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

Northwest Orchard & Vineyard Show; January 21, 2013

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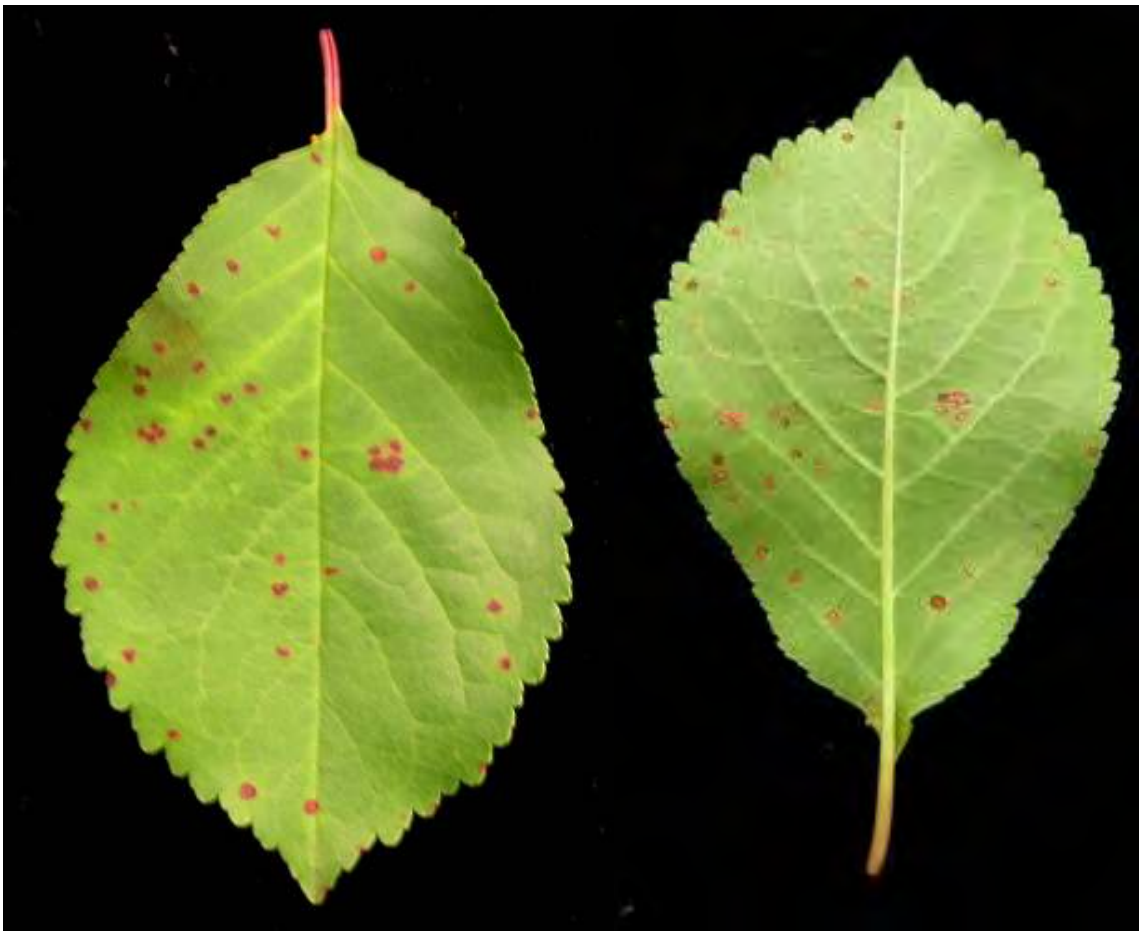


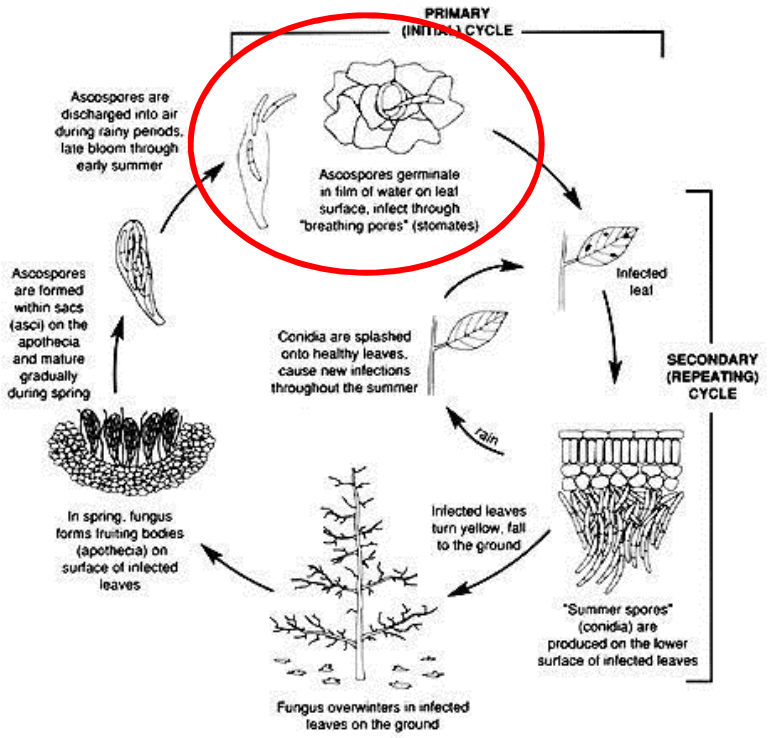
Cherry Leaf Spot Terms to Remember

- **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

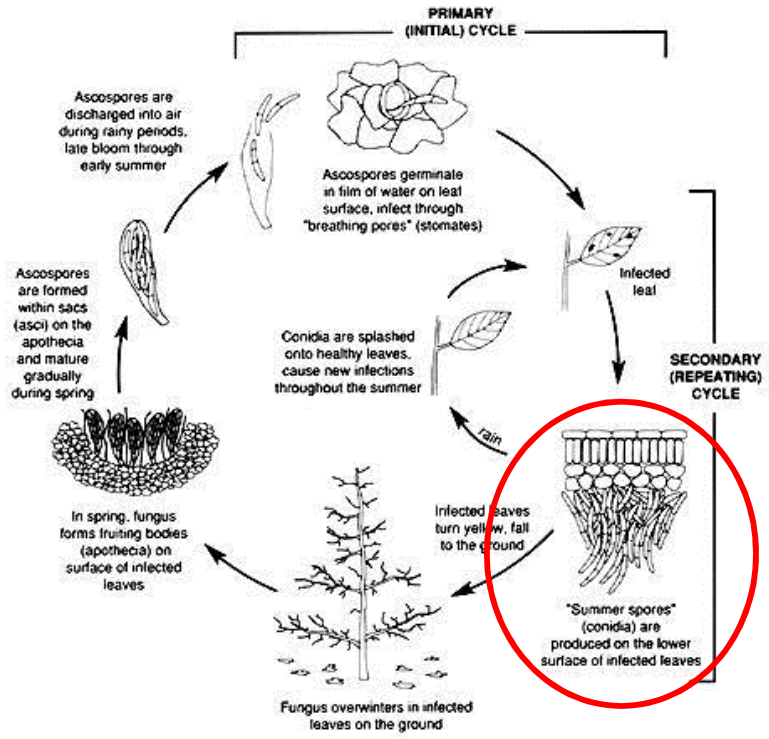
Ascospore discharge:

* 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 disease cycle.

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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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)

Once leaf infection occurs – even marginal infection periods become significant

Cherry Leaf Spot infection periods in NW Michigan, 2012

May 2 (high)	May 2 – 0.24”
May 27-28 (moderate)	May 3 – 1.29”
June 1 (high)	May 6 – 0.31”
June 16 (moderate)	May 7 – 0.3”
June 18 (moderate)	May 27 – 1.5”
Jul 3 (low)	Jun 1 – 0.71”
Jul 8 (low)	Jun 2 – 1.24”
Jul 17 (moderate)	Jun 16 – 1.46”
Jul 19 (high)	Jun 18 – 0.83”
Jul 27 (low)	Jul 3 – 0.36”
Jul 30 (moderate)	Jul 19 – 0.15”

Cherry Leaf Spot infection periods in NW Michigan, 2012

May 2 (high)	May 2 – 0.24”	***
May 27-28 (moderate)	May 3 – 1.29”	
June 1 (high)	May 6 – 0.31”	
June 16 (moderate)	May 7 – 0.3”	
June 18 (moderate)	May 27 – 1.5”	***
Jul 3 (low)	Jun 1 – 0.71”	***
Jul 8 (low)	Jun 2 – 1.24”	
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Suttons Bay, MI 27 June 2012


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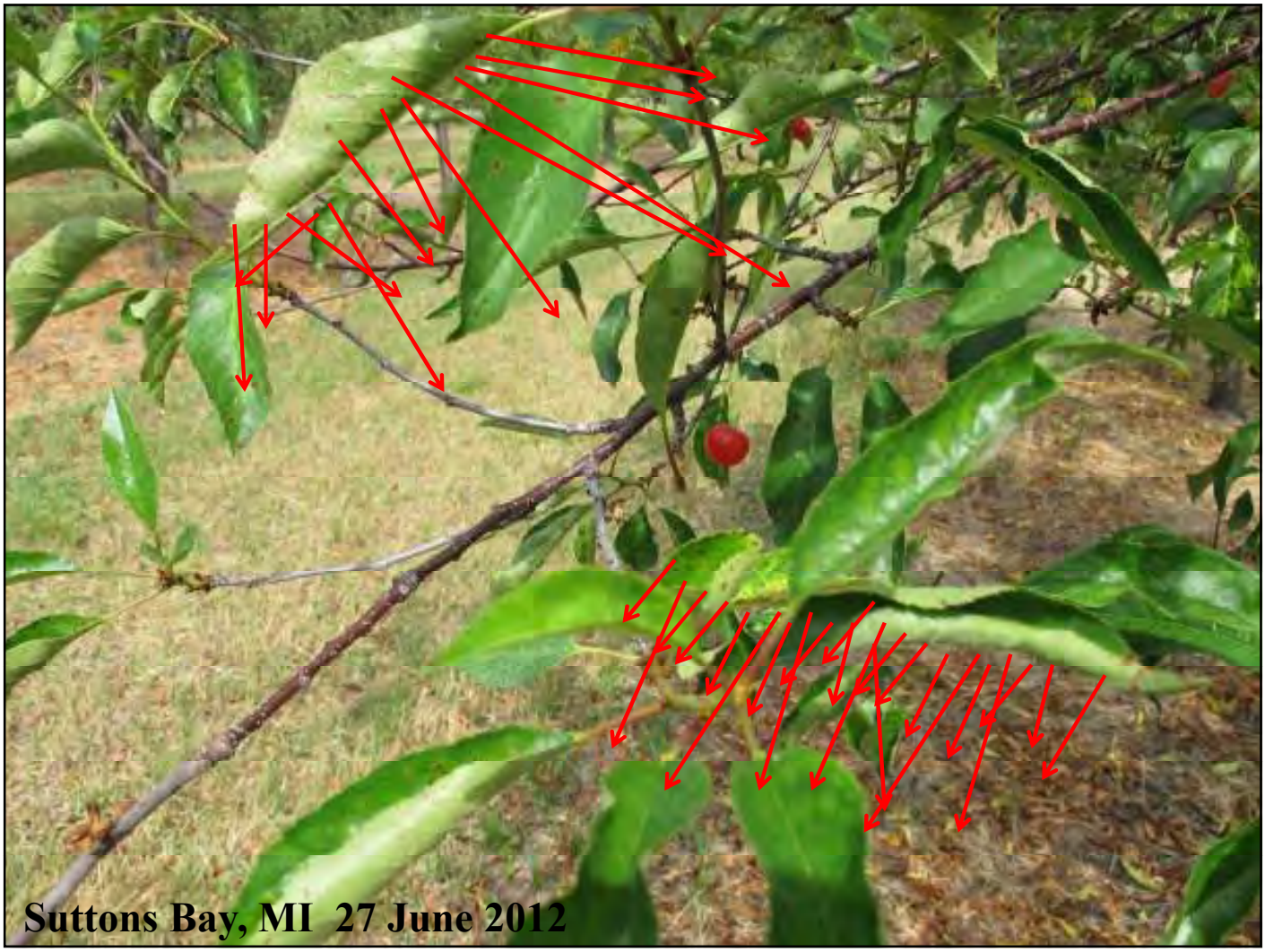
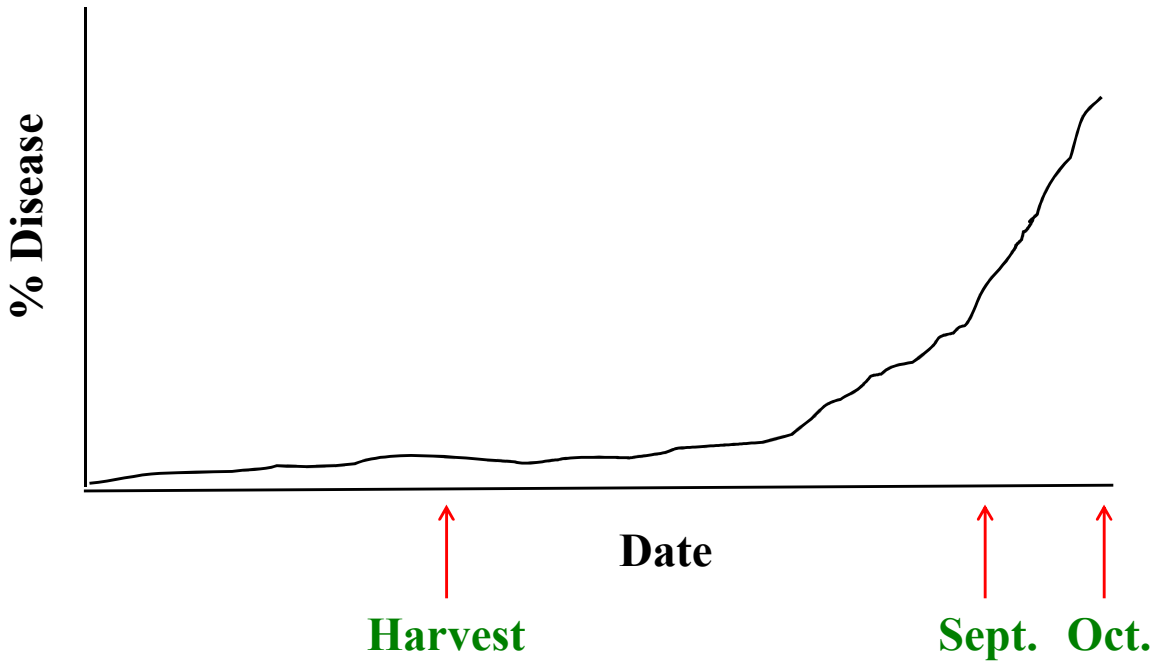
Suttons Bay, MI 27 June 2012

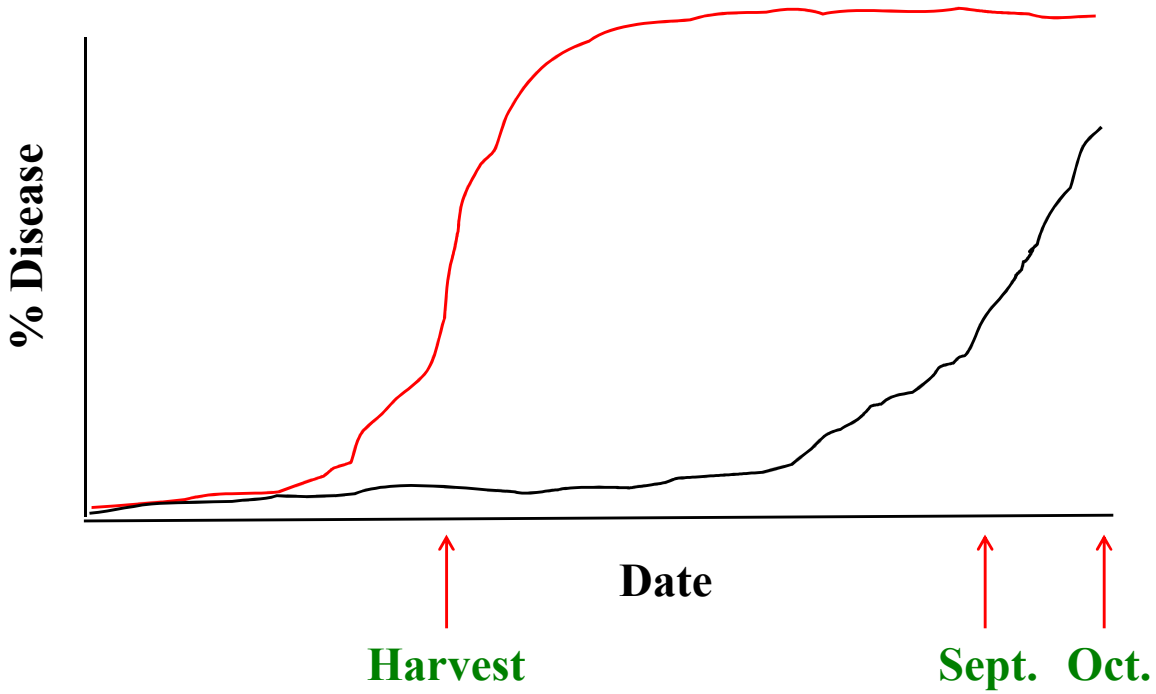

Suttons Bay, MI 27 June 2012


Suttons Bay, MI 27 June 2012

Cherry Leaf Spot Disease Epidemic



Cherry Leaf Spot Disease Epidemic



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

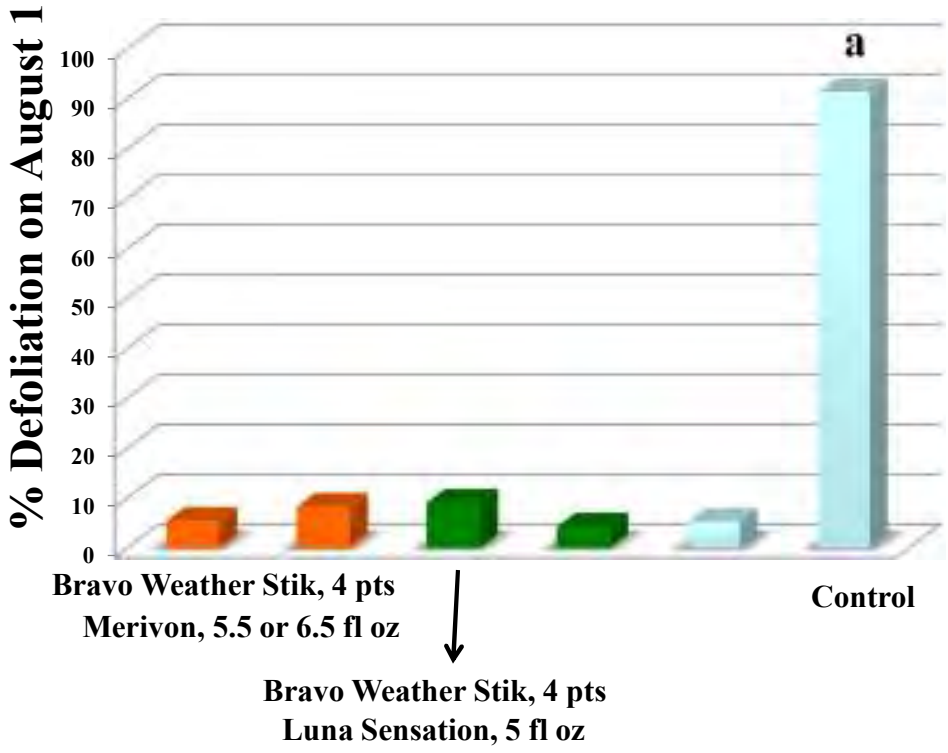
- **Cherry leaf spot can be effectively controlled using protective fungicide applications**
- **Cover leaves before fungal spores arrive – disease control and low inoculum load**
- **Goal is to prevent leaf infection in the early stages of the season through harvest**

- **MUCH EASIER TO CONTROL DISEASE IF INOCULUM LOAD IS LOW!!**

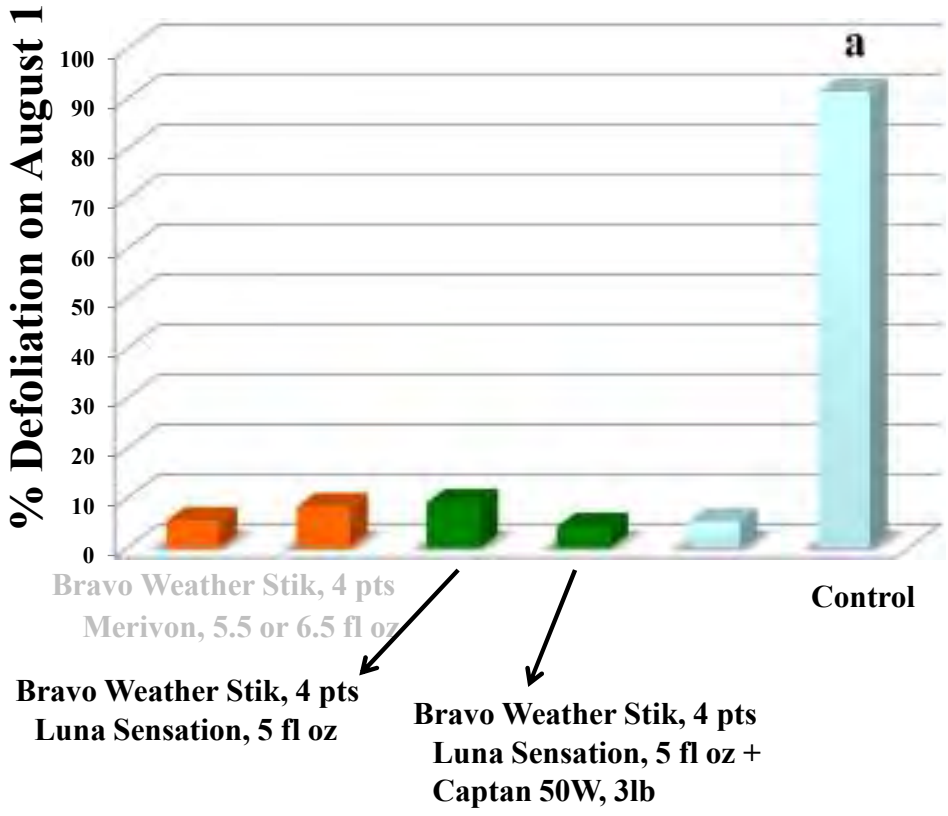
Fungicides for CLS control

- **New SDHIs –**
  - **Luna Sensation (Bayer) – Luna S**
  - **Merivon (BASF)**
- **Bravo Weather Stik – section 24(c) extension to 21 day PHI**

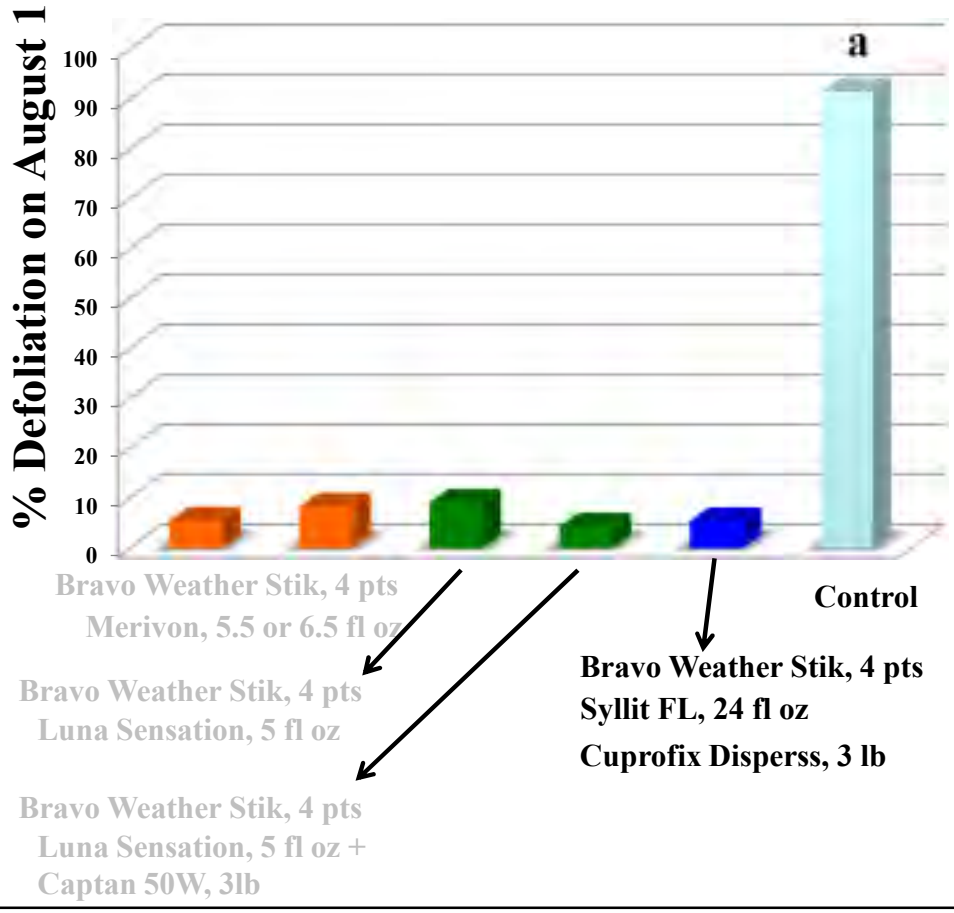
2012 Field Trial A at NWMHRC



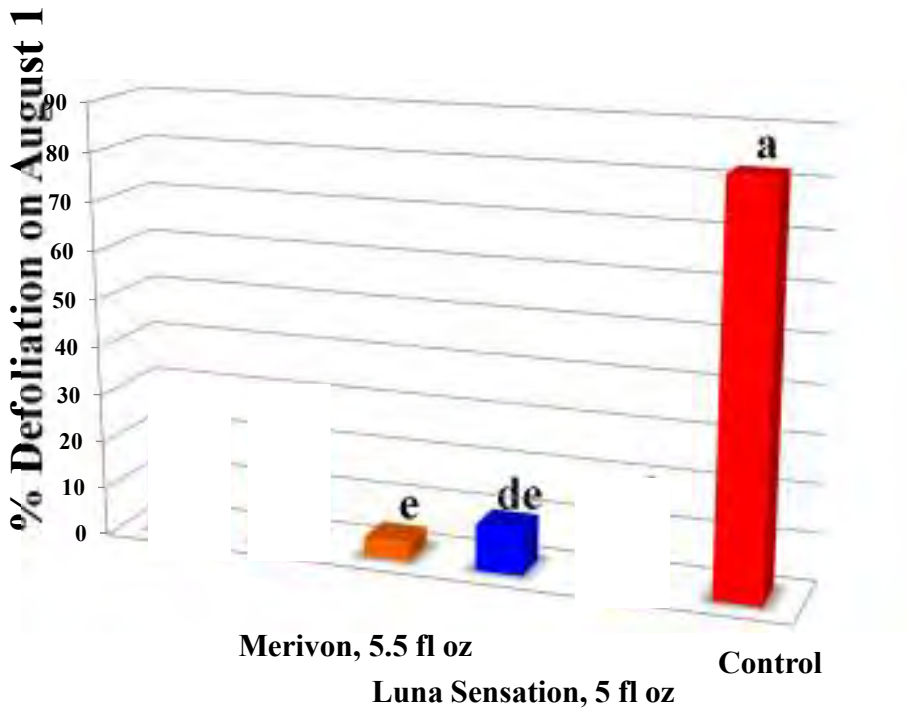
2012 Field Trial A at NWMHRC



2012 Field Trial A at NWMHRC



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

Spray dates	CLS infection periods
	May 2 (high)
May 4	
May 14	
May 24	
	May 27-28 (moderate)
	June 1 (high)
June 4	
June 14	
	June 16 (moderate)
	June 18 (moderate)
June 25	

2012 Fungicide Expt at NWMHRC

- **<u>On 29 Jun</u>:**
- **% 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

		Cherry Leaf spot			
		29 Jun		1 Aug	
Treatment and Product/acre	Timing	%defoliation	%infection	%defoliation	%infection
2 – Bravo Weather Stik 4 pts	ABCDEF	0.7 b	16.9 c	15.2 cd	31.8 cd
3 – Bravo Weather Stik 4 pts Merivon 4.17SC 5.5 fl oz	AB CDEF	0.9 b	16.1 c	3.9 e	22.4 e
4 – Bravo Weather Stik 4 pts Luna Sensation 500 SC 5 fl oz	AB CDEF	0.5 b	14.1 c	9.4 de	22.1 e
9 – Untreated control		3.1 b	65.1 a	82.2 a	90.2 a

2012 Fungicide Expt at NWMHRC

		Cherry Leaf spot			
		29 Jun		1 Aug	
Treatment and Product/acre	Timing	%defoliation	%infection	%defoliation	%infection
2 – Bravo Weather Stik 4 pts	ABCDEF	0.7 b	16.9 c	15.2 cd	31.8 cd
3 – Bravo Weather Stik 4 pts	AB				
Merivon 4.17SC 5.5 fl oz	CDEF	0.9 b	16.1 c	3.9 e	22.4 e

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

		Cherry Leaf spot			
		29 Jun		1 Aug	
Treatment and Product/acre	Timing	%defoliation	%infection	%defoliation	%infection
2 – Bravo Weather Stik 4 pts	ABCDEF	0.7 b	16.9 c	15.2 cd	31.8 cd
3 – Bravo Weather Stik 4 pts Merivon 4.17SC 5.5 fl oz	AB CDEF	0.9 b	16.1 c	3.9 e	22.4 e
4 – Bravo Weather Stik 4 pts Luna Sensation 500 SC 5 fl oz	AB CDEF	0.5 b	14.1 c	9.4 de	22.1 e

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

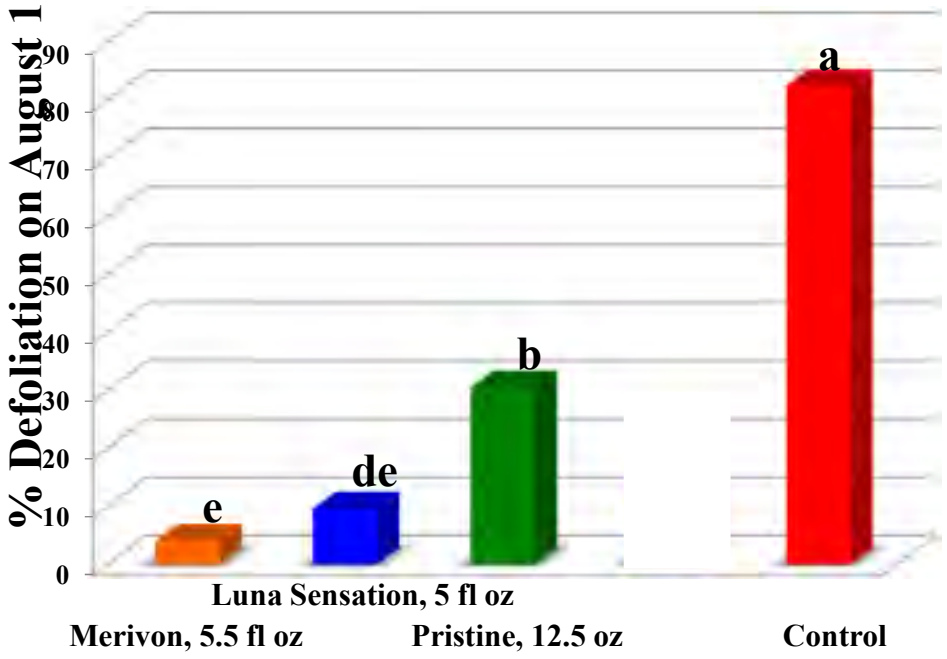
Persistence and systemic nature of the Merivon and Luna Sensation

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

Pristine

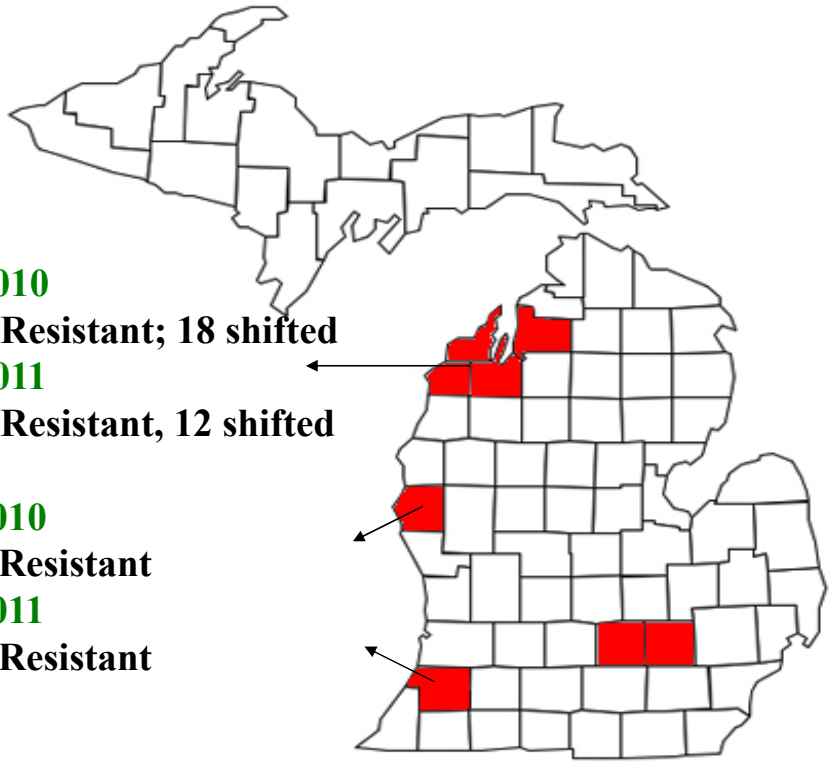
- First registered in 2004
- Premix of boscalid (SDHI) and pyraclostrobin (strobilurin)
- Our field testing indicated that the boscalid component was most important for CLS control
- Original label rate was 14.7 oz/A
- Growers adopted a rate of 10.5 oz/A

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**

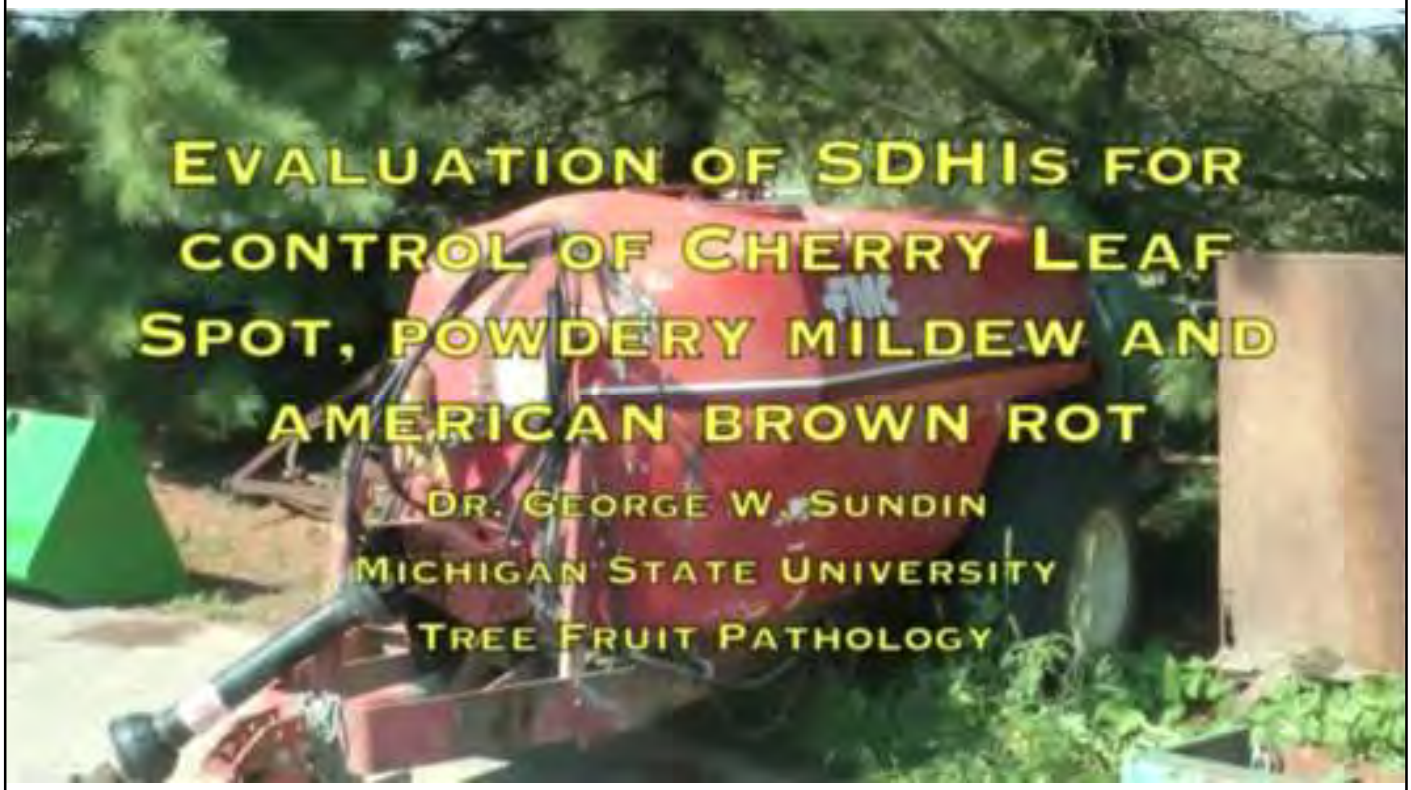
News and Notes; Cherry Leaf Spot Control

- **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**



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Search "tree fruit pathology"

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