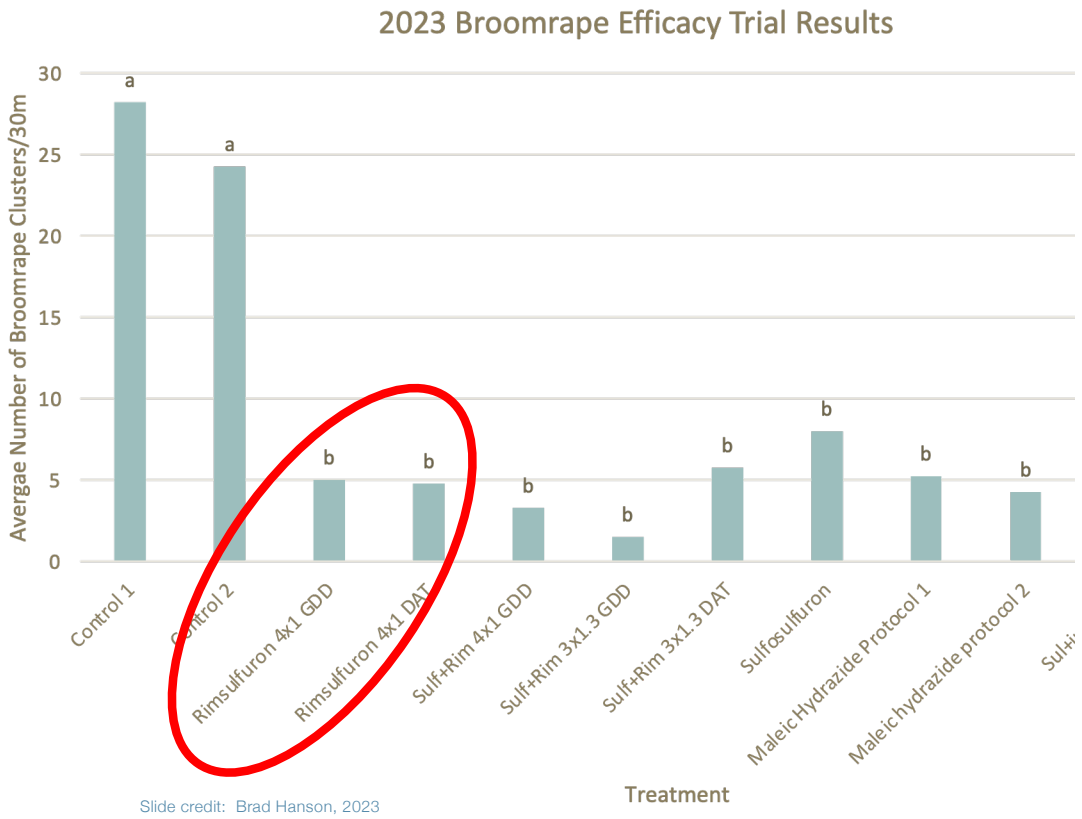
Branched Broomrape
Phelipanche ramosa syn. *Orobanche ramosa*

Photo credit: Brad Hanson

- Native to Eurasia and North Africa-Mediterranean countries
- Obligate root parasite (holoparasite)
- Haustorium– modified root that parasitizes host plant
- "A-Listed" noxious weed in California
- At high density, can greatly reduce yield
  or even result in crop failure
- Large agricultural host range

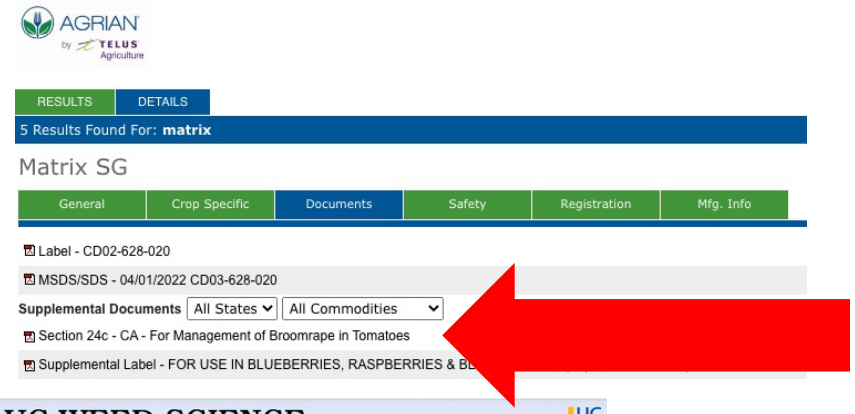
Herbicide Efficacy Studies 2020 and beyond

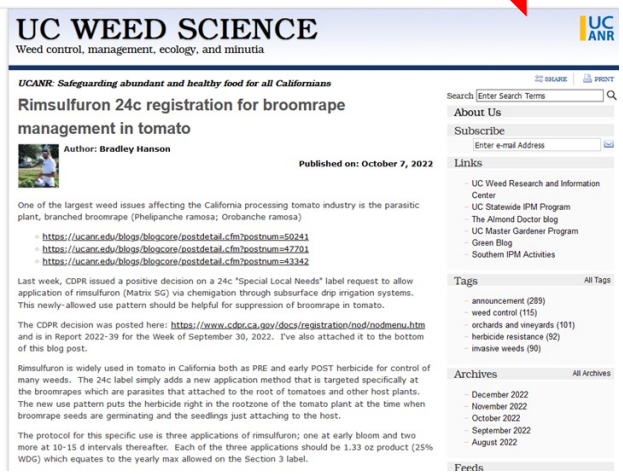
- Brad Hanson, Matt Fatino, Pershang Hosseini
- Planting date important
- Rimsulfuron (Matrix) chemigation through the drip



Slide credit: Brad Hanson, 2023

Rimsulfuron 24c Special Local Need Label





CORTEVA™ agriscience

RIMSULFURON	GROUP	2	HERBICIDE

FIFRA Section 24(c) Special Local Need (SLN) Label

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF CALIFORNIA

For management of broomrape in tomatoes

Matrix SG

EPA Reg No. 352-768 **SLN # 303093**

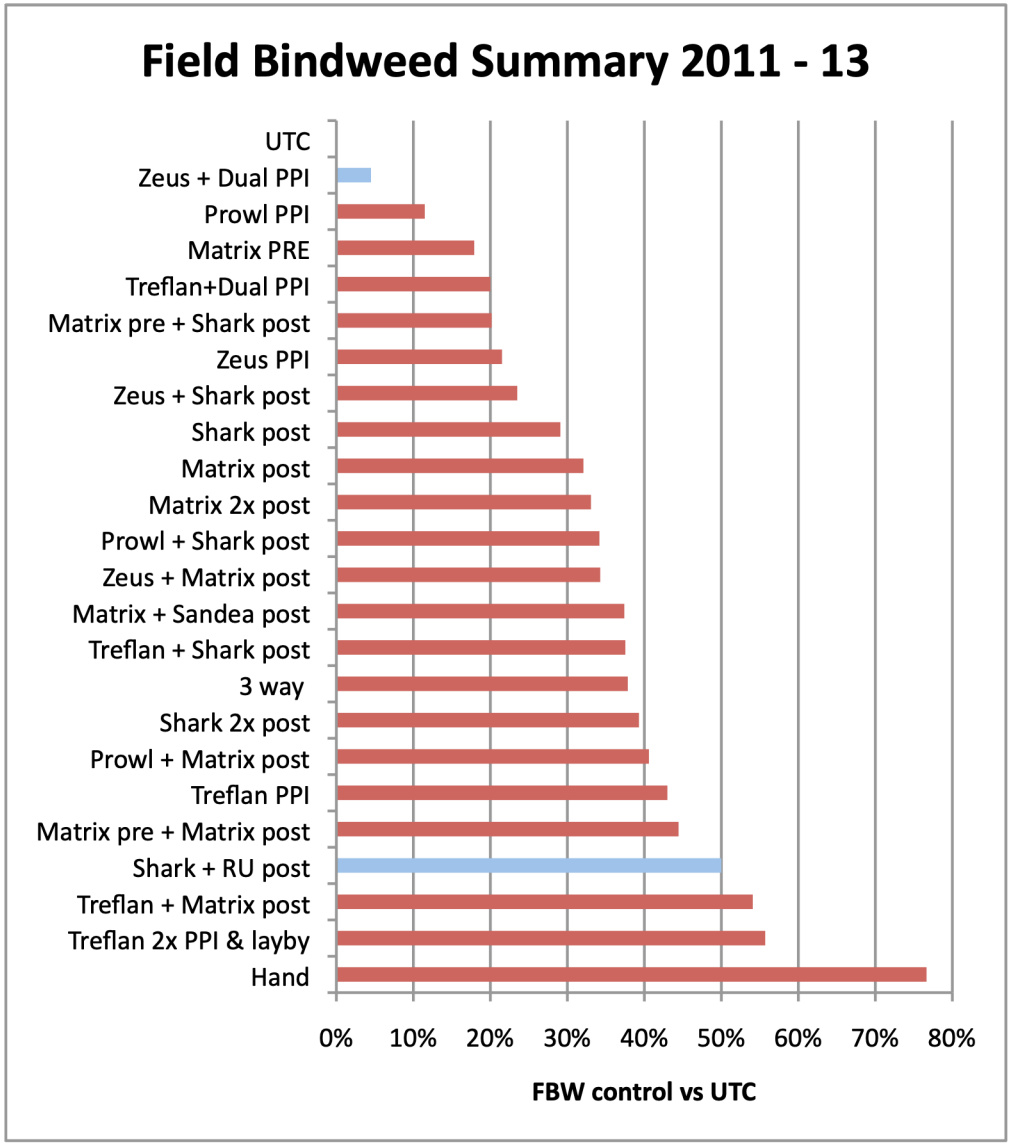
ATTENTION

- It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
- This labeling must be in the possession of the user at the time of application.
- Follow all applicable directions, restrictions, Worker Protection Standard requirements and precautions on the EPA registered label for Matrix SG (352-768).

Chemigation

Additional benefits?

- Reports of reduction in field bindweed in fields using broomrape protocols.
- Small plot trials by Hanson and Fatino did not show this effect.


Field Bindweed Summary 2011 - 13
UTC
Zeus + Dual PPI
Prowl PPI
Matrix PRE
Treflan+Dual PPI
Matrix pre + Shark post
Zeus PPI
Zeus + Shark post
Shark post
Matrix post
Matrix 2x post
Prowl + Shark post
Zeus + Matrix post
Matrix + Sandea post
Treflan + Shark post
3 way
Shark 2x post
Prowl + Matrix post
Treflan PPI
Matrix pre + Matrix post
Shark + RU post
Treflan + Matrix post
Treflan 2x PPI & layby
Hand
0%
10%
20%
30%
40%
50%
60%
70%
80%
FBW control vs UTC

Chemigating rimsulfuron for bindweed control?

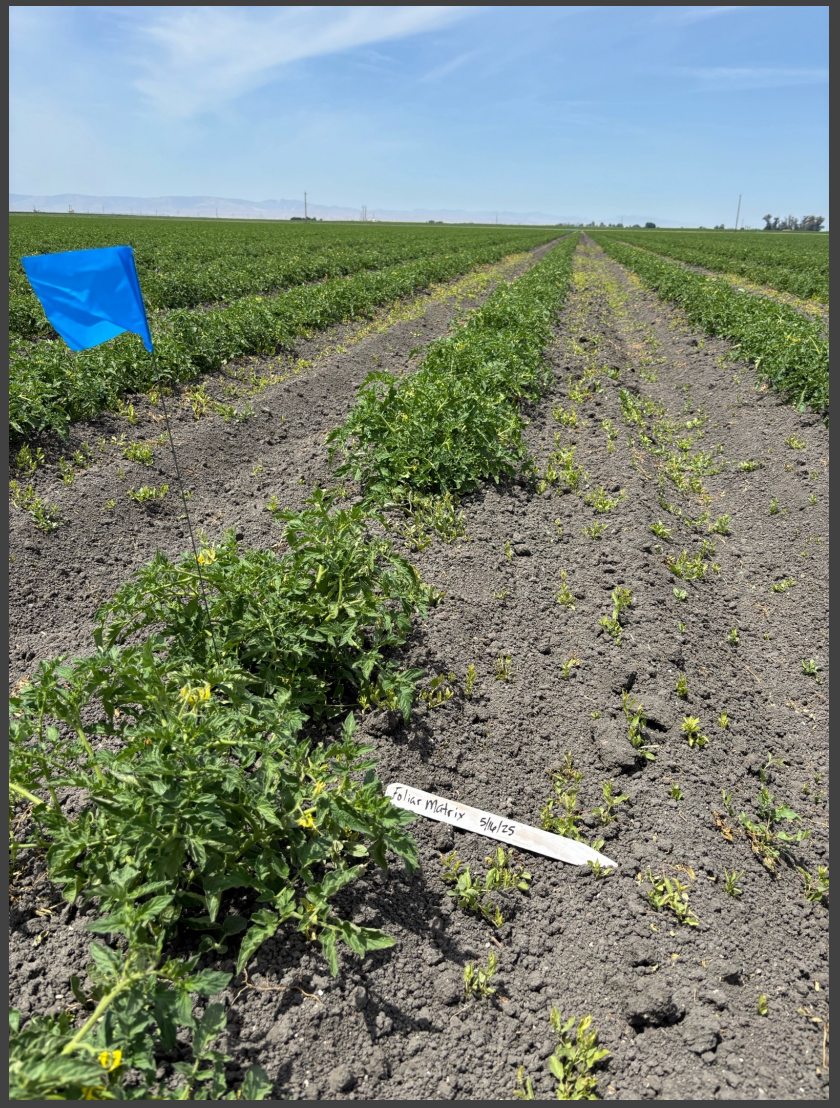
- Co-conspirators Brad Hanson and Patricia Lazicki
- Rimsulfuron (Matrix) applied 20, 30, and 40 DAP at 1.33 oz/A through the drip.
  - Foliar matrix not applied.
- Dos Palos, UC Davis Veg Crops, UC Russell Ranch, Yolo Co.
- Treatment areas 16, 30, 20, and 9 acres
- Lazicki: 4 reps. Stoddard: 2 reps. Hanson: not replicated

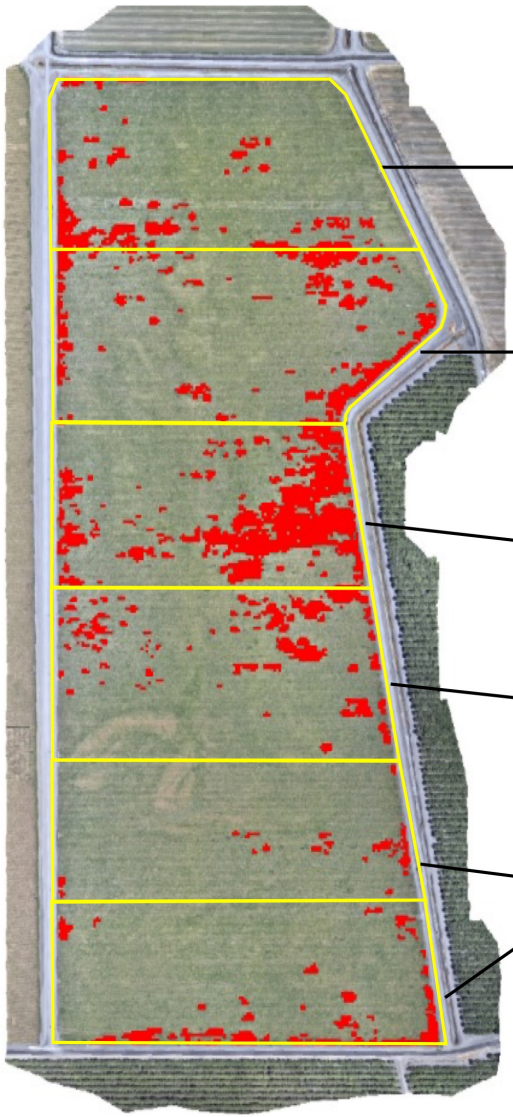
Methods

- Transects: 3 – 4 beds per treatment area, +/- FBW every 25 ft.
- DJI Phantom multi-rotor drone with an image resolution of 2.5 cm/pixel
  - Color differences used to calculate FBW area near harvest.
  - Pilot and photographer: Ahmed Kayad, UCCE Intermountain REC
- Yields at Yolo and Merced

2007 PT variety trial


Matrix inj. 5/16/25 10 days post 1st app


Foliar Matrix 5/16/25



Merced Field

Field 1 chemigated Matrix
Field Area: 18.5 Acre - Weed Area: 1.67 Acre
Weed area percentage: 9%

Field 2
Field Area: 20.34 Acre - Weed Area: 2.19 Acre
Weed area percentage: 10.8%

Field 3 chemigated Matrix
Field Area: 16.6 Acre - Weed Area: 4.3 Acre
Weed area percentage: 25.9%

Field 4
Field Area: 18.8 Acre - Weed Area: 1.75 Acre
Weed area percentage: 9.3%

Field 5 & 6
Field Area: 34.6 Acre - Weed Area: 1.65 Acre
Weed area percentage: 4.8%

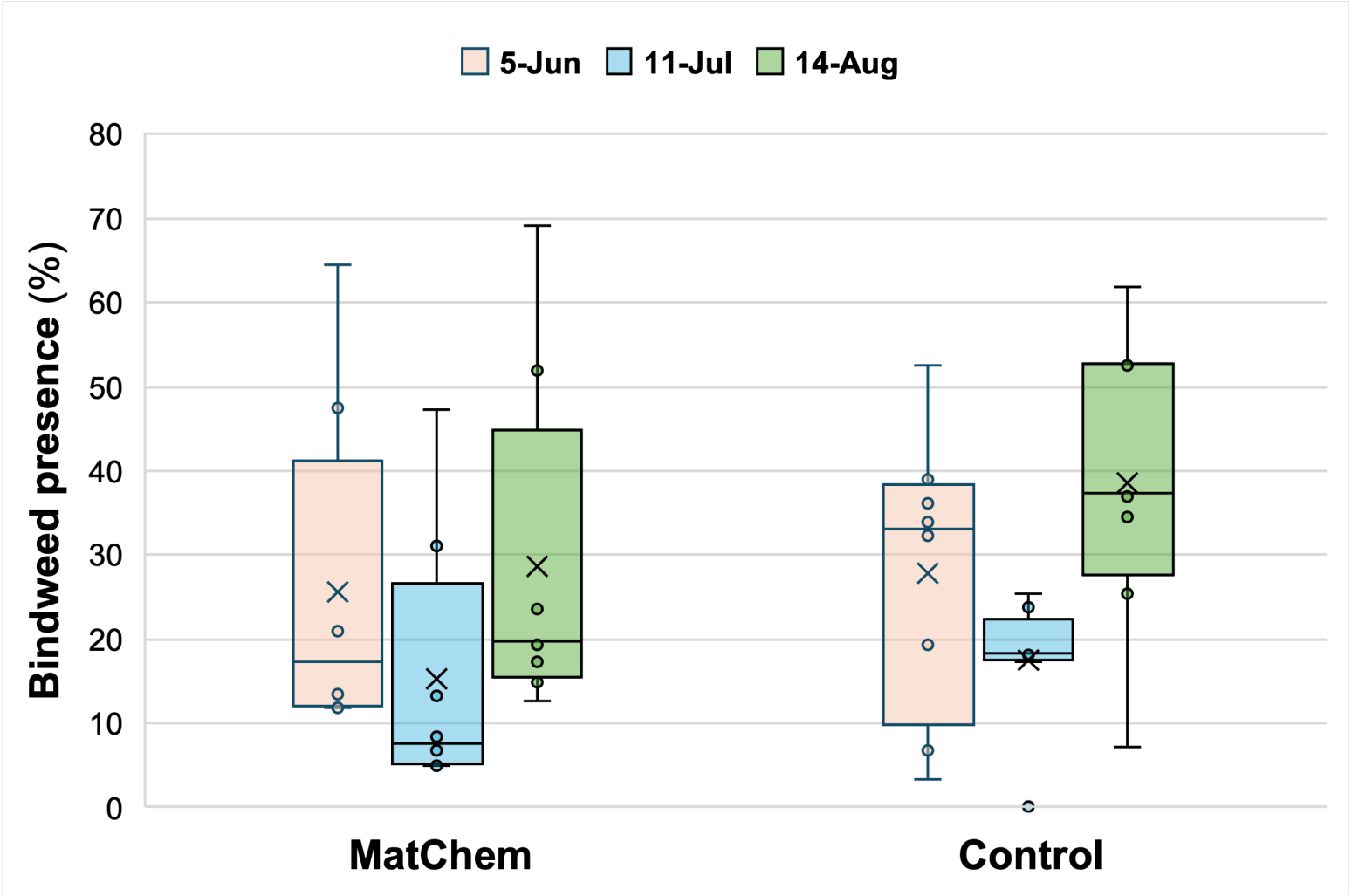
Results - Merced

Table 2. Field bindweed (FBW) incidence, area coverage, and tomato yield by treatment block, Merced County 2025.

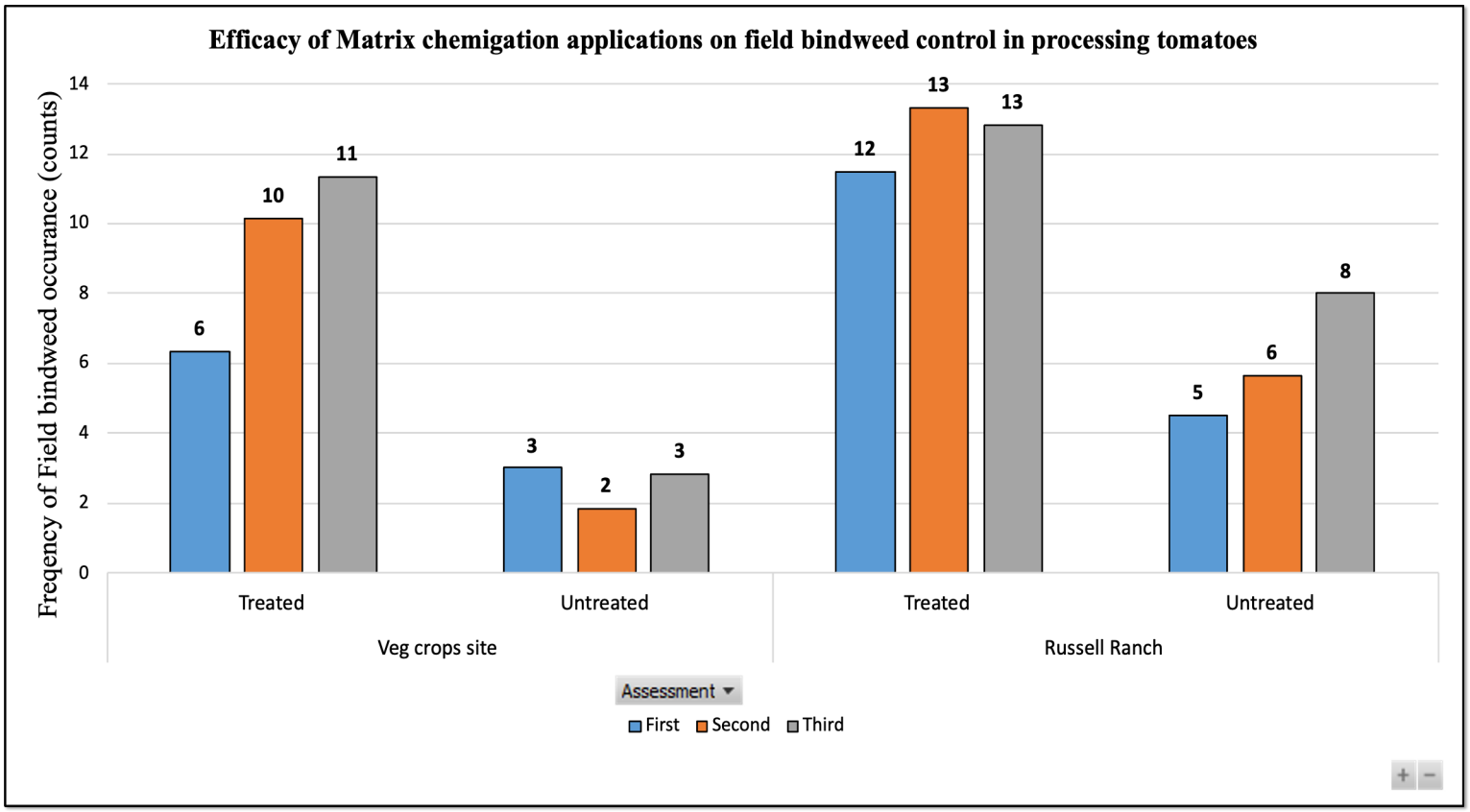
Herbicide Treatment	block	FBW % incidence on date 19-Jun	17-Jul	Area % FBW	total yld T/A
1 Grower Std	2	29.9	40.9	10.8	63.101
2 Matrix chemigated	1	49.2	42.7	9.0	62.873
1 Grower Std	4	29.8	39.7	9.3	64.450
2 Matrix chemigated	3	25.2	42.1	25.9	44.377

% incidence: presence/absence of FBW measured every 25 ft on 3 to 4 beds per treatment block.

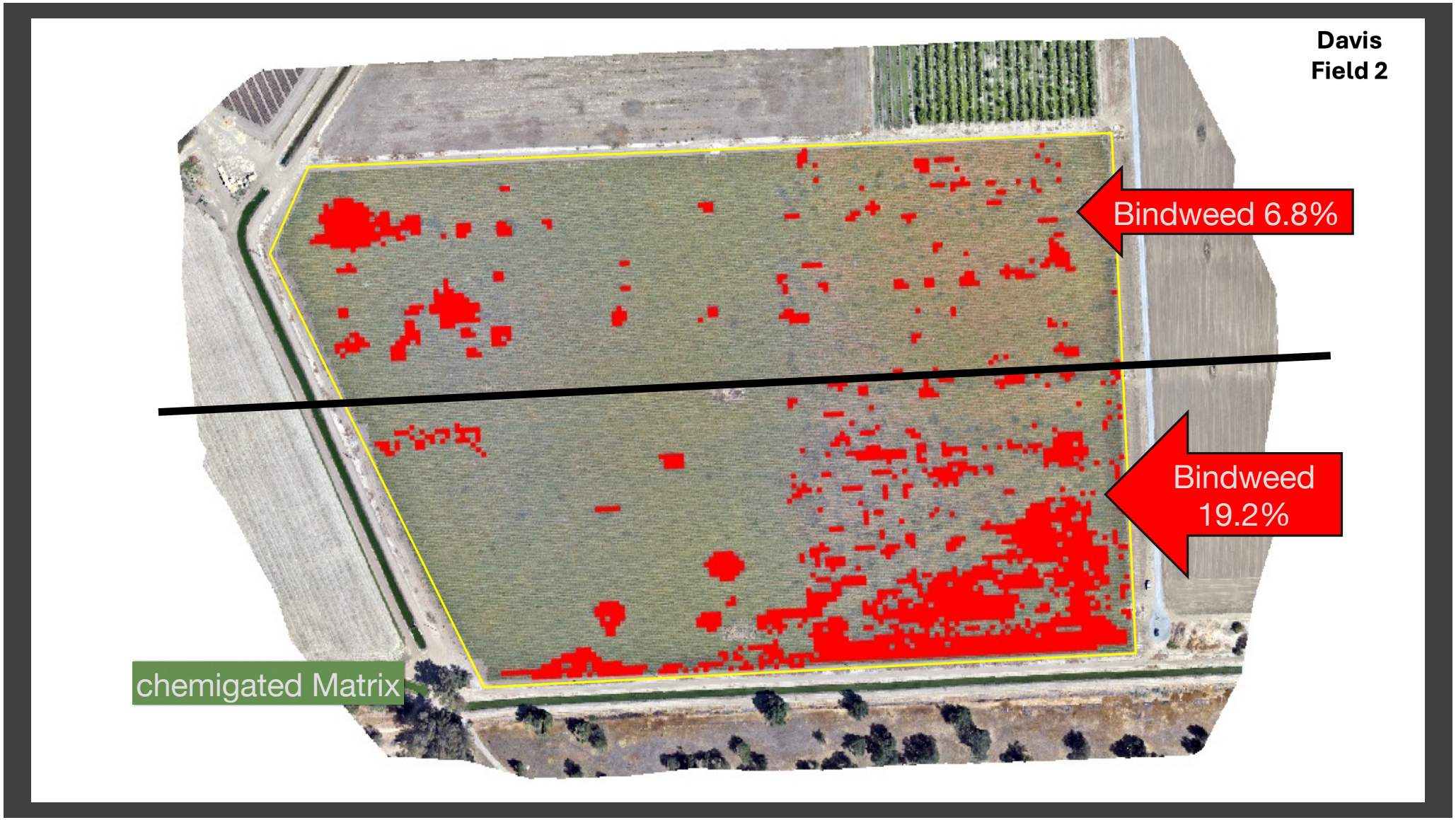
%FBW: field bindweed area as a percentage of total area in irrigation block based on drone image at harves



Yolo County commercial field bindweed from transects showed no significant differences



UC Davis research station transects data: field bindweed higher in treated areas


Davis
Field 2
Bindweed 6.8%
Bindweed
19.2%
chemigated Matrix

Summary

- Lazicki (Yolo Co): no significant differences incidence%, weeding time, or yield.
- Hanson (UC Davis Veg Crops and Russell Ranch): more FBW in treated areas for both fields.
- Stoddard (Merced Co): more FBW in treated areas, reduced yield in 1 treated block.

Acknowledgements

- Dr. Brad Hanson, UC Davis
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- Tony Turkovich, Button and Turkovich Ranch
- UC Davis Veg Crops and UC Russell Ranch
- Ahmed Kaya, UC ANR Intermountain REC
- CTRI

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