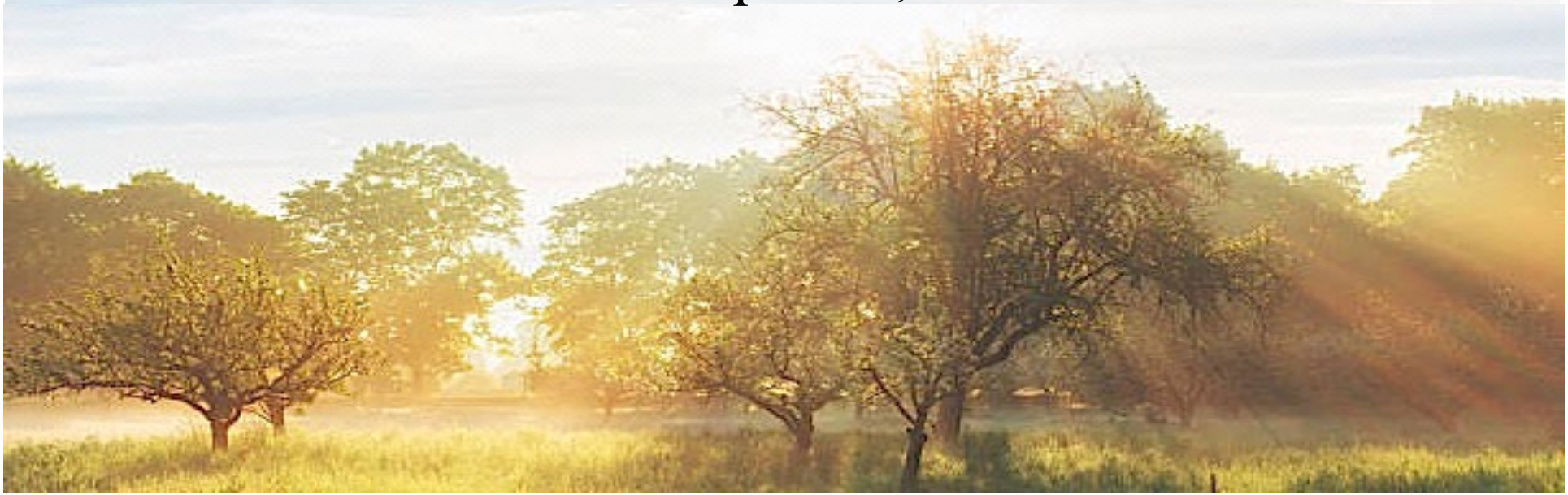
THE JENTSCH LAB

INSECT BIOLOGY, ECOLOGY, AND MANAGEMENT IN HUDSON VALLEY AGRICULTURAL COMMODITIES

Morning Brew: Conversations on Tree Fruit Pest Management

6 a.m. April 5th, 2021



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Agenda:

- Welcome
  - Weather forecast - Application windows
  1. Prebloom Diseases Apple Scab, Mildew, Fireblight (K. Cox & D.Rosenberger)
     a. Copper
  2. Insect management during bloom & early petal fall:
     1. Pear:
        a. Pear psylla
     2. Apple:
        a. San Jose Scale, Dogwood Borer, European Red Mite
     3. 2020 Pack Out. What problems will looming in 2021

Extended Forecast for
Highland NY

Tonight	Monday	Monday Night	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday	Thursday Night
								
Mostly Clear	Sunny	Mostly Clear	Sunny	Mostly Clear	Mostly Sunny	Partly Cloudy	Mostly Sunny	Mostly Cloudy
Low: 38 °F	High: 59 °F	Low: 35 °F	High: 61 °F	Low: 39 °F	High: 63 °F	Low: 42 °F	High: 64 °F	Low: 43 °F

Detailed Forecast

Tonight	Mostly clear, with a low around 38. Northwest wind 5 to 11 mph.
Monday	Sunny, with a high near 59. Northwest wind 8 to 16 mph, with gusts as high as 29 mph.
Monday Night	Mostly clear, with a low around 35. Northwest wind 5 to 11 mph.
Tuesday	Sunny, with a high near 61. Northwest wind 5 to 7 mph.
Tuesday Night	Mostly clear, with a low around 39. North wind around 5 mph.
Wednesday	Mostly sunny, with a high near 63.
Wednesday Night	Partly cloudy, with a low around 42.
Thursday	Mostly sunny, with a high near 64.
Thursday Night	Mostly cloudy, with a low around 43.
Friday	A chance of showers after 8am. Mostly cloudy, with a high near 58. Chance of precipitation is 30%.
Friday Night	A chance of showers. Mostly cloudy, with a low around 44. Chance of precipitation is 30%.
Saturday	A chance of showers. Mostly cloudy, with a high near 57. Chance of precipitation is 30%.
Saturday Night	Mostly cloudy, with a low around 44.
Sunday	Partly sunny, with a high near 59.

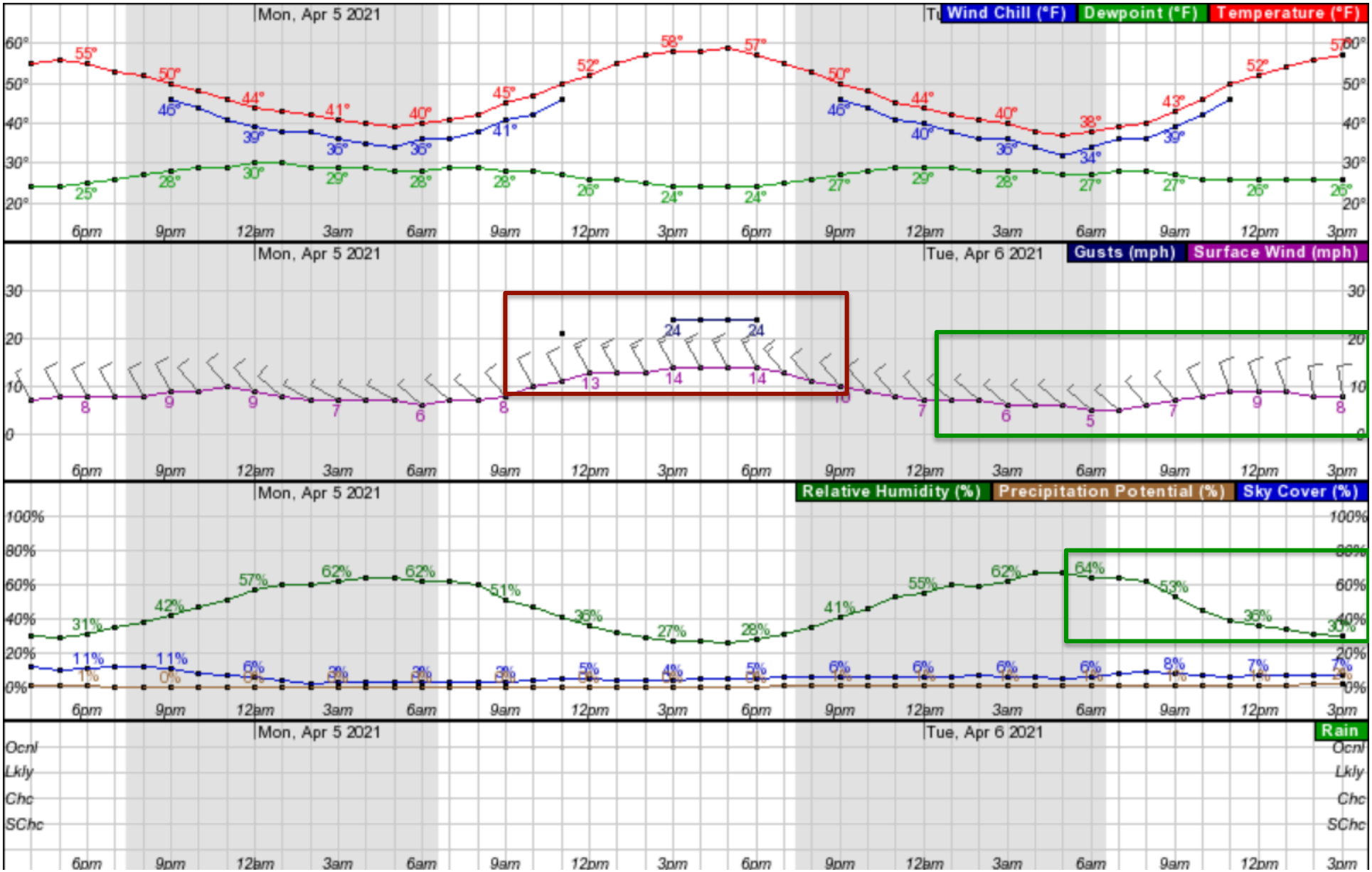
Monday

Today…wind after 9 AM - gusts to 24 mph

Tuesday

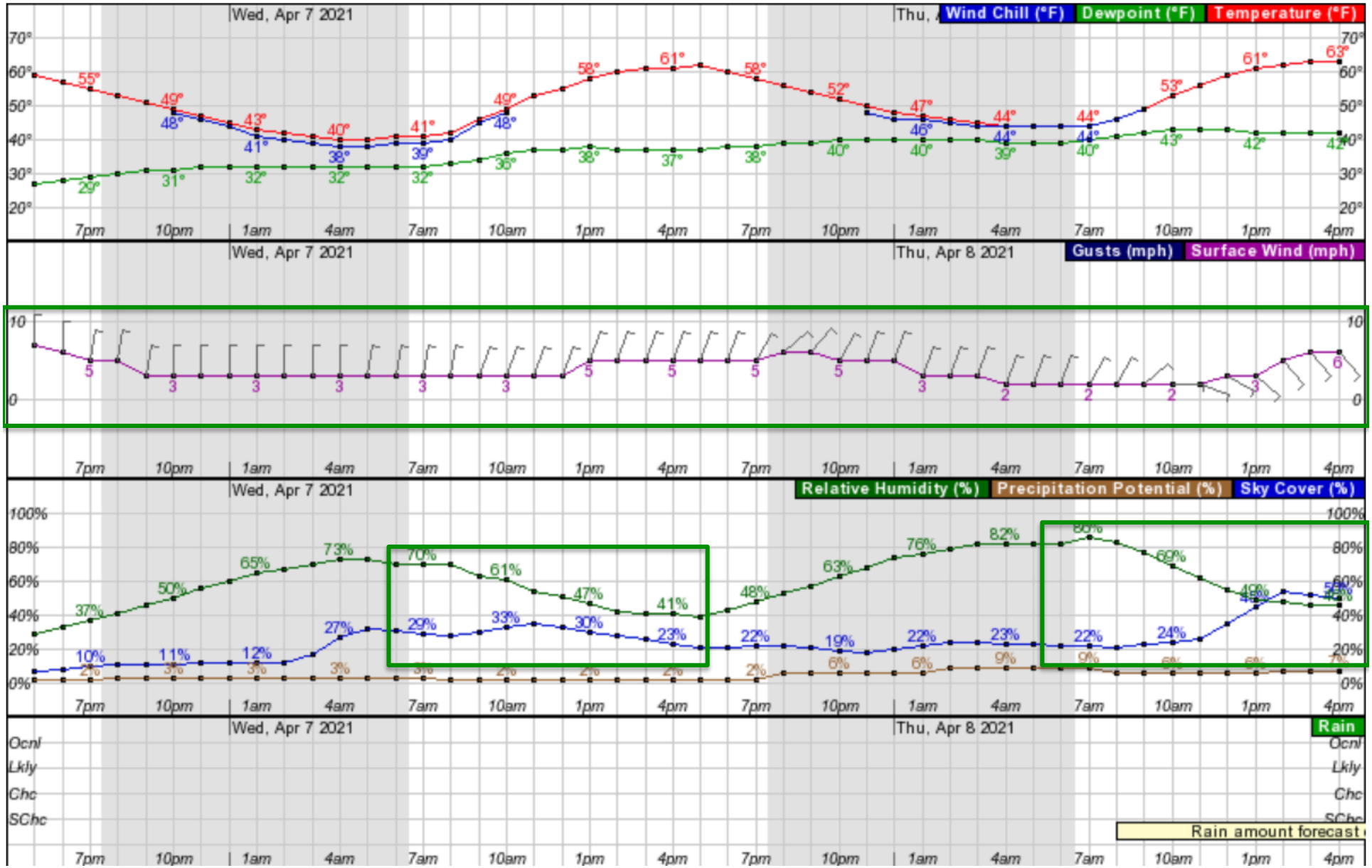
Low to moderate wind

rH good for adhesion / then drying



Wednesday Thursday

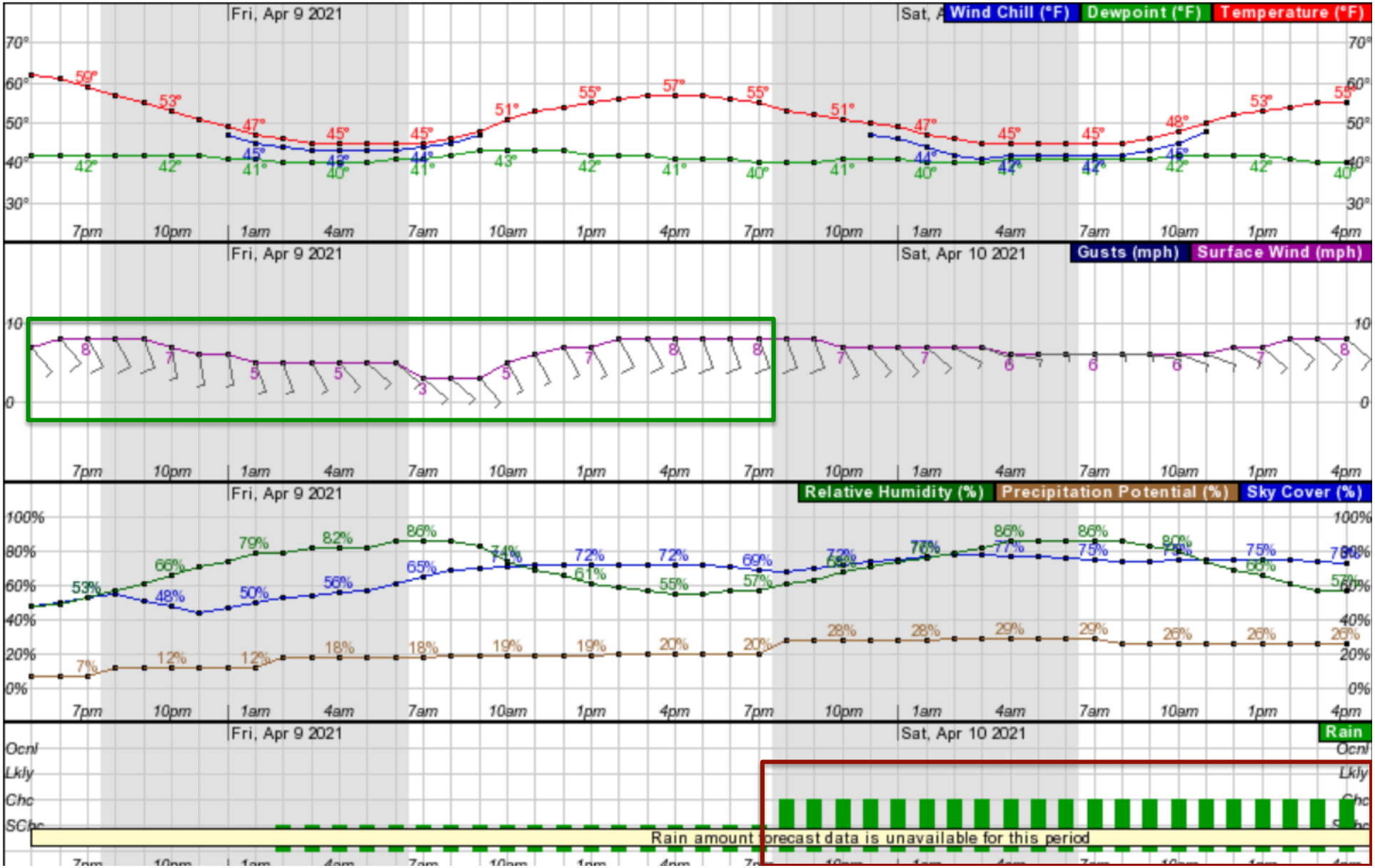
Very low N winds 3 – 5 mph over Wednesday & Thursday with good drying time



High rH (Good Adhesion
SlowDry time)

South wind 2-3 mph

Increasing chance for rain

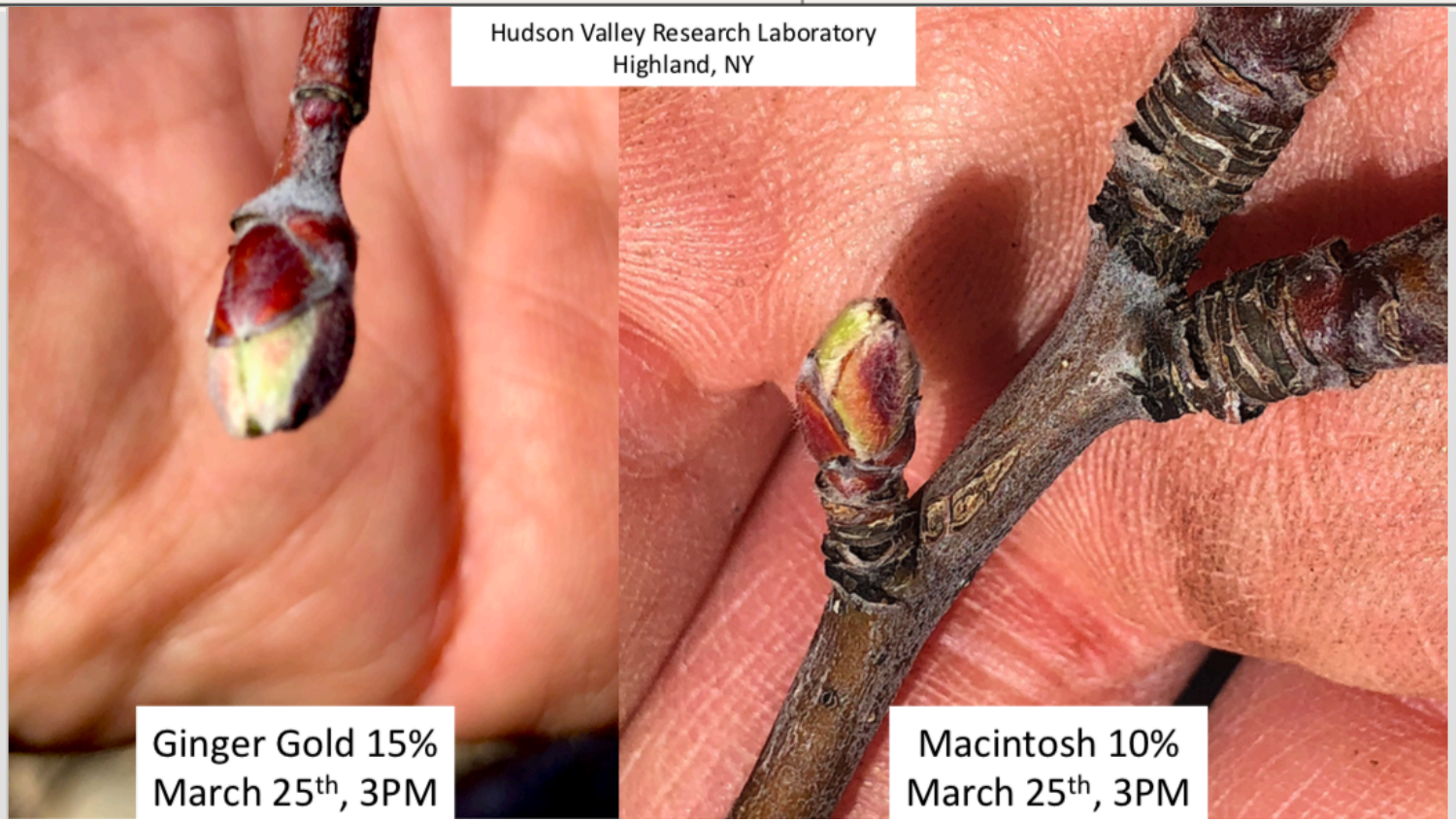


NEWA Network for Environment and Weather Applications

Highland, NY
HVRL

Apple Scab Infection Events (March 1 - April 4)

Start Date & Time	End Date & Time	Wet Hours	Temp Avg. (F)	Rain (in.)	Combined Event
March 31 2:01 PM	April 1 1:00 PM	20	48	0.20	Yes
March 28 10:01 AM	March 29 2:00 AM	14	50	1.17	Yes
March 24 3:01 PM	March 26 8:00 AM	28	53	0.49	Yes
Dry conditions last 223 hours at download			Download Time: 4/4/2021 17:00		



NEWA Network for Environment and Weather Applications

Apple Scab Results for Highland HVL 2

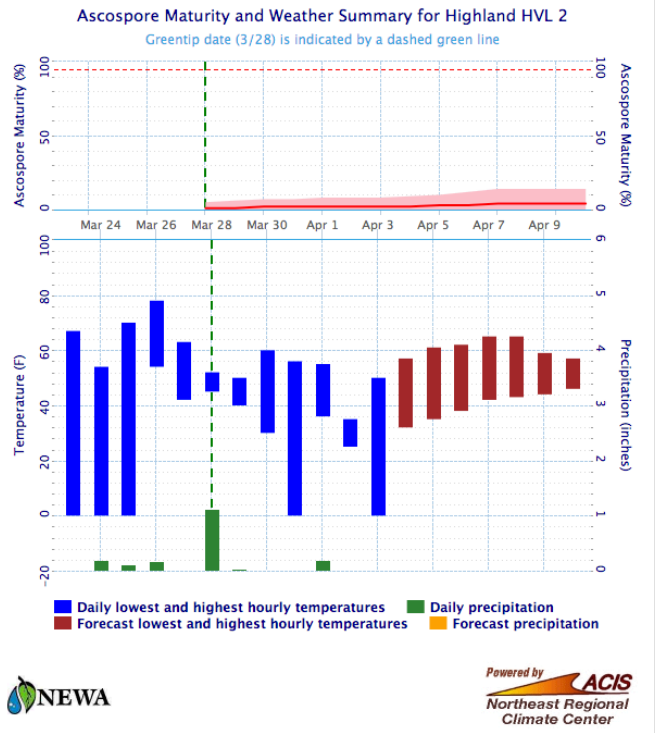
The Ascospore Maturity degree day model begins at 50% green tip on McIntosh flower buds. To recalculate ascospore maturity for your orchard, enter your green tip date:

Green Tip Date: 3/28/2021 Click if greentip has not occurred

Ascospore Maturity Summary

	Past	Past	Current	5-Day Forecast Forecast Details				
Date	4/2	4/3	4/4	4/5	4/6	4/7	4/8	4/9
Ascospore Maturity	2%	2%	2%	3%	3%	4%	4%	4%
Daily Ascospore Discharge	0%	0%	0%	0%	0%	0%	0%	0%
Cumulative Ascospore Discharge	2%	2%	2%	2%	2%	2%	2%	2%

Ascospore Maturity Graphs



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Ascospore Maturity Graphs

Infection Events Summary

	Past	Past	Current	5-Day Forecast Forecast Details				
Date	4/2	4/3	4/4	4/5	4/6	4/7	4/8	4/9
Infection Events	No	No	No	No	No	No	No	No
Average Temp (F) for wet hours	-	-	-	48	48	49	51	47
Leaf Wetness (hours)	0	0	0	2	2	2	2	3
Hours ≥90% RH	0	0	0	0	0	0	0	2
Rain Amount	0.00	0.00	0.00	0.00	0.00	Night 5% Day 7%	Night 10% Day 21%	Night 29% Day 30%

Mildew (Ruby Frost, Ginger Gold) ??

Begin mgt. at ight cluster and pink applications
Microthiol Sulfur at 5 lb/A
or Rally at 5-6 oz/A. Rally may not work well if they have DMI-resistant mildew.

The most critical sprays for mildew are PF, 1st and 2nd cover. With high mildew pressure, use one of the SDHI fungicides.

Merivon may be one of the most effective SDHI's against mildew, although Luna Sensation would also work well. Under high pressure, use at least two applications of one of these starting when terminal shoots are about 2 inches long.

Merivon and Luna Sensation are both package mixes that contain both an SDHI and a QoI, so a single application of either one of those counts as one SDHI spray plus one QoI spray of 4 total apps allowed.

Rotate with Sulfur to alternate for resistance mgt. (Microthiol Sulfur contains bentonite clay providing longer residual)

Fire blight is the most devastating bacterial disease of apples, pears and crabapples, caused by a gram negative bacteria called *Erwinia amylovor*.

2020 was year with ideal conditions for fireblight. Hail damage to trees contributed to the spread of the disease.

Prunning and removal of infected wood with cankers during winter will reduce innoculum in the orchard.

A “delayed-dormant” application of copper at silver tip will help reduce inoculum of fire blight in cankers and apple scab in buds. Applications resulting in 2lbs. actual copper / A, such as a high (>15%) metallic copper equivalent (MCE) copper fungicide (e.g. Badge, Kocide, Cuprofix) should be used in orchards with fireblight strikes in 2020. This will also reduce overwintering apple scab.

https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/f/3191/files/2021/04/2021_HVRL_Scouting-Report-4.4.21.pdf

2021 Hudson Valley Research Lab Scouting Report

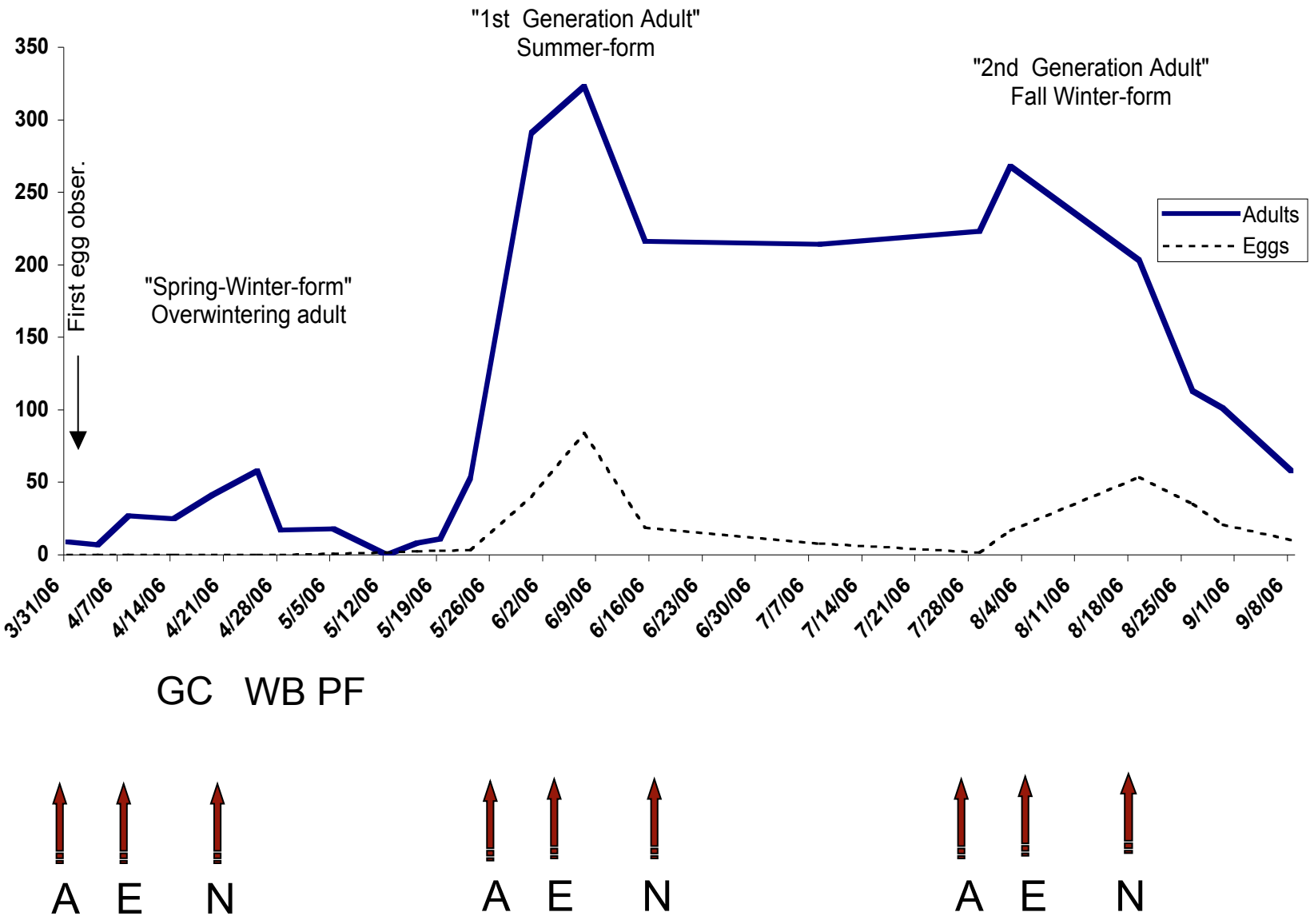
Cornell AgriTech Entomology Department, Highland, NY

Date	Baskerville-Emin (BE) DD Accumulations (previous day NEWA) 43 F	50 F	# / trap / day (pheromone trap)	Field Observations / Trap Catches / Models
3/22	44.2	17.9		Degree day accumulations beginning 1 January,
			0.0	Speckled Green Fruitworm (SGFW) (0/0)
			0.5	Redbanded Leafroller (RBLR) (0/1)
			0.0	Spotted Tentiform Leafminer (STLM) (0/0)
			0.0	Oriental Fruit Moth (OFM) (0/0)
			0.0	Lesser Apple Worm (LAW) (0/0)
			0.0	Psylla eggs / bud (0 egg / 25 buds)
			0.93	Weekly Rainfall
			1.20	Total Rainfall (Since 1 March, 2021)

Crop	Cultivar	Rootstock	Stage (%)	
Apple			*Dormant*	*Silver Tip*
	Zestar	M9	21	79
	Jersey Mac	M9	24	76
	Cortland	M9	31	59
	McIntosh	M26	17	83
	Red Chief	M26	24	76
	Ginger Gold	M26	21	79
	Smoothie	M26	40	60
	Empire	M9T337	22	78
	Gala	B9	32	68
	Honey Crisp	Nic29	51	49
Pear			*Dormant*	*Swollen Bud*
	Bartlett		48	52
	Bosc		58	42

Date	Baskerville-Emin (BE) DD Accumulations (previous day NEWA) 43 F	50 F	# / trap / day (pheromone trap)	Field Observations / TrapCatches / Models
3/24	114.8	25.8		Degree day accumulations beginning 1 January,
			0.2	Psylla eggs / bud (8 egg / 50 buds)

Pear Psylla Adult Vacuum Sweeps & Egg Counts in Untreated Bartlett Pear
Hudson Valley Lab. Highland, NY



Evaluations of insecticide schedules against summerform pear psylla adults on Bartlett pear[1]. Hudson Valley Lab., Highland, N.Y.-2005.

Treatment	Formulation amt./100 gal.	Application Dates	7/8 nymphs[1]	7/18 nymphs[1]	% Reduct. nymphs[1]
Actara 25WP	1.4 oz.	14 July	2.1 abc	1.0 cd	52.3
AgriMek Damoil	2.5 oz. 32.0 oz.	14 July	6.3 d	1.3 d	79.5
Asana XL Incite	5.8 oz. 2.0 oz.	14 July	1.2 a	0.1 a	94.4
Assail 70WP	0.85 oz.	14 July	1.8 ab	0.4 b	79.2
Warrior	1.71 oz.	14 July	5.0 bcd	1.8 de	64.1
Asana XL	5.8 oz.	14 July	5.5 cd	2.8 ef	50.0
Colloidal soap	1 gal.	14 July	1.1 a	0.9 ab	20.0
Damoil	32.0 oz.	14 July	0.9 a	2.3 b	- 172.0
Damoil	0.5 gal.	14 July	1.8 a	0.8 ab	57.2
Damoil	1.0 gal.	14 July	0.8 a	0.2 a	80.4
Untreated	-		6.6 d	4.1 f	36.8

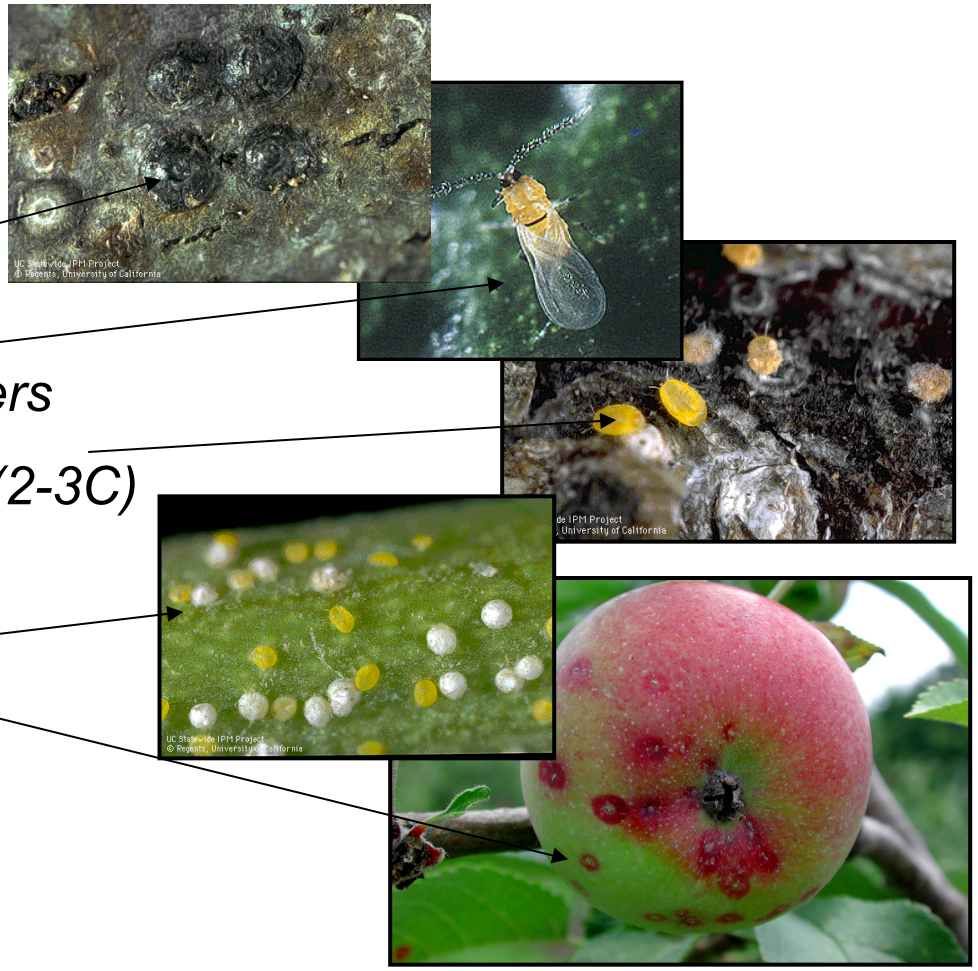
San Jose Scale (SJS)
Biology

- *OW on bark as 'black-cap'.*
- *Adult males emerge and mate.*
- *Do not lay eggs - produce live crawlers*
- *Crawlers appear 4-6 wk post bloom (2-3C)*

310 DD from adult flight.

500 DD_{50} from 1 March

- *'White cap' → 'Black cap'*



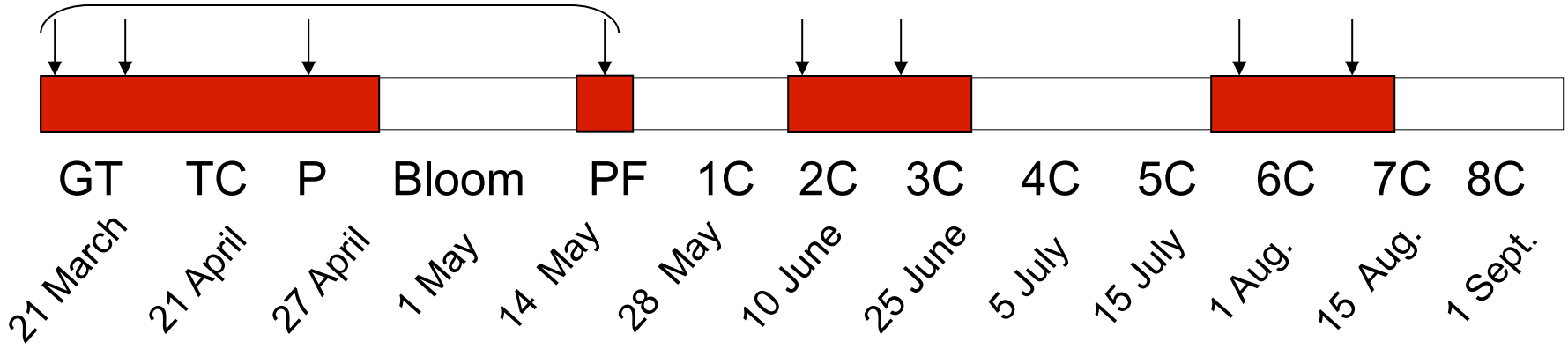
San Jose Scale - Management

Spring applications: Made from Dormant to Pink and PF against black cap phase.

Early Summer, 1st Gen. : Use pheromone traps to determine Male emergence = biofix. Nymphs emerge after 310 DD from biofix or 500 degree days (base 50F) since March 1 (crawler emergence on +/- 20 June)

Mid Summer, 2nd Gen. : Male emergence biofix. Nymphs emerge after 310 DD. Applications should be made prior to 2nd gen. nymph emergence. Late July and a second mid August. (1451DD$_{50}$ 1 March).

In summer 2 applications are required for complete control of each generation of crawlers.



Pre-bloom

Evaluation of insecticides for controlling San Jose scale on apple,
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-2005

Treatment	Quantity	Timing	% mortality per # of days post application 7 d	14 d	21 d	45 d	% Infested Fruit
1. Damoil	3.0 gal. / 100	GT	100.0 c	100.0 c	100.0 c	100.0 c	0.0 a
2. Damoil	2.0 gal. / 100	HIG	100.0 c	100.0 c	100.0 c	100.0 c	0.9 a
3. Lorsban 4E	1.0 pt. / 100	HIG	100.0 c	100.0 c	100.0 c	100.0 c	3.0 ab
4. Esteem	1.25 oz./ 100	HIG	48.5 b	41.3 b	37.5 a	59.4 b	1.4 ab
5. Assail	1.25 oz./ 100	HIG	51.6 b	44.6 b	78.4 b	99.9 c	31.2 bc
9. Untreated	-	-	2.7 a	23.0 a	37.5 a	34.9 a	95.9 d

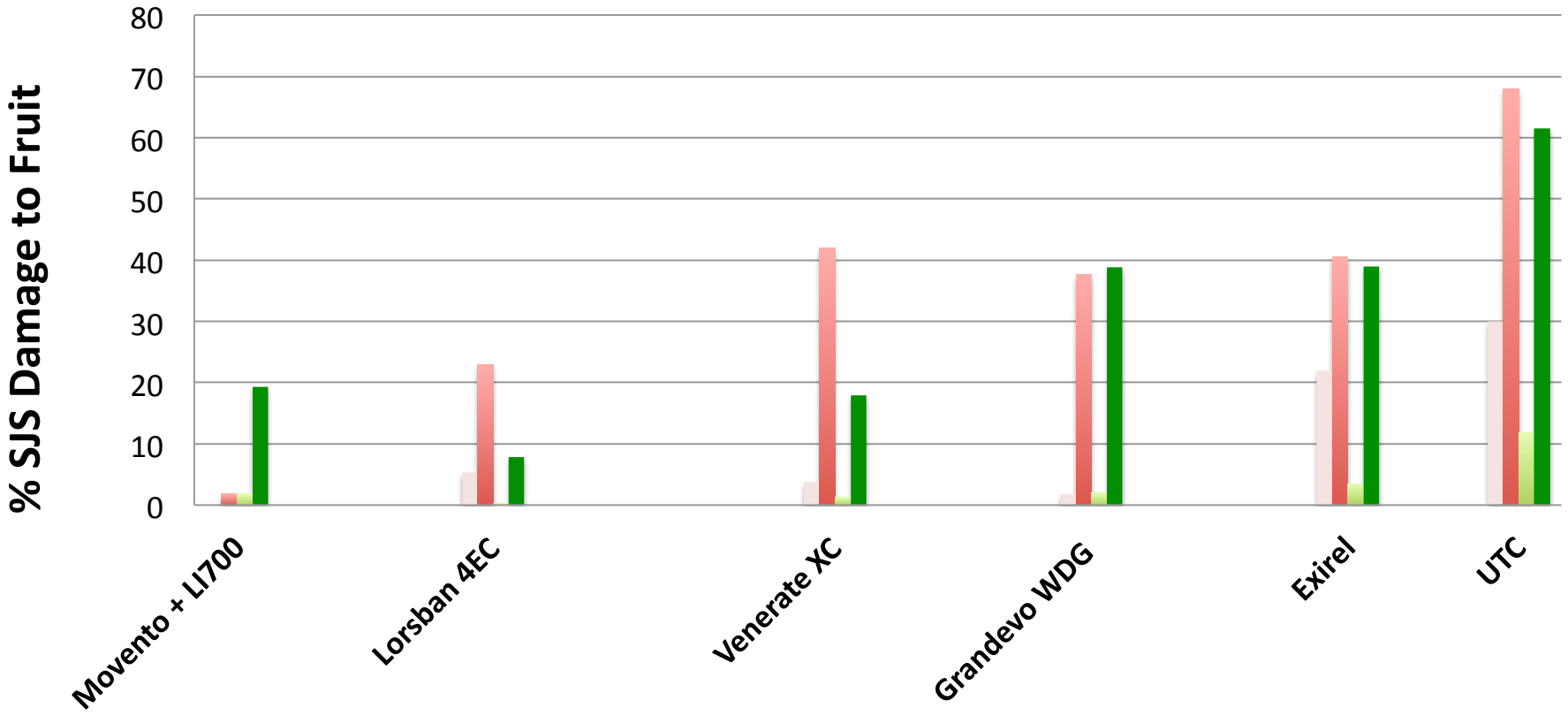
GT on 4 April
HIG on 7 April

Marrone Bio Innovations

% San Jose Scale Fruit Injury
1st & 2nd Gen. HVRL, 2017

Red Delicious 16th June 21st Sept.

Ginger Gold 16th June 31st July



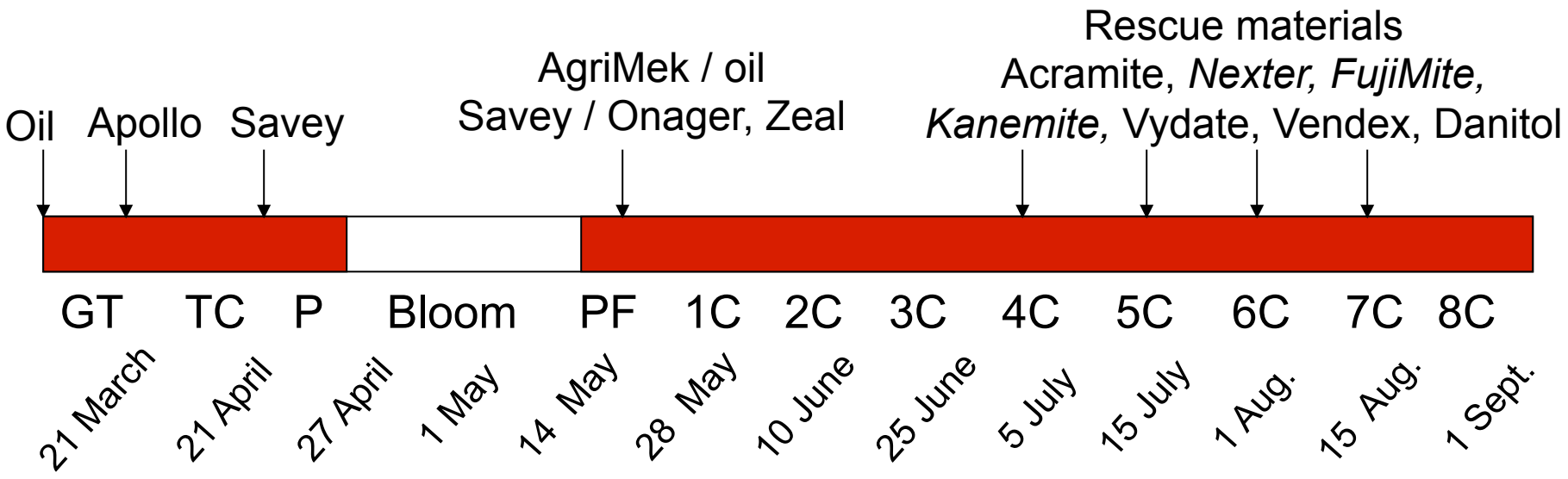
European Red & Two Spotted Spider Mite (ERM & TSSM)

- Endemic yet move within the orchard
- Feeding reduces photosynthesis

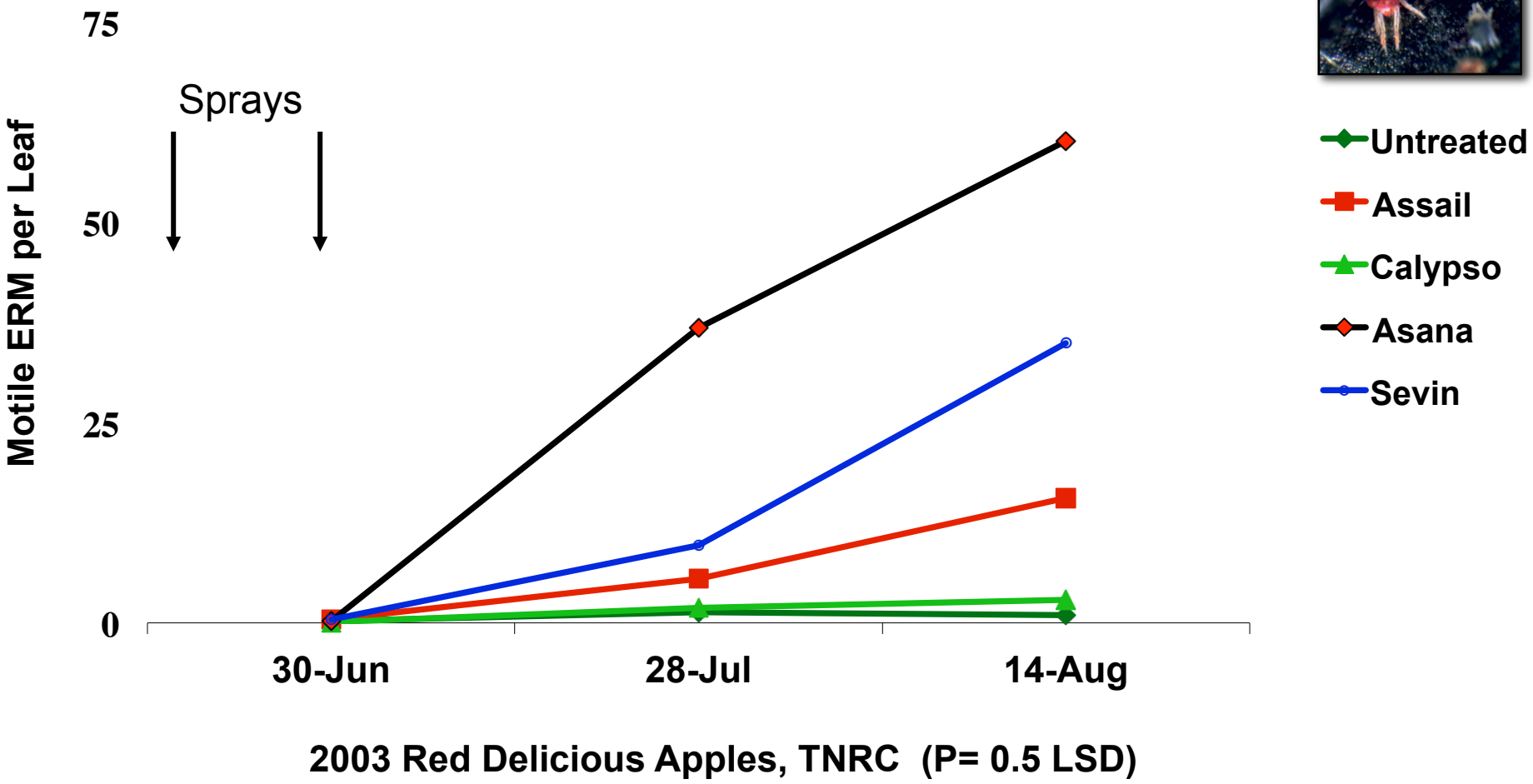
return bloom, fruit size, quality, color, pre-mature drop of fruit & leaves

- OW as fertilized eggs
- Egg hatch >50% complete @ pink; 100% by end of bloom
- Reproduction both sexual and parthnogenetic

  Fertilized = both sexes; Unfertilized = *males only*

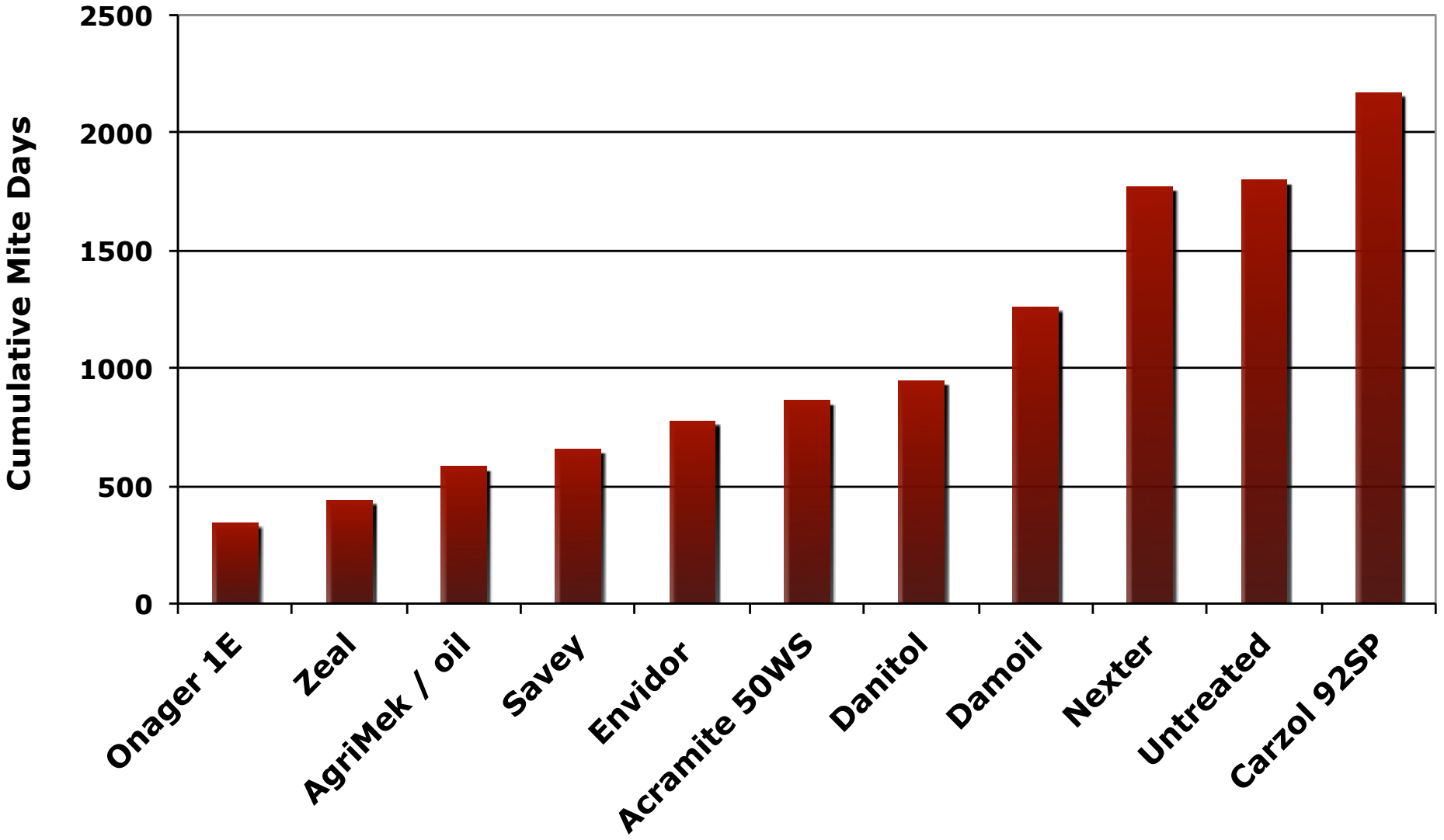


Mite Flaring Potential of Apple Insecticides*



*John Wise - Michigan State

Evaluation of Miticides to Manage Cumulative European Red Mite Days on Red Delicious Apple. Campbell Hall, NY - 2007



Single Application on 19 May @ highest labeled rate / product

Tarnished Plant Bug Injury to Gala (>10%)

- TPB often begin feeding to buds after 2d @ 70F bloom
- 3 timings targeting TPB beginning at TC, P, PF
- Beleaf (anti-feedent)
- Pyrethroid / Pyrethroid premix with neonicotinoids

3A	Ambush 25WP	6.4-25.6 oz/acre	PF	12	High	
3A	*Asana XL 0.66EC	4.8-14.5 fl oz/acre 2-5.8 fl oz/100 gal water	21	12	High	
3A	*Baythroid XL 1EC	2-2.4 fl oz/acre	7	12	High	
3A	*Danitol 2.4EC	10.67-16 fl oz/acre	14	24	High	
3A	*Pounce 25 WP	6.4-16 oz/acre	PF	12	High	
3A	Warrior II 2.08CS	1.28-2.56 fl oz/acre	21	24	High	
9C	Beleaf 50SG	2-2.8 oz/acre	21	12	High	
22	Avaunt 30WDG	5-6 oz/acre	14	12	Moderate	
3A/6	*Gladiator EC	19 fl oz/acre 4.75 fl oz/100 gal water	28	12	High	Zeta-cypermethrin/ Avermectin B1
3A/28	*†Besiege	6-12 fl oz/acre	21	24	High	Chlorantraniliprole/ Lambda-cyhalothrin
4A/3A	*†Endigo ZC	5-6 fl oz/acre	35	24	High	Thiamethoxam/ Lambda-cyhalothrin
4A/3A	*Leverage 360	2.4-2.8 fl oz/acre	7	12	High	Beta-Cyfluthrin/ Imidcloprid

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