Considering Cherry Leaf Spot Management without SDHI Fungicides

IPM Fruit School; February 2, 2017
Review of Cherry Leaf Spot Biology

**Ascospore discharge:**

* Ascospores released by wetting (bloom + 4-6 weeks)
* > 61 F, maximum discharge
* 50’s F, reduced discharge
* 39-46 F, minimal discharge
Cherry Leaf Spot -- Life Cycle

* Inoculum coming up from ground is readily controllable
* However, if we miss an infection, consequences can be severe
* Secondary spores >>>>>> Primary spores
* Much easier for CLS to spread within a tree
Once leaf infection occurs – even marginal infection periods become significant.
Cherry Leaf Spot Management

Objectives

• 1. Control primary infection before harvest
• 2. Control primary infection before harvest
• 3. Control primary infection before harvest
• 4. Control primary infection before harvest
Cherry Leaf Spot Management

• Cherry leaf spot is much easier to manage prior to harvest when leaves are “clean” and we are focused on preventing infection prior to harvest

• It becomes much more difficult to control CLS when we have sporulating lesions in trees (high pressure)
Montmorency (East Lansing)

Defoliation: Average Percent of Leaves Lost
Incidence: Average Percent of Leaves Infected

Lesion Density: Average Number of Lesions per cm² of Leaf Area
Precipitation (cm)

Dates:
- 5/28
- 6/11
- 6/25
- 7/9
- 7/23
- 8/6
- 8/20
- 9/3
- 9/17
SDHI Fungicide Chemistries for Cherry Leaf Spot Control

- Luna Sensation, Merivon
- Excellent fungicides for CLS
  - Also excellent for powdery mildew
  - VG to excellent for American brown rot
- Translaminar, persistent during long spray intervals
The Story of Pristine

- First registered in 2004
- Premix of boscalid (SDHI) and pyraclostrobin (strobilurin)
- Was a really excellent fungicide for CLS
- At the time, was a replacement for SI fungicides that we were losing to resistance
The Story of Pristine

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• By 2010-2011, we were observing a reduction in control efficacy in field trials conducted at the NWMHRC
2010 and 2011 *B. jaapii* isolate survey

2010
276 isolates, 20 orchards
2011
762 isolates, 18 orchards

2010
47 isolates, 1 orchard
2011
150 isolates, 3 orchards

Non-treated trees in Ohio
2010
44 isolates, 2 orchards
2011
9 isolates, 1 orchard

2010
0 isolates, 0 orchards
2011
58 isolates, 4 orchards
Boscalid sensitivity analysis in *B. jaapii*
Boscalid Sensitivity – Isolate distribution per orchard

Frequency Distribution %

Boscalid Concentration ug/ml

- 2010 Sensitive
- 2011 Sensitive
- 2010 Reduced Sensitivity
- 2011 Reduced Sensitivity
- 2010 Resistant
- 2011 Resistant
2012 Field Trial at NWMHRC

First two applications are Bravo Weather Stik, 4 pts
Identification of fungicide resistance mutation in *SDHB* target gene from *B. jaapii* isolates

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<th>Sensitive Isolates</th>
<th>225</th>
<th>272</th>
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<td>S1</td>
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<th>Isolates with Reduced Sensitivity</th>
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<th>Resistant Isolates</th>
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Cherry leaf spot (*B. jaapiii*) orchard sampling, 2016

- 34 commercial orchards and the NWMHRC
  - NW MI down to Oceana county
- 872 single spore isolates
  - 1 leaf per tree, 25 leaves per orchard
- Screening sensitivity to SDHIs:
  - Boscalid (Pristine)
  - Fluopyram (Luna)
  - Fluxapyroxad (Merivon)
Cherry leaf spot (*B. jaapii*) orchard sampling, 2016

- 34 commercial orchards and the NWMHRC
  - 872 isolates
- Some potentially concerning numbers on sensitivities to Luna and Merivon
- We don’t have field data yet on impacts of various sensitivity numbers (i.e., 25 ppm MIC)
- Spring testing will be done on inoculated trees
Potential issues with Luna Sensation and Merivon moving forward since 2013

• Consistent exposure of fungus population to SDHI fungicides since 2004

• Boscalid resistance mutation exists in population
  – A second mutation could make these strains resistant to Luna and Merivon

• Reduced sensitive strains may have a different mutation
  – A second mutation could make these strains resistant to Luna and Merivon

• Because of the current mutation status, resistance to Luna and Merivon may happen more easily
Fungicide Chemistries for Cherry Leaf Spot Control, 2009

- Chlorothalonil
- Pristine
- Adament, Gem
- Syllit + Captan
- Copper
Fungicide Chemistries for Cherry Leaf Spot Control, 2017

- Chlorothalonil
- *Luna Sensation, Merivon*
- Gem
- Syllit + Captan
- Copper
Cherry leaf spot fungicides

- **Chlorothalonil**
  - Broad-spectrum protectant
- **Captan** — *broad spectrum protectant*
- **SDHIs** — Merivon and Luna Sensation
- **Syllit**
- **Gem**
- **Copper** — *broad spectrum protectant*
Cherry leaf spot fungicides

- Chlorothalonil
  - Broad-spectrum protectant
- Captan – broad spectrum protectant
- SDHIs – Merivon and Luna Sensation
- Syllit
- Gem
- Copper -- broad spectrum protectant

* Should be tank-mixed with Captan 80WDG (2.5 lbs/A)
Cherry leaf spot fungicides

• Captan 80 WDG, 2.5 lbs / A
  – Very robust CLS fungicide
  – Broad spectrum protectant (surface, not systemic)
  – No mildew activity, some ABR activity

– Essential mixing partner for SDHIs, Syllit, Gem
Cherry leaf spot fungicides

- Chlorothalonil, Captan, SDHIs, Syllit, Gem, Copper
- SDHIs are a **key tool** for CLS, we don’t want to lose them …..
- SDHIs control multiple diseases
- Gem is at long-term risk of resistance because strobilurins are known to break down over long-term use
- Alternatives will be fine in lower and medium pressure years but will be problematic in significant CLS years
Considering cherry leaf spot management without SDHI fungicides

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- SDHIs are a key tool for CLS, we don’t want to lose them …..
- SDHIs control multiple diseases
Considering cherry leaf spot management without SDHI fungicides

- Chlorothalonil, Captan, **SDHIs**, Syllit, Gem, Copper
- **SDHIs** are a key tool for CLS, we don’t want to lose them …..
- **SDHIs** control multiple diseases

**For now, we need to practice excellent resistance management strategies**

- **Tank-mix** Luna Sensation and Merivon with **2.5 lbs/A Captan 80WDG**
- **Two applications max per season**
Thank you to:
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Karen Powers
Bill Klein

MI Cherry committee