

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

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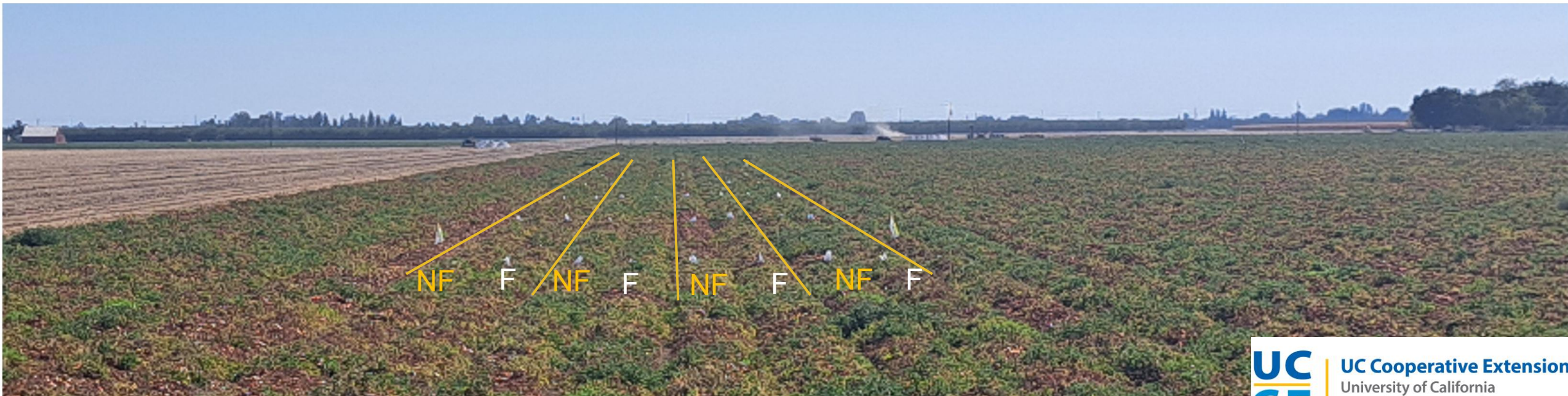


# Fumigation & FRD: variable results over the years

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

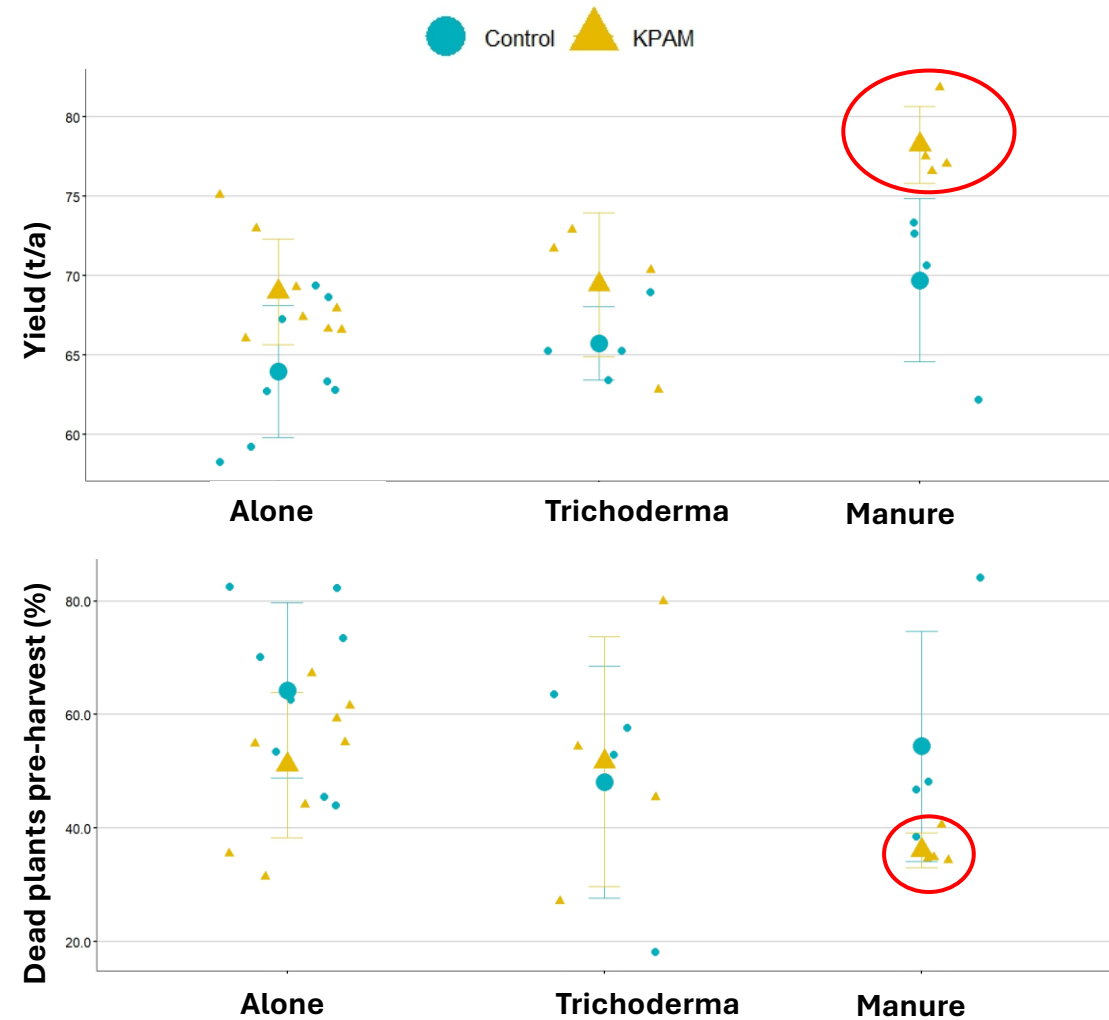
	No secondary trt	Inoculant	Manure
K-Pam (25 gal/acre)	K-Pam alone	K-Pam + Trichoderma	K-Pam + manure
No fumigant (control)	Untreated control	Trichoderma alone	Manure alone
Application method		Triatum P (Koppert) 16 oz/acre at planting, 8 oz /acre 4 & 8 WAT	Poultry manure, 2.5 t/ac, banded & shallowly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



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

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- UCCE Yolo county colleagues

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- Stephen Pozzi (Stephen Pozzi Commodities)

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