

Tomato Disease Management

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Current and recent past projects – Tomato plant health/Disease management

- Impact of K-Pam fumigation on Fusarium diseases and other soilborne problems, and yield outcomes
- Fungicide trials: powdery mildew, black mold fruit rot, Fusarium diseases
- Non-fumigant nematicides in fields with both root knot nematode and Fusarium diseases
- Variety evaluation in fields with FRD (*Fusarium noneumartii*/*F. falciforme*)



Fusarium wilt



Fusarium crown
and root rot



Fusarium stem
rot and decline



A photograph of a tomato field showing significant damage from Fusarium stem rot and decline. The plants are stunted, with many leaves and stems turned brown and wilted. Numerous ripe, red tomatoes are scattered on the ground, indicating they have fallen from the plants. The soil is visible in patches between the plants. The overall scene depicts a severe agricultural loss.

Fusarium
stem rot and decline

Crown rot/stem rot





Materials evaluated:

Please note that Propulse is not registered for use on California tomatoes.

Fungicides (applied at planting and early season):

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

Fumigant (applied at least two weeks prior to planting):

- **K-Pam (AMVAC)** – metam potassium

Chemical effectiveness in product trials, 2019-2024

- Results of 10 trials in Yolo, Solano, and San Joaquin counties
- Diseases present include FRD, Fusarium wilt and other soilborne diseases

Product (active ingredient)	Sig. disease effect?	Sig. yield effect?	Range in average yield boost (where sig.)
K-Pam (metam potassium) ~30 gal/acre	3 (of 6 trials)	5 (of 7 trials)	3.5 – 26 t/a
K-Pam (metam potassium) ~15 gal/acre	2 (of 3)	2 (of 3)	11.9 – 13.6 t/a
Miravis (pydiflumetofen)	3 (of 3)	1 (of 3)	9.2 t/a
Rhyme (flutriafol)	2 (of 3)	1 (of 1)	10 t/a
Velum One (fluopyram)	1* (of 3)	0 (of 3)	

Site	UC Davis	Yolo Co.	San Joaquin Co.	San Joaquin Co.	San Joaquin Co.	Yolo Co.	Solano Co.	San Joaquin Co.	Yolo Co.	Yolo Co.	
Year	2019	2019	2019	2020	2021	2023	2023	2024	2024	2024	
Disease	FRD	FRD	FRD	Fol & FRD	Fol & FRD	Fol, FRD, Forl, s. blight	FRD, Forl	RKN & FRD	FRD, vert	FRD	
Product	Vine decline in non-treated control	47%	73%	20%	31%	30%	55%	16%	19%	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				+	++		NS			
	Yield				NS	10 t/a		NS			
Velum	Disease	+			-			NS			
	Yield	NS			NS			NS			
	Disease P-value	NS	NS	Not tested	P=0.06	P=0.0004	NS	P=0.008	NS	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	NS	P=0.0006

+=statistically weak positive effects ++=statistically strong positive effect; NS=not significant



Managing Fusarium diseases of tomato

- Field selection (soil test not yet ready)
- Equipment sanitation
- Variety selection (resistance, tolerance)
 - Resistance in many varieties for Fusarium wilt race 3
 - Resistance in a few varieties for Fusarium crown and root rot (HM5522 and others)
 - Tolerance to FRD/*F. falciforme* (contact me or seed salesperson for list)
- Fumigants and fungicides

Southern blight – *Sclerotium rolfsii*



UC Statewide JPM Project
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Fungicides (FRAC group)	Products with SB control on label (any crop)	Federal crops/labels for SB control
QoIs/strobilurins (FRAC 11)		
fluoxastrobin	Evito, Aftershock	peanut, soybean, fruiting veg group
azoxystrobin	Quadris and others	legume group, soybean, leaves of root and tuber vegetables group 2, Root vegetables crop subgroup 1A, tuberous and corm subgroup 1C
pyraclostrobin	Headline, 1 partner of Priaxor, 1 partner of Pristine	peanut, soybean, Brassica leafy greens, fruiting veg group, carrot & alfalfa
trifloxystrobin	partner of Armada, Tartan	turf and ornamentals
penthiopyrad	Fontelis	tomatoes, root veg
DMIs/triazoles (FRAC 3)		
triadimefon	Bayleton, part of Armada & others	ornamentals
difenoconazole	partner of formulated mixtures Aprovia Top, Quadris Top, Briskway	fruiting veg group, carrots, turfgrass
propiconazole	Tilt, plus numerous formulated mixtures	beans, turfgrass, peanut
tebuconazole	Folicur, plus numerous other, both solo and formulated mixtures	peanut
SDHI/carboxamide (FRAC 7)		
bosalid	Endura, Pristine	Alfalfa, carrot
fluxapyroxad	1 partner of Priaxor	fruiting veg group, peanut, soybean
flutolanil	Convoy, Prostar, Artisan	peanut, turfgrass
inpyrfluzam	Excalia	apple, sugarbeet, peanut, soybean
FRAC group 29		
fluazinam	Omega	carrots
phenylpyrroles (FRAC 12)		
fludioxonil	Medallion and others	ornamentals



Powdery mildew fungicides

Product & rate per acre	Active ingredient(s)	FRAC grouping
Rhyme 7 oz	flutriafol	3
Rally 4 oz	myclobutanil	3
Priaxor 8 oz	pyraclostrobin + fluxapyroxad	11 + 7
Quadris Top 8 oz	azoxystrobin + difenoconazole	11 + 3
Mettle 6 to 8 oz	tetraconazole	3
Luna Sensation 7 oz	trifloxystrobin + fluopyram	11+ 7
Torino 3.4 oz	cyflufenamid	U06
Vivando 15.4 oz	metrafenone	B6
Fontelis 15 oz	penthiopyrad	7

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