PROCESSING TOMATO WEED MANAGEMENT TRIALS

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CA TOMATO CONFERENCE NOV 2023

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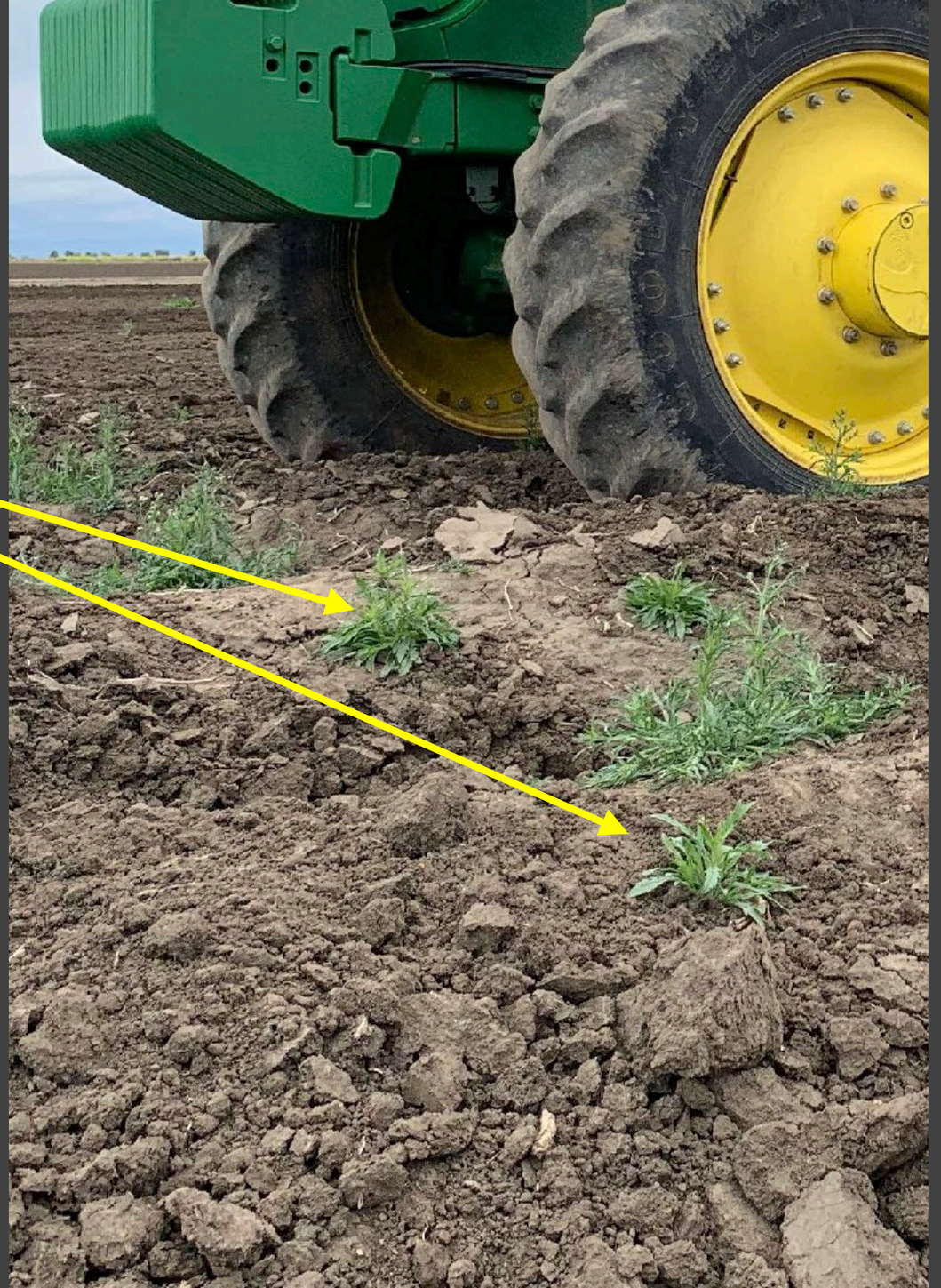
Getting worse?

- glyphosate-resistant *Conyza?*
- purslane (*Portulaca*)?
- alkali mallow (*Sida hederacea*)?
- black nightshade (*Solanum nigrum*)

- field bindweed
- others? Orobache currently very limited



Amaranthus spp.

A problem?

Multiple herbicide resistance strains exist (glyphosate, metolachlor, 2,4-D, atrazine, imazamox, mesotrione), but not rimsulfuron.

> 100,000 seeds per plant.

MANAGING WEEDS WITH HERBICIDES IN PROCESSING TOMATOES

- ROUNDUP (GLYPHOSATE)
- MATRIX (RIMSULFURON), SANDEA (HALOSULFURON), ZEUS (SULFENTRAZONE)
- PROWL (PENDIMETHALIN), TREFLAN (TRIFLURALIN), DUAL (METOLACHLOR), DEVRINOL (NAPROPAMIDE)
- POAST (SETHOXYDIM), CLETHODIM (SELECT)
- SHARK (CARFENTRAZONE): SHIELDED

- SENCOR (METRIBUZIN), EPTAM (EPTC)

Roundup PRE burn down
Treflan + Dual Magnum PPI
fb 2 oz Matrix 1 week POST
fb 2 oz Matrix 2 - 3 weeks POST

UC IPM Agriculture: Tomato Pest Management Guidelines

Herbicide Treatment Table

https://ipm.ucanr.edu/agriculture/tomato/herbicide-treatment-table/

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Matrix better when weed size at cotyledon or 1st leaf


Metribuzin


Rimsulfuron (Matrix) post

In-row weed management alternatives

Robotic cultivators.

Precision sprayers.

Laser weeders.

Finger weeders

- Flexible fingers need to reach across plant row.
- Can also break crusts.
- Very limited weed control window.
- Simple, reliable.
- Cost: $

CROP AND WEED SIZE

MEDIUM CROP, SMALL WEEDS

Kult/Robovator robotic cultivators

- Work well in many transplanted crops.
- Can remove larger weeds.
- 5 - 25% crop damage in tomatoes.
- Adjusting: physical and digital challenges
- Cost: $$

Carbon Robotics Laser weeder

- Works well high density seeded crops.
- Limited to small weeds.
- High precision, high crop safety.
- Slow (< 1 mph operational speed).
- Cost: $$$

Cultivation trials 2020-2022

1. Matrix 2 oz + 2 oz POST
2. Robovator 2 weeks POST
3. Finger weeder
4. Standard cultivation

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Collaboration with:
Dr. Steve Fennimore, Amber Vinchesi, various growers

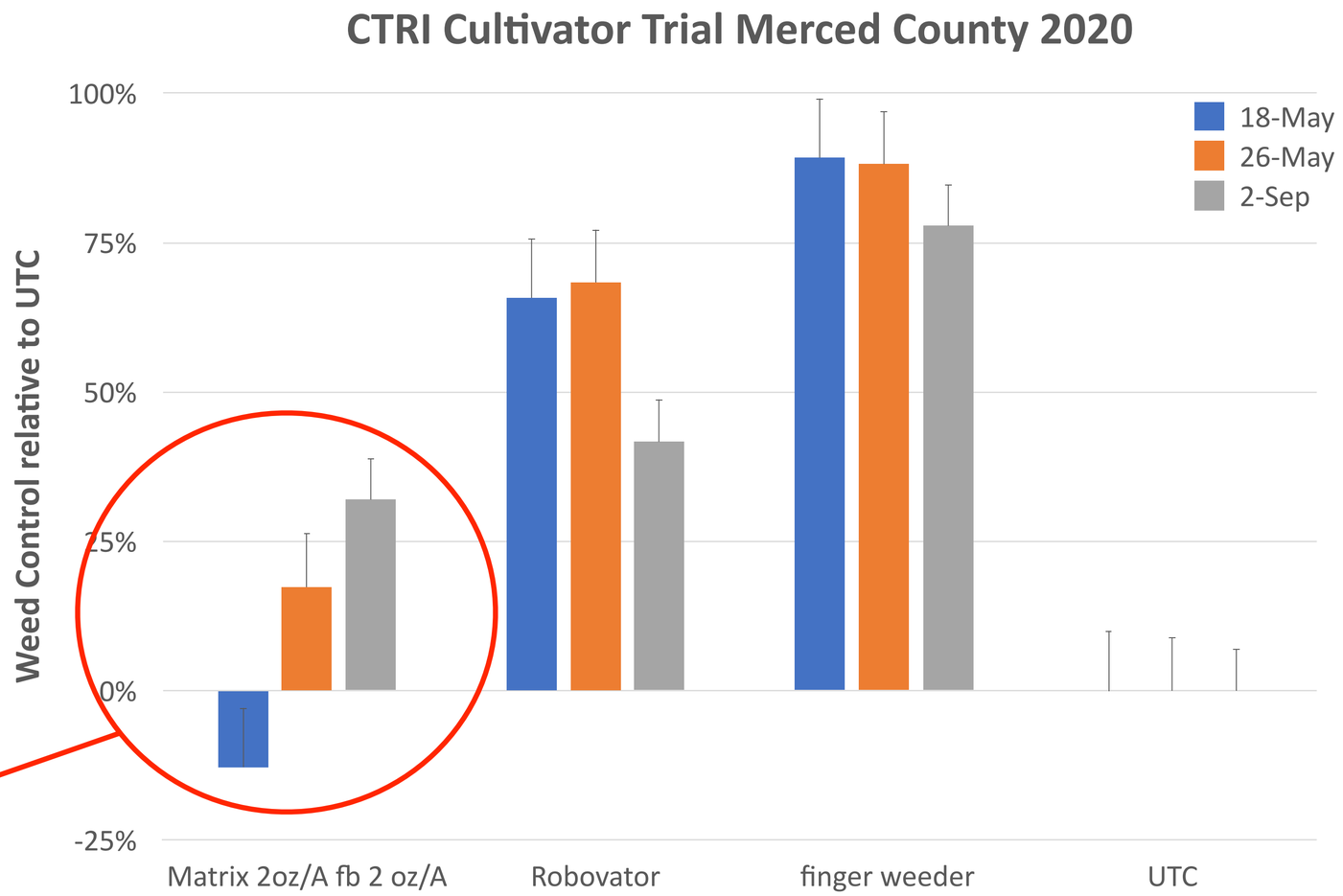
Banded post application of Matrix (rimsulfuron) 2 oz/A fb 2 oz (total 4 oz/A)

Results

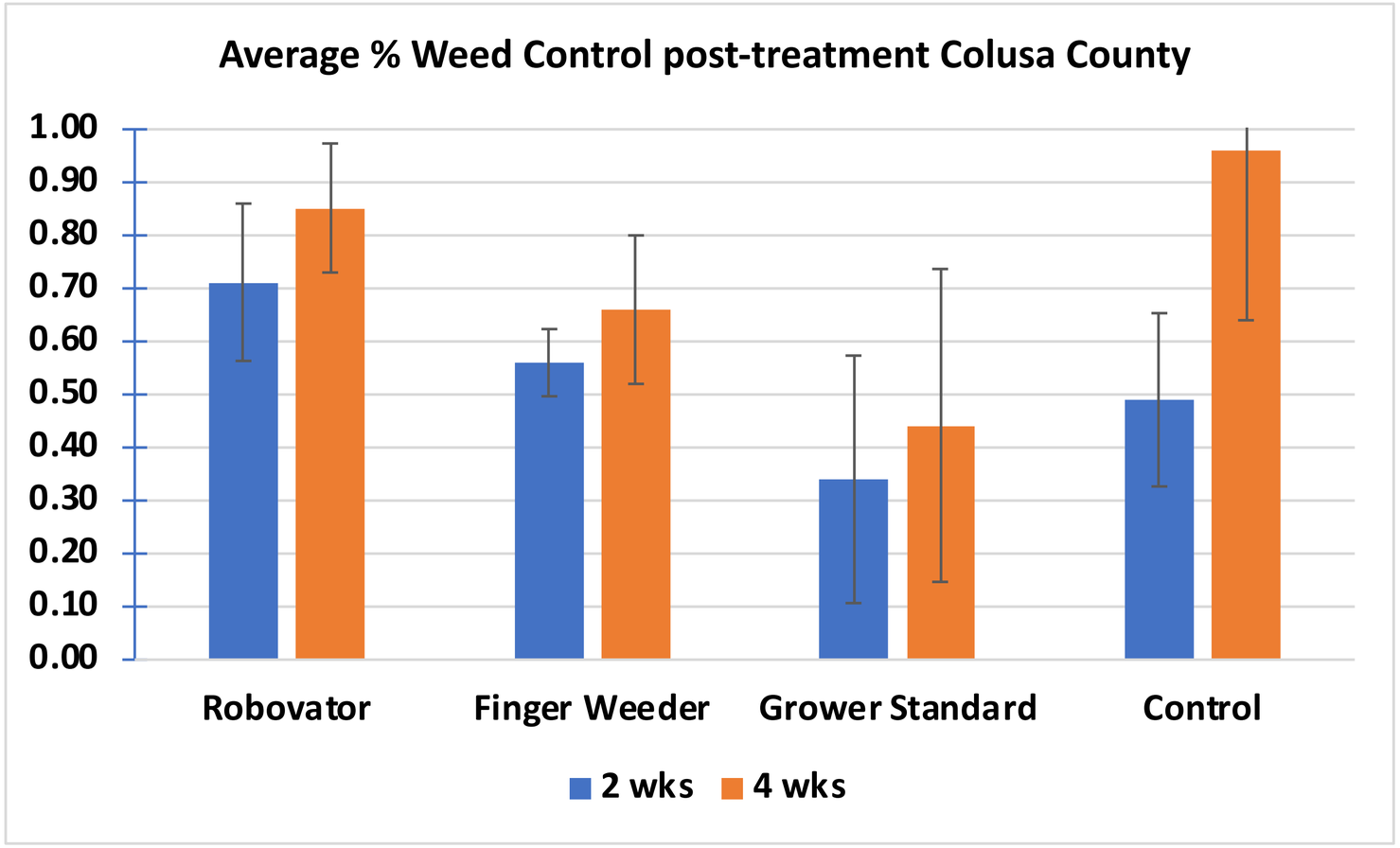
2020 Results

- Significant reduction in weeds
- Significant reduction in hand hoeing time
- Matrix treatments had significantly better yield than other treatments.

black nightshade



2021 Results (A. Vinchesi, Colusa County)



weeding time reduction:

Robovator: 60%
Finger weeder: 43%
Matrix: 43%

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2022 Results (Merced County)

Significant increase in weed control compared to treatment 1 until hand weeded.

1. Grower std, no Matrix

2. + Matrix 4 oz/A

3. Finger weeder

4. Robovator

2023 POST Cultivator Trials

1. Soledad (Carbon Robotics laser weeder)
2. Gilroy (Kult)
3. UC Davis (Kult, finger weeder, Matrix herbicide)
4. Dos Palos (Kult)
5. Dos Palos (laser weeder, Robovator, finger weeder, Matrix herbicide)

RCBD with 4 or 5 reps depending on location

OBJCTIVE: Evaluation of in-row weed control and crop injury

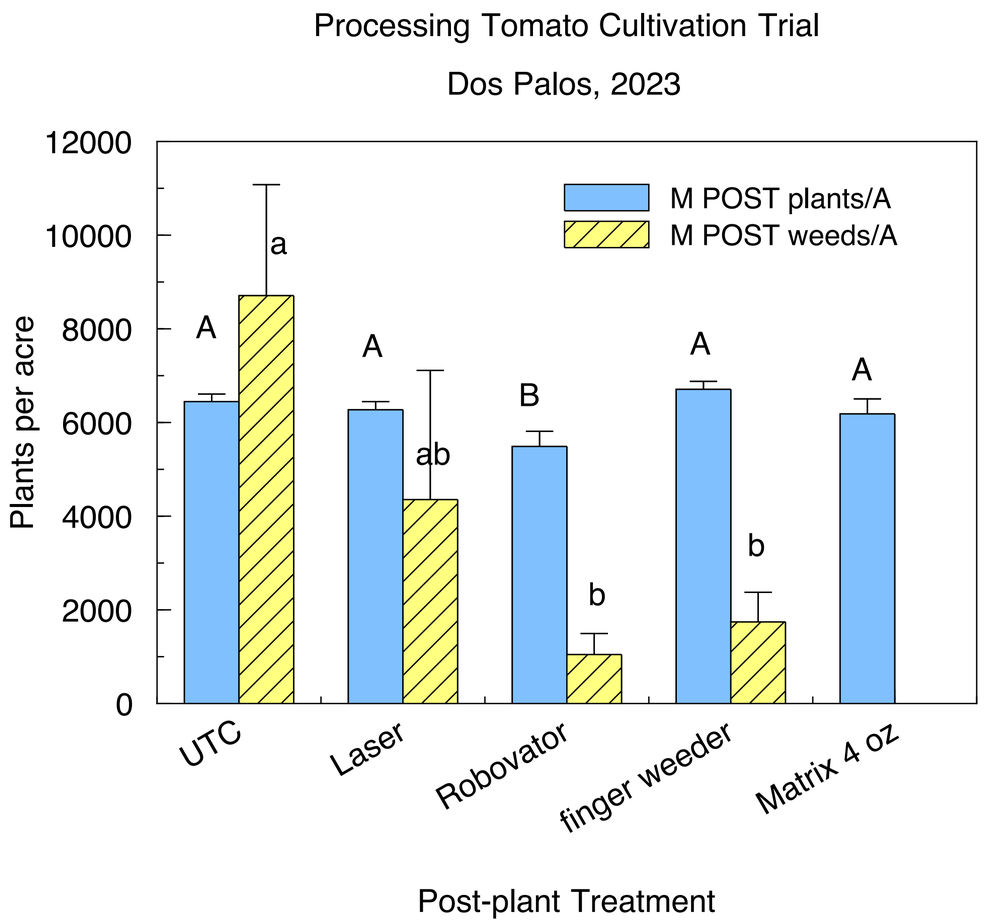

Gilroy

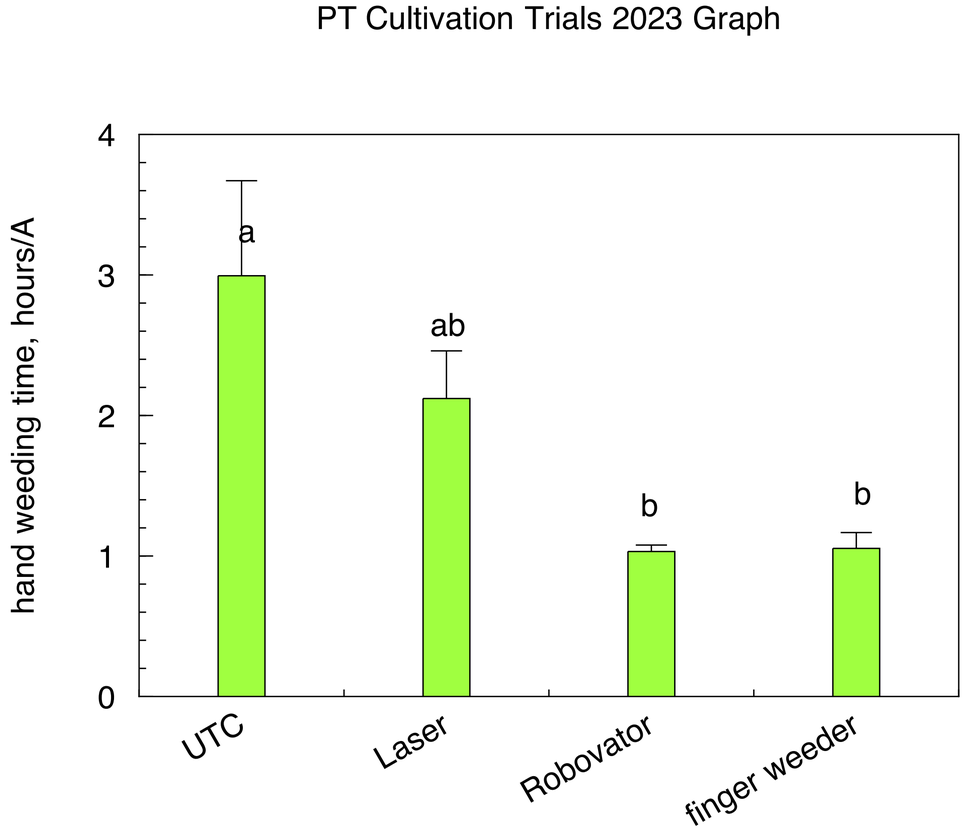

Dos Palos

2023 Results

	Weed Control (vs UTC)	hand weeding time (vs UTC)	Crop injury
Gilroy	91%	reduced 64%	yes
Davis	Kult: 87% Finger: 60%	reduced 52% reduced 44%	no
Soledad	79%	reduced 56%	no
Dos Palos 1	same	none	yes, 20%
Dos Palos 2	Laser: 12% Robovator: 85% Finger: 62%	reduced 30 - 60%	yes, 16% with Robovator

Results





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UC Davis Weed Day June 21, 2023

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- CTRI

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