Efficacy of drip-applied fungicides and fumigants against *Fusarium* diseases

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Agriculture and Natural Resources

Efficacy of drip-applied fungicides and metam-potassium fumigant against:

- Fusarium wilt caused by *Fusarium oxysporum* f. sp. *lycopersici* race 3
- Fusarium stem rot and vine decline caused by *Fusarium falciforme*

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Materials evaluated in 2019. *Please note that Miravis and Propulse are not currently registered for use on California tomatoes.*

Fungicides:

Applied via buried drip at planting and 3 weeks later

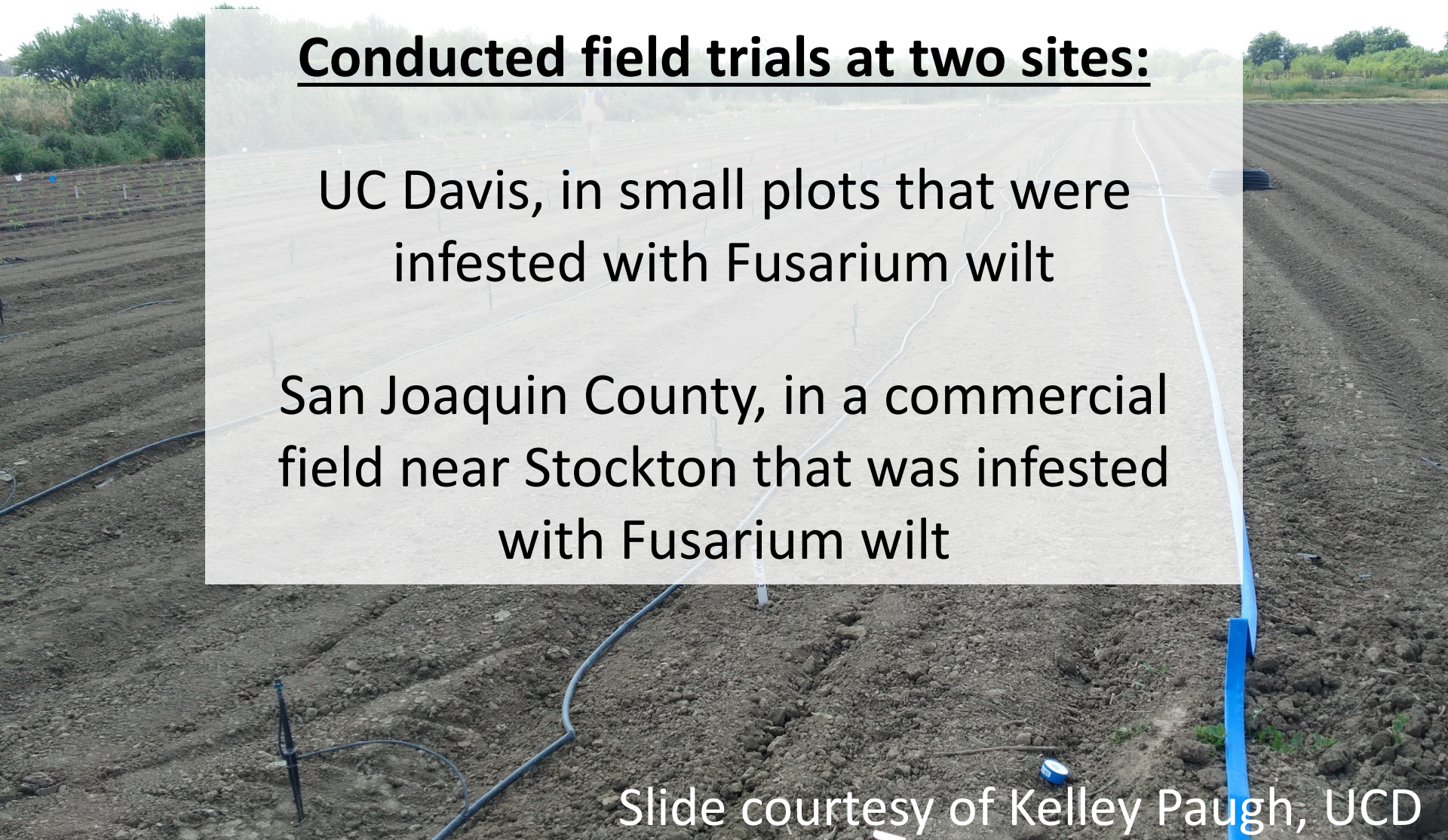
- **Miravis** (Syngenta) – pydiflumetofen (7)
- **Velum** (Bayer) – fluopyram (7)
- **Propulse** (Bayer) – prothioconazole (3) + fluopyram (7)
- **Rhyme** (FMC) – flutriafol (3)

Fumigant:

Applied approx. two weeks prior to transplanting

- **K-Pam (AMVAC)** – metam potassium

Management of Fusarium wilt in tomato



<u>Conducted field trials at two sites:</u>

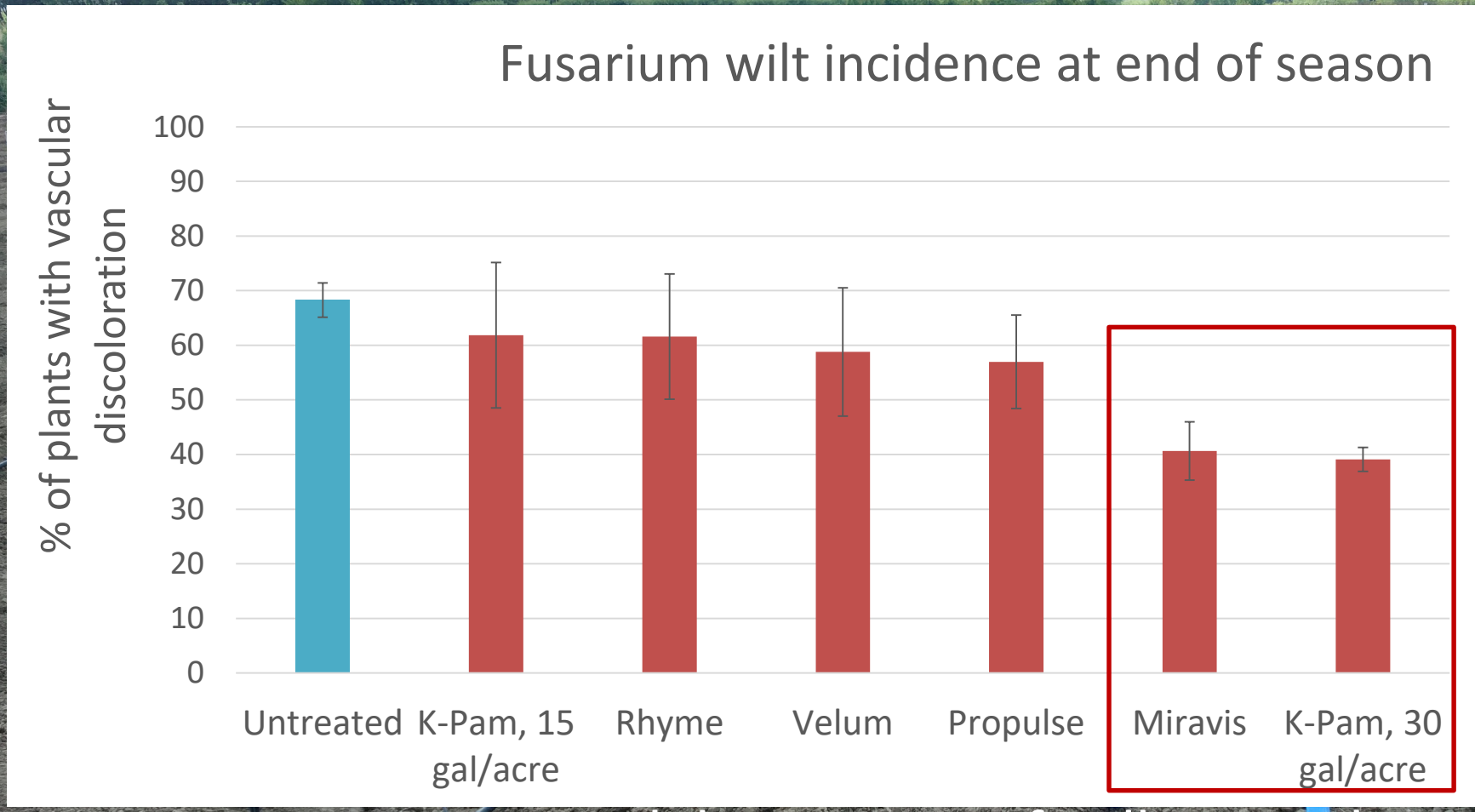
UC Davis, in small plots that were infested with Fusarium wilt

San Joaquin County, in a commercial field near Stockton that was infested with Fusarium wilt

Slide courtesy of Kelley Paugh, UCD

UC Davis Fusarium wilt trial

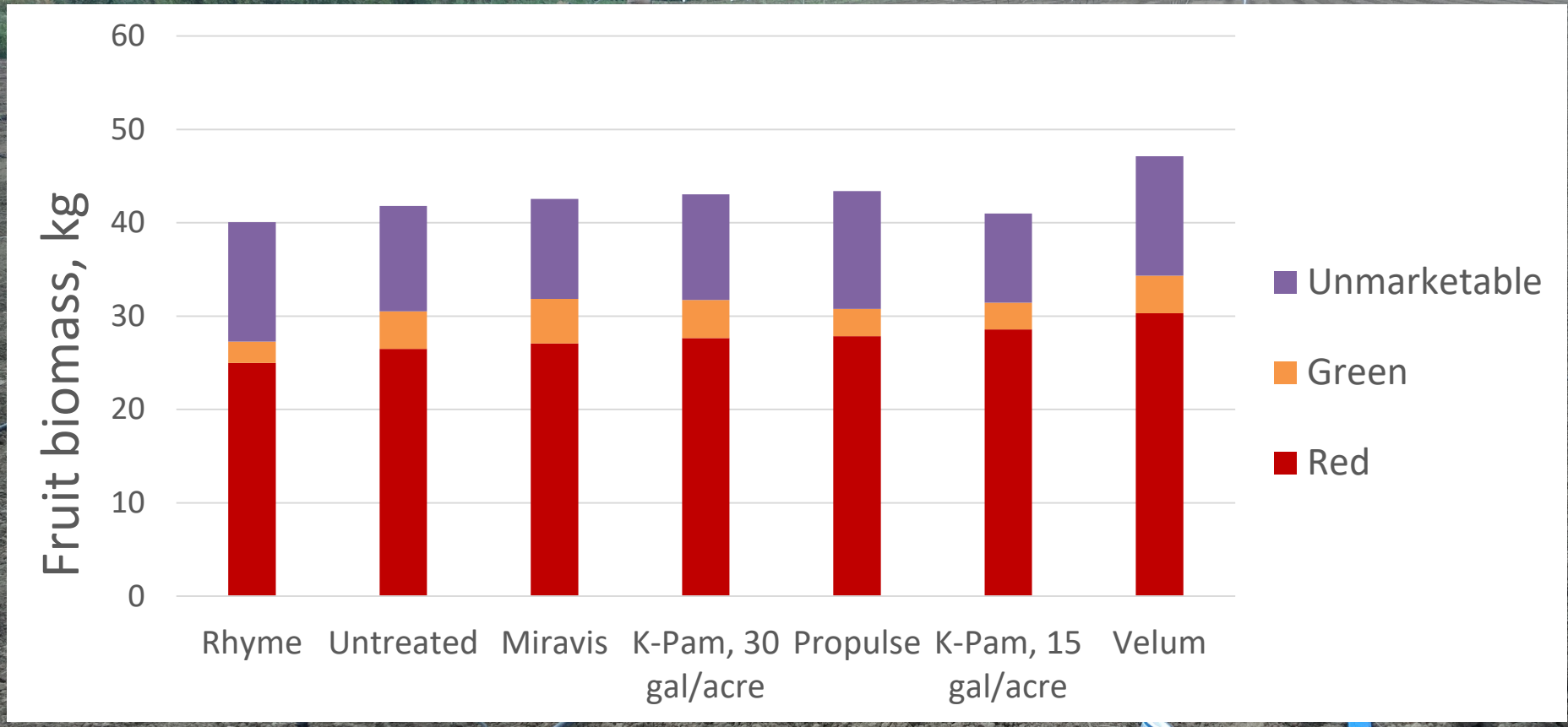
Miravis and K-Pam (30 gal/A) most effective



Slide courtesy of Kelley Paugh, UCD

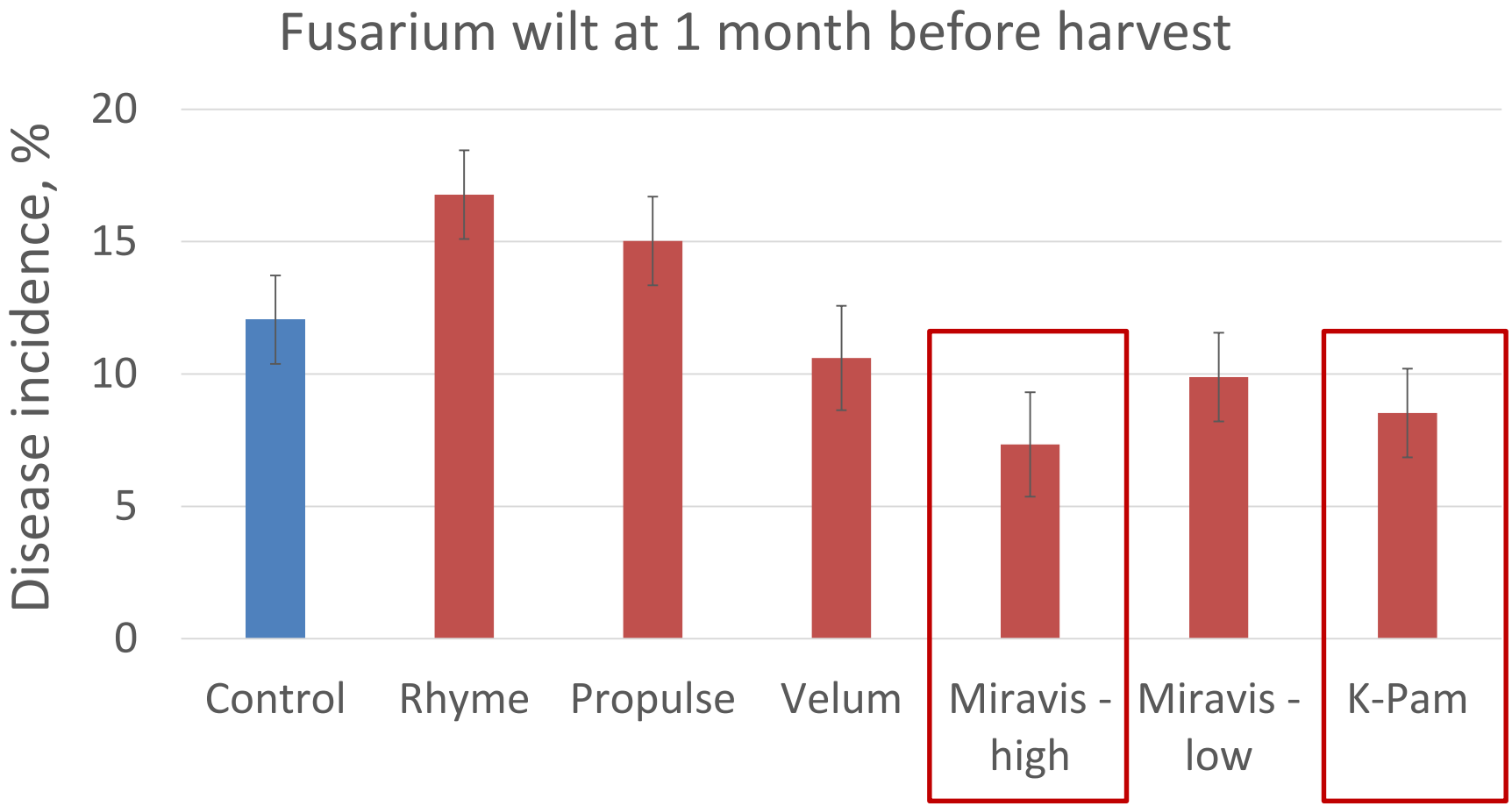
UC Davis Fusarium wilt trial

No difference in yields
Low disease pressure

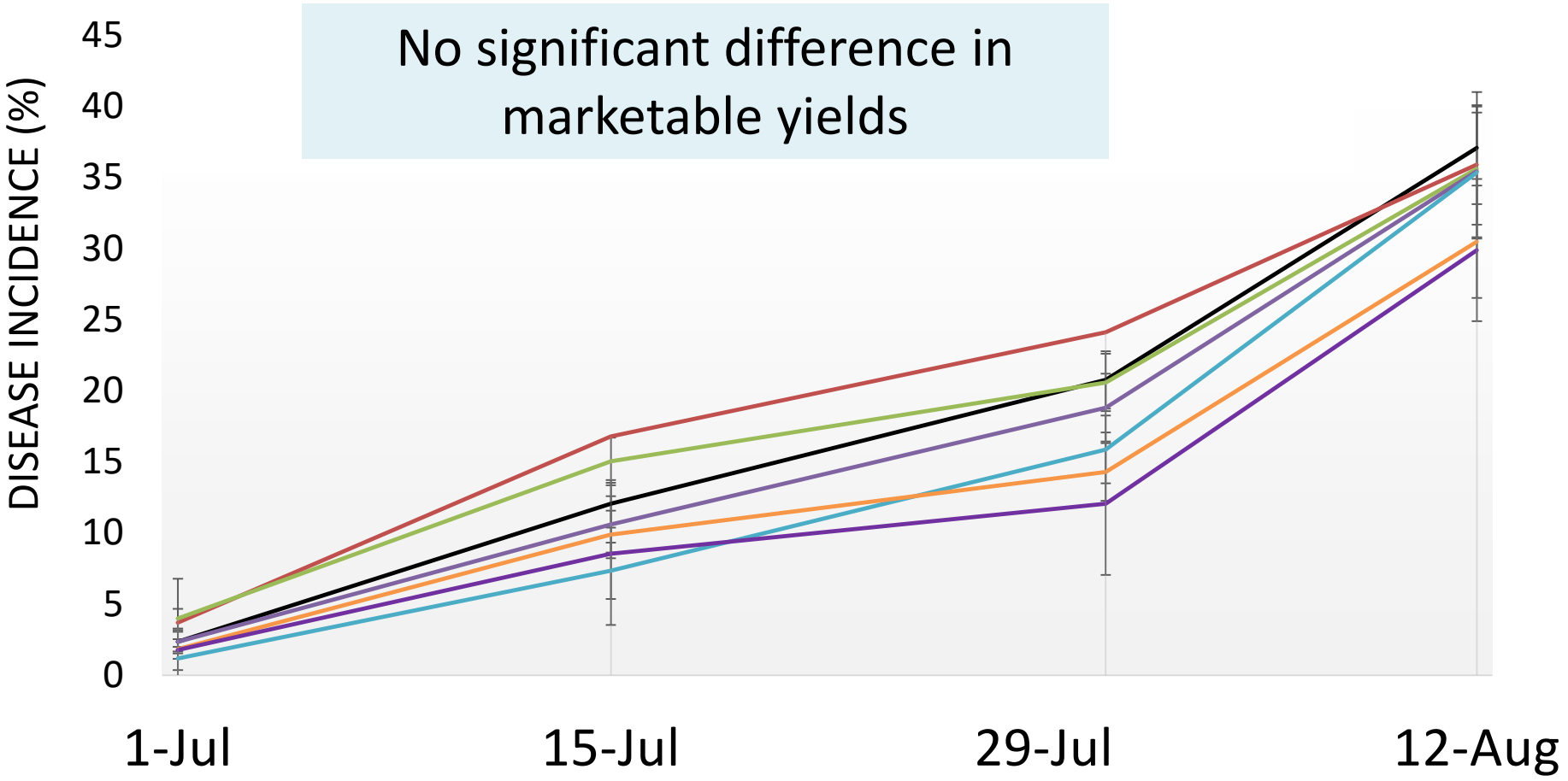


Slide courtesy of Kelley Paugh, UCD

Stockton-area Fusarium wilt trial, 2019



Stockton-area Fusarium wilt trial, 2019



Management of *Fusarium falciforme* in tomato

Fusarium stem rot and vine decline

Causes severe losses

No known management options

Slide courtesy of Kelley Paugh, UCD

Management of *Fusarium falciforme* in tomato

Conducted field trials at three sites:

UC Davis small plot (fungicides only)

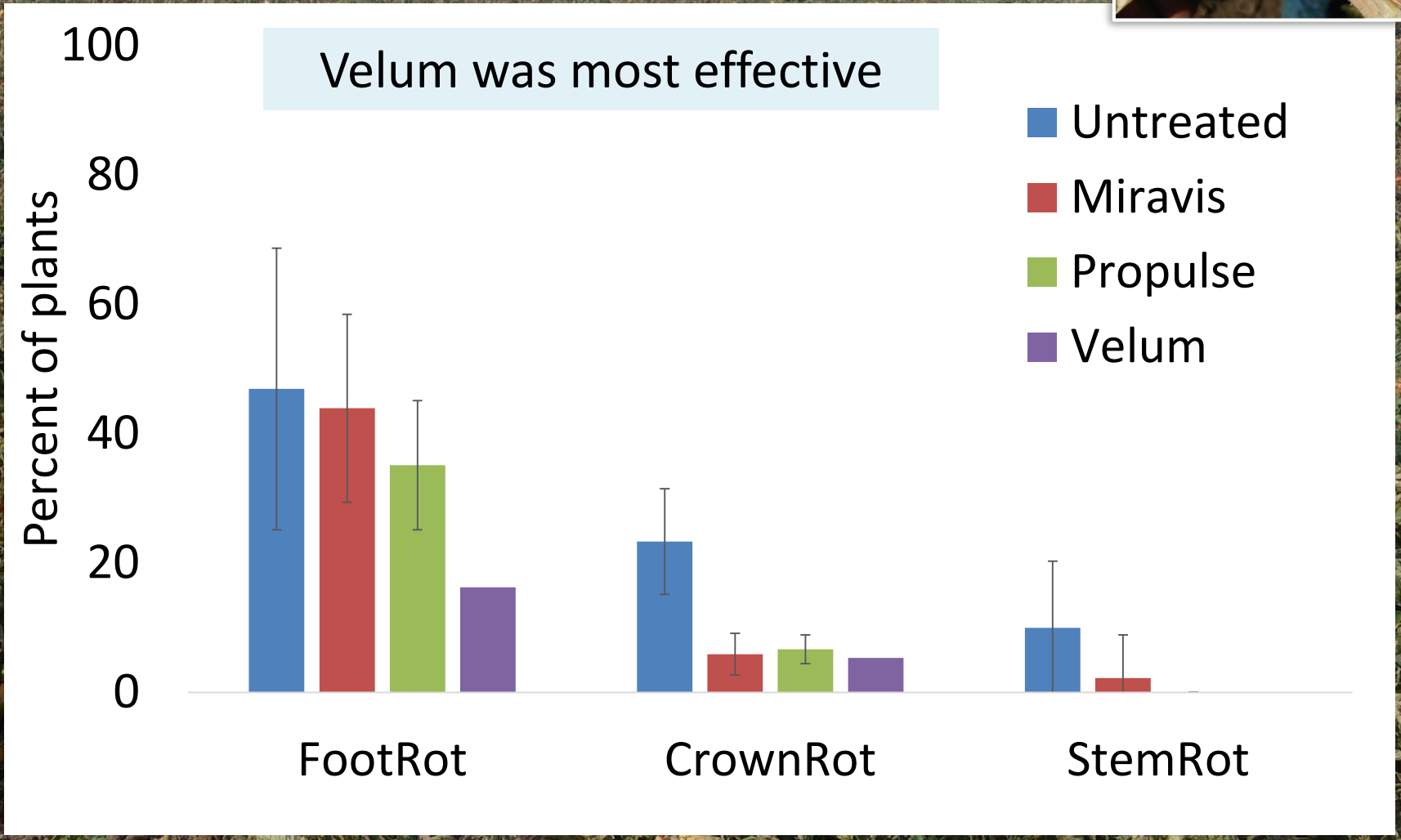
San Joaquin grower field (K-Pam only)

Yolo grower field (K-Pam only)

Same application rates and timing as used for Fusarium wilt trials

Slide courtesy of Kelley Paugh, UCD

UC Davis *F. falciforme* trial



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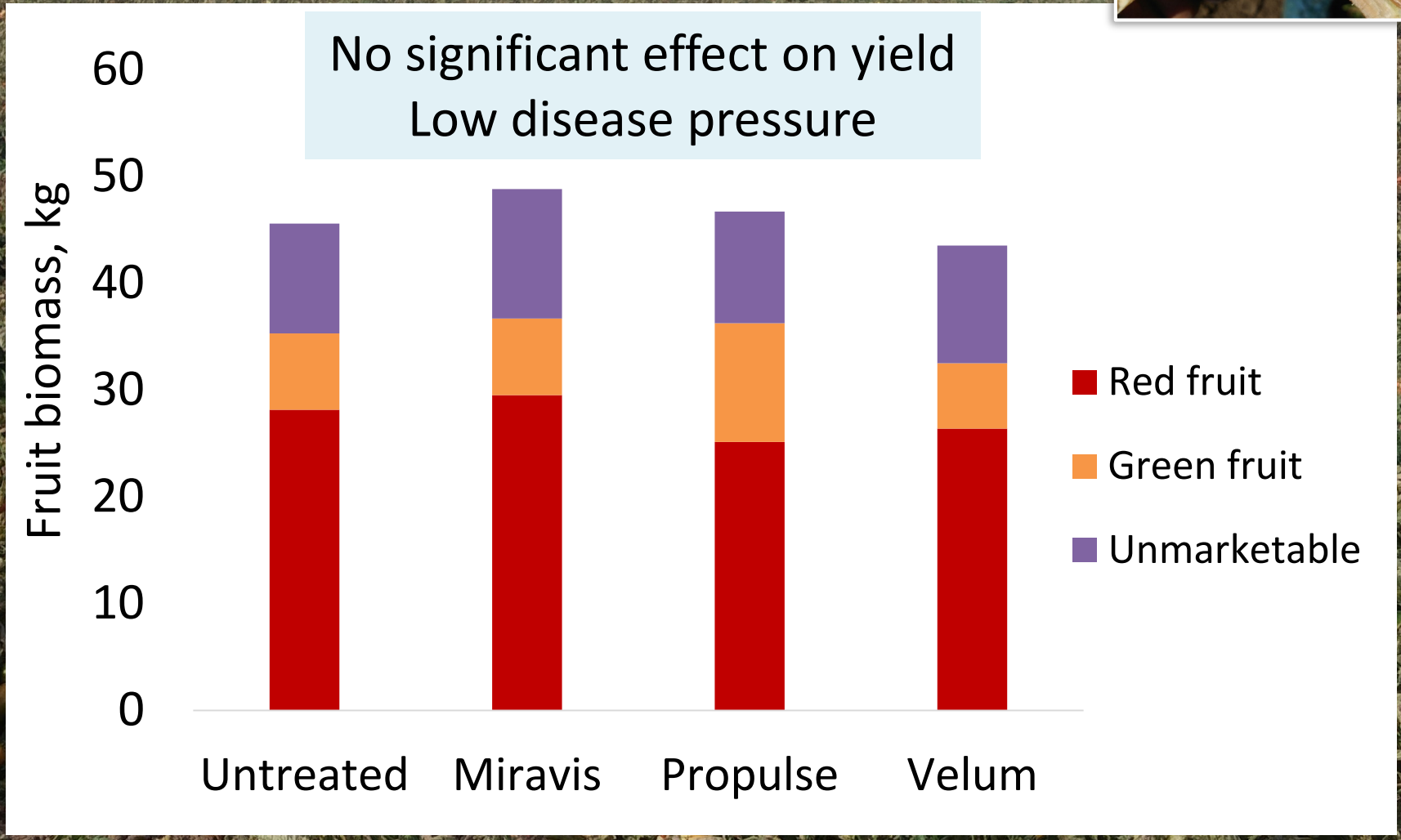
UC Davis *F. falciforme* trial



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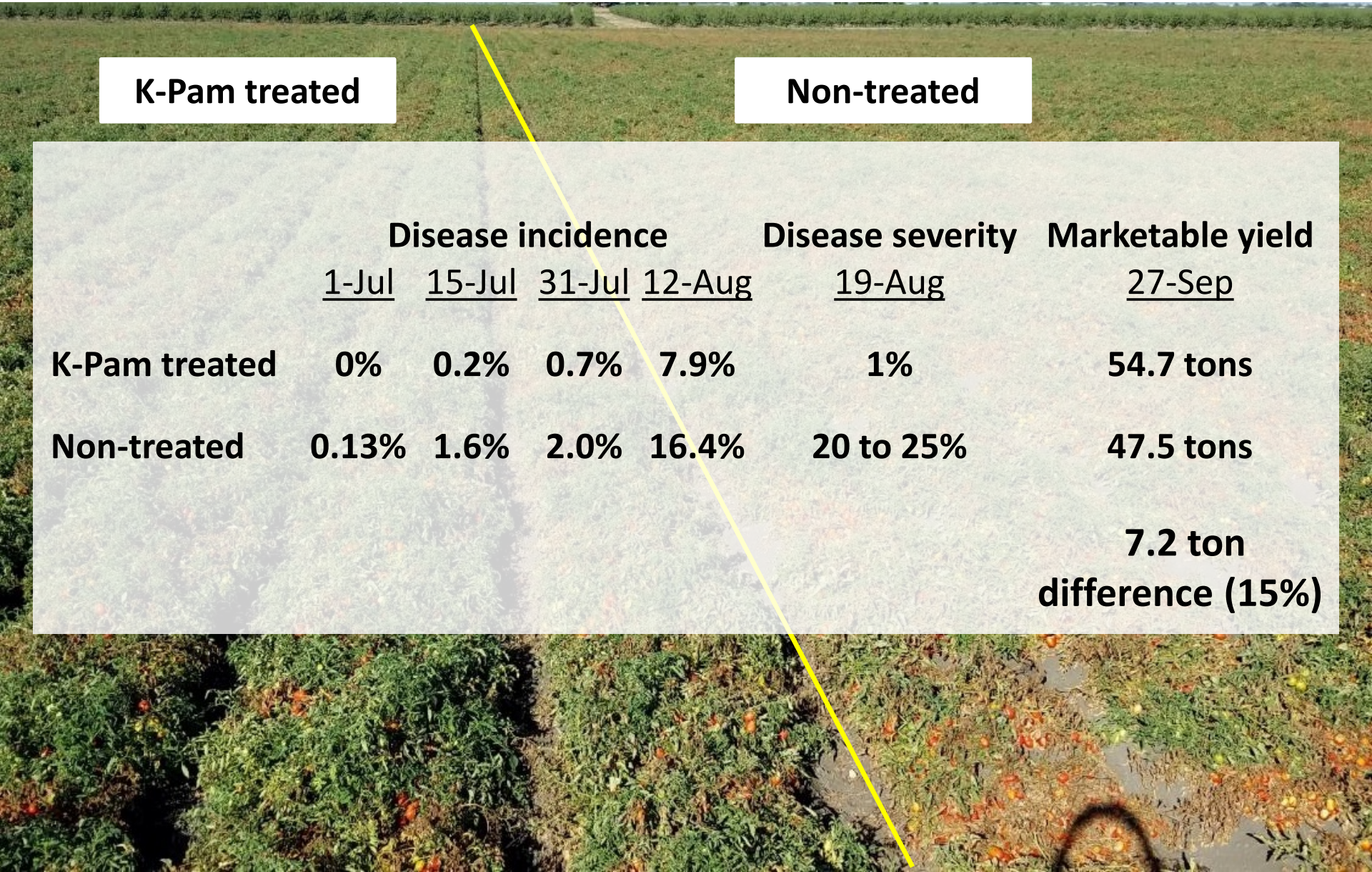
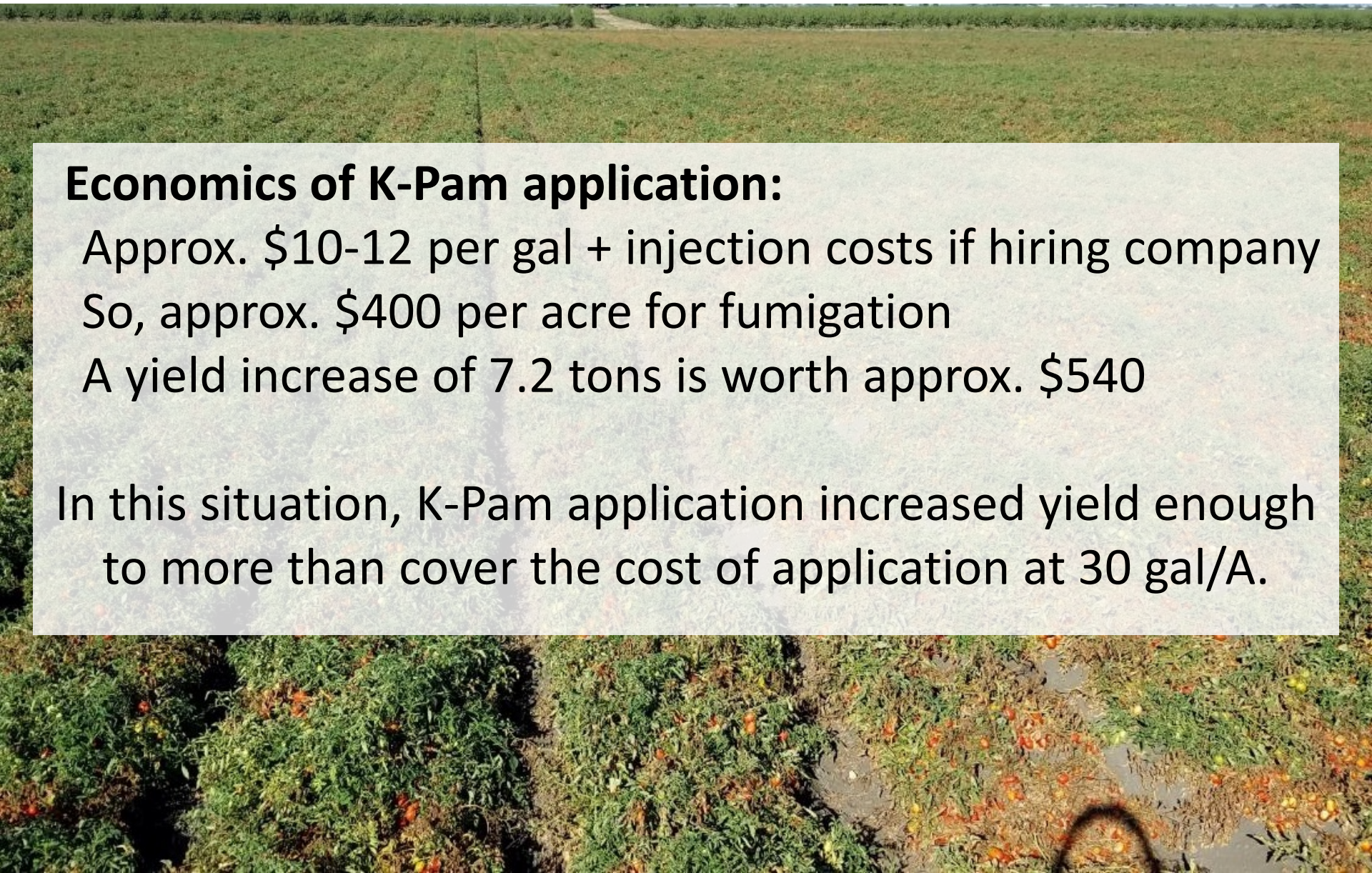
Stockton *F. falciforme* trial – non-replicated



	Disease incidence				Disease severity	Marketable yield
	1-Jul	15-Jul	31-Jul	12-Aug	19-Aug	27-Sep
K-Pam treated	0%	0.2%	0.7%	7.9%	1%	54.7 tons
Non-treated	0.13%	1.6%	2.0%	16.4%	20 to 25%	47.5 tons
						7.2 ton difference (15%)



Economics of K-Pam application:

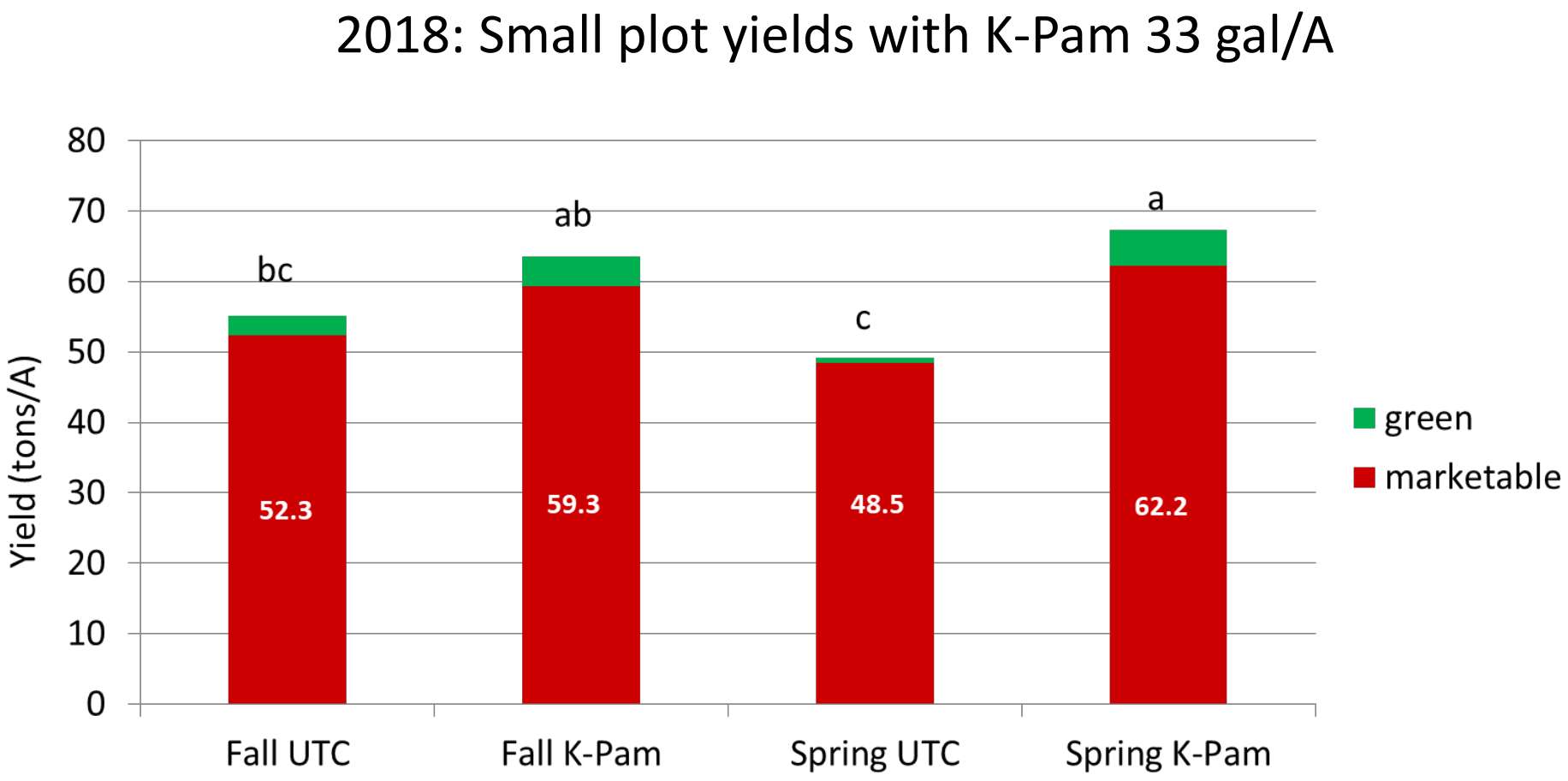
Approx. $10-12 per gal + injection costs if hiring company

So, approx. $400 per acre for fumigation

A yield increase of 7.2 tons is worth approx. $540

In this situation, K-Pam application increased yield enough to more than cover the cost of application at 30 gal/A.

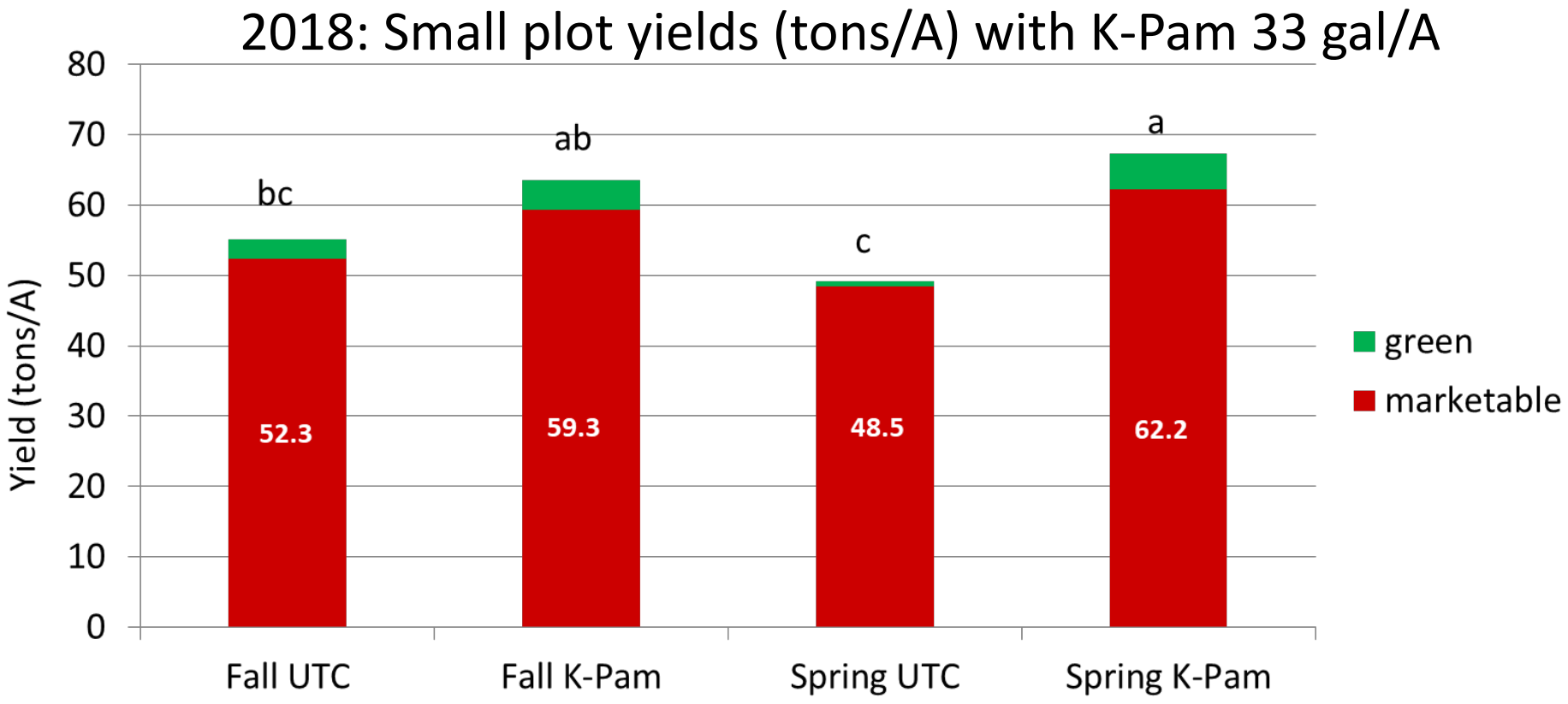
On-farm application of K-Pam in commercial field infested with *F. falciforme*, Yolo County



courtesy of Kelley Paugh, UCD and Marja Koivunen, AMVAC

Yolo *F. falciforme* trial

K-Pam at 33 gal/A increased marketable yield by 25%

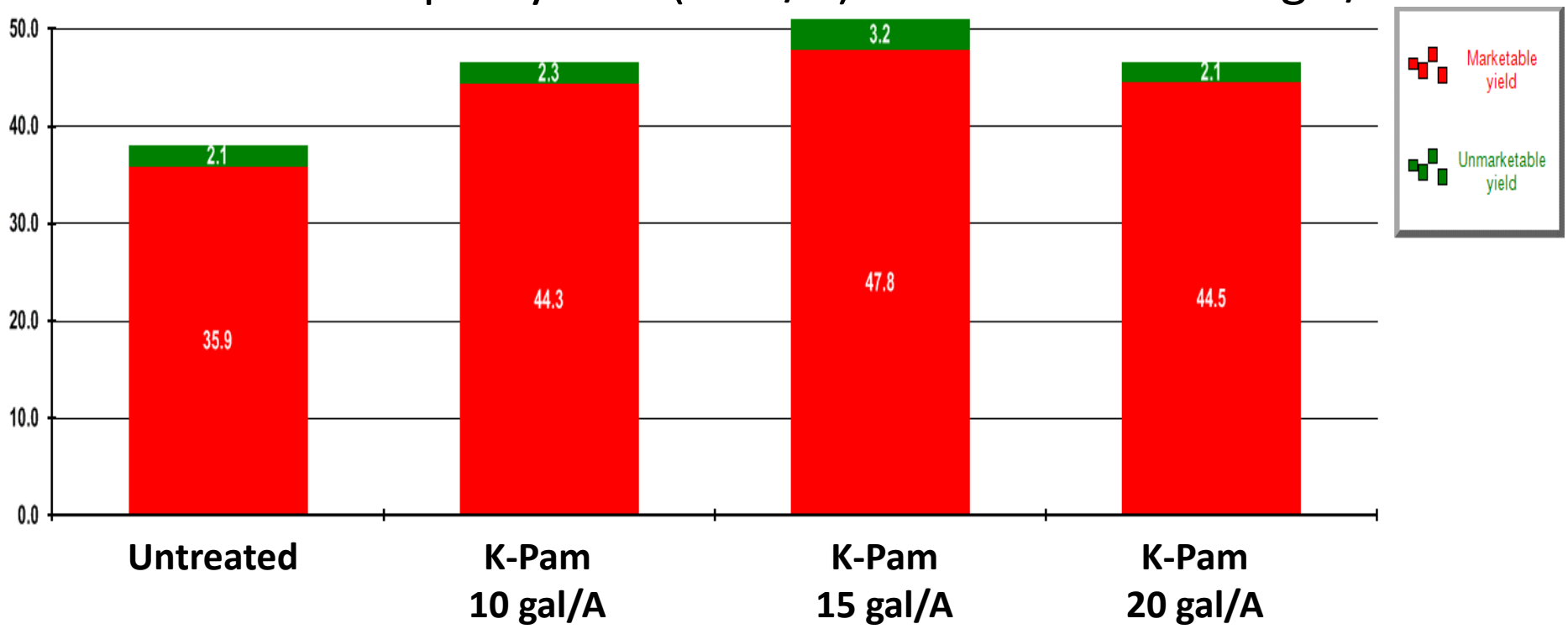


courtesy of Kelley Paugh, UCD and Marja Koivunen, AMVAC

Yolo *F. falciforme* trial

No significant differences in yield when K-Pam applied at low rate

2019: Small plot yields (tons/A) with K-Pam 10-20 gal/A

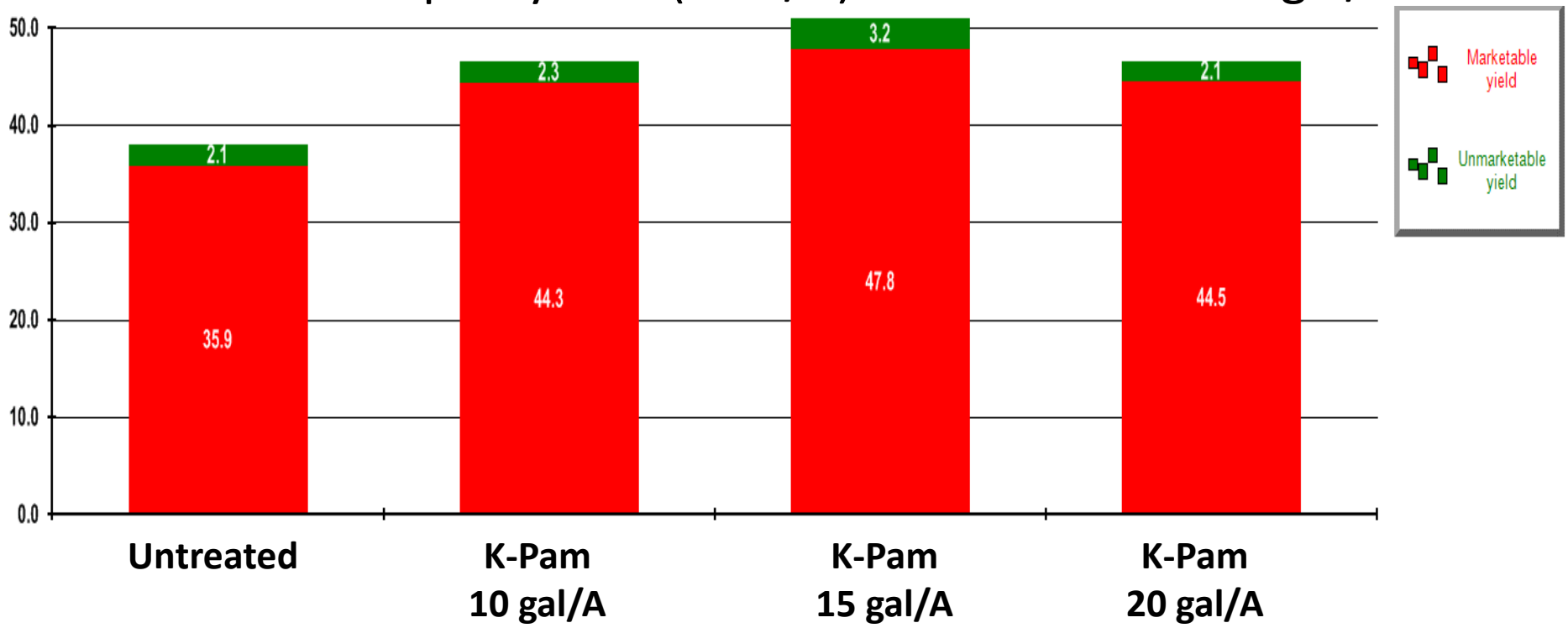


courtesy of Kelley Paugh, UCD and Marja Koivunen, AMVAC

Yolo *F. falciforme* trial

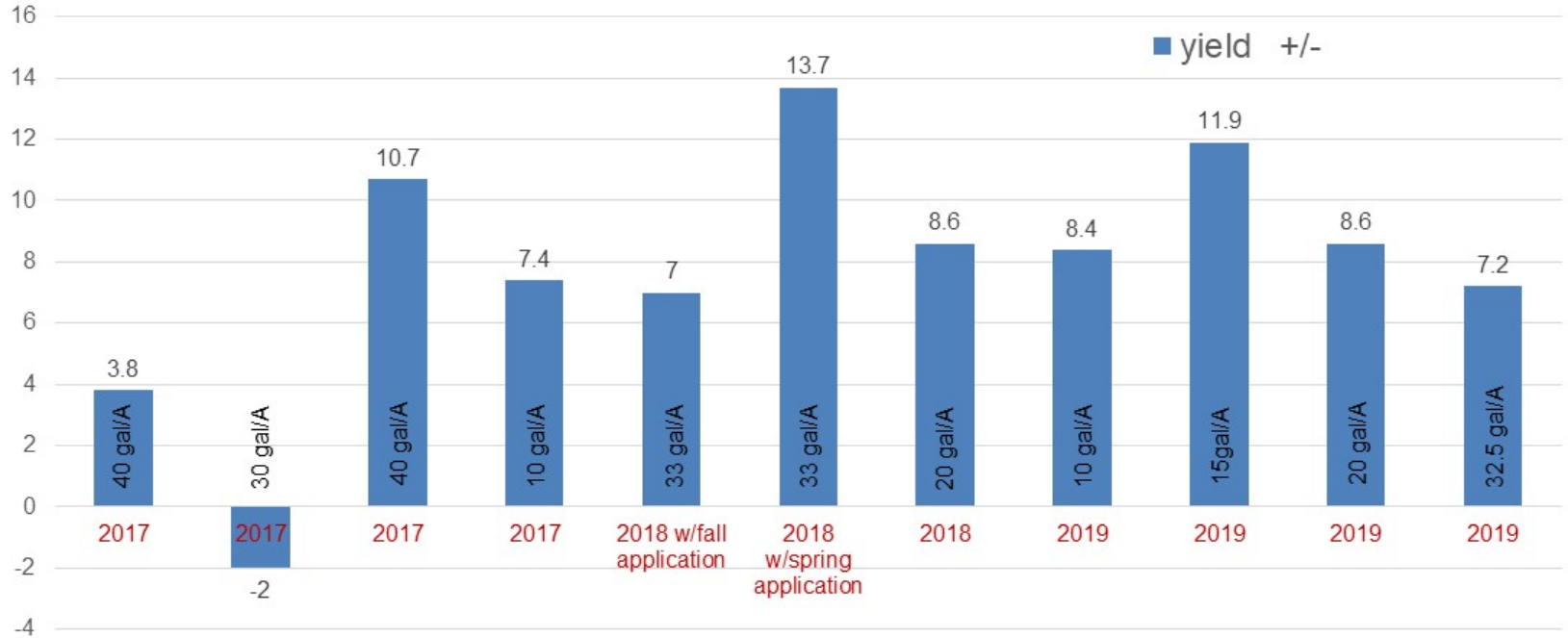
No significant differences in disease incidence

2019: Small plot yields (tons/A) with K-Pam 10-20 gal/A



courtesy of Kelley Paugh, UCD and Marja Koivunen, AMVAC

Effect of K-Pam drip application on processing tomato marketable yield in demo trials 2017-19



Marja Koivunen, AMVAC

Rates are expressed as broadcast equivalents,
Yield difference is expressed in comparison to UTC in Tons/A

Efficacy of drip-applied fungicides and fumigants against *Fusarium* diseases

- Preliminary data from first year suggest that Miravis (not registered) may have some benefit against Fusarium wilt, while Velum may have some benefit against *Fusarium falciforme*. More studies are needed.
- K-Pam may help reduce severity of both diseases. As always, optimal soil conditions are important for good efficacy.
- Project will continue in 2020 with funding from CTRI, the IR-4 Program, and chemical manufacturers