

# Fusarium Stem Rot & Decline (FRD): Intro & Variety trials

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# Host resistance or tolerance to Fusarium diseases in processing tomatoes

- Many varieties have resistance to Fusarium wilt race 3 (resistance designated by 'FFF' or F3)
- A few varieties have resistance to Fusarium crown and root rot (resistance designated by 'Fr')
- No resistance yet identified to Fusarium stem rot and vine decline (FRD) in commercial varieties grown in CA

# Varietal tolerance



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

**Goal: Identify varieties which consistently perform well in infested fields**

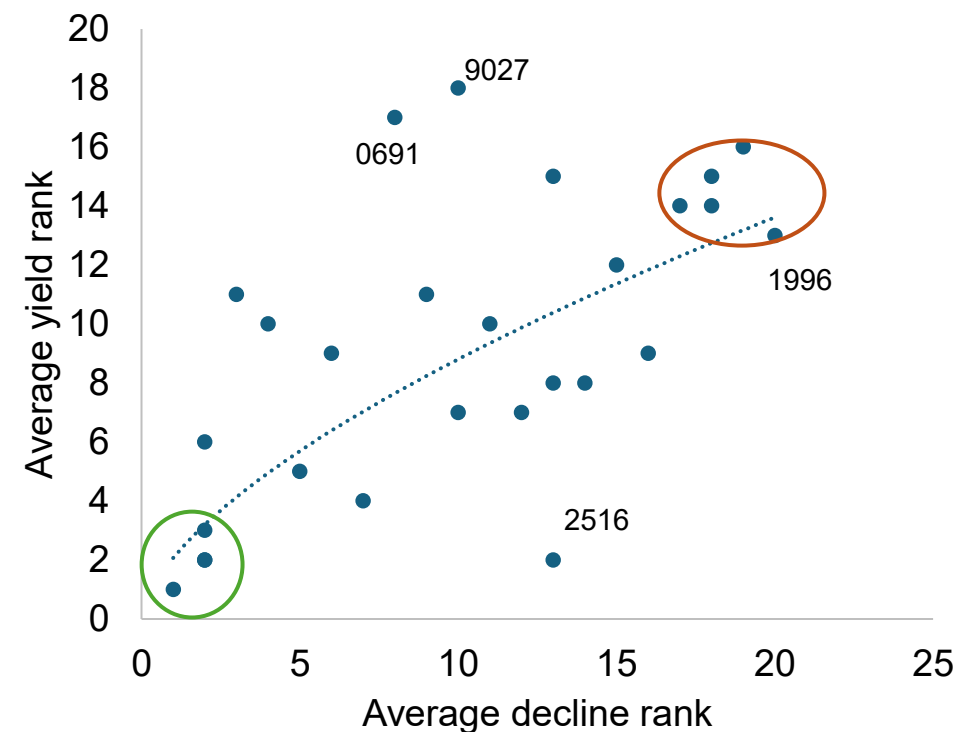
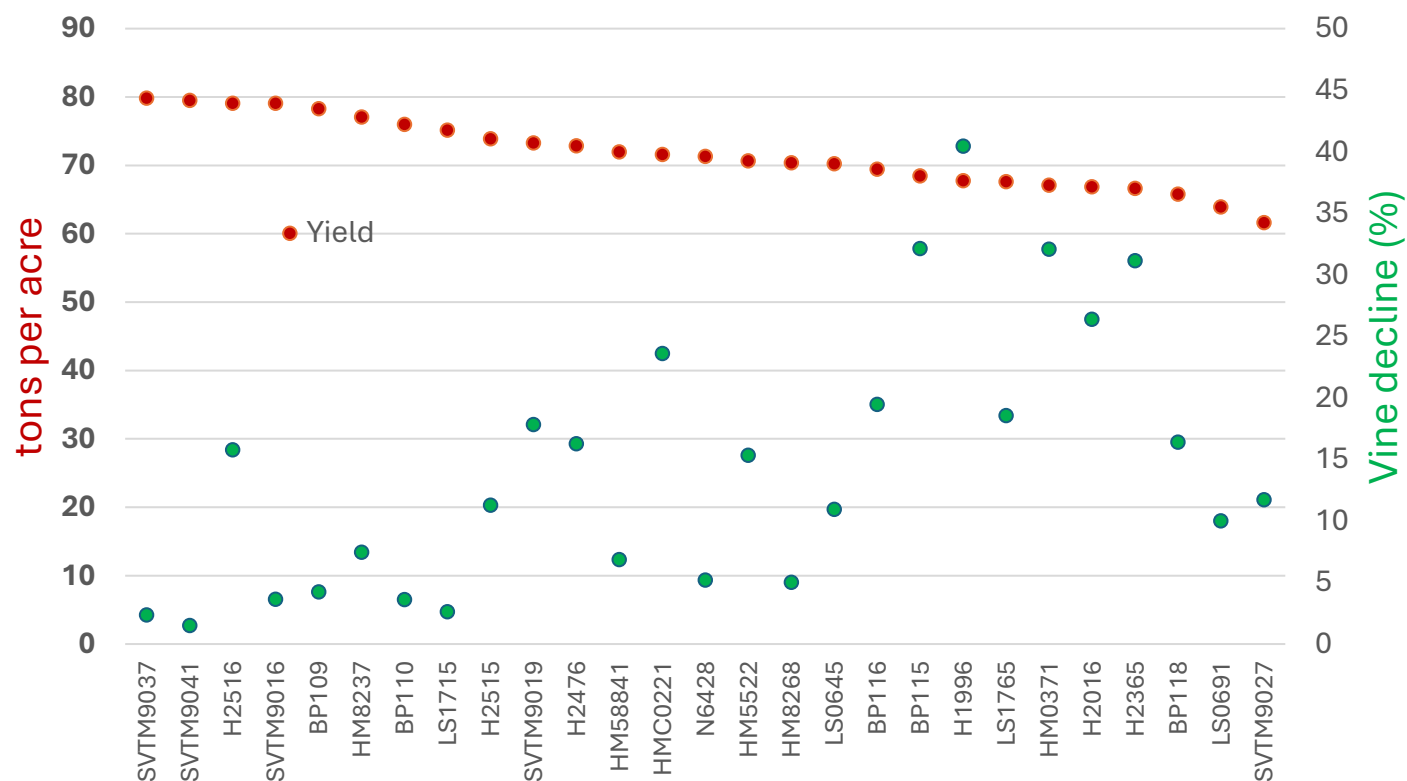
- Grower fields, UCD inoculated trials
- ~30 replicated trials 2019-2025
- Other non-replicated trials we find
- Variety choice:
  - Widely grown
  - New material
  - Unusually susceptible or tolerant (control)



# 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 not that 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 results: AgSeeds Bioassay Trials



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

# 2025 Results

|                 |          | Sutter Co 1          |       | Yolo Co         |       | Sutter Co 2          |       | Colusa Co            |       | San Joaquin Co  |      |       |
|-----------------|----------|----------------------|-------|-----------------|-------|----------------------|-------|----------------------|-------|-----------------|------|-------|
|                 |          | FRD (F. noneumartii) |       | FRD (F. martii) |       | FRD (F. noneumartii) |       | FRD (F. noneumartii) |       | FRD (F. martii) |      |       |
|                 |          |                      |       |                 |       |                      |       | + Vert, foot rot     |       | + Fus wilt      |      | Mean  |
| 2025 loads rank | Variety  | VD                   | Yield | VD              | Yield | VD                   | Yield | VD                   | Yield | VD              | VD   | Yield |
| 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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# 2025 State top ten varieties: FRD risk

| 2025 loads rank | Variety   | # trials | Performance                                                                                                            | Risk in FRD-infested sites |
|-----------------|-----------|----------|------------------------------------------------------------------------------------------------------------------------|----------------------------|
| 1               | HM 8237   | 19       | Typically performs well in high-pressure fields                                                                        |                            |
| 2               | H 2016    | 16       | When disease pressure is high, there is typically high vine decline, although it can yield reasonably well despite FRD |                            |
| 3               | H 1996    | 16       | Consistently high vine decline, low yields under pressure                                                              |                            |
| 4               | SVTM 9016 | 21       | Generally has low vine decline and high yields in FRD fields                                                           |                            |
| 5               | HM 8268   | 13       | Tends to have low vine decline, medium yields                                                                          |                            |
| 6               | HM 58841  | 23       | Susceptible to race 3, tends to do well in FRD fields if no Fusarium wilt present                                      |                            |
| 7               | SVTM 9023 | 10       | Susceptible to vine decline, but yields decently                                                                       |                            |
| 8               | SVTM 9027 | 10       | Moderate vine decline, not high yielding                                                                               |                            |
| 9               | HM 5522   | 19       | Susceptible to both FRD and F3. Yields decently despite decline. Resistant to Forl.                                    |                            |
| 10              | SVTM 9037 | 21       | Low to moderate vine decline                                                                                           |                            |

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