2017 Onion Research Updates from Tulelake
Comparing New Fungicides for White Rot Suppression and Managing Maggots

Rob Wilson
UC IREC Director/Farm Advisor
White Rot Disease

• Devastating disease of garlic and onion worldwide.
• 25,000+ infested acres in CA
• Acreage base is severely restricted in long-time production regions due to infested acres
• Growers need an effective management strategy to remain sustainable.
Management Strategies

• Prevention
• Fumigation
• Sclerotial germination stimulants
• Fungicides
• Plant resistance
Fungicides

- Soil-applied in early season before infection to suppress the disease
- Applications in-furrow at planting have been the most effective
- Important to have fungicides concentrated at the basal plate of onion or garlic
- Several fungicides have activity on white rot
Fungicides

- Tebuconazole (Tebustar) and penthiopyrad (Fontelis) were most effective in CA testing
- Fungicides work best when sclerotia populations are low and conditions are not optimal for rapid disease development
In-furrow fungicide Application
In-furrow vs. Banded on soil surface
Growth response of Calif and Oregon isolates of *S. cepivorum* (n=120) to tebuconazole
Fate of Tebuconazole in Soil

Tebuconazole (ppm)

Days post-application

Tulelake, organic

Sandy loam
Evaluation of New Fungicides

• Several new fungicides many in the SDHI group have recently been released

• Do any have activity on white rot?
Leaf Dieback Caused by White Rot
Influence of Tebuconazole on Disease-free Onion Yield Averaged Across all Germination Stimulants tested in Tulelake in 2017
Untreated
Diseased Bulbs
TebuStar 21 fl.oz/A
Percentage of clean bulbs without disease symptoms

- Untreated: d
- Tebustar 20.5 fl. oz: a
- Fontelis 24 fl. oz: a
- Merivon 8 oz: abc
- Merivon 11 oz: ab
- Velium Prime 6.5 fl. oz: bcd
- Aprovia Top 13.5 fl. oz: cd
- Miravis Top 13.7 fl. oz: bcd
Thank You

• California Garlic and Onion Research Advisory Board
• California Department of Pesticide Regulation
• Dung OSU Lab
• IREC Staff
• BASF, Syngenta, and Bayer Crop Science
Comparison of Insecticides and Insecticide Application Methods to Protect Spring-seeded Processing Onions from Seedcorn Maggot and Onion Maggot Damage

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Background

• Early season stand loss from maggots is a regular problem for Tulelake onion growers

• Seedcorn maggot flies are captured in most onion fields during the normal onion planting window between mid-April to mid-May

• Onion maggot flies are often captured starting in mid-May

• Previous research by Wilson and Taylor showed maggots can reduce a onion stand by 65% to 95% of the initial seeding rate without insecticide treatment at planting
Background

- Tillage of green plants, plant residues and manure attract seed corn maggot egg-laying and damage is often severe when onions are planted shortly after tillage.

- Onion maggots flies lay their eggs on soil near young onion plants and damage is often severe when onions are planted nearby old onion fields and cull piles.

- Insecticides are an effective treatment to prevent seed corn maggot and onion maggot damage.

- Many growers experienced greater than 15% stand loss with chlorpyrifos in recent years & proposed regulations to limit chlorpyrifos use due to environmental concerns has the industry searching for alternatives.
2017 Study

- Main focus was evaluating seed treatment options
- Evaluated several insecticide/fungicide package combinations using different seed coatings
- A smaller study manipulated the duration between tillage and onion planting to examine its’ influence on maggot damage.
  - We wanted to determine if delayed onion planting decreased onion loss from maggots
Insecticide Application Methods

- Seed treatment
  - Filmcoat, encrustment, and bb-sized pellet

- In-furrow treatments
  - 3-inch band of insecticide applied directly over the seed after seed placement but before furrow closure using Teejet even fan nozzles mounted on the onion planter
Seed Treatment Options

Thiram Film Coat: 91,820 seed per pound
Cornell Encrustment: 60,000 seed per pound
Skagit Encrustment: 47,053 seed per pound
Skagit Mini-Pellet: 23,650 seed per pound
Full Size Pellet: 15,090 seed per pound
2017 Results
Difference in early season onion plant population for various insecticide treatments
Onions Stand at Harvest for Maggot Insecticide Treatments tested in Tulelake, CA in 2017 (averaged across two sites)

- untreated encrustment- no insecticide
- untreated pellet- no insecticide
- Trigard pellet
- Capture LFR (bifenthrin) at 8.5 fl. oz in-furrow
- FarMore OI100 encrustment
- Sepresto 75WS encrustment
- Sepresto 75WS pellet
- FarMore OI100 pellet
- FarMore FI500 encrustment
- FarMore FI500 pellet
- FarMore OI100 filmcoat

onions per bed ft

10.0
12.0
14.0
16.0
18.0
20.0
22.0
Comparison of Insecticides Averaged Across Seed Coating Methods tested in Tulelake, CA in 2017 (averaged across two sites)

- No insectide + FarMore 300
- Sepresto 75WS + FarMore 300
- Regard Ol100 + FarMore 300
- Regard Ol100 (no fungicide package)
- FarMore F1500

onions per bed ft at harvest

- b
- a
- a
- a
- a
Comparison of Regard Ol100 Seed Coatings Averaged Across Fungicides tested in Tulelake, CA in 2017 (averaged across two sites)

- Full-size pellet seed coating
  - 18.0
  - ab

- Encrustment seed coating
  - 17.0
  - b

- Film-coat seed coating
  - 20.0
  - a

onions per bed ft at harvest

Values with different letters are significantly different at α = 0.05.
The Influence of Onion Plant Population on Onion Bulb Yield

R² = 0.6477
Cultural Management Practices for Seedcorn Maggot

• Later plantings, shallow plantings, higher seeding rates help prevent poor stands

• Try to incorporate manure, weeds, cover crops, and crop residues in fall or as early in the spring as possible

• Olfactory cues and contact cues created by tillage trigger egg laying. Can we alter the timing of tillage and/or duration between tillage and onion planting to reduce maggot damage?
Influence of Onion Planting Date on Onion Stand at Harvest in 2017

- **Untreated seed**
- **Sepresto treated seed**

<table>
<thead>
<tr>
<th>Onions planted</th>
<th>Onions per bed ft</th>
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<tbody>
<tr>
<td>21 days after initial tillage</td>
<td>17</td>
</tr>
<tr>
<td>13 days after initial tillage</td>
<td>15</td>
</tr>
<tr>
<td>One day after initial tillage</td>
<td>11</td>
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Thank You

• California Garlic and Onion Research Advisory Board
• Alan Taylor, Cornell University
• Jess Holcomb with Syngenta R&D
• Olam International and Sensient Technologies
• Incotec Seed Coating
• Tulelake Grower Cooperators
• IREC Staff