Cherry Leaf Spot: The challenges of managing this disease in 2012 and 2013

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Northwest Orchard & Vineyard Show; January 21, 2013
Cherry Leaf Spot Terms to Remember

- Prolific
- Unrelenting
- Tireless
- Epidemic
- Speed
- When you see lesions, there are likely many more developing that you can’t see yet
Review of Cherry Leaf Spot Biology

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

Cherry leaf spot disease cycle.
2012 CLS season, NW Michigan

- Early start – relatively rare
  - Bract leaf infection, extra spore production
- Sustained by (un)timely rains
Cherry Leaf Spot infection periods in NW Michigan, 2012

May 2 (high) – petal fall
May 27-28 (moderate) -- ~ 1st cover timing
June 1 (high)
June 16 (moderate)
June 18 (moderate)
Jul 3 (low)
Jul 8 (low)
Jul 17 (moderate)
Jul 19 (high)
Jul 27 (low)
Jul 30 (moderate)
Cherry Leaf Spot infection periods in NW Michigan, 2012

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Jul 17 (moderate)
Jul 19 (high)
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Once leaf infection occurs – even marginal infection periods become significant
Cherry Leaf Spot infection periods in NW Michigan, 2012

May 2 (high)  
May 27-28 (moderate)  
June 1 (high)  
June 16 (moderate)  
June 18 (moderate)  
Jul 3 (low)  
Jul 8 (low)  
Jul 17 (moderate)  
Jul 19 (high)  
Jul 27 (low)  
Jul 30 (moderate)  

May 2 – 0.24”  
May 3 – 1.29”  
May 6 – 0.31”  
May 7 – 0.3”  
May 27 – 1.5”  
Jun 1 – 0.71”  
Jun 2 – 1.24”  
Jun 16 – 1.46”  
Jun 18 – 0.83”  
Jul 3 – 0.36”  
Jul 19 – 0.15”
<table>
<thead>
<tr>
<th>Date</th>
<th>Condition</th>
<th>Rainfall</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2</td>
<td>high</td>
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<td>***</td>
</tr>
<tr>
<td>May 27-28</td>
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Cherry Leaf Spot Disease Epidemic

% Disease

Date

Harvest

Cherry Leaf Spot Disease Epidemic

% Disease

Date

Harvest

2012 CLS season, NW Michigan

• Exception year
• # spores from leaf lesions >>>> # spores from ground
• When you see leaf infection, there are always newer lesions you don’t see yet.....
• Bract leaf infection quickens the pace of leaf spot development in orchards
• Rain events in May and June “sustain and feed” the infection
Fungicides for CLS control

• Cherry leaf spot can be effectively controlled using protective fungicide applications
• Cover leaves before fungal spores arrive – disease control and low inoculum load
• Goal is to prevent leaf infection in the early stages of the season through harvest

• MUCH EASIER TO CONTROL DISEASE IF INOCULUM LOAD IS LOW!!
Fungicides for CLS control

• New SDHIs –
  – Luna Sensation (Bayer) – Luna S
  – Merivon (BASF)

• Bravo Weather Stik – section 24(c) extension to 21 day PHI
2012 Field Trial A at NWMHRC

% Defoliation on August 1

Bravo Weather Stik, 4 pts
Merivon, 5.5 or 6.5 fl oz

Bravo Weather Stik, 4 pts
Luna Sensation, 5 fl oz

Control
2012 Field Trial A at NWMHRC

- Luna Sensation, 5 fl oz
- Merivon, 5.5 or 6.5 fl oz
- Bravo Weather Stik, 4 pts
- Captan 50W, 3lb
2012 Field Trial A at NWMHRC

% Defoliation on August 1

- Bravo Weather Stik, 4 pts
- Merivon, 5.5 or 6.5 fl oz
- Luna Sensation, 5 fl oz
- Syllit FL, 24 fl oz
- Cuprofix Disperss, 3 lb
- Control

Bravo Weather Stik, 4 pts
Luna Sensation, 5 fl oz +
Captan 50W, 3lb
2012 Field Trial B at NWMHRC

First two applications are Bravo Weather Stik, 4 pts
Chlorothalonil for CLS control

• Section 24(c) lengthens time window for use of Bravo Weather Stik
  – 21 day PHI

• Broad spectrum fungicide – excellent CLS control

• Protectant, adsorbed to leaf surface, not systemic
2012 Fungicide Expt at NWMHRC

- 6 applications before harvest

**Treatments:**

- **Bravo Weather Stik, 4 pts/A**
  - A B C D E F

- **Bravo Weather Stik; then Merivon, 5.5 fl oz/A**
  - A B C D E F

- **Bravo Weather Stik; then Luna Sensation, 5 fl oz/A**
  - A B C D E F

- **Bravo Weather Stik; then Pristine, 12.5 oz/A**
  - A B C D E F
## 2012 Field Trial at NWMHRC

<table>
<thead>
<tr>
<th>Spray dates</th>
<th>CLS infection periods</th>
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<tbody>
<tr>
<td>May 4</td>
<td></td>
</tr>
<tr>
<td>May 14</td>
<td></td>
</tr>
<tr>
<td>May 24</td>
<td>May 2 (high)</td>
</tr>
<tr>
<td>June 4</td>
<td>May 27-28 (moderate)</td>
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<tr>
<td>June 14</td>
<td>June 1 (high)</td>
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<td>June 25</td>
<td>June 16 (moderate)</td>
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<td></td>
<td>June 18 (moderate)</td>
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</table>
2012 Fungicide Expt at NWMHRC

- On 29 Jun:
  - % leaf infection was similar among all treatments
    - Range from 14.1% to 18.4%
  - % leaf infection in non-treated control was 65.1%

- % defoliation was low (0.5% to 0.9%) except for Pristine treatment (6.7%)
- % defoliation in non-treated control was 3.1%
2012 Fungicide Expt at NWMHRC

- No fungicides applied between 29 Jun and 1 Aug
- Harvest was 9 Jul
2012 Fungicide Expt at NWMHRC

<table>
<thead>
<tr>
<th>Treatment and Product/acre</th>
<th>Timing</th>
<th>%defoliation</th>
<th>%infection</th>
<th>%defoliation</th>
<th>%infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – Bravo Weather Stik 4 pts</td>
<td>ABCDEF</td>
<td>0.7 b</td>
<td>16.9 c</td>
<td>15.2 cd</td>
<td>31.8 cd</td>
</tr>
<tr>
<td>3 – Bravo Weather Stik 4 pts</td>
<td>AB</td>
<td>0.9 b</td>
<td>16.1 c</td>
<td>3.9 e</td>
<td>22.4 e</td>
</tr>
<tr>
<td>Merivon 4.17SC 5.5 fl oz</td>
<td>CDEF</td>
<td>0.5 b</td>
<td>14.1 c</td>
<td>9.4 de</td>
<td>22.1 e</td>
</tr>
<tr>
<td>4 – Bravo Weather Stik 4 pts</td>
<td>AB</td>
<td>0.5 b</td>
<td>14.1 c</td>
<td>9.4 de</td>
<td>22.1 e</td>
</tr>
<tr>
<td>Luna Sensation 500 SC 5 fl oz</td>
<td>CDEF</td>
<td>0.5 b</td>
<td>14.1 c</td>
<td>9.4 de</td>
<td>22.1 e</td>
</tr>
<tr>
<td>9 – Untreated control</td>
<td></td>
<td>3.1 b</td>
<td>65.1 a</td>
<td>82.2 a</td>
<td>90.2 a</td>
</tr>
</tbody>
</table>
Bravo trt – 15% defoliation; of 85% remaining leaves, ~ 32% infected
(85 x 0.32) + 15 = 42.2

Merivon trt – 4% defoliation; of 96% remaining leaves, ~ 22% infected
(96 x 0.22) + 4 = 25.1

~ 40% fewer leaves infected by CLS in Merivon treatment
2012 Fungicide Expt at NWMHRC

Control differences between Bravo and Merivon or Luna Sensation likely due to:

Persistence and systemic nature of the Merivon and Luna Sensation

Four additional CLS infection periods in July that could have affected disease by 1 Aug
Pristine

• First registered in 2004
• Premix of boscalid (SDHI) and pyraclostrobin (strobilurin)
• Our field testing indicated that the boscalid component was most important for CLS control
• Original label rate was 14.7 oz/A
• Growers adopted a rate of 10.5 oz/A
2012 Field Trial B at NWMHRC

First two applications are Bravo Weather Stik, 4 pts
Resistance to boscalid in CLS

2010
2 Resistant; 18 shifted

2011
7 Resistant, 12 shifted

2010
1 Resistant

2011
3 Resistant
News and Notes; Cherry Leaf Spot Control

• Resistance data suggest dropping Pristine

• Replacement is Merivon or Luna Sensation
Fungicide Resistance Management

• **Critical issues:**

  • **KILL** the pathogen
  • **Rotation of modes of action and tank-mixing with broad-spectrum protectants**
  • **Control disease early in season to keep population levels down**
  • **Avoid after-infection applications**
  • **Treatment of larger populations increases potential selection for resistance**
News and Notes; Cherry Leaf
Spot Control

• New SDHIs – Merivon and Luna Sensation
  – Captan should be added for resistance management

• Use high rates of these materials – essential for long-term protection from resistance

• Merivon – 6.5 fl oz/A
• Luna Sensation – 5 fl oz/A
News and Notes; Cherry Leaf Spot Control

• Syllit FL – excellent leaf spot control; limiting defoliation
  – Syllit + Captan – recommended for resistance management

• Copper – excellent leaf spot control; limiting defoliation (1.2 lbs metallic/A)

• Check 2013 MI Fruit Management Guide
http://www.youtube.com

Search “tree fruit pathology”
SDHI Fungicide Premixes - Resistance Management Strategies for the SDHIs

Dr. George W. Sundin
Michigan State University
Tree Fruit Pathology

http://www.youtube.com
Search “tree fruit pathology”