

Fusarium stem rot and decline (FRD)

Brenna Aegerter, UCCE San Joaquin County

Patricia Lazicki, UCCE Yolo, Solano and Sacramento counties

Cassandra Swett & Myles Collinson, UC Davis



UC Cooperative Extension
University of California
Agriculture & Natural Resources

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Fusarium diseases of processing tomato in CA

Fusarium oxysporum

Fusarium wilt
(**Fol race 3**)



Fusarium crown and
root rot (**Forl**)



Fusarium solani

Fusarium stem rot
and decline (**FRD**)



Fusarium foot rot
(*F. falciforme*)

- Milder symptoms on both foliage and roots
- No vine decline

Fusarium oxysporum

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HOST RESISTANCE

Many varieties

Resistance designated
by 'FFF' or F3

~ a dozen varieties

Resistance designated by 'Fr'

No resistance yet identified
to these pathogens

No resistance gene for FRD, but wide range of tolerance among varieties

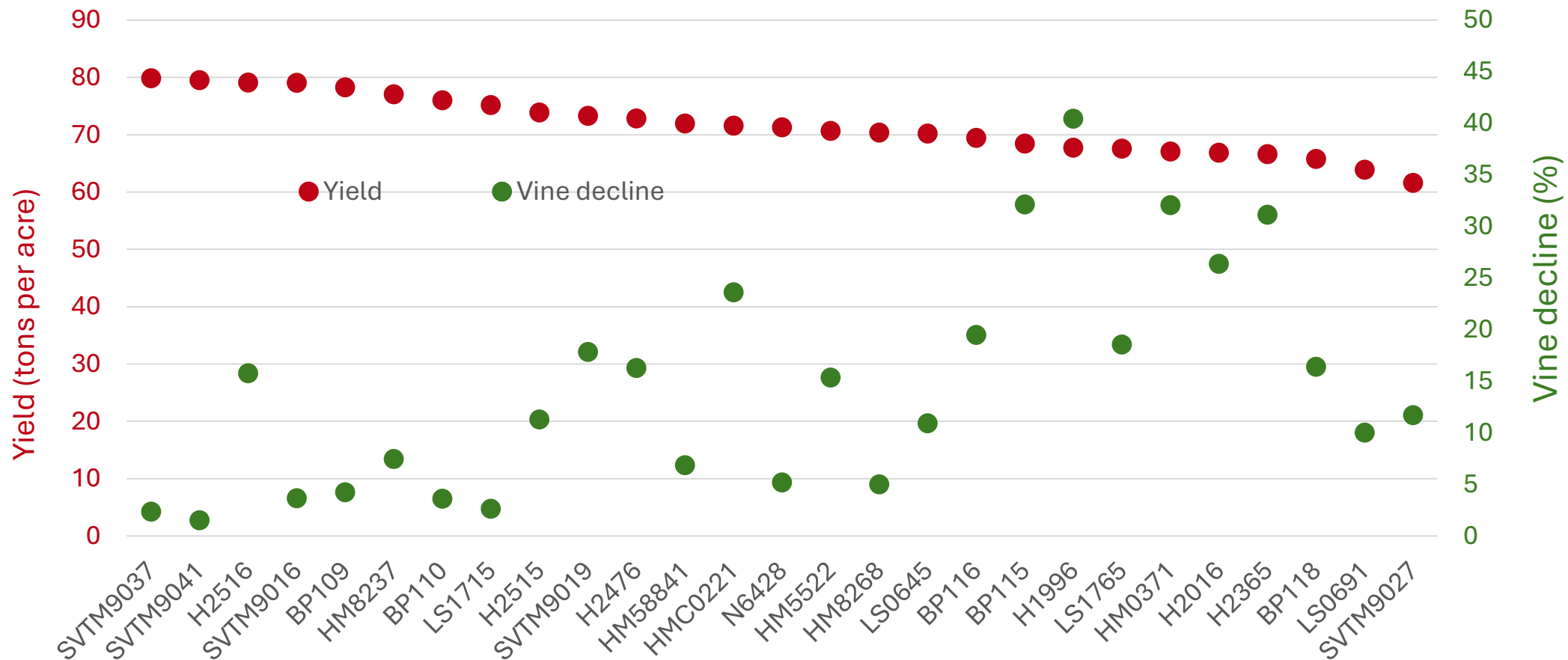


Goal: Identify varieties which consistently perform well in infested fields

- Grower fields and UCD inoculated trials
- 25 replicated trials over 7 years (2019 to 2025)
- Variety choice:
 - Widely grown
 - New early commercial
 - Unusually susceptible or tolerant (control)

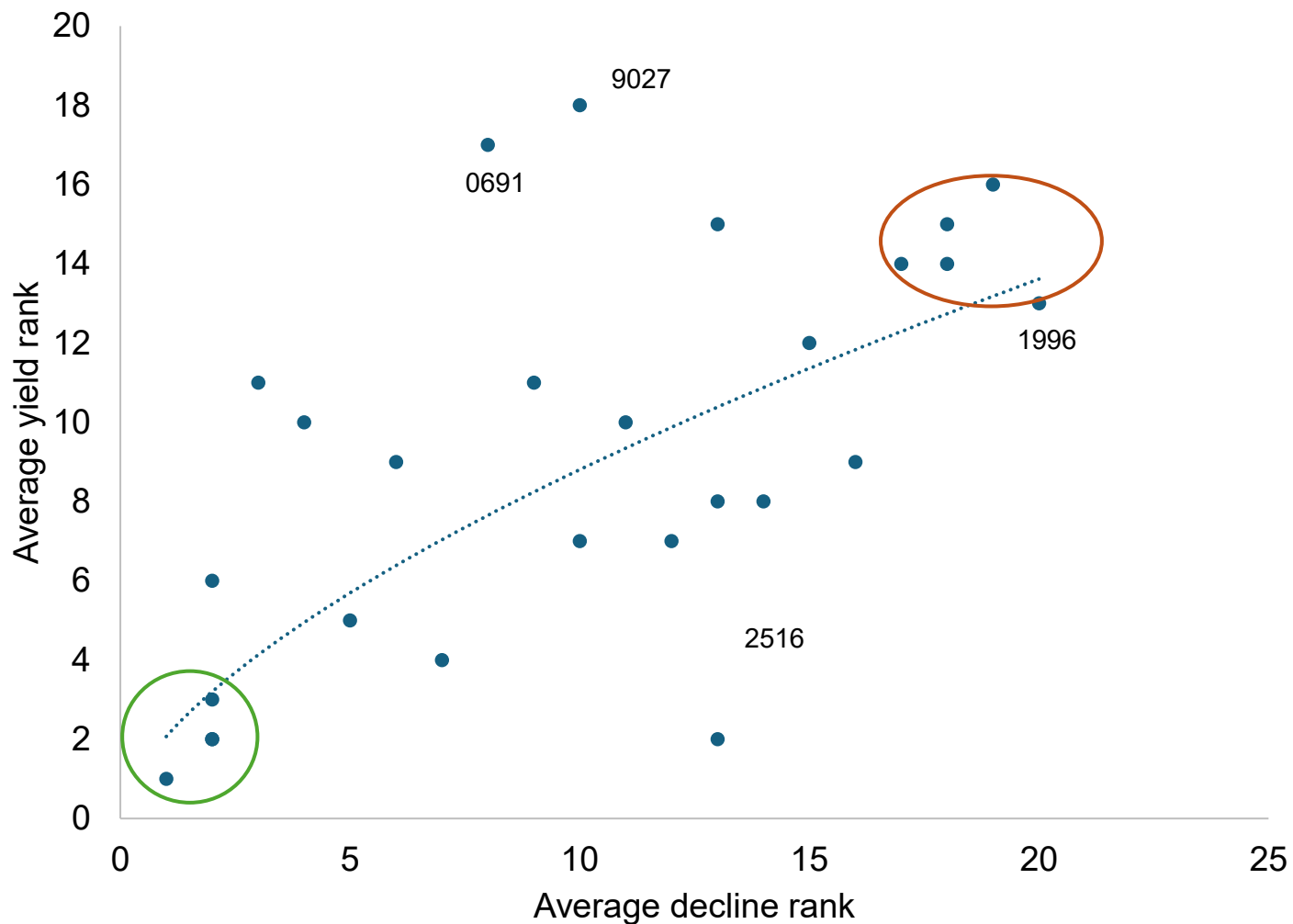


2025 results: AgSeeds Bioassay Trials



5 commercial fields: Yolo, Sutter, Colusa, San Joaquin counties. 3 replicates at each site

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2025 Results

2025 loads rank	Variety	Sutter Co 1		Yolo Co		Sutter Co 2		Colusa Co		San Joaquin Co		Mean
		FRD (F. noneumartii)		FRD (F. martii)		FRD (F. noneumartii)		FRD (F. noneumartii) + Vert, foot rot		FRD (F. martii) + Fus wilt		
		VD	Yield	VD	Yield	VD	Yield	VD	Yield	VD	VD	
14	SVTM9041	0.0	88.56	1.4	88.03	0.8	73.87	3.8	67.50	9.6	3.5	80.42
10	SVTM9037	0.5	85.74	0.5	85.83	6.3	70.65	2.1	77.13	22.4	5.4	79.84
	H2516	0.0	89.77	0.9	85.17	12.0	67.45	50.1	73.93	16.0	13.1	79.39
4	SVTM9016	0.8	89.90	0.5	88.59	10.1	68.11	3.1	69.67	8.7	4.6	79.07
	BP109	0.0	85.36	1.0	89.71	9.8	70.75	6.1	67.21	12.3	4.4	78.26
1	HM8237	0.0	87.12	2.5	81.64	6.3	69.26	21.1	70.13	16.0	7.9	77.51
	BP110	0.0	84.81	0.5	82.71	6.8	71.26	7.1	65.21	6.4	3.6	76.82
	LS1715	1.2	79.49	2.4	79.20	7.4	58.94	-0.5	82.96	14.6	5.0	74.28
	H2515	1.2	84.80	2.9	77.67	12.2	62.19	28.7	70.75	37.0	11.8	73.98
	H2476	0.0	84.09	3.5	83.72	9.3	62.24	52.2	61.26	8.7	12.6	73.72
11	SVTM9019	2.4	84.62	1.9	88.10	36.4	60.58	30.6	59.77	18.7	17.3	73.27
6	HM58841	1.4	82.35	2.4	75.43	8.7	66.17	14.9	63.88	8.7	6.7	72.53
	HMC0221	0.0	88.28	0.0	83.89	32.8	60.28	61.6	53.90	28.8	22.0	71.59
16	N6428	0.9	81.06	1.8	80.03	17.5	52.96	0.6	71.13	5.0	4.9	71.15
9	HM5522	0.4	80.48	5.4	74.76	24.5	65.31	31.0	62.05	19.2	13.8	70.65
5	HM8268	0.0	80.91	1.4	79.74	7.9	55.73	10.7	65.00	18.3	6.3	70.35
39	LS0645	2.3	80.33	1.0	83.44	17.9	56.04	22.5	61.02	12.8	10.7	70.21
	BP116	14.5	70.94	4.9	78.45	39.4	63.40	19.1	65.00	16.9	17.0	69.45
	LS1765	---	---	3.4	75.01	---	---	33.7	60.15	5.5	13.6	68.72
3	H1996	16.8	75.78	3.4	83.32	64.3	54.18	77.2	57.65	40.6	33.8	68.49
	BP115	9.7	77.17	10.4	77.46	83.0	47.34	25.4	71.87		28.7	67.99
2	H2016	3.0	80.62	0.9	79.49	54.3	48.64	47.2	58.70	6.8	18.4	67.45
28	HM0371	2.2	83.71	4.3	80.51	32.8	55.80	88.9	48.25	33.3	31.0	67.07
45	H2365	10.4	75.94	0.0	77.69	61.1	52.38	53.1	60.43	17.1	24.5	67.01
	BP118	7.6	71.49	5.4	72.73	25.8	56.50	26.7	62.28	47.0	17.5	65.75
	LS0691	1.3	76.92	4.3	73.28	18.3	54.65	16.1	50.71	24.2	12.1	63.89
8	SVTM9027	1.3	72.09	2.9	71.52	20.5	47.78	22.1	54.97	17.4	12.1	61.59



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Challenges of variety evaluation

- Variation from site to site and year to year → need lots of data
- Variable disease pressure across the field
- Many pests/pathogens/abiotic issues in a field
- Foliar symptoms and rot are not very indicative of impact on yield
- We have focused on advanced vine decline and yield
- Yield performance is complex – many factors
- Current turnover in varieties is fast!

2025 State top ten varieties: FRD risk

2025 load rank	Variety	# of trials	Normalized trial yield	FRD susceptibility and fruit holding traits
1	HM8237	17	1.146	Tolerant, EFH, Forl resistance
2	H2016	16	0.975	Moderately susceptible to FRD, but manages to yield decently in problem fields
3	H1996	14	0.909	Very susceptible to vine decline, has EFS TM trait
4	SVTM9016	20	1.109	Tolerant to FRD; EFH
5	HM8268	11	1.024	Tolerant to FRD
6	HM58841	21	1.067	Fairly tolerant of FRD, susceptible to Fus wilt race 3. EFH.
7	SVTM9023	10	1.049	Moderate rates of vine decline
9	HM5522	15	0.997	Susceptible to FRD and Fus wilt race 3, Forl resistance
10	SVTM9037	18	1.067	Low to moderate vine decline, EFH

ACKNOWLEDGEMENTS



Collaborators:

AgSeeds, TS&L, Swett Lab, UC Davis

Funding:

California Tomato Research Institute

Grower cooperators:

You know who you are, thank you for hosting yield trials!

Technical assistance:

Dan Rivers, Shirley Alvarez, Indiana Waterman, Mat Talton

