Antibiotics, Copper, Biologicals, and Others

Fire Blight Control:

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Outline

 Seasonal fire blight concerns & considerations for using models

- 2015 Fire blight trials in Geneva
 - -Blossom blight
 - -Shoot blight

Seasonal fire blight concerns

- Fire blight epidemics avoided in eastern NY & western NY hit hard
- Heavy June rains in western and northern NY & higher historical inoculum
- ENY growers felt models failed > wasted money





- Web-based intuitive pest/disease forecasting systems
 - Web versions of time-tested relationships with integrated weather data
- Promoted and used for apples in WA, Canada, China, & Europe:
- Prevents unnecessary pesticide applications, promotes pesticide stewardship, improves cost-effectiveness of pesticides, prevents losses due to disease

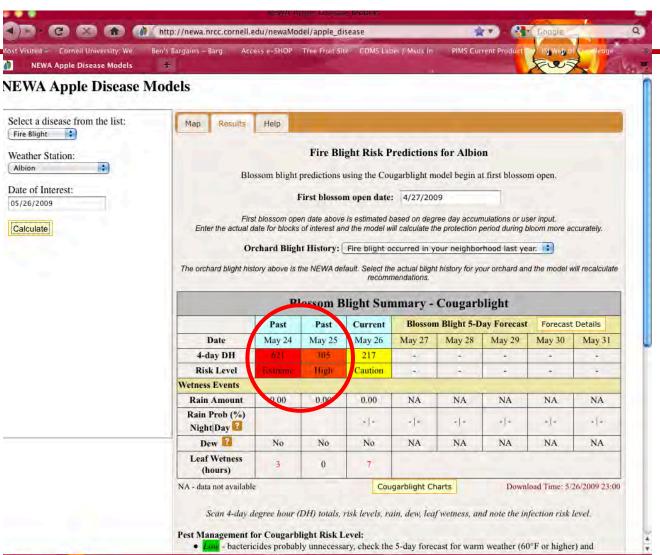
- Fire blight forecasting:
 - Predicts blossom blight infection risk periods
 - Helps track development of shoot blight (not infection)
 - Best practice for avoiding antibiotic resistance
 - NEWA system &
 Marybylt 7.1: heat units
 & presence of moisture





- NEWA system:
 - Based on CougarBlight logic (WSU)
 - Model works well on east coast apples
 - Integrated with NEWA/NRCC data
 - Updated regularly (EIP Logic)
 - Fully Automated: w/ limited user input http://newa.cornell.edu/index.php?page=apple-diseases

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http://newa.nrcc.cornell.edu/newaModel/apple_disease

- MaryBlyt 7.1:
 - Based on east coast research and validation
 - Standalone program
 - Requires more user input/data, but higher level of specificity
 - Season long predictions
 - Can import NEWA data (NEWA will incorporate logic) <u>http://www.caf.wvu.edu/kearneysville/Maryblyt/</u>



🐞 Maryblyt 7.1 G:\Work\2014\Meetings 2014\EXPO 2015\MaryBylt Example\Idared 2014 Example Maryblyt-Full.mb7

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			Inputs Data Entry Mode							Outputs				
Date	Phenology	Max Temp (F)	Min Temp (F)	Wetness (in)	Trauma	Spray	Notes	Avg Temp (F)	EIP	BHWTR	BBS	CBS	SBS	TBS
5/3/2014	GT	58.4	46.9	0.06				52.6	+	-	-	4		
5/4/2014	GT	54.9	43.9	0.01			-	49.4	-	1	-	4		*
5/5/2014	TC	57.9	39.9	0.03				48.9		-		4	14	*
5/6/2014	TC	58.7	42.0	0.00	-			50.4	-		-	5		
5/7/2014	TC	64.7	33.8	0.00		_		49.2	-	÷	-	6	-	*
5/8/2014	PK	74.4	49.0	0.00				61.7		19	-	10		τ.
5/9/2014	РК	84.1	53.8	0.09				68.9	-	-	-	17	1.4.5	-
5/10/2014	BL	73.3	56.7	0.15				65.0	36	+-++H		22		Ŧ
5/11/2014	BL	74.7	49.0	0.00				61.8	73	+-++H	-	26	4	-
5/12/2014	BL	82.5	49.8	0.00				66.2	145	++-+H		32		
5/13/2014	BL	86.1	58.0	0.65		Yes		72.0	-	+ - + + H	-	41	(<u>4</u>)	-
5/14/2014	BL	84.8	60.0	1.05				72.4	97	+-++H	-	49	-	Ŧ
5/15/2014	BB	76.7	63.9	0.22				70.3	1 8	++++1		57	-	
5/16/2014	BB	64.2	44.1	1.48				54.2	10 5	+++-H	Ja	59		
5/17/2014	BB	57.1	39.6	0.00				48.4	53	+-+-M	3a	59	14	*
5/18/2014	BB	61.0	42.9	0.00				52.0	-	++k	5a	60		Ŧ
5/19/2014	BB	66.4	38.3	0.00				52.4	14	+	8 a	61	100	
5/20/2014	BB	73.9	47.0	0.00				60.4	24	++M	15 a	65	1.00	
5/21/2014	BB	67.9	56.1	0.00				62.0	36	++M	21 a	68	4	÷.
5/22/2014	B2	74.5	54.6	0.26				64.6	73	+-++H	31 a	73		*
5/23/2014	B2	57.0	52.6	0.05				54.8	49	+-+-M	32 a	74	-	-
5/24/2014	B2	72.7	51.9	0.00				62.3	57	++M	40 a	78		÷
5/25/2014	B2	77.3	49.3	0.00				63.3	97	++M	49 a	83	14	*
5/26/2014	B2	82.0	62.6	0.00				72.3	170	++-+H	65 a	91		+
5/27/2014	B2	81.3	60.7	0.00		_		71.0	255	++-+H	81a	99	-	\$
5/28/2014	B2	69.8	54.1	0.00		_		62.0	194	++-+H	87 a	CMS		*
5/29/2014	B2	68.1	54.1	0.00				61.1	109	++-+H	93 a	6	140	-
5/30/2014	B2	73.4	47.3	0.00				60.4	133	++-+H	100 a	13	-	-
5/31/2014	B2	71.2	49.7	0.00				60.4	61	++M		19	-	5
6/1/2014	PF	80.3	44.8	0.00				62.6	-		-	29		-
6/2/2014	PF	86.8	59.3	0.27				73.0	-	1	-	47	17	*
6/3/2014	PF	81.7	65.9	0.03				73.8	-	-	-	65	36	-

- Considerations for models:
 - Tells: When and How favorable environmental conditions are for blossom blight infection
 - Doesn't predict control failures or future disease
 - Shoot blight > internal movement of bacteria to growing shoot tips or external following a warm windy storm
 - It's more cost-effective to spray for fire blight when environment conditions are favorable
 - If you are going to spray, use the models to guide you application timing

- Considerations for models:
 - Fire Trials without inoculation during favorable conditions
 - No infection Barely noticeable infection
 - Not enough blight to see differences
 - Shoot blight only if hot summer storms during periods of vigorous growth
 - Fire blight trial blocks don't get fire blight every year
 - Do you need to spray for fire blight?

- Considerations for models:
 - The consequences are too severe if fire blight develops or gets established (esp. New Plantings)



Outline

 Seasonal fire blight concerns & considerations for using models

- 2015 Fire blight trials in Geneva –Blossom blight
 - -Shoot blight

2015 Fire Blight Trials - Geneva

- Orchard site
 - 12-year-old 'Idared' trees on B.9



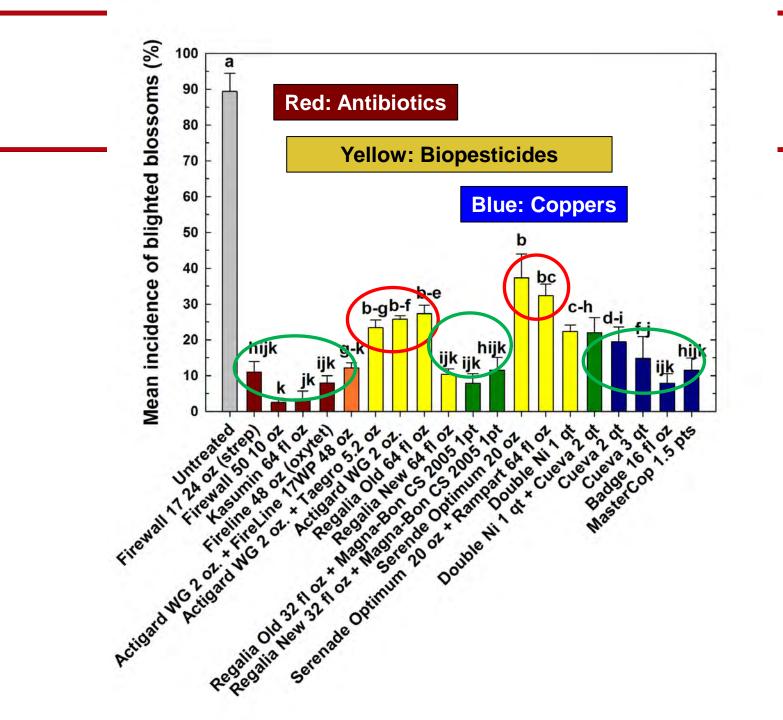
 Artificial inoculum: hand-pump sprayer for blossom blight & scissor dip for SB

2015 Fire Blight Trials - Geneva

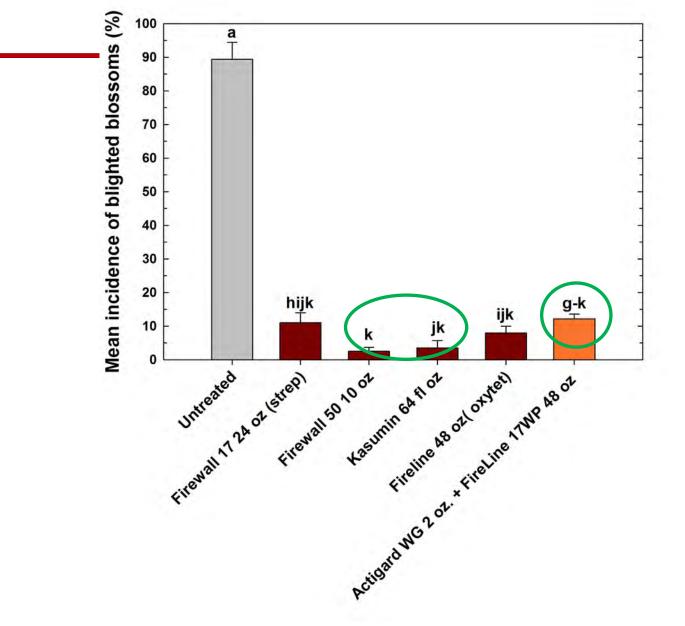
- Blossom blight application timing
 - Pre-bloom timings for biopesticides
 - All antibiotics & biopesticides @ 80% bloom
 - 10% (9 May) to 80% (10 may) 80°F
 - (Ea 273 at 1x10⁵ CFUml⁻¹)
- Blossom blight incidence: percentage of blighted blossoms (5 reps)



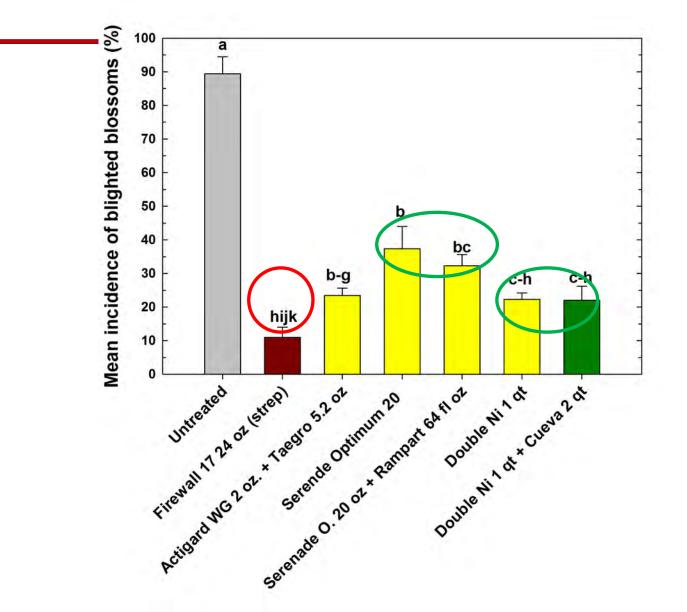




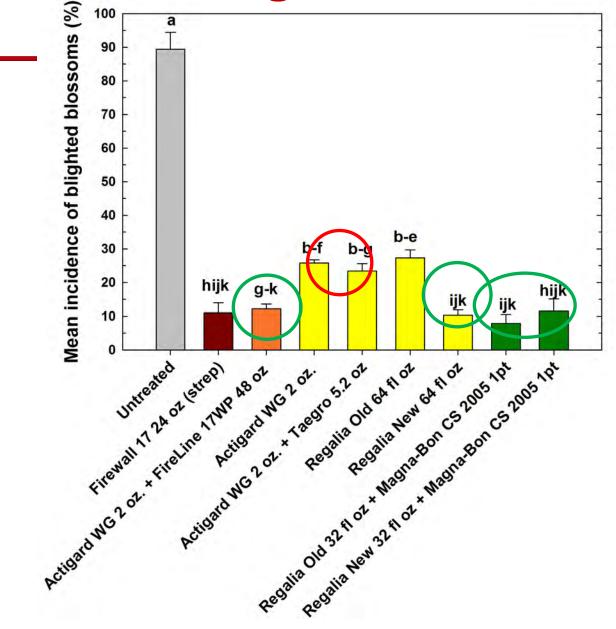
2015 Fire Blight Trials: Anti BB



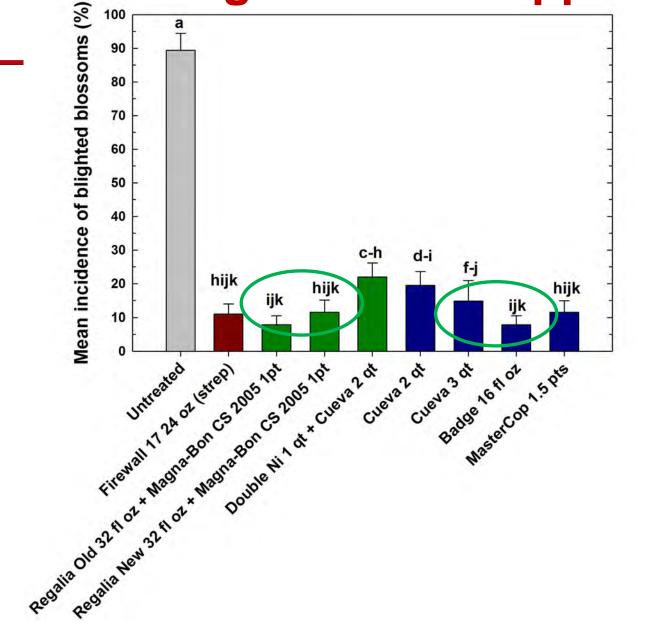
2015 Fire Blight Trials: Bio BB



2015 Fire Blight Trials: SARS BB

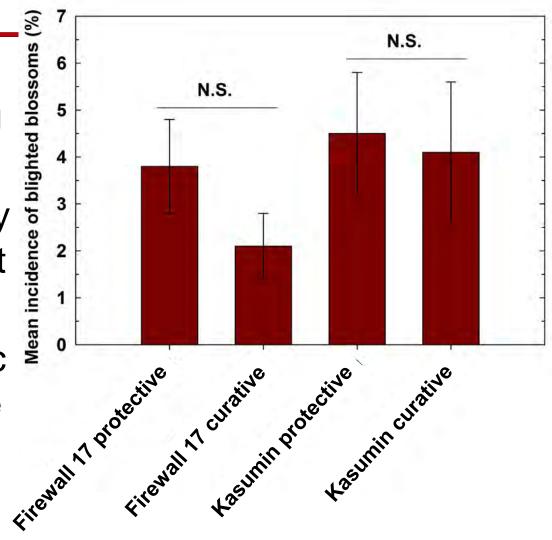


2015 Fire Blight Trials: Coppers – BB



2015 Fire Blight Trials: Post-infection

- Curative applications applied 24 h following inoculation
- Streptomycin: partially systemic 12-24 h post infection
- Kasumin: no systemic activity > still effective 24 h post infection
- May 10-12: 60-80 °F, 0.13-0.50"



2015 Fire Blight Trials: Blossom Blight

Trends & Considerations

- Antibiotics:
 - Firewall 50WP most effective antibiotic (Section 18 for citrus canker)
 - Kasumin 2L: most effective of registered antibiotics for fire blight
 - Fireline 17WP: worked well this year (protectant static)
- Coppers: Badge, MasterCop, & Cueva (3qt rate) on par with weaker antibiotics No phyto!

2015 Fire Blight Trials: Blossom Blight

Trends & Considerations

- Biologicals: Double Nickel LC > Serenade
 - Work fairly well good in light pressure situations and organic
- SARS: Regalia worked well enough to look like antibiosis
 - New formulation of Regalia even better
 - Adding Magna-Bon CS improved lower rate applications

2015 Fire Blight Trials: Shoot blight

- Shoot blight application timing
 - Active terminal growth (5-7"):
 24 hours after inoculation (trauma)
 - Apogee (PF/1-2") & Actigard (5-days prior)
 - June ~64°F 7.28"
- Shoot blight: progression of canker of 20 shoots (5 reps)

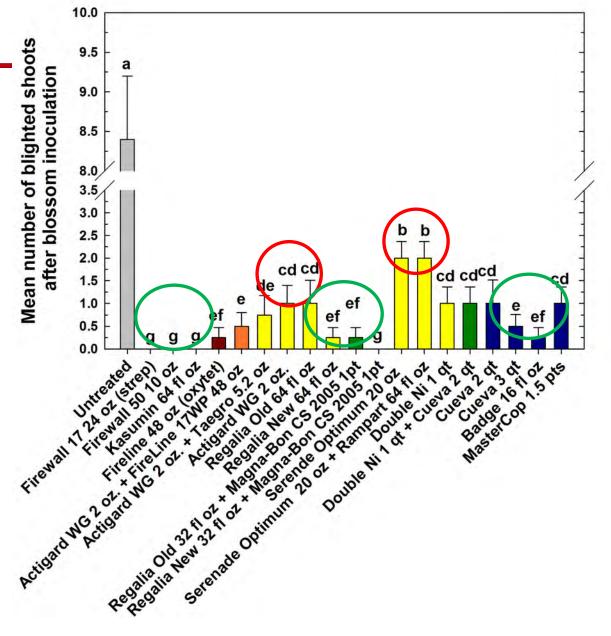




2015 Fire Blight Trials: Shoot blight

- Severe shoot blight > June ~64°F 7.28"
- Kasumin 2L, FireWall 17WP, Apogee > ~ 60% control
- Actigard 2 oz = Untreated
- Orchard mostly dead in August –except apoged

2015 Fire Blight Trials: BI-SB



2015 Fire Blight Trials: Shoot blight

Trends & Considerations

- Trauma based inoculation Apogee or antibiotics are the only viable options
 - Apogee 3-6 oz/100 gal @ 1-3" growth & again 14-21 days later
 - Apogee 2 (oz/100 gal) 1-3" growth > 3 oz > 2oz @ 21 days
- Late season antibiotic use (No Kasumin) > trauma events

2015 Fire Blight Trials: Shoot blight

Trends & Considerations

- Blossom inoculated shoot blight (small trees)
 - Trends mirror the blossom blight trends with antibiotics and coppers > best
 - Inoculum reduction > secondary shoot blight
 - Regalia + Magna-Bon comparable to other copper alternatives & even strep
 - Adding to Regalia to Apogee may be beneficial

Additional Questions

