Fire Blight Workshop 2016

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- Conditions Favoring Infections 2016
- History of FB in Champlain Valley
- Fire Blight is Risk of Production
- Management Strategy
- Future Outbreaks
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Conditions Favoring Infections 2016 - NY -

- Late cv-s: still in bloom
- Early cv-s: rat-tail flowers; young shoots
- Extremely conducive conditions in NE:
 - Bloom (still)
 - No terminal bud set
 - Shoot growth
 - Hot: high 80's
 - Several short rain or dew events
 - Storms with hail
 - Fire blight history (nursery, old cankers) 0.5 miles
- May 27, thinning meeting: predicted extreme risks rain on 29 & 30

NEWA - Summary

Fire Blight Risk Predictions for Peru

Blossom blight predictions using the Cougarblight model begin at first blossom open.

First blossom open date: 5/7/2016

First blossom open date above is estimated based on degree day accumulations. <u>Infection cannot occur without</u> open blossoms. If the predicted bloom date is incorrect, enter the actual date for blocks of interest and the model will calculate the protection period during bloom more accurately. If bloom in your orchard has not yet occurred, continue to check Cougarblight daily and monitor your bloom. If bloom in your orchard has not yet occurred, enter a future bloom date, up to five days into the future, to gauge fire blight risk potential.

Orchard Blight History: Fire blight occurred in your neighborhood last year.

The orchard blight history above is the NEWA default. Select the actual blight history for your orchard and the model will recalculate recommendations.

Fire Blight Risk Predictions for Chazy

Blossom blight predictions using the Cougarblight model begin at first blossom open.

First blossom open date: 5/10/2016

First blossom open date above is estimated based on degree day accumulations. <u>Infection cannot occur without</u> open blossoms. If the predicted bloom date is incorrect, enter the actual date for blocks of interest and the model will calculate the protection period during bloom more accurately. If bloom in your orchard has not yet occurred, continue to check Cougarblight daily and monitor your bloom. If bloom in your orchard has not yet occurred, enter a future bloom date, up to five days into the future, to gauge fire blight risk potential.

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Blossom Blight Summary - Cougarblight								Blossom Blight Summary - Cougarblight									
	Past	Past	Current	В	lossom Bl For	l ight 5-Da ecast Det	y Forecas tails	t		Past	Past	Current	В	lossom B Foi	light 5-Day recast Det	y Forecas t ails	ţ
Date	May 18	May 19	May 20	May 21	May 22	May 23	May 24	May 25	Date	May 18	May 19	May 20	May 21	May 22	May 23	May 24	May 25
4-day DH	15	33	140	311	407	599	743	866	4-day DH	10	51	180	342	436	602	745	863
Risk Level	Low	Low	Low	High	High	Extreme	Extreme	Extreme	Risk Level	Low	Low	Caution	High	High	Extreme	Extreme	Extreme
Wetness Events									Wetness Events								
Rain Amount	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05	Rain Amount	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.05
Rain Prob (%) Night Day			- -	- -	- -	- -	- -	- -	Rain Prob (%) Night Day			- -	- -	- -	- -	- -	- -
Dew 김	Yes	Yes	Yes	No	No	Yes	No	Yes	Dew 📔	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaf Wetness (hours)	0	1	0						Leaf Wetness (hours)	0	2	0					
NA - data not available Cougarblight Charts					Downloa	ad Time: 5/2	0/2016 23:00	0 NA - data not available				Cougarblight Charts Download Time: 5/20/2016 23:				0/2016 23:00	

NEWA - Summary

	Fire Blight Risk Predictions for Chazy																
Blossom	Blossom blight predictions using the Cougarblight model begin at first blossom open.																
		First bl	ossom one	en date:	5/10/2016	}											
		1130 01	ossom opv	en date.	0/10/2010	,											
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	Past	Past	Current	В	lossom Bl For	<mark>ight 5-Da</mark> ecast Det	y Forecas ails	t		Past	Past	Current	Blossom Blight 5-Day Forecast Forecast Details				t
Date	May 27	May 28	May 29	May 30	May 31	Jun 1	Jun 2	Jun 3	Date	May 27	May 28	May 29	May 30	May 31	Jun 1	Jun 2	Jun 3
4-day DH	1142	1358	1315	1527	1385	1101	1106	1017	4-day DH	1095	1289	1241	1462	1293	1044	1072	958
Risk Level	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Risk Level	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme
Wetness Events									Wetness Events								
Rain Amount	0.00	0.00	0.51	0.16	0.00	0.00	0.07	0.02	Rain Amount	0.00	0.00	0.38	0.12	0.00	0.00	0.09	0.02
Rain Prob (%) Night Day			- -	- -	- -	- -	- -	- -	Rain Prob (%) Night Day			- -	- -	- -	- -	- -	- -
Dew 김	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Dew <table-cell></table-cell>	No	Yes	Yes	No	No	Yes	Yes	No
Leaf Wetness (hours)	0	0	9						Leaf Wetness (hours)	1	0	11					
NA - data not available Cougarblight Charts Download Time: 5/29/2016 23:						9/2016 23:00	NA - data not available Cougarblight Charts Download Time: 5/29/2016 2					9/2016 23:00					

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				Inputs			Da	ata Entry Mode			
Date	Phenology	Max Temp (F)	Min Temp (F)	Wetness (in)	Trauma	Spray	Notes	Avg Temp (F)	EIP	BHWTR	BBS
5/15/2016	В	51.4	39.5	0.03				45.4	-	+-+-M	
5/16/2016	В	54.9	37.1	0.02				46.0	-3	+-+-M	-
5/17/2016	В	64.8	33.6	0.00				49.2	-	t	-
5/18/2016	В	60.9	39.9	0.00				50.4	22	4-41	1
5/19/2016	В	65.1	45.1	0.00				55.1	×	4	
5/20/2016	В	71.6	42.7	0.00				57.2	17	4100-044	
5/21/2016	В	74.4	47.0	0.00				60.7	46	++M	
5/22/2016	В	79.0	55.3	0.01				67.2	106	1 + + + +	1
5/23/2016	В	76.8	49.8	0.00				63.3	148	++-+H	9 a
5/24/2016	В	82.6	52.1	0.00				67.4	205	++-+H	21 a
5/25/2016	В	80.8	54.9	0.00				67.8	244	+ + - + H	34 a
5/26/2016	В	74.9	54.3	0.00				64.6	222	++-+H	43 a
5/27/2016	В	90.0	60.1	0.00				75.0	238	+ + - + H	63 a
5/28/2016	В	83.4	67.8	0.00				75.6	298	++-+H	83 a
5/29/2016	В	83.8	61.8	0,51		2		72.8	362	+ + + + 3	100 a
5/30/2016	В	84.5	66.4	0.02				75.4	356	++++1	20 b
5/31/2016	В	80.2	61.3	0.00				70.8	306	+ + - + H	35 b
6/1/2016	В	75.1	57.9	0.00				66.5	248	++-+H	46 b
6/2/2016	В	74.9	59.7	0.03				67.3	166	++++	58 b
6/3/2016	В	83.0	63.0	0.00				73.0	188	++-+H	76 b
6/4/2016	В	76.1	58.0	0.00				67.0	193	++-+H	87 b
6/5/2016	В	67.1	55.8	1.46				61.4	153	++++1	94 b
6/6/2016	В	75.9	59.9	0.00				67.9	103	+ + + + 1	106 b
6/7/2016	В	70.4	53.9	0.01				62.2	120	++++	93 c

High RH

		1\A/	roin	DLI
		LVV	rain	КП
5/30/16 9:00	70.9	7	0	96
5/30/16 8:00	67.9	60	0	98
5/30/16 7:00	66.4	60	0	98
5/30/16 6:00	66.6	60	0.01	98
5/30/16 5:00	66.5	60	0	98
5/30/16 4:00	66.6	60	0.01	99
5/30/16 3:00	66.6	60	0	98
5/30/16 2:00	66.5	60	0	98
5/30/16 1:00	66.8	60	0	98
5/30/16 0:00	66.9	60	0	98
5/29/16 23:00	67.7	60	0.02	98
5/29/16 22:00	68.5	56	0.01	98
5/29/16 21:00	69.5	53	0	96
5/29/16 20:00	69	60	0	98
5/29/16 19:00	69.7	60	0.15	98
5/29/16 18:00	70.7	60	0.05	98
5/29/16 17:00	71.2	60	0.07	98
5/29/16 16:00	70.4	60	0.01	98
5/29/16 15:00	72.3	26	0.2	94

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Fire Blight in Champlain Valley? - Past -

- Limited outbreaks = fire blight present
- Peru: 2012, 2010, 2006
- Chazy
- Crown Point

2016:

- Flower infections occurred May 29-30 with rains
- One flower can carry \geq 1,000,000 cells
- One shoot infected with 20 cells



Photo by Pusey & Curry

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Fire Blight is a Risk of Production - Biology -







Fire Blight Cankers



Actively Oozing Canker





Worst Cases - Trauma and Rootstock Blight -



Photo by Mark Longstroth

Photo by Michael A. Ellis

Photo by Kerik D. Cox



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Management Strategy – Pruning & Sprays - Late Spring & Early Summer -

If models predicted infection: Scout 3 times per week for symptoms ~ 90-100 DD (base 55°F) after infection event (rain during bloom or summer hailstorm)

- Low number of clusters/ strikes (5-15)
- Prune our rapidly / Sanitize tools?
- 18-24" below visible symptom edge
- If not, prune to older wood (12")
- Prevent further spread
- Drop cuttings in the middle, let it dry, chop with flail-mower
- Spray copper, Apogee
- If done early effective
- Scout and cut on a cool dry day

- High number of clusters/ strikes (25-30)
- Spray Apogee high rate, copper with 1-3lbs/A of hydrated lime
- Slow migration of bacteria to the larger limbs
- Prevent further spread
- Severe pruning on a cool dry day
- Every day/hour of delay in spray allows FB spread
- <u>Can promote shoot growth more infections</u>
- Scout every week and cut





Management Strategy – Prevent Secondary Infections - Mid Summer -

Fact: Bacteria are inside flowers, shoots, wood, fruit

Goal: Prevent/ Reduce inoculum spread

- Copper before/ after pruning lower doses, cultivar dependent
 - Limit spread to shoots
 - Cuprofix, Badge SC or X2 (16 fl oz), or Kocide
 - Bordeaux Mixture
- Apogee: 6-12 oz/100 gal; 3-6 oz for trees <5 years
 - 1-3 inch shoot growth (late bloom)
 - 14-21 days later
 - Stunt current growth
 - Stop new growth
 - Limit new infections
 - Bridge to terminal bud set

Management Strategy – Continued Pruning and Sprays - Late Summer -

- Scout once every week and cut
- Terminal bud set is variable
- Pruning can promote new shoot growth
- Apply copper before/after pruning
- New shoot growth needs to be covered
- 7-10 day interval use low doses until terminal bud set
- Avoid slow drying conditions (fruit russet)
- Hand thin on a cool dry day, then apply copper

Hail

- Late Summer -

- No wounds on leaves cause enough fruit injury for infection
- Blight is in the region
- Copper does not penetrate
- Any hail, gusts, or T-storm (up to 24h) like June 18: You must spray STREPTOMYCIN: FireWall 50WP (10 oz) of 17 (24 oz) + Regulaid

Management Strategy - Young Trees and Suckers -

- Later bloom
- Prone to lingering bloom
- Prune ASAP and if possible on a cool dry day
- No pruning in rain
- If 12" is into leader remove & replant
- If early control effective suckers should not be infected
- Do not use M.26 and M.9
- Avoid nitrogen
- Minimize/ avoid irrigation
- Sanitize tools when removing suckers
- Apogee effect on suckers no data?



Management Strategy – Scout, Pruning, Sprays - Fall, Winter & Spring 2017 -

- Scout for and remove cankers and left-over strikes
 - Reduce inoculum sources
 - Difficult to find
 - 1-4 per two acres
- Late dormant copper: silver to green tip/ QIG/ HIG
 - Kills bacteria on the bark in ooze
- Do not gamble FB is there
 - Warm weather boosts bacterial populations in cankers
- Use prediction models decide on bloom sprays
 - Bloom: streptomycin (0.5 lb/100 gal) 50 DPI
- **Organic:** Cueva + Double Nickel, Badge X2 + hydrated lime
 - Serenade Optimum, or Blossom Protect



Spraying Antibiotics in Bloom 2017 - Considerations -

- Precise timing = high efficiency
- Bacterial populations build rapidly in flowers during warm weather (> 65 F)
- Antibiotic protects only blossoms that are open at the spray time
- After drying, antibiotic will not redistribute
- Spray just before wetting so that all open blossoms are protected during infection
- Use models to time strep sprays and avoid control failures
- MID-BLOOM: NEWA enter the first strep spray to calculate the need for additional treatment
- Reapplication to protect newly opened blossoms before the next rain

Petal fall 2017

FACT: For at-risk orchards (any blight history), apply antibiotic:

- 1. <u>any open flowers</u>,
- no antibiotic in previous 3-4 days and the DH over 65° currently exceed or are expected to exceed 145 (MaryBlyt 7.1 EIP of 75) within the next few days

GOAL: antibiotic protects the lingering bloom typical in young orchards

CONSEQUENCE: 50,000 infected shoots

- One flower: ≥ 1,000,000 cells
- Shoot infection: 20 cells

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Future Outbreaks = Yes - Take home -

- FB is established
- A lot of inoculum
- It waits until conditions are right
- Use prediction models to guide sprays
- Bloom: use FireWall (up 24h after rain event) or FireLine
- Cheaper to spray when conditions favor fire blight
- FB prediction accuracy depends on weather forecast:
- Each year is different: use NEWA Cougarblight & Maryblyt

Models Are Not Perfect - However -

- Border line cases early season:
 - Warm but dry
 - Cold during bloom
- Relative humidity unaccounted
 - 85%
 - Requires research
- Much more accurate from mid-bloom on
 - Usually much warmer days
 - Cold nights
 - Dew, fog, spraying



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Research

- Learn more about fire blight survival, population sizes, physiology
- What and how much affects *Ea* populations in cankers:
 - Environmental factors
 - Bactericides
 - Impact on outbreaks
- Improve efficacy of bactericides
- Chemical eradication
- Alternatives to antibiotics (bloom, dormancy)
- Sucker infections
 - distance of progress
 - Apogee

Questions