Fungal Disease Update

Brenna Aegerter
University of California
Cooperative Extension, San Joaquin County
Fusarium wilt (*F. oxysporum* f. sp. *lycopersici* race 3)

Fusarium crown & root rot (*F. oxysporum* f. sp. *radicis-lycopersici*)

Fusarium foot rot (*F. solani* f. sp. *eumartii*)

Fusarium solani crown rot?
Fusarium wilt Race 3
Swett lab, UCD research on Fusarium wilt of tomato

• Developing a quick test to differentiate the four Fusarium diseases and races

• How much do other crops, weeds and resistant tomato varieties contribute to Fusarium surviving in field soil?

• Effects of abiotic stress (salinity, deficit irrigation) on disease severity of F3
Swett lab, UCD research on Fusarium wilt of tomato

- Commercial seed lots do not seem to be a source of Fol R3 (Hung Doan)
- Fol R3 can likely survive for several years in the soil (they are working on a soil test)
- Salinity and deficit irrigation do accelerate Fusarium wilt under controlled conditions in the greenhouse (work ongoing)
Southern blight (*Sclerotium rolfsii*)

Alex Putman, UCR

R. Melanson, Miss. St. Univ., Bugwood.org
Tomato powdery mildew

- *Leveillula taurica* *(Oidiopsis sicula)*

- *Oidium neolycopersici*

- *Oidium lycopersici*
<table>
<thead>
<tr>
<th>FRAC Group Code(s) &amp; risk</th>
<th>Mildew fungicide products (chemical common names)</th>
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</thead>
<tbody>
<tr>
<td>11 - high</td>
<td>Quadris (azoxystrobin), Cabrio (pyraclostrobin), Flint (trifloxystrobin)</td>
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<tr>
<td>3 - medium</td>
<td>Rhyme (flutriafol), Rally (myclobutanil), Inspire (difenoconazole), Mettle (tetraconazole) – not registered in CA</td>
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<tr>
<td>11 + 3 - medium</td>
<td>Quadris Top (azoxystrobin + difenoconazole)</td>
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<tr>
<td>7 – med-high</td>
<td>Fontelis (pentyiopyrad)</td>
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<tr>
<td>7 + 11 - medium</td>
<td>Priaxor (fluxapyroxad + pyraclostrobin )</td>
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<tr>
<td></td>
<td>Luna Sensation (fluopyram + trifloxystrobin)</td>
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<tr>
<td>7 + 3 - medium</td>
<td>Aprovia Top (solatenol + difenoconazole) – Federally approved, awaiting CA label perhaps in time for late summer applications?</td>
</tr>
<tr>
<td>U06 – high?</td>
<td>Torino (cyflufenamid) – label expansion to tomato - Summer 2018?</td>
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<tr>
<td>50 - medium</td>
<td>Vivando (metrafenone)</td>
</tr>
<tr>
<td>M – low risk</td>
<td>Sulfur (dusting sulfur, wettable/sprayable/micronized sulfurs)</td>
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<tr>
<td>Not categorized – low risk</td>
<td>Kaligreen and others (potassium bicarbonate)</td>
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<tr>
<td></td>
<td>Regalia (plant extract)</td>
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<td></td>
<td>Taegro, Sonata, Actinovate (biological fungicides)</td>
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### Efficacy of “older” fungicides in field trials, 2015 & 2016

<table>
<thead>
<tr>
<th></th>
<th>Powdery mildew severity (AUDPC)</th>
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<tbody>
<tr>
<td><strong>2015 &amp; 2016 trials</strong></td>
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<tr>
<td><strong>Quadris Top</strong></td>
<td><strong>azoxystrobin + difenoconazole</strong></td>
</tr>
<tr>
<td><strong>10-day</strong></td>
<td>e</td>
</tr>
<tr>
<td><strong>20-day</strong></td>
<td>de</td>
</tr>
<tr>
<td><strong>Quadris</strong></td>
<td><strong>azoxystrobin</strong></td>
</tr>
<tr>
<td><strong>10-day</strong></td>
<td>e</td>
</tr>
<tr>
<td><strong>20-day</strong></td>
<td>de</td>
</tr>
<tr>
<td><strong>Rally</strong></td>
<td><strong>myclobutanil</strong></td>
</tr>
<tr>
<td><strong>10-day</strong></td>
<td>de</td>
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<tr>
<td><strong>20-day</strong></td>
<td>de</td>
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<tr>
<td><strong>Cabrio</strong></td>
<td><strong>pyraclostrobin</strong></td>
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<tr>
<td><strong>10-day</strong></td>
<td>bc</td>
</tr>
<tr>
<td><strong>20-day</strong></td>
<td>b</td>
</tr>
<tr>
<td><strong>non-treated control</strong></td>
<td>a</td>
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*Note: Letters indicate statistical significance among treatments.*
## Efficacy of selected “newer” fungicides in field trials, 2013 to 2016

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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Rhyme 7 oz</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Priaxor 8 oz</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Quadris Top 8 oz</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Luna Sensation 7 oz</td>
<td>Not tested</td>
<td>2</td>
<td>4</td>
<td>Not tested</td>
</tr>
<tr>
<td>Torino 3.4 oz **</td>
<td>Not tested</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Fontelis 15 oz</td>
<td>4</td>
<td>Not tested</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

** still awaiting California registration
Some newer fungicides can be applied through the drip: e.g. Velum, Rhyme, Priaxor. Field trial results have been mixed; sometimes great control, other times less than great control.
Powdery mildew control via drip-applied fungicides

7 fl oz Rhyme via drip twice, ~6 & 10 weeks after transplanting

Non-treated control no fungicides

6.5 fl oz Velum via drip twice, ~6 & 10 weeks after transplanting