

Northern Michigan FruitNet 2016

Northwest Michigan Horticultural Research Center

Weekly Update

FruitNet Report – May 20, 2016

CALENDAR OF EVENTS

5/3 – 6/28	Leelanau County IPM Updates, 12PM – 2PM Jim and Jan Bardenhagen's Farm (details below)
5/3 – 6/28	Grand Traverse County IPM Updates, 3PM – 5PM Wunsch Farms (details below)
5/4 – 6/29	Antrim County IPM Updates, 10AM – 12PM Jack White Farms (details below)
5/4 – 6/29	Benzie County IPM Updates, 2PM – 4PM Blaine Christian Church (details below)

What's New?

- **Northwest Michigan Fruit Disease Report – May 20, 2016**
- **Potential Damage and Insurance Claims**
- **Post-shucksplit Applications of Bravo WeatherStik**
- **Where can Growers Find the Special 24 (c) Label for Using Bravo WeatherStik Past Shucksplit?**
- **A Primer for Streptomycin, Kasumin, and Oxytetracycline use for Fire Blight Management**
- **Brownfield Assessment Grant Funds Available in Leelanau County**

Northwest Michigan Fruit Disease Report – May 20, 2016

Temperatures are warming up and rain is predicted; growers are considering their strategies for disease management, particularly for fire blight as we approach apple bloom.

Emily Pochubay and Nikki Rothwell

Dry conditions this week have not been favorable for fungal diseases such as cherry leaf spot, both European and American brown rots, and apple scab. The weather is expected to be dry and even warmer until Tuesday or Wednesday when the forecast is predicting rain showers or thunderstorms. Currently, the forecast predicts a relatively low chance of rain, so growers should continue to check the radar to determine when to make fungicide applications. Although conditions have not been favorable for fungal disease infections, overwintering apple scab and cherry leaf spot lesions will continue to reach maturity on last year's leaves, and spores will be ready to discharge during the next rain event. Green tissue continues to expand and fill out tree canopies, and these leaves are susceptible to spores that will be released with the next rain.

Fire blight bacteria will develop rapidly with the predicted several consecutive days that will reach daytime temperatures in the upper 60s and 70s. The fire blight model on Enviro-weather is currently reporting high EIP values (near or above 100) for all northwest weather stations by at least midweek next week and sooner in areas that are expected to be warmer (see outputs below). In orchards that do not have streptomycin resistance, both streptomycin and Kasumin are excellent materials for fire blight control. Depending on accuracy of the forecasts and currently predicted EIP values, many growers are planning to apply a bactericide over the weekend or early next week for fire blight control. This strategy is recommended as both streptomycin and Kasumin will provide forward control for two to four days prior to rain events. Growers should consider applying a bactericide in advance of possible rains to kill the fire blight bacteria, particularly if the bactericide Kasumin is used as this material is not systemic and will not be effective if applied after rainfall. Streptomycin is systemic and will be effective for blossom blight if applied within 12-24 hours after a rain event. Growers that have had fire blight in particular blocks in the past should be sure to make a bactericide application before next week's predicted rains. Fire blight-susceptible varieties such as Gingergold, Gala, Jonagold, Ide Red, and Fuji, should be covered to minimize the potential for a fire blight infection. Additionally, we recommend protecting high value blocks/varieties against fire blight.

Bear Lake Fire Blight Assist Chart(Report issued 5/20/2016 11:50)

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

2016		Temperature(F)				Rain		EIP for Biofix Date: (Bloom or spray date)											
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26
Sunday	5/15	49.7	29.8	39.7	0.03	--	0	0											
Monday	5/16	64.9	32	48.4	0	--	0	0	0	0									
Tuesday	5/17	63.8	34	48.9	0	--	0	0	0	0									
Wednesday	5/18	65.2	32.3	48.7	0	--	0	0	0	0	0								
Thursday	5/19	69	28.8	48.9	0	--	2	2	2	2	2	2							

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Actual (10:55-11:00AM): 69	Actual (6:00-6:05AM): 34.1	51.55	0	4%	15	15	15	15	15	15	12						
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Forecast Data

Saturday	5/21	71	42	56.5	--	8%	27	27	27	27	27	27	25	12					
Sunday	5/22	66	45	55.5	--	7%	27	27	27	27	27	27	25	12	0				
Monday	5/23	74	42	58	--	7%	52	52	52	52	52	52	49	37	25	25			
Tuesday	5/24	74	51	62.5	--	48%	74	74	74	74	74	74	74	62	49	49	25		
Wednesday	5/25	75	57	66	--	55%	86	86	86	86	86	86	86	86	86	86	62	37	
Thursday	5/26	76	55	65.5	--	50%	135	135	135	135	135	135	135	135	135	135	111	86	49

Benzonia Fire Blight Assist Chart(Report issued 5/20/2016 11:50)

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

Missing temperature/degree day data for dates: 2016-05-19

Missing degree day data for dates: 2016-05-19

2016		Temperature(F)				Rain		EIP for Biofix Date: (Bloom or spray date)											
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26
Sunday	5/15	48.9	31.4	40.1	0.04	--	0	0											
Monday	5/16	62.7	37.8	50.2	0	--	0	0	0										
Tuesday	5/17	61.6	33.9	47.7	0	--	0	0	0	0									
Wednesday	5/18	63.6	34.5	49.1	0	--	0	0	0	0	0								
Thursday	5/19	66.7	NA	NA	0	--	0	0	0	0	0	0							

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Forecast: 69	Actual (5:10-5:15AM): 39.6	54.3	0	4%	12	12	12	12	12	12	12					
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Forecast Data

Saturday	5/21	71	42	56.5	--	8%	25	25	25	25	25	25	25	25	12			
Sunday	5/22	66	45	55.5	--	7%	25	25	25	25	25	25	25	25	12	0		
Monday	5/23	74	42	58	--	7%	49	49	49	49	49	49	49	49	37	25	25	
Tuesday	5/24	74	51	62.5	--	48%	74	74	74	74	74	74	74	74	62	49	49	25
Wednesday	5/25	75	57	66	--	55%	86	86	86	86	86	86	86	86	86	86	62	37
Thursday	5/26	76	55	65.5	--	50%	135	135	135	135	135	135	135	135	135	111	86	49

East Leland Fire Blight Assist Chart(Report issued 5/20/2016 11:51)

Show sidebar

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

2016		Temperature(F)				Rain		EIP for Biofix Date: (Bloom or spray date)											
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26
Sunday	5/15	48.3	33.7	41	0	--	0	0											
Monday	5/16	60	37.7	48.8	0	--	0	0	0										
Tuesday	5/17	58.5	31.2	44.8	0	--	0	0	0	0									
Wednesday	5/18	61.4	29.5	45.4	0	--	0	0	0	0	0								
Thursday	5/19	67.8	31.7	49.8	0	--	1	1	1	1	1	1							

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Forecast: 73	Actual (6:05-6:10AM): 35.2	54.1	0	4%		26	26	26	26	26	26	25					
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Forecast Data

Saturday	5/21	74	45	59.5	--	9%		50	50	50	50	50	50	49	25					
Sunday	5/22	70	47	58.5	--	15%		63	63	63	63	63	63	62	37	12				
Monday	5/23	78	44	61	--	6%		112	112	112	112	112	112	111	86	62	49			
Tuesday	5/24	78	57	67.5	--	45%		148	148	148	148	148	148	148	148	148	123	111	62	
Wednesday	5/25	75	56	65.5	--	56%		160	160	160	160	160	160	160	160	160	148	98	37	
Thursday	5/26	76	54	65	--	50%		197	197	197	197	197	197	197	197	197	197	148	86	49

Eastport Fire Blight Assist Chart(Report issued 5/20/2016 11:52)

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

2016		Temperature(F)				Rain		EIP for Biofix Date: (Bloom or spray date)											
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26
Sunday	5/15	47.3	30.6	38.9	0.01	--	0	0											
Monday	5/16	59.6	37.4	48.5	0.01	--	0	0	0										
Tuesday	5/17	62	35.2	48.6	0	--	0	0	0	0									
Wednesday	5/18	63	32.4	47.7	0	--	0	0	0	0	0								
Thursday	5/19	70.8	34.7	52.7	0	--	7	7	7	7	7	7							

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Forecast: 74	Actual (6:10-6:15AM): 36	55	0	3%	32	32	32	32	32	32	25					
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Forecast Data

Saturday	5/21	74	40	57	--	9%	57	57	57	57	57	57	49	25				
Sunday	5/22	69	44	56.5	--	18%	69	69	69	69	69	69	62	37	12			
Monday	5/23	78	38	58	--	6%	106	106	106	106	106	106	98	74	49	37		
Tuesday	5/24	78	50	64	--	44%	148	148	148	148	148	148	148	123	98	86	49	
Wednesday	5/25	76	54	65	--	56%	148	148	148	148	148	148	148	148	148	135	98	49
Thursday	5/26	76	54	65	--	49%	185	185	185	185	185	185	185	185	185	148	98	49

Elk Rapids Fire Blight Assist Chart(Report issued 5/20/2016 11:52)

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

2016		Temperature(F)				Rain		EIP for Biofix Date: (Bloom or spray date)											
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26
Sunday	5/15	49.5	32.9	41.2	0	-	0	0											
Monday	5/16	60.2	37.5	48.8	0	-	0	0	0										
Tuesday	5/17	58.6	30.7	44.7	0	-	0	0	0	0									
Wednesday	5/18	64	29.5	46.8	0	-	0	0	0	0	0								
Thursday	5/19	73	32.7	52.9	0	-	15	15	15	15	15	15							

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Forecast: 73	Actual (6:50-6:55AM): 38.3	55.65	0	4%	39	39	39	39	39	39	25						
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Forecast Data

Saturday	5/21	74	45	59.5	-	9%	64	64	64	64	64	64	49	25					
Sunday	5/22	70	47	58.5	-	15%	76	76	76	76	76	76	62	37	12				
Monday	5/23	78	44	61	--	6%	126	126	126	126	126	126	111	86	62	49			
Tuesday	5/24	78	57	67.5	--	45%	148	148	148	148	148	148	148	148	148	123	111	62	
Wednesday	5/25	75	56	65.5	--	56%	160	160	160	160	160	160	160	160	160	160	148	98	37
Thursday	5/26	76	54	65	--	50%	197	197	197	197	197	197	197	197	197	197	148	86	49

Kewadin Fire Blight Assist Chart(Report issued 5/20/2016 11:53)

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

Missing temperature/degree day data for dates: 2016-05-15

Missing degree day data for dates: 2016-05-15

2016		Temperature(F)			Rain		EIP for Biofix Date: (Bloom or spray date)													
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	
Sunday	5/15	48.7	NA	NA	0.01	--	0	0												
Monday	5/16	60.4	38.2	49.3	0	--	0	0	0											
Tuesday	5/17	60.6	34.3	47.5	0	--	0	0	0	0										
Wednesday	5/18	62.8	34.9	48.8	0	--	0	0	0	0	0									
Thursday	5/19	72	38.1	55.1	0	--	12	12	12	12	12	12								

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Forecast: 74	Actual (5:25-5:30AM): 41.4	57.7	0	3%	37	37	37	37	37	37	25							
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Forecast Data

Saturday	5/21	74	40	57	--	9%	62	62	62	62	62	62	49	25					
Sunday	5/22	69	44	56.5	--	18%	74	74	74	74	74	74	62	37	12				
Monday	5/23	78	38	58	--	6%	111	111	111	111	111	111	98	74	49	37			
Tuesday	5/24	78	50	64	--	44%	148	148	148	148	148	148	148	123	98	86	49		
Wednesday	5/25	76	54	65	--	56%	148	148	148	148	148	148	148	148	148	148	135	98	49
Thursday	5/26	76	54	65	--	49%	185	185	185	185	185	185	185	185	185	185	148	98	49

Northport Fire Blight Assist Chart(Report issued 5/20/2016 11:53)

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

2016		Temperature(F)			Rain		EIP for Biofix Date: (Bloom or spray date)													
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	
Sunday	5/15	46.1	33.2	39.6	0	-	0	0												
Monday	5/16	58.4	34.3	46.3	0	-	0	0	0											
Tuesday	5/17	57.4	35	46.2	0	-	0	0	0	0										
Wednesday	5/18	58.3	34.3	46.3	0	-	0	0	0	0	0									
Thursday	5/19	67.5	35.1	51.3	0	-	0	0	0	0	0	0								

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Forecast: 68	Actual (5:35-5:40AM): 39.5	53.75	0	4%	0	0	0	0	0	0								
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Forecast Data

Saturday	5/21	70	45	57.5	-	13%	12	12	12	12	12	12	12	12	12	12	12	12	12	
Sunday	5/22	65	46	55.5	-	17%	12	12	12	12	12	12	12	12	12	12	12	12	0	
Monday	5/23	72	43	57.5	-	7%	25	25	25	25	25	25	25	25	25	25	25	12	12	
Tuesday	5/24	74	55	64.5	-	49%	62	62	62	62	62	62	62	62	62	62	49	49	37	
Wednesday	5/25	72	54	63	-	56%	74	74	74	74	74	74	74	74	74	74	74	74	62	25
Thursday	5/26	71	53	62	--	48%	98	98	98	98	98	98	98	98	98	98	98	86	49	25

Old Mission Fire Blight Assist Chart(Report issued 5/20/2016 11:54)

Directions for assist chart:

Locate the Biofix Date (the date bloom opened or the date a spray was applied to control Fireblight) on the top row. Follow that column down to determine Epiphytic Infection Potential for that block on each date in the left column. If this number is greater than 100, and the average temperature is greater than or equal to 60°F, this area will be highlighted, and rain, or trauma (high winds or hail) is all that is needed for infection. Repeat for additional blocks that bloomed or were sprayed on a different date.

2016		Temperature(F)				Rain		EIP for Biofix Date: (Bloom or spray date)											
Day	Date	Max	Min	Avg	In.	Chance of rain	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26
Sunday	5/15	49.8	32.6	41.2	0.01	--	0	0											
Monday	5/16	60.5	39.5	50	0	--	0	0	0										
Tuesday	5/17	58.7	34.6	46.7	0	--	0	0	0	0									
Wednesday	5/18	63.4	31.6	47.5	0	--	0	0	0	0	0								
Thursday	5/19	71.7	33.4	52.5	0	--	9	9	9	9	9	9							

Today's data:

Note: Last time reported by station is (10:55-11:00AM)

Friday	5/20	Forecast: 73	Actual (5:40-5:45AM): 38.2	55.6	0	4%	33	33	33	33	33	33	25						
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Forecast Data

Saturday	5/21	74	45	59.5	--	9%	58	58	58	58	58	58	49	25						
Sunday	5/22	70	47	58.5	--	15%	70	70	70	70	70	70	62	37	12					
Monday	5/23	78	44	61	--	6%	119	119	119	119	119	119	111	86	62	49				
Tuesday	5/24	78	57	67.5	--	45%	148	148	148	148	148	148	148	148	148	123	111	62		
Wednesday	5/25	75	56	65.5	--	56%	160	160	160	160	160	160	160	160	160	160	148	98	37	
Thursday	5/26	76	54	65	--	50%	197	197	197	197	197	197	197	197	197	197	197	148	86	49

Potential Damage and Insurance Claims

As we move through bloom this season, we have heard of reports of some damage in different locations throughout the region. We suspect that some of this damage was a result of the cold temperatures at the beginning of April. Some areas also had some cold temperatures on Saturday night into Sunday morning (14-25 May). Even if growers do not know the extent of the damage, they should still call their insurance agent to let them know that there may be potential damage. In the case of a NAP policy, growers should alert their insurance agents within 15 days of the cold event.

Post-shucksplit applications of Bravo WeatherStik for cherry leaf spot control

Growers can use Bravo WeatherStik past the typical shucksplit timing on mechanically harvested tart cherries only.

Nikki Rothwell and John Wise

Because of fungicide resistance issues and the season-long challenge of controlling cherry leaf spot (*Blumeriella jappii*), growers can use the fungicide Bravo WeatherStik

past the typical post-shucksplit timing on mechanically harvested tart cherries. The old Bravo label prohibited this fungicide from use past shucksplit, but with new residue information provided by Michigan State University Extension, this label has been changed to provide Michigan tart cherry growers with an additional tool for controlling cherry leaf spot.

In 2011, MSU's John Wise worked with the Michigan cherry industry and Syngenta to determine the levels of residues of chlorothalonil, the active ingredient of Bravo, on machine-harvested cherries that had spent time on a cooling pad. This situation simulates what a grower would do in the "real world" – harvest tart cherries into water and place on a cooling pad for a time period before delivering fruit to the processor. The study confirmed that when tart cherries were harvested and handled in water, they had less chlorothalonil residue than fruit not harvested in water.

As a result of this work, the Michigan Department of Agriculture and Rural Development granted a Section 24 (c) special local need registration for allowing use of Bravo WeatherStik past the old shucksplit timing on mechanically harvested tart cherries that are handled in water. **However, to ensure that post-shucksplit applications do not result in illegal residues (less than 0.5ppm), there are use restrictions that growers must follow:**

- 1 The minimum pre-harvest interval (PHI) is 21 days.
- 2 Cherries must be mechanically harvested.
- 3 Cherries must spend at least two hours on the cooling pad.
- 4 The initial flow rate on the cooling pad must be eight to 10 gallons of water per minute (gpm). After this period, the flow rate can be reduced to 4 to 6gpm.
- 5 Rinse water generated during the cooling process must not drain or channel toward aquatic areas.
- 6 Cherries cannot be used fresh; they must be processed by a commercial processor.
- 7 This special registration is for Bravo WeatherStik only! Even though there are other generics of chlorothalonil available, this label applies only to Bravo WeatherStik.
- 8 This special registration cannot be used on cherries harvested dry for the juice or other markets; fruit must be harvested in water and cooled on a cooling pad.
- 9 Cooling pad rules need to be followed explicitly — the MSU data that were collected specified fruit would be on a cooling pad for two hours, so the resulting regulations were based on this information. Even if a grower cools cherries for a shorter amount of time, this time specification is important to follow to remain in compliance.
- 10 Growers should check with their processor if fruit is to be harvested in a special manner (e.g., dry) if the grower wants to take advantage of this special registration.
- 11 ****Important step!!** Growers that want to use this special registration must go through a training affidavit online at the [MDARD website](http://www.michigan.gov/cherrysln) (<http://www.michigan.gov/cherrysln>) and complete steps 2 and 3. The language

of the Bravo WeatherStik label states that to use this product post-shucksplit, a grower must sign this affidavit **EVERY YEAR**. Therefore, if growers that did or did not go through the online training process last season must do so this year if Bravo WeatherStik will be used post-shucksplit. If growers do not have access to a computer, please call Nikki at 231-946-1510 for assistance.

To reiterate, growers need to follow these steps to ensure they will be in compliance of this special use label. Cherries that are harvested 21 days after the last application of Bravo WeatherStik **will** have illegal residues — growers must follow the label carefully to ensure the residues on fruit are reduced to a legal level (less than 0.5ppm). Illegal residues would violate federal law and would have serious consequences for the grower, processor and the Michigan cherry industry as a whole.

Where can growers find the special 24 (c) label for using Bravo WeatherStik past shucksplit?

Nikki Rothwell

Many growers have not been able to find the special 24 (c) label for using Bravo WeatherStik past shucksplit; it is not currently available on the [CDMS](#) or [Syngenta](#) websites. In talking with the Syngenta representative, we at Michigan State University Extension found out that growers must go through the steps to obtain an Indemnified label – the regular Bravo WeatherStik label **IS NOT ACCEPTED** for this special use. The label is on [farmassist.com](#) and is now available. This Section 24c Indemnified label must be obtained by the grower – neither Syngenta nor resellers may provide this label. The directions for navigating the [farmassist.com](#) website are as follows:

1. Go to the www.farmassist.com (simply click on the link provided here).
2. If you are a first time user, register as a new user.
3. Complete the registration information and click on the “I accept” button.
4. Once into the site, look on the upper left side of the screen and select Products.
5. Select Indemnified Labels.
6. On this screen, select the state and product.
Note: take care to select the exact product name.
7. Click the submit button just below these windows.
8. On the next screen, you should see the title of any indemnified labels that fit your description. Select the desired crop and click submit.
9. You may now print the waiver.
10. In order to view, print or download the indemnified label, you must read and “accept” the terms set forth in the “WAIVER OF LIABILITY AND INDEMNIFICATION AGREEMENT.”
11. Click “I accept” to continue.

12. You will then receive a link to the label you have selected.
13. Click the link to display, print or download the label.

In addition to obtaining this special label via the [farmassis website](#), growers must also [sign the MDA training affidavit](#). This process is straight forward, and the signed affidavit must be kept with the special label and the spray records.

Lastly, we remind growers that the 24c label is only for Bravo Weather Stik (EPA Reg. No. 50534-188-100); other Bravo formulations, Chloronil or generic chlorothalonil products must be used under their Section 3 labels, and are not covered by this Special Local Needs label. Also, the rules to use this product past the traditional shucksplit timing need to be followed (refer to "[Tart cherries receive 24 \(c\) for use of Bravo Weather Stik \(chlorothalonil\) beyond shuck split](#)"). We highly recommend growers check with their processor **before** using Bravo WeatherStik past shucksplit.

A primer for Streptomycin, Kasumin, and Oxytetracycline use for fire blight management

George Sundin, MSU Extension, Dept. Plant, Soil, and Microbial Sciences

The apple or pear flower is a critical site for multiplication of the fire blight pathogen *Erwinia amylovora*. When temperatures are conducive for growth (70s to low 80s optimal), *E. amylovora* populations can grow to one million cells per flower within one to two days. As these populations grow, remember they will also be very quickly disseminated among flowers by pollinators. Thus, warm and sunny days during bloom can very quickly lead to high percentages of flowers colonized with incredibly large fire blight populations.

The fire blight pathogen only grows well on flower stigmas, not on other flower parts. These bacteria do not need rain to grow on the stigma. They do, however, require free moisture, as little as 0.01 inch rain, to move from the stigma tip down the outside of the style to the base of the flower where infection occurs through the nectaries. Blossom blight infection can really kick start a fire blight epidemic because these infected flower clusters will ooze more inoculum out and bacteria will be spreading internally through the tree.

With the [full registration of Kasumin](#) by the [Environmental Protection Agency](#) (EPA) last fall, we now have three antibiotics available for fire blight management during bloom. Below is information about these antibiotics and suggestions for best use. These suggestions will differ based on the occurrence of streptomycin resistance in the fire blight pathogen in your orchard or region.

Streptomycin

Streptomycin is an **excellent** fire blight material and provides forward control for two to four days prior to rain events and will be effective for blossom blight control if applied within 12-24 hours after a rain event. Streptomycin is used at a rate of 24 ounces per acre and should be applied with a non-ionic surfactant such as Regulaid (1 pint per 100 gallons). The use of the surfactant enhances deposition of the antibiotic on flowers and increases the chances that the critical stigma targets will be hit.

Note: If streptomycin is reapplied within three to four days after a previous application, Regulaid can be omitted to avoid phytotoxicity – usually viewed as yellowing of leaf margins. Streptomycin is partially systemic and can reach fire blight bacteria that have entered flower nectaries.

Kasumin

Kasugamycin is an antibiotic related to streptomycin. There is no cross-resistance between Kasumin and streptomycin as Kasumin controls streptomycin-resistant strains of *E. amylovora*.

Kasumin is an **excellent** fire blight material and provides forward control for two to four days prior to rain events and will be effective for blossom blight control if applied within 12 hours after a rain event. Kasumin is used at a rate of 2 quarts (64 fluid ounces) per acre in 100 gallons of water per acre and should be applied with a non-ionic surfactant such as Regulaid (1 pint per 100 gallons). Read the Kasumin label carefully as there are some specifications, including:

- Do not apply Kasumin in orchards in which the soil has been fertilized with animal manure.
- Do not apply after petal fall.
- Do not use alternate row applications.

The main difference between Kasumin and streptomycin is that Kasumin is not partially systemic like streptomycin is. Thus, Kasumin will not penetrate into the nectaries and will not be able to control an infection once the fire blight pathogen reaches the nectaries.

Oxytetracycline

Oxytetracycline is a **good** fire blight material and should be applied within one day prior to a rain event for best results. Oxytetracycline is bacteriostatic and does not kill fire blight bacteria, it only inhibits their growth. Thus, it has to be applied prior to rains where it can prevent growth on stigmas, but it can't eliminate existing populations. Oxytetracycline is also highly sensitive to degradation by sunlight and much of the activity is lost within one to two days after application. Oxytetracycline is best used as a 200 ppm solution (1 pound per 100 gallons) and should be applied with a non-ionic

surfactant such as Regulaid (1 pint per 100 gallons). Per the label, a maximum of 1.5 pounds per acre can be applied, using 150 gallons water in this case.

Two slightly different formulations of oxytetracycline are sold: Mycoshield (OxyTc-calcium complex) and FireLine (OxyTc-hydrochloride). The FireLine formulation is a bit more soluble than Mycoshield and has performed slightly better for blossom blight control in head-to-head comparisons.

Antibiotic use for blossom blight management

Fire blight predictive models such as MaryBlyt or Cougar Blight should be used as guides for timing management decisions. The output of the MaryBlyt model, for example, is the epiphytic infection potential (EIP) number, which is an estimator of the risk of blossom blight infection. The higher the number, the larger the infection risk. I would place forecasted EIP numbers into four categories of risk:

- 12 Low to moderate ($50 < \text{EIP} < 75$)
- 13 Moderate to high ($75 < \text{EIP} < 100$)
- 14 High ($\text{EIP} > 100$)
- 15 Epidemic potential ($\text{EIP} > 200$)

When the infection risk is moderate to high, high or of epidemic potential, only streptomycin or Kasumin can be expected to provide adequate blossom blight control. These two antibiotics provide the best blossom blight control and also reduce or eliminate most of the fire blight inoculum from flowers. During these types of high-risk conditions, the spray interval for streptomycin or Kasumin is usually predicated by the occurrence of rainfall. Very high EIPs (greater 200) also necessitate additional antibiotic applications at shorter intervals. Finally, remember the overall risk increases as bloom progresses as the fire blight pathogen is building up populations on flowers over time. In addition, the more open flowers there are increases fire blight risk, provides more sites for pathogen growth and increases the number of unprotected flowers (flowers opening since the last spray).

Firstly, when the EIP is high (greater than 100) but conditions are dry for several days, remember inoculum is building up rapidly on flower stigmas. Growers should apply streptomycin or Kasumin strategically in the middle of a period such as this to reduce inoculum potential. The outcome of enabling several days of population buildup by doing nothing will make blossom blight much more difficult to control if rain events follow. Controlling diseases under high inoculum situations is always more difficult than controlling diseases in a lower inoculum situation.

When the EIP is high and rain events are forecasted, the application of streptomycin or Kasumin would be best about 24 hours before the rain event and then followed up about one to two days after the rain event. Subsequent spray applications will be based on current and future conditions. For example, if temperatures cool significantly and EIPs are reduced to low to moderate risk values, sprays can be held off. If EIPs remain

high, a third application should be made within two to four days based on the occurrence of wet or dry conditions.

Oxytetracycline is best used when the infection risk is low to moderate (EIP less than 75). Under warmer conditions when *E. amylovora* is capable of very rapid growth on flower stigmas, oxytetracycline can be overwhelmed by the pathogen and fail to provide adequate control. In addition, the incidence of shoot blight infection is typically higher in oxytetracycline-treated trees compared to streptomycin- or Kasumin-treated trees because the innate activity of this antibiotic is the lowest of the three and its effect on inoculum reduction is the lowest.

In the absence of streptomycin resistance, streptomycin is the best choice for fire blight management. While the effectiveness of streptomycin and Kasumin are essentially equivalent in the inoculated blossom blight control tests that I have conducted over a seven-year period, the partial systemic nature of streptomycin gives it an advantage in that it can reach internal populations of *E. amylovora* that Kasumin cannot.

Streptomycin is also significantly cheaper than Kasumin. Long-term evidence from around the Midwest and eastern United States suggests that if streptomycin use is limited to a maximum of three to four applications per season, and only used during the bloom period, then the chances of streptomycin resistance development are very low.

The main risk factor for streptomycin resistance development is an increased number of applications per season above four and regular use during the summer for shoot blight control. This use pattern increases the chances of mutation of the fire blight pathogen to streptomycin resistance or acquisition of a streptomycin-resistance gene from the indigenous microflora in orchards.

A resistance management strategy for streptomycin can be used; the best strategy would be to alternate applications of streptomycin and Kasumin. [Michigan State University Extension](#) advises that a tank-mix strategy of using streptomycin and oxytetracycline is not a resistance management strategy. Since the oxytetracycline is not killing bacterial cells, it would not kill any streptomycin-resistant cells that might arise; it would only temporarily prevent their growth.

In streptomycin-resistance situations, Kasumin is the antibiotic of choice and is best used in advance of moderate to high risk conditions. This is because where we have detected streptomycin resistance in orchards in Michigan, the incidence of resistant bacterial pathogen strains is usually very high to 100 percent. Thus, streptomycin should not be used in these situations because it will have no effect on the pathogen. If the disease risk is low to moderate, oxytetracycline is also an effective substitute for streptomycin in orchards where streptomycin resistance occurs.

Summary of antibiotic use for fire blight management

The target of antibiotic sprays for fire blight control is the stigma surface, style and base of the flower. Adding a non-ionic surfactant such as Regulaid to antibiotic sprays

increases the chances of deposition on target surfaces. The best timing for all antibiotics is to arrive prior to the arrival of fire blight bacteria because these arriving populations are typically small and can be readily controlled if the antibiotic is already present. However, streptomycin and Kasumin can be used effectively after *E. amylovora* cells have arrived and started growing on stigmas. When EIPs predict potential high risk to epidemic conditions, only streptomycin or Kasumin will be effective for blossom blight control. Under these conditions, the two most important considerations are very tight spray intervals and excellent spray coverage.

Brownfield Assessment Grant Funds Available in Leelanau County

Michigan is home to thousands of brownfield sites, which effects each and every County including ours. The Leelanau County Brownfield Redevelopment Authority (LCBRA) was awarded two Brownfield Assessment Grants from the U.S. Environmental Protection Agency in October of 2014. These funds were granted to assess contaminated or potentially contaminated sites, provide cleanup planning and community outreach activities. Although Brownfield sites are typically contaminated sites, they may also be blighted, functionally obsolete, tax reverted, or historic properties and eligible to receive assessment dollars. The County currently has \$336,000 in funds available to 'assess' sites (brownfields) to help return abandoned, underutilized and typically contaminated properties to productive use.

How does this affect Michigan fruit growers? You may own a piece of land or know of one that fits the above brownfield description that needs to be assessed for potential future redevelopment. The types of activities eligible for funding include Phase I Environmental Site Assessments (ESAs), Phase II ESAs, Baseline Environmental Assessments and Documentation of Due Care Compliance, Hazardous Materials Building Surveys including lead and asbestos surveys, Development of Brownfield Plans and Act 381 Work Plans. For an explanation of the above eligible activities visit <http://www.envirologic.com/due-diligence-services>.

If you are interested in learning more about this funding opportunity, please contact Trudy Galla, Director of the LCBRA at (231) 256-9812 or tgalla@co.leelanau.mi.us. Or visit the LCBRA website at <http://www.leelanau.cc/brownfield.asp>.

2016 IPM Update Schedule

Emily Pochubay and Nikki Rothwell
Michigan State University Extension

Tree Fruit IPM Updates beginning the first week of May through mid-July (as needed) will highlight management of the seasons current potential pest challenges dictated by weather and pest biology. Attendees are encouraged to bring examples of pests and

damage found on the farm to these workshops for identification and discussion. Workshops will be held weekly in Leelanau and Grand Traverse counties and bi-weekly in Antrim and Benzie counties in May. Beginning in mid-June, we will hold weekly meetings in all four locations. Tree fruit growers are welcome to attend meetings at any of the locations and times that are most convenient (see below). These workshops are free and do not require registration. For more information, please contact Emily Pochubay (pochubay@msu.edu), 231-946-1510.

Leelanau County

Location: Jim and Jan Bardenhagen, 7881 Pertner Road, Suttons Bay

Dates: May 3, 10, 17, 24, 31; June 7, 14, 21, 28

Time: 12PM – 2PM

Grand Traverse County

Location: Wunsch Farms, Phelps Road Packing Shed, Old Mission

Dates: May 3, 10, 17, 24, 31; June 7, 14, 21, 28

Time: 3PM – 5PM

Antrim County

Location: Jack White Farms, 10877 US-31, Williamsburg (south of Elk Rapids on the southeast side of US-31)

Dates: May 4, 18; June 1, 15, 22, 29

Time: 10AM – 12PM

Benzie County

Location: Blaine Christian Church, 7018 Putney Rd, Arcadia, MI 49613

Dates: May 4, 18; June 1, 15, 22, 29

Time: 2PM – 4PM

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Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities.

WEB SITES OF INTEREST:

Insect and disease predictive information is available at:

<http://enviroweather.msu.edu/homeMap.php>

This issue and past issues of the weekly FruitNet report are posted on our website:

<http://agbioresearch.msu.edu/nwmihort/faxnet.htm>

60-Hour Forecast:

<http://www.agweather.geo.msu.edu/agwx/forecasts/fcst.asp?fileid=fous46ktvc>

Information on cherries:

<http://www.cherries.msu.edu/>

Information on apples:

<http://apples.msu.edu/>

Information on grapes:

<http://grapes.msu.edu>

Fruit CAT Alert Reports:

<http://news.msue.msu.edu>