

# Integrated management for Fusarium Stem Rot & Decline (FRD)

**Patricia Lazicki**

(UCCE farm advisor, Yolo, Solano & Sacramento counties);  
[palazicki@ucanr.edu](mailto:palazicki@ucanr.edu)

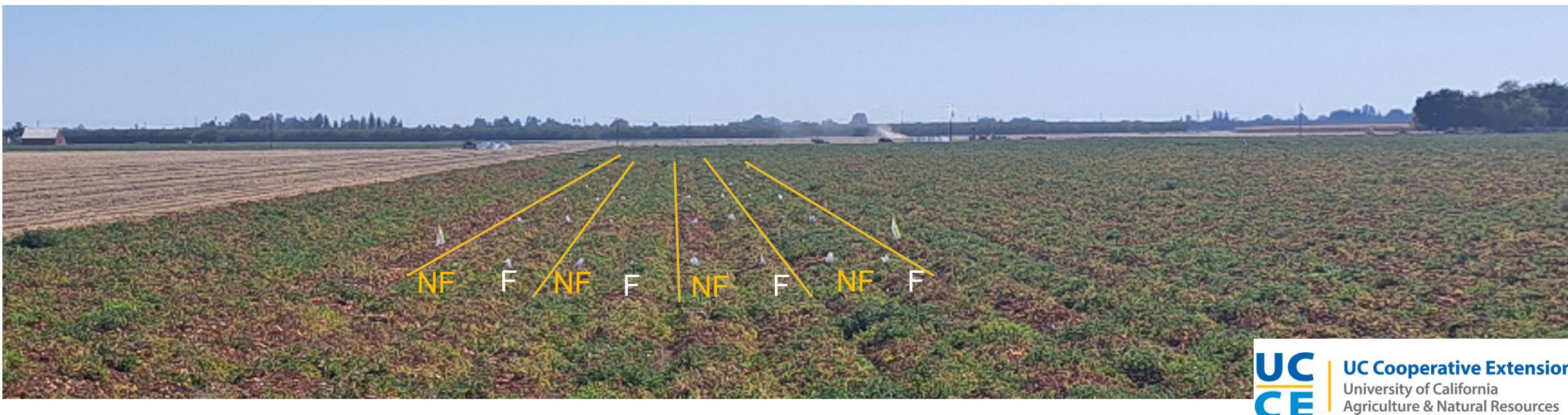


**UC Cooperative Extension**  
University of California  
Agriculture & Natural Resources

# Fumigation & FRD: variable results over the years

	<b>Site</b>	UC Davis	Yolo Co.	San Joaquin Co.	San Joaquin Co.	San Joaquin Co.	Yolo Co.	Solano Co.	Yolo Co.	Yolo Co.
	<b>Year</b>	2019	2019	2019	2020	2021	2023	2023	2024	2024
	<b>Disease</b>	FRD	FRD	FRD	Fol & FRD	Fol & FRD	Fol, FRD, Forl, s. blight	FRD, Forl	FRD, vert	FRD
<b>Product</b>	<b>Vine decline in non-treated control</b>	47%	73%	20%	31%	30%	55%	16%	18%	21%
K-Pam ~30 gal	<b>Disease</b>				+	++	NS	++	NS	-
	<b>Yield</b>			7.2 t/a	NS	26 t/a	4.7 t/a	3.5 t/a	NS	7.5 t/a
K-Pam ~15 gal	<b>Disease</b>		NS		+	++				
	<b>Yield</b>		11.9 t/a		NS	13.6 t/a				
Miravis	<b>Disease</b>	+			+	++				
	<b>Yield</b>	NS			NS	9.2 t/a				
Rhyme	<b>Disease</b>				+	++				
	<b>Yield</b>				NS	10 t/a				
Velum	<b>Disease</b>	+			-					
	<b>Yield</b>	NS			NS					
	<b>Disease P-value</b>	NS	NS	Not tested	p=0.06	p=0.0004	NS	p=0.008	NS	p=0.04
	<b>Yield P-value</b>	NS	P=0.01	p=0.016	NS	p=0.015	p=0.05	p=0.01	NS	p=0.0006

Can fumigant effectiveness be increased by combination with manure addition or beneficial microbial inoculation?



# Treatments

Variety = SVTM 9016 (relatively non-susceptible to FRD)

Preplant soil K: 150 ppm; 160 lb/acre K<sub>2</sub>O fertigated as 0-0-12 between planting and mid-bloom

	No secondary trt	Inoculant	Manure
<b>K-Pam (25 gal/acre)</b>	K-Pam alone	K-Pam + Trichoderma	K-Pam + manure
<b>No fumigant (control)</b>	Untreated control	Trichoderma alone	Manure alone
<b>Application method</b>		Trianum P (Koppert) 16 oz/acre at planting, 8 oz /acre 4 & 8 WAT	Poultry manure, 2.5 t/ac, banded & shallowly incorporated after fumigation, before planting

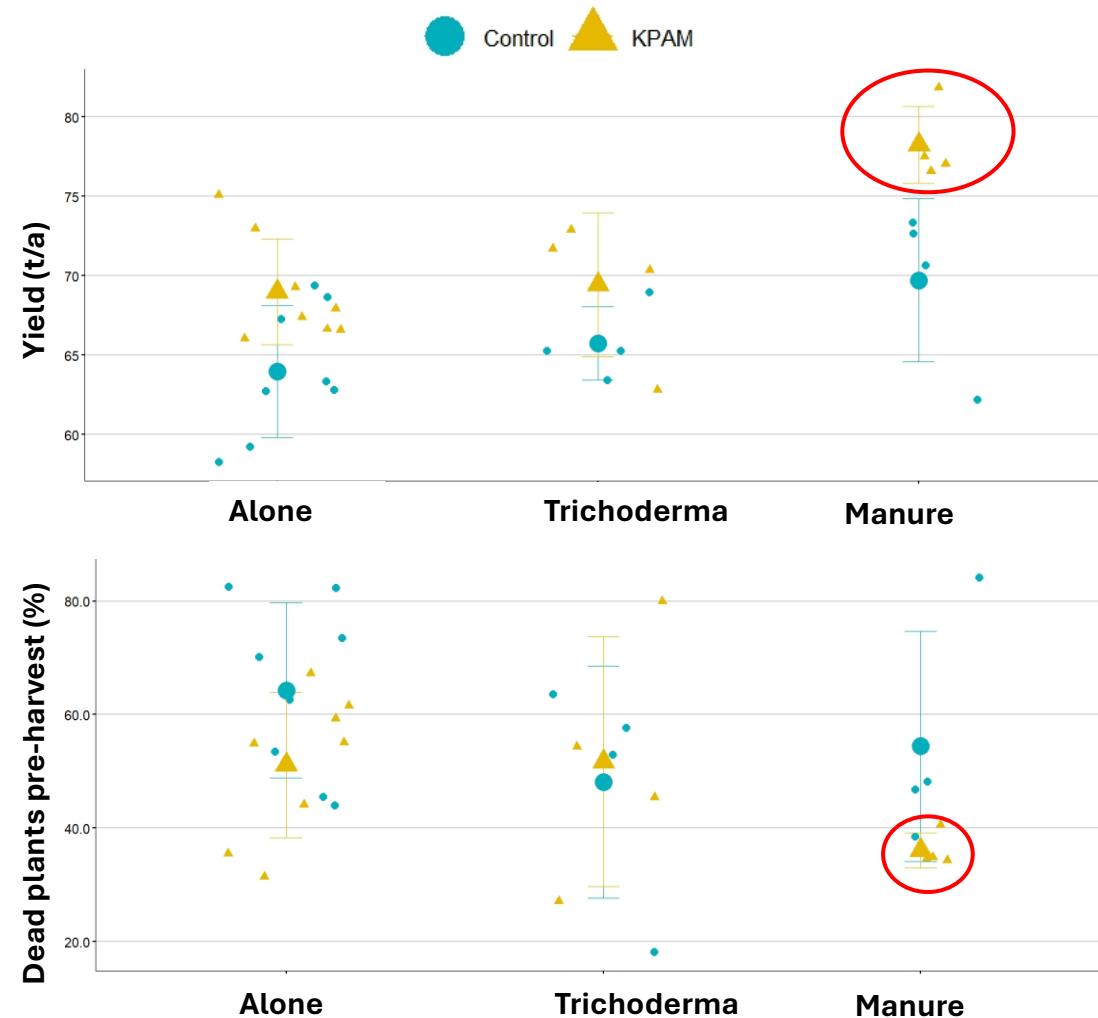


UC Cooperative Extension  
University of California  
Agriculture & Natural Resources

## Adding manure to K-Pam:

- Increased yields by 22% compared to the untreated control & 13.5% compared to K-Pam alone (a 14.3 and 9.3 t/a difference, respectively).
- Reduced vine decline by 44%

Secondary treatment	Fumigation	Yield t/a	Decline %
<b>Alone</b>	Control	64 b	64 b
	KPAM	69 b	51 ab
<b>Trichoderma</b>	Control	66 b	48 ab
	KPAM	70 ab	52 ab
<b>Manure</b>	Control	70 ab	54 ab
	KPAM	78 a	36 a
<b>Fumigation</b>	Control	66	58
	KPAM	71	48
	p-value	<b>0.03</b>	<b>0.03</b>
<b>Treatment</b>	Alone	66.5	58
	Trichoderma	67.6	50
	Manure	74.0	45
<b>Fum * Trt</b>	p-value	<b>&lt;0.0001</b>	<b>NS</b>
	p-value	NS	NS



# Conclusions

- Adding 2.5 t/a poultry manure after fumigating with 25 gal/acre K-Pam consistently increased yields & decreased vine decline in a heavily infested FRD field
- Effect evident even with a somewhat tolerant variety

# Thank you!



## Collaboration

- Blake Harlan & Chris McAllister (Harlan Family Ranch)

## Field assistance & diagnostics

- Cassandra Swett & Indiana Waterman (UC Davis)
- UCCE Yolo county colleagues

## Materials donation

- Tito Zuniga (Koppert)
- Stephen Pozzi (Stephen Pozzi Commodities)

## Funding

- California Tomato Research Institute
- IR-4 Project

