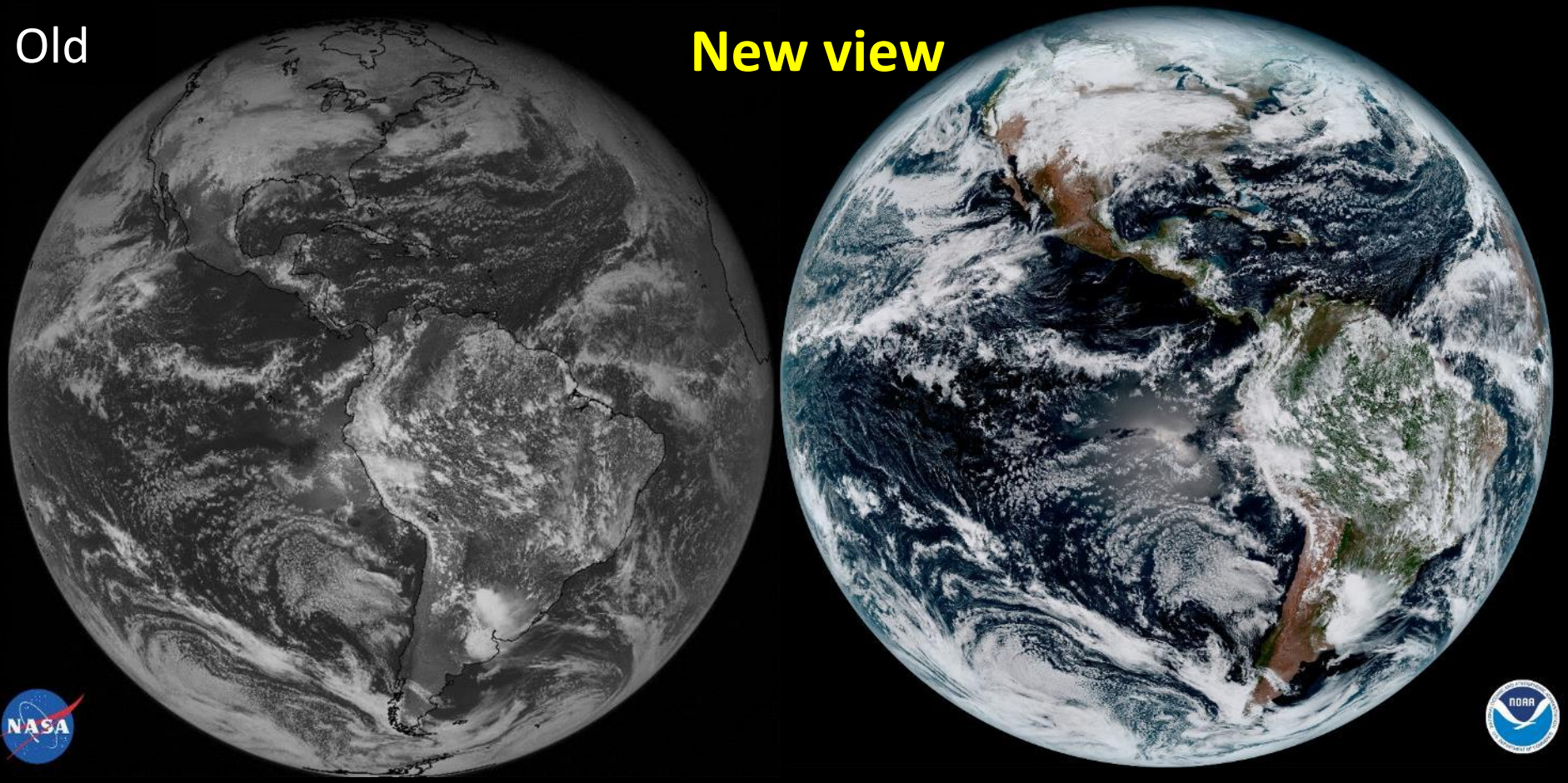
Ag-Radar - a low-cost, easy-to-use, flexible, & powerful platform for weather data in farm decisions

Northeastern IPM Center
February 18, 2025
Glen Koehler, glen.koehler@maine.edu
University of Maine Cooperative Extension
Pest Management Unit

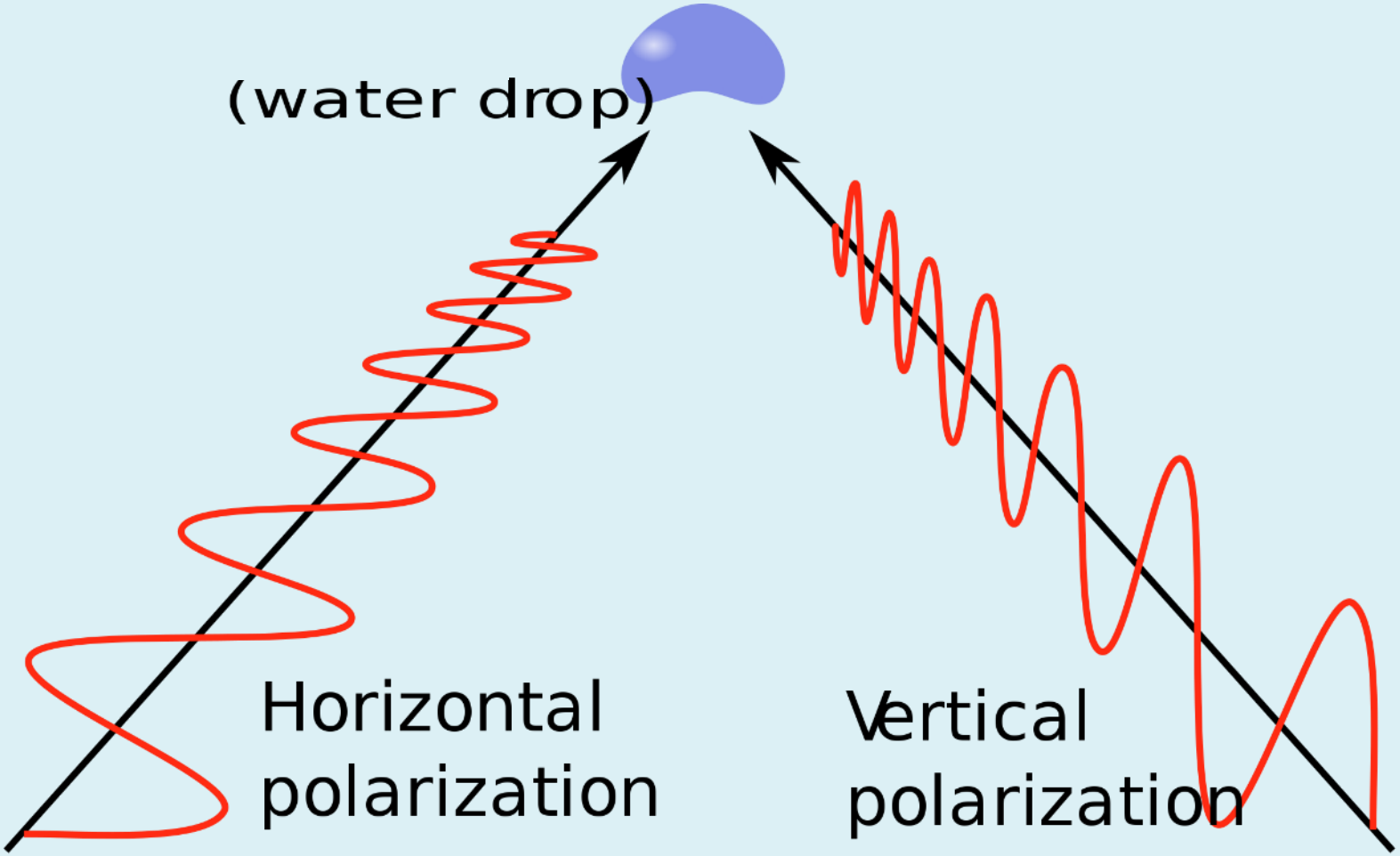
1865 THE UNIVERSITY OF MAINE Cooperative Extension



New generation satellites
started in 2018

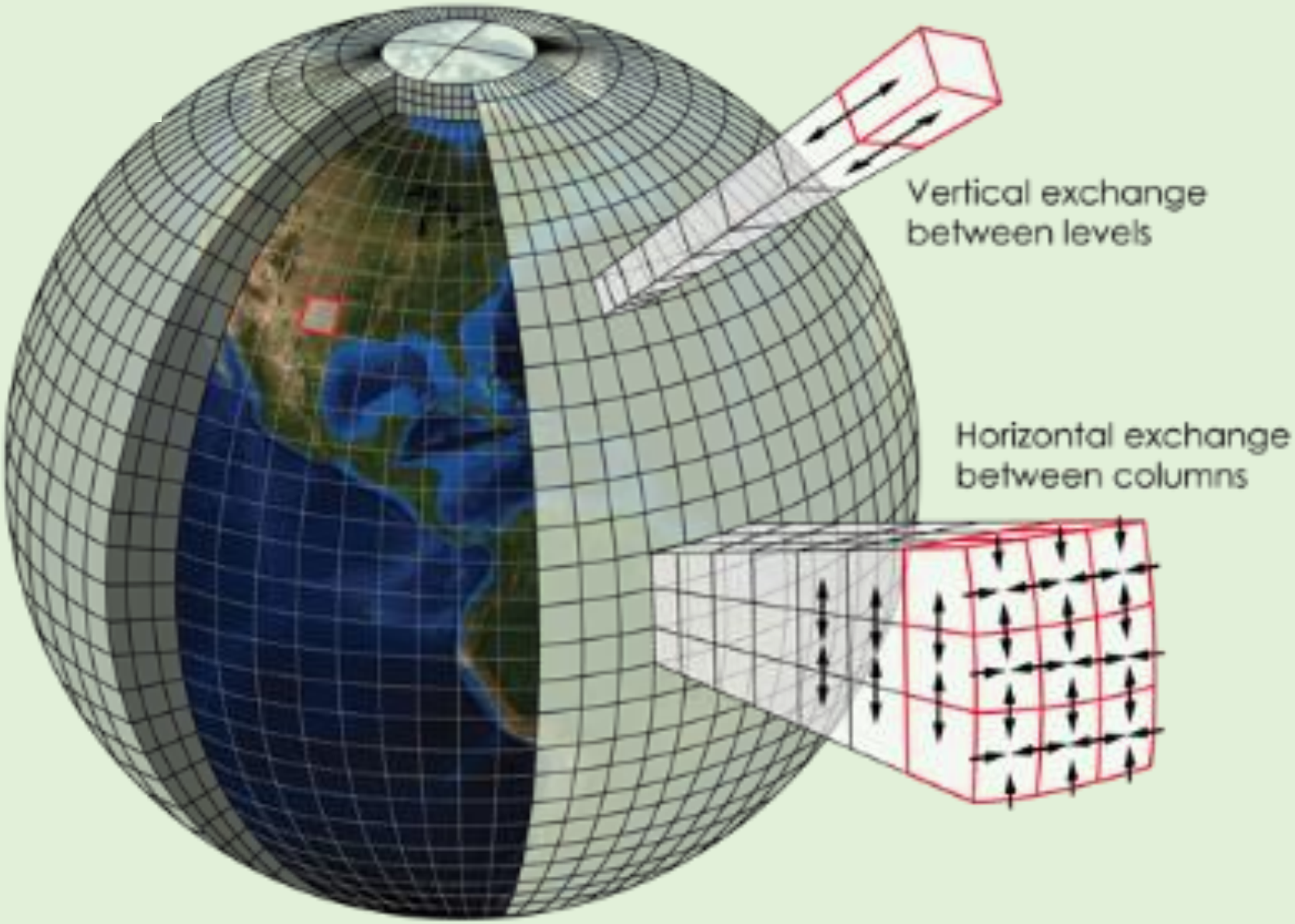
5X faster, 4X resolution, 3X channels

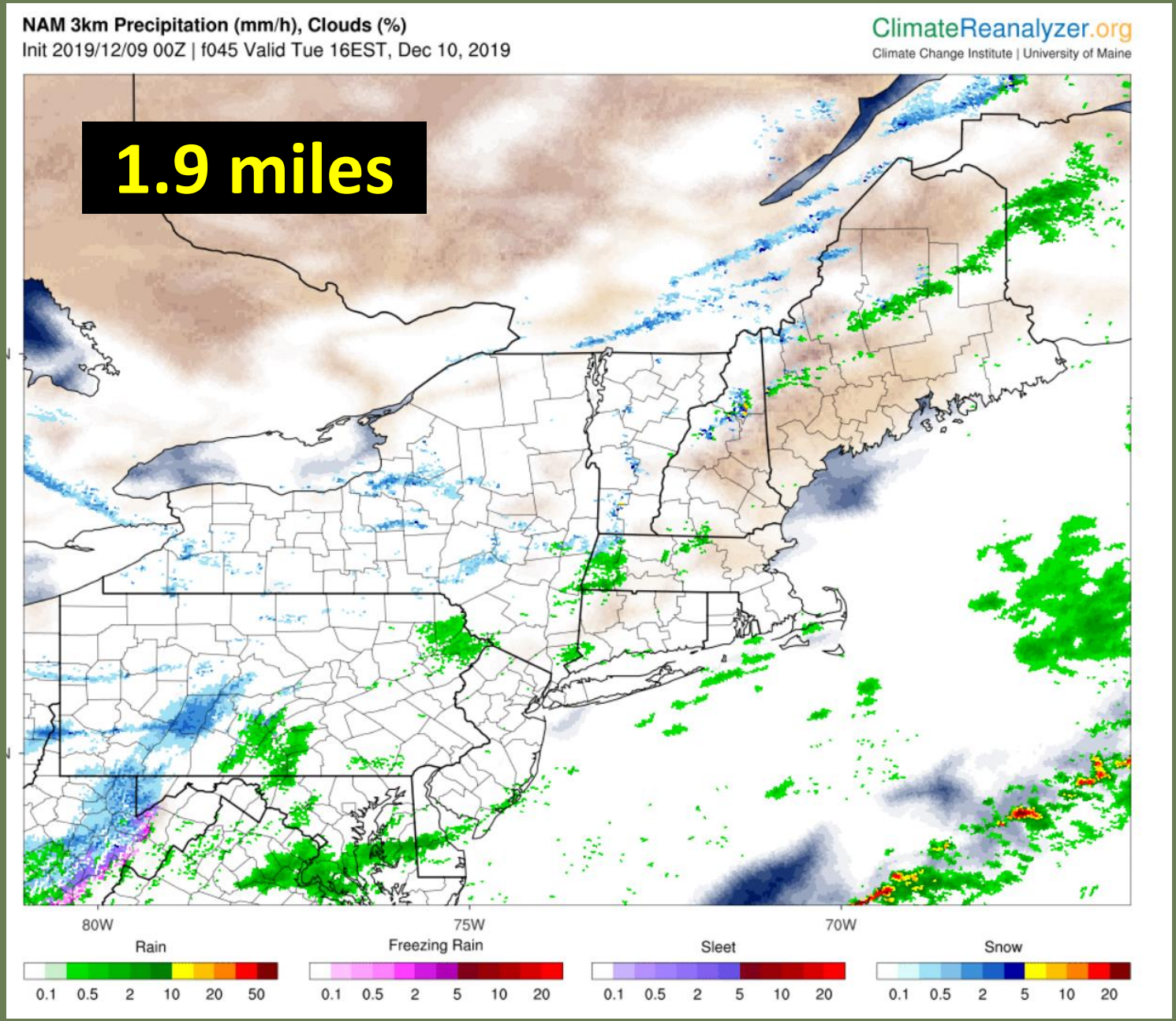
Dual Polarized Doppler Radar

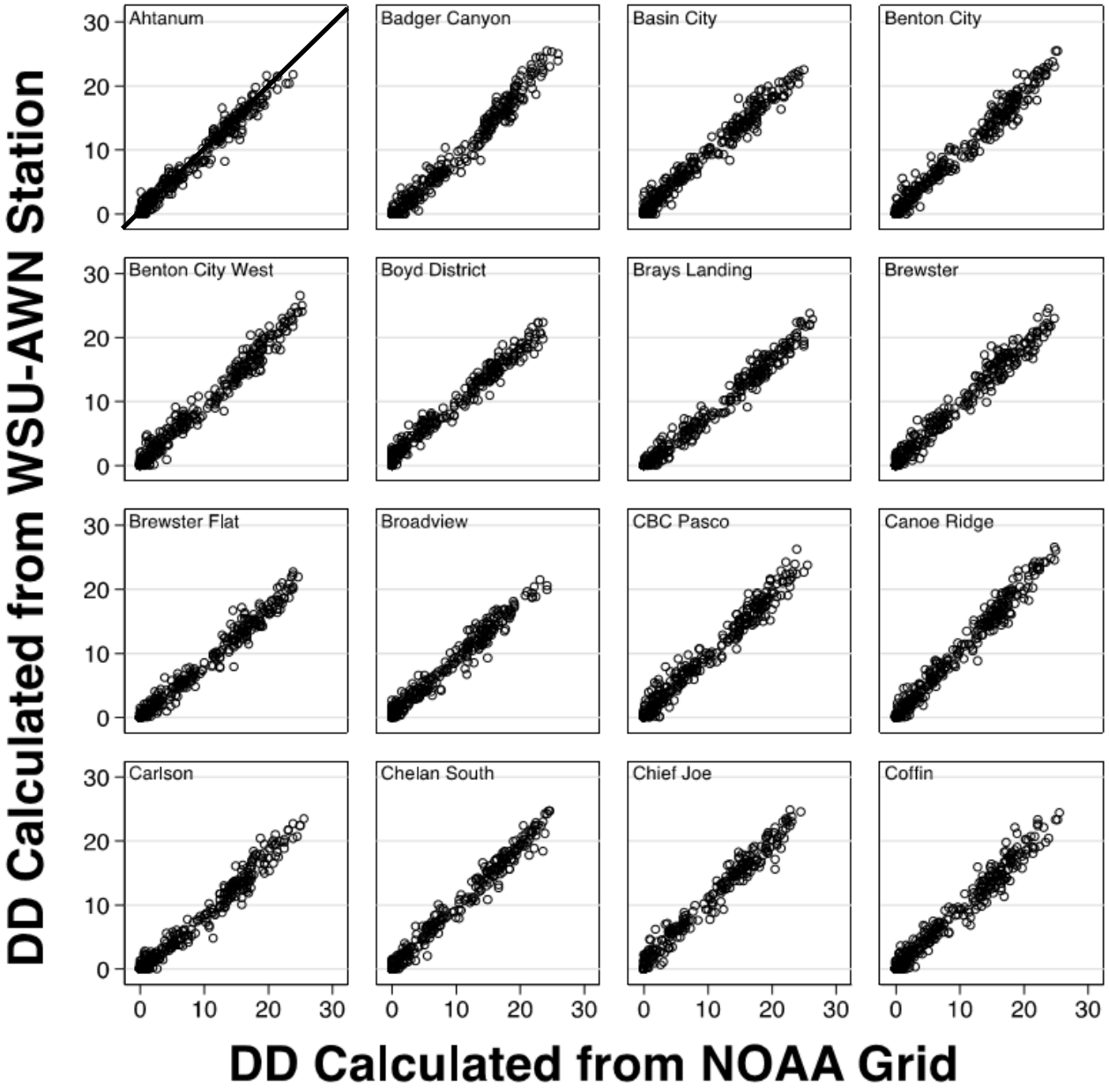


Precipitation Type & Accumulation

Wikpedia: https://en.wikipedia.org/wiki/Weather_radar#Polarization


Vertical exchange
between levels
Horizontal exchange
between columns


NAM 3km Precipitation (mm/h), Clouds (%)
Init 2019/12/09 00Z | f045 Valid Tue 16EST, Dec 10, 2019
ClimateReanalyzer.org
Climate Change Institute | University of Maine
1.9 miles
80W
75W
70W
Rain
0.1 0.5 2 10 20 50
Freezing Rain
0.1 0.5 2 5 10 20
Sleet
0.1 0.5 2 5 10 20
Snow
0.1 0.5 2 5 10 20



NDFD
- 3-mile grid Forecast in mountain terrain

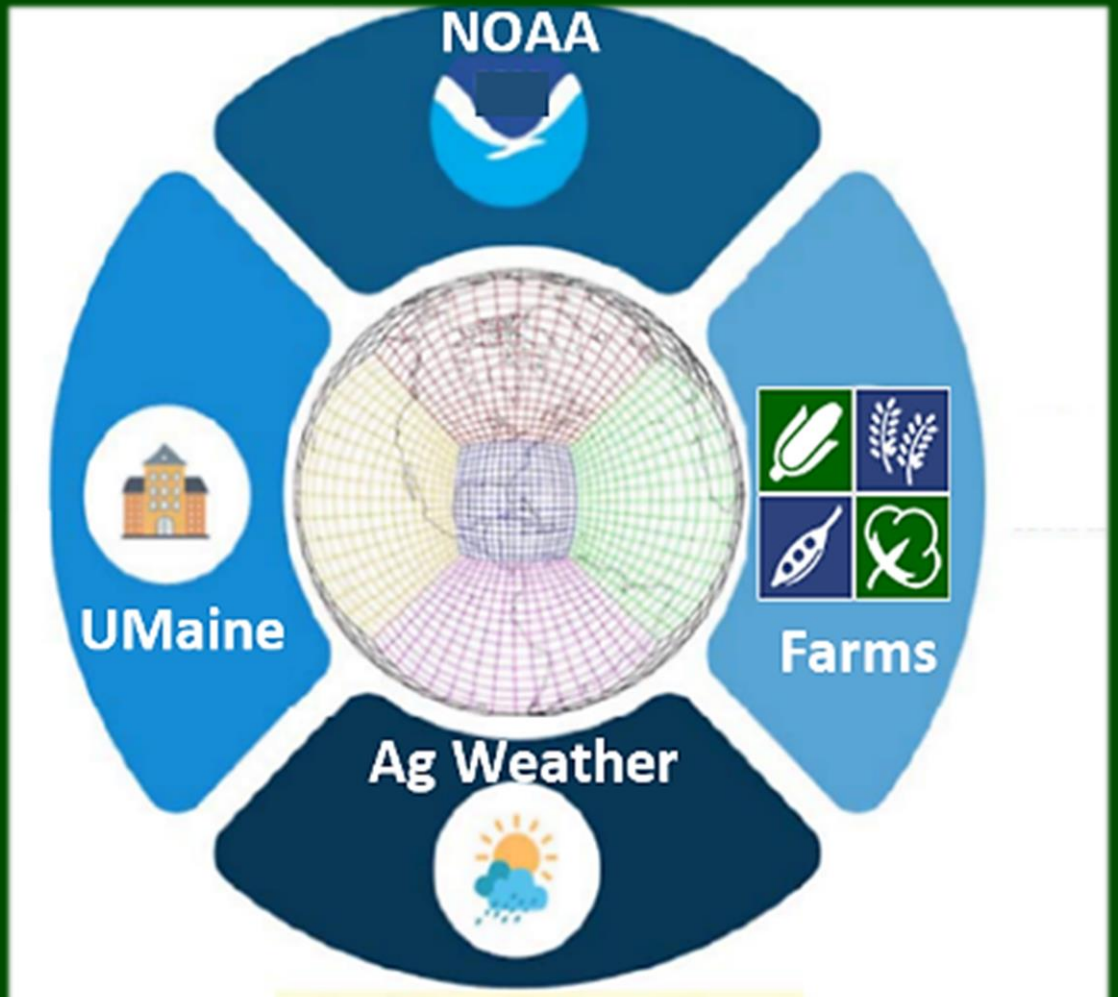
vs.

On-site observations (instrument estimates)

Washington State University Ag Weather Network
Jones & Chambers, 2015

“It is clear that the NDFD data hold great promise for use as virtual weather stations.”

Washington State University Ag Weather Network
Jones & Chambers, 2015



AgEye Weather

AgEye Weather

Location
(View Map)

Acton

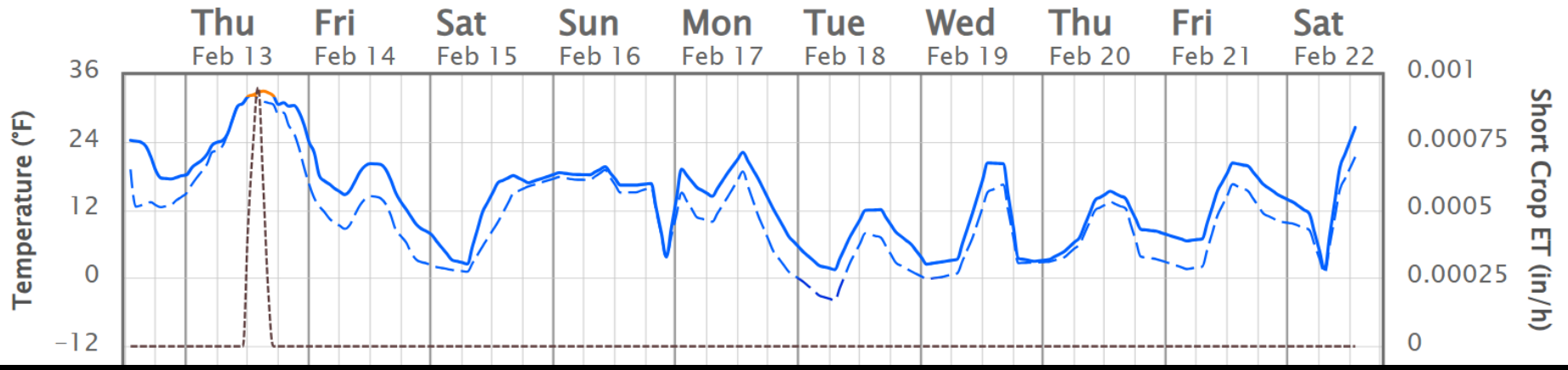
Forecast Start

2025-02-12-18z

Thu 2/13	**Fri** 2/14	**Sat** 2/15	**Sun** 2/16	**Mon** 2/17
33 °F	20 °F	18 °F	17 °F	22 °F
18 °F	15 °F	3 °F	18 °F	14 °F
0.6 in	0.0 in	0.1 in	1.0 in	0.0 in
Wind 8 mph	Wind 17 mph	Wind 4 mph	Wind 9 mph	Wind 17 mph
Gust 30 mph	Gust 46 mph	Gust 25 mph	Gust 34 mph	Gust 49 mph
SE	W	SW	E	W

AgEye Weather 10-day Forecast
Acton (43.53°N ,70.91°W)

Export Chart



AgEye Email Report Deliveries

Weather variables:

Hourly air temperature.
Daily max. & min. temp.
Surface temperature.
2” and 10” soil temp.
Dewpoint temperature.
Apparent temperature
(heat index & wind chill).
Precipitation amount.
Chance of precipitation.
Leaf wetness.
Relative humidity.
Wind speed.
Wind gusts.
Wind direction.
Cloud cover.
Evapotranspiration.
Soil moisture % at 0 – 4”.
Soil moisture % at 4 – 16”.
Air pressure.
Potential evaporation.
Solar radiation (absolute and % of full sunlight shortwave down.)
Upward shortwave, down & up longwave radiation.
Ground heat flux.
Additional values available.

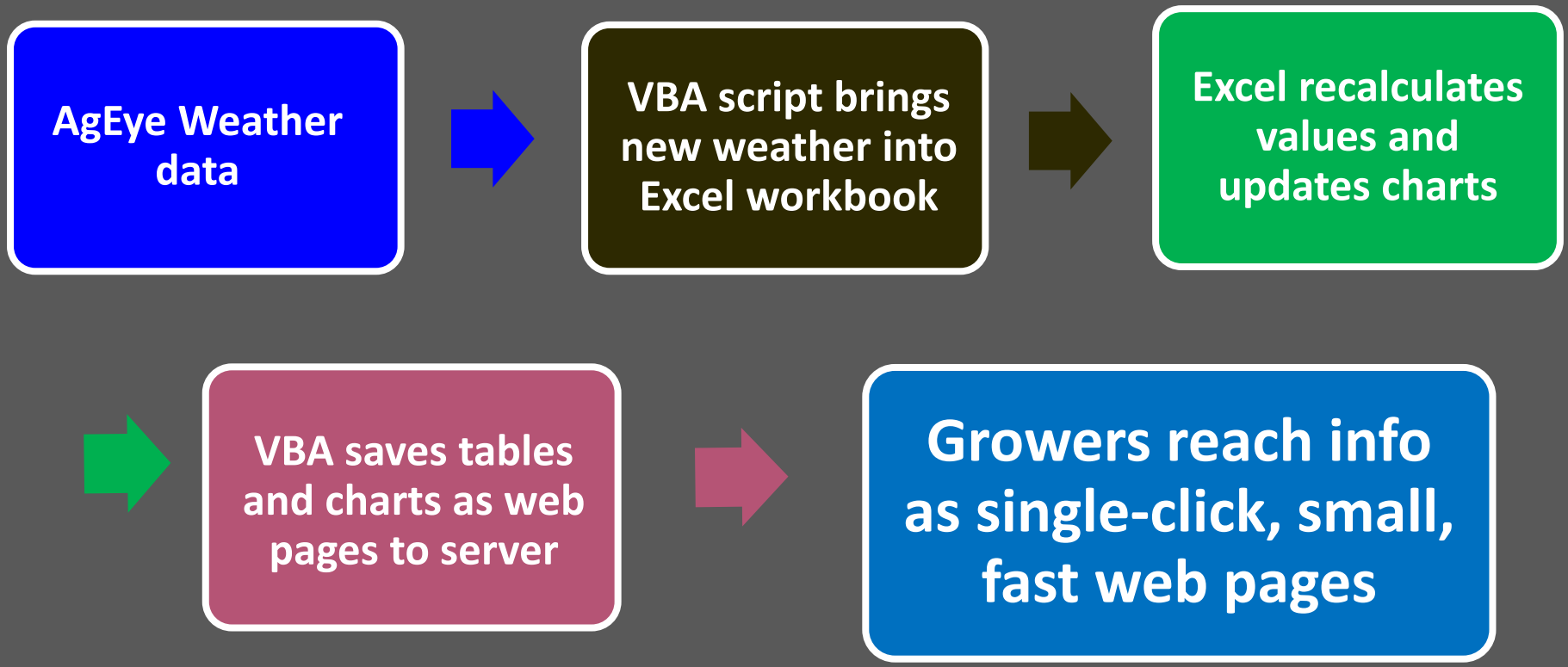
+ Daily Forecast and Observation tables

48-hour Forecast	<--- Tue Sep 10 ---------->								<--- Wed Sep 11 ---------->							
Time (EDT)	12a	3a	6a	9a	12p	3p	6p	9p	12a	3a	6a	9a	12p	3p	6p	9p
Air Temp (°F)	49	43	40	52	62	66	62	56	56	56	56	63	71	75	71	65
Apparent Temp (°F)	49	43	40	52	62	66	62	56	56	56	56	62	72	76	72	66
Dewp Temp (°F)	46	43	40	45	46	47	49	49	50	52	54	62	65	69	69	64
2in Soil Temp (°F)	56	53	51	51	55	58	58	57	56	55	55	55	57	58	59	59
Rel Hum (%)	92	100	100	79	54	50	60	77	83	89	93	95	81	82	92	97
3h Precip (in)	0	0	0	0	0	0	0	0	.10	.16	0	0	0	.05	.05	.06
3h Precip Prob (%)	0	0	0	0	0	0	0	0	92	91	0	0	0	54	83	75
Wind Speed (mph)	0	0	0	0	1	2	3	4	5	5	7	7	5	7	5	4
Gust (mph)	0	1	1	0	2	4	7	8	10	10	12	18	11	13	16	7
Wind Direction	NW	N	N	N	NE	E	SE	S	S	S	S	SW	SW	SW	S	SW
Cloud Cover	FEW	FEW	FEW	FEW	FEW	SCT	CDY	CDY	OVC	OVC	OVC	OVC	CDY	SCT	CLE	CLE
3h Solar Rad (W/m^2)	0	0	0	432	760	562	64	0	0	0	0	165	375	546	183	0
Solar Radiation (%)	99	99	99	99	99	97	81	55	39	27	32	28	46	95	99	99

Love makes the world go ’round

But weather makes the crops grow

Ag-Radar



4 update cycles per day

Nature
+ Human influence?

NOAA

Standard Weather reports

gap

What does it mean? - You're on your own

Grower ---->

Nature
+ Human influence?

NOAA

AgEye **AgRadar**

Grower

Diseases

Apple scab
Fire blight bacteria
Sooty blotch/Flyspeck

Apple models

* When to start/end protection
* Severity
* Re-spray dates
* Key monitoring dates

Apple models

Insect and Mites

- Plum curculio
- Codling moth
- Obliquebanded LR
- European red mite
- Apple maggot
- Leafminers
- White apple LH
- San Jose Scale
- Dogwood & Roundheaded Apple Tree borer

* When to start/end protection
* Severity
* Re-spray dates
* **Key monitoring dates**

Apple models

Weather

- Bud freeze potential
- Fruit Sunburn
- Spray conditions
  - Inversion indicator
- Weekly & Monthly weather archive
- Rain surplus or deficit
- Evapotranspiration, Soil moisture deficit
- Climatic averages

Apple models

Horticulture

- Pollinator Protection
- Thinning sensitivity
- Harvest Dates
- Preharvest Drop risk
- Storage & Fruit quality indicators

*** MAINE	*** CONNECTICUT
♣ ME-Monmouth (UMaine Highmoor Farm)	♣ CT-Southington
♣ ME-Auburn	*** MASSACHUSETTS
♣ ME-Cumberland Center	♣ MA-Amherst
♣ ME-Fairfield	♣ MA-Belchertown (UMass Cold Spring Orchard)
♣ ME-Gorham	♣ MA-Belchertown (Phoenix)
♣ ME-Hebron	♣ MA-Brookfield
♣ ME-Hope	♣ MA-Deerfield
♣ ME-Levant	♣ MA-Easthampton
♣ ME-Limerick	♣ MA-Groton
♣ ME-New Gloucester	♣ MA-Leominster – halted 11/1
♣ ME-Newport	♣ MA-Northboro
♣ ME-Old Town (UMaine Rogers Farm)	♣ MA-Westhampton
♣ ME-Presque Isle	*** NEW BRUNSWICK
♣ ME-Sabbatus	♣ NB-Fredericton – halted 10/3
♣ ME-Sanford	*** NEW YORK
♣ ME-Skowhegan	♣ Private sites: Geneva and Highland
♣ ME-South Bridgton	*** RHODE ISLAND
♣ ME-Sweden	♣ RI-Greenville
♣ ME-Thorndike	♣ RI-Middletown
♣ ME-Vassalboro	*** VERMONT
	♣ VT-Cornwall
	♣ VT-Dummerston
	♣ VT-South Burlington – halted 11/1 (UVM Hort. Farm)

Observed, Estimated, & Predicted growth stages. Diameters = pollinated King Fruit. Cutivar-specific bud freeze potential shown if >0%					Observed or Forecast 2 meter Temperature F	
Date Today's date highlighted	**Zestar**	**McIntosh** (Rogers Red)	**Honeycrisp** (NOT Premier)	**Golden Delicious**	**Minimum**	**Maximum**
Thu, Apr 11, 2024	Green Tip				39.0	45.1
Fri, Apr 12					41.7	56.7
Sat, Apr 13		**Green Tip**			40.7	56.5
Sun, Apr 14					37.1	59.0
Mon, Apr 15			**Green Tip**		37.4	62.4
Tue, Apr 16	QIG				33.1	59.9
Wed, Apr 17					31.2	56.5
Thu, Apr 18					32.3	56.2
Fri, Apr 19					41.4	54.9
Sat, Apr 20		**QIG**			41.8	53.4
Sun, Apr 21	HIG				32.7	54.0
Mon, Apr 22				Green Tip	32.6	50.8
Tue, Apr 23	<10%	**<10%**	**<10%**	<10%	**26.4**	56.8
Wed, Apr 24					30.3	54.6
Thu, Apr 25	<10%	**HIG <10%**	**QIG <10%**	<10%	**25.4**	50.0
Fri, Apr 26	<10%	**<10%**	**<10%**	QIG <10%	**25.8**	57.7
Sat, Apr 27	early TC <10%	**<10%**	**<10%**	<10%	**27.6**	62.7
Sun, Apr 28			**HIG**		39.5	53.4
Mon, Apr 29		**early TC**		HIG	47.1	68.0

* INSECTS *

INSECT DATES (CM, DWB, LAW, MPB, OFM, OBLR, RBLR, SJS, STLM, TPB, WAL)

Key life cycle and management dates

Plum Curculio – insecticide depletion Table

Plum Curculio – insecticide depletion Chart

Experimental only: Plum Curculio activity rating

Codling Moth insecticide depletion table: JUNE

Codling Moth insecticide depletion table: JULY

Codling Moth insecticide depletion table: AUGUST

Apple Maggot JULY monitoring & respray dates

Apple Maggot AUGUST monitoring & respray dates

* MITES *

European Red Mite (ERM) KEY DATES

ERM resample dates – JUNE

ERM resample dates – July&August

Mite thresholds

* FLYSPECK *

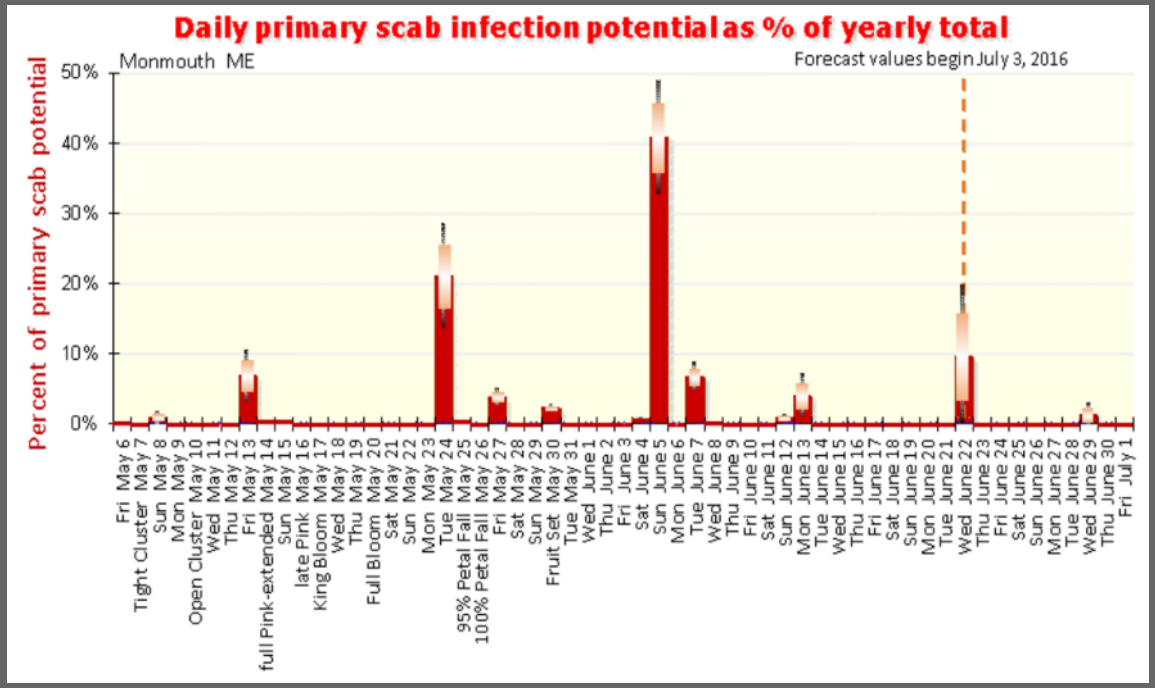
Background information for flyspeck estimates

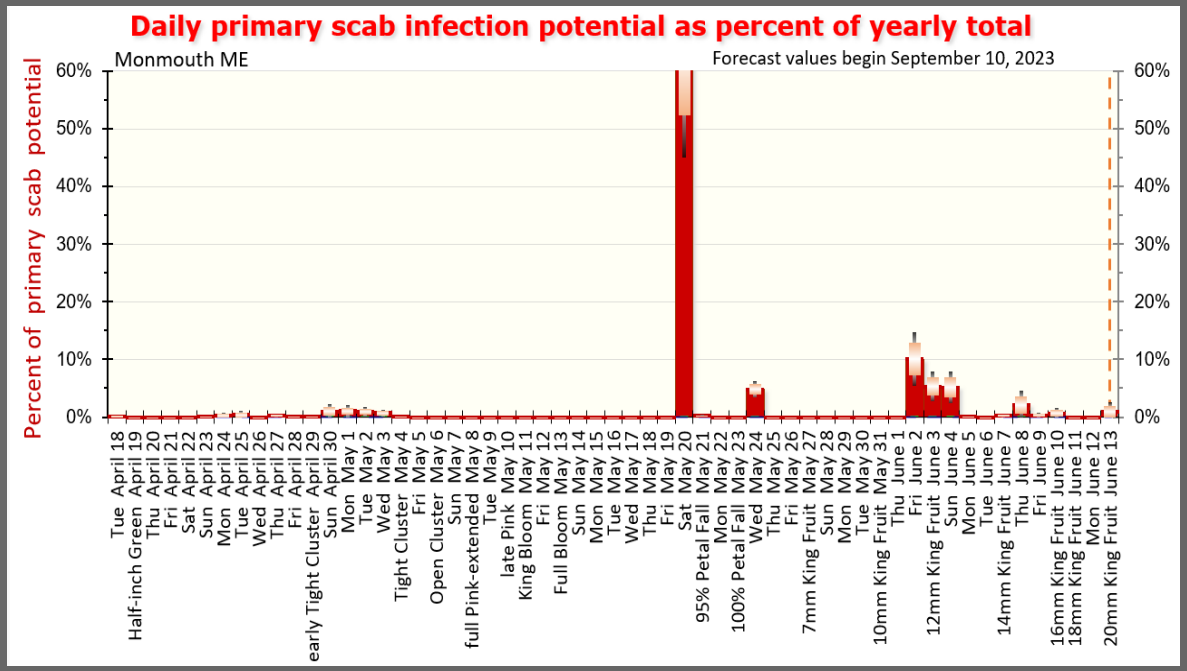
Flyspeck control with **Pristine** – 21 days or 2.5" rain protection
Flyspeck – Pristine – 1stCOVER through JUNE spray dates
Flyspeck – Pristine – JULY spray dates
Flyspeck – Pristine – AUGUST-SEPT. spray dates

Flyspeck control with **Group A fungicides** (Topsin M, Flint, Sovran, captan + phosphite)
- 21 days or 2.0" rain protection
Flyspeck – Group A fungicides – 1stCOVER through JUNE spray dates
Flyspeck – Group A fungicides – JULY spray dates
Flyspeck – Group A fungicides – AUGUST-SEPT. spray dates

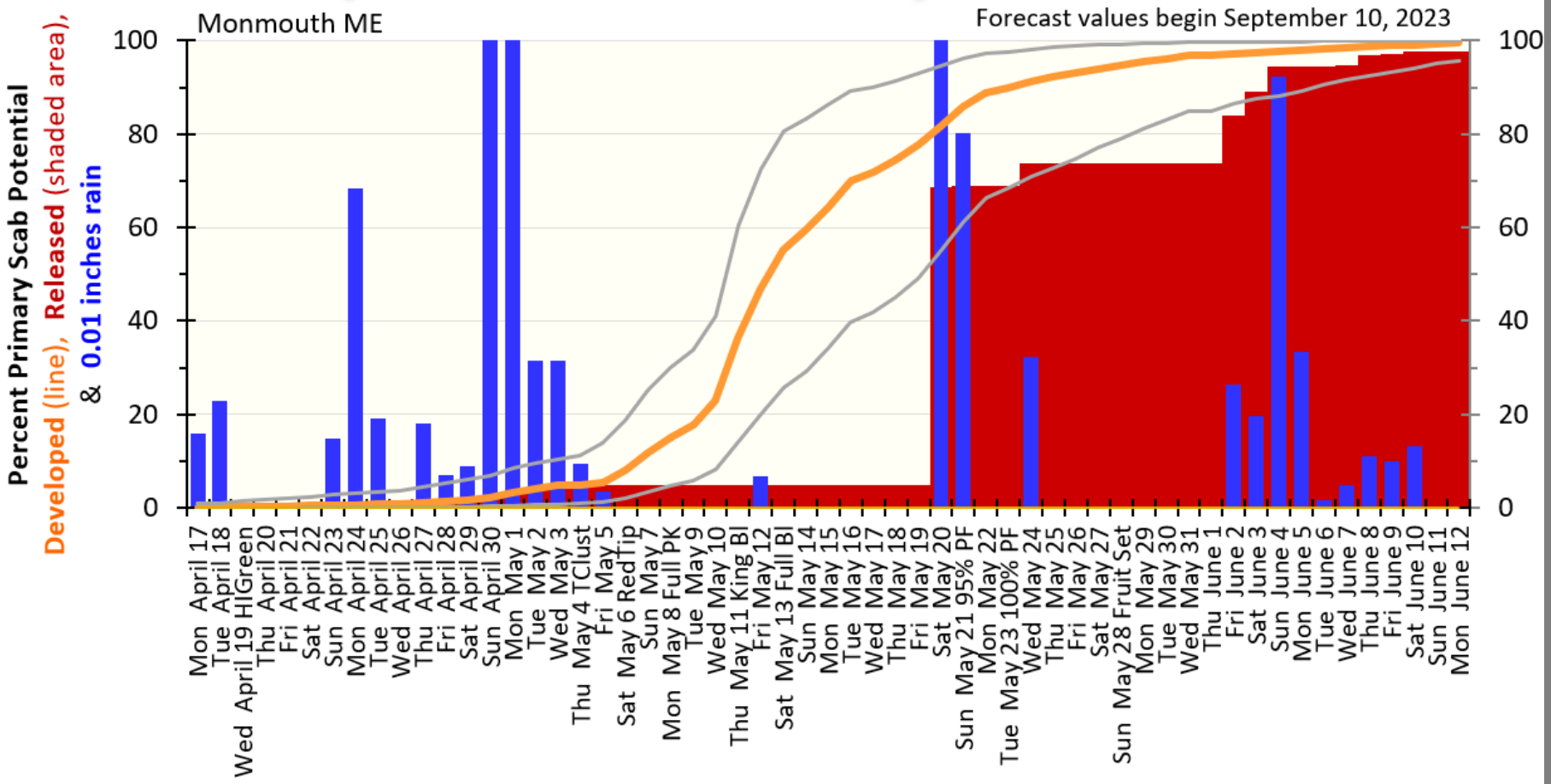
Flyspeck control with **Group B fungicides** (captan, ziram) - 14 days or 1.5" rain protection
Flyspeck – Group B fungicides – 1stCOVER through JUNE spray dates
Flyspeck – Group B fungicides – JULY spray dates
Flyspeck – Group B fungicides – AUGUST-SEPT. spray dates

Flyspeck Growth Hours Chart – Daily and Cumulative


Daily primary scab infection potential as % of yearly total
Monmouth ME
Forecast values begin July 3, 2016
Percent of primary scab potential
50%
40%
30%
20%
10%
0%
Fri May 6
Tight Cluster May 7
Sun May 8
Mon May 9
Open Cluster May 10
Wed May 11
Thu May 12
Fri May 13
full Pink-extended May 14
Sun May 15
late Pink May 16
King Bloom May 17
Wed May 18
Thu May 19
Full Bloom May 20
Sat May 21
Sun May 22
Mon May 23
Tue May 24
95% Petal Fall May 25
100% Petal Fall May 26
Fri May 27
Sat May 28
Sun May 29
Fruit Set May 30
Tue May 31
Wed June 1
Thu June 2
Fri June 3
Sat June 4
Sun June 5
Mon June 6
Tue June 7
Wed June 8
Thu June 9
Fri June 10
Sat June 11
Sun June 12
Mon June 13
Tue June 14
Wed June 15
Thu June 16
Fri June 17
Sat June 18
Sun June 19
Mon June 20
Tue June 21
Wed June 22
Thu June 23
Fri June 24
Sat June 25
Sun June 26
Mon June 27
Tue June 28
Wed June 29
Thu June 30
Fri July 1


Daily primary scab infection potential as percent of yearly total
Monmouth ME
Forecast values begin September 10, 2023
Percent of primary scab potential
60%
50%
40%
30%
20%
10%
0%
Tue April 18
Half-inch Green April 19
Thu April 20
Fri April 21
Sat April 22
Sun April 23
Mon April 24
Tue April 25
Wed April 26
Thu April 27
Fri April 28
early Tight Cluster April 29
Sun April 30
Mon May 1
Tue May 2
Wed May 3
Tight Cluster May 4
Fri May 5
Open Cluster May 6
Sun May 7
full Pink-extended May 8
Tue May 9
late Pink May 10
King Bloom May 11
Fri May 12
Full Bloom May 13
Sun May 14
Mon May 15
Tue May 16
Wed May 17
Thu May 18
Fri May 19
Sat May 20
95% Petal Fall May 21
Mon May 22
100% Petal Fall May 23
Wed May 24
Thu May 25
Fri May 26
7mm King Fruit May 27
Sun May 28
Mon May 29
Tue May 30
10mm King Fruit May 31
Thu June 1
Fri June 2
12mm King Fruit June 3
Sun June 4
Mon June 5
Tue June 6
14mm King Fruit June 7
Thu June 8
Fri June 9
16mm King Fruit June 10
18mm King Fruit June 11
Mon June 12
20mm King Fruit June 13

Development and Release of Primary Scab Infection Potential

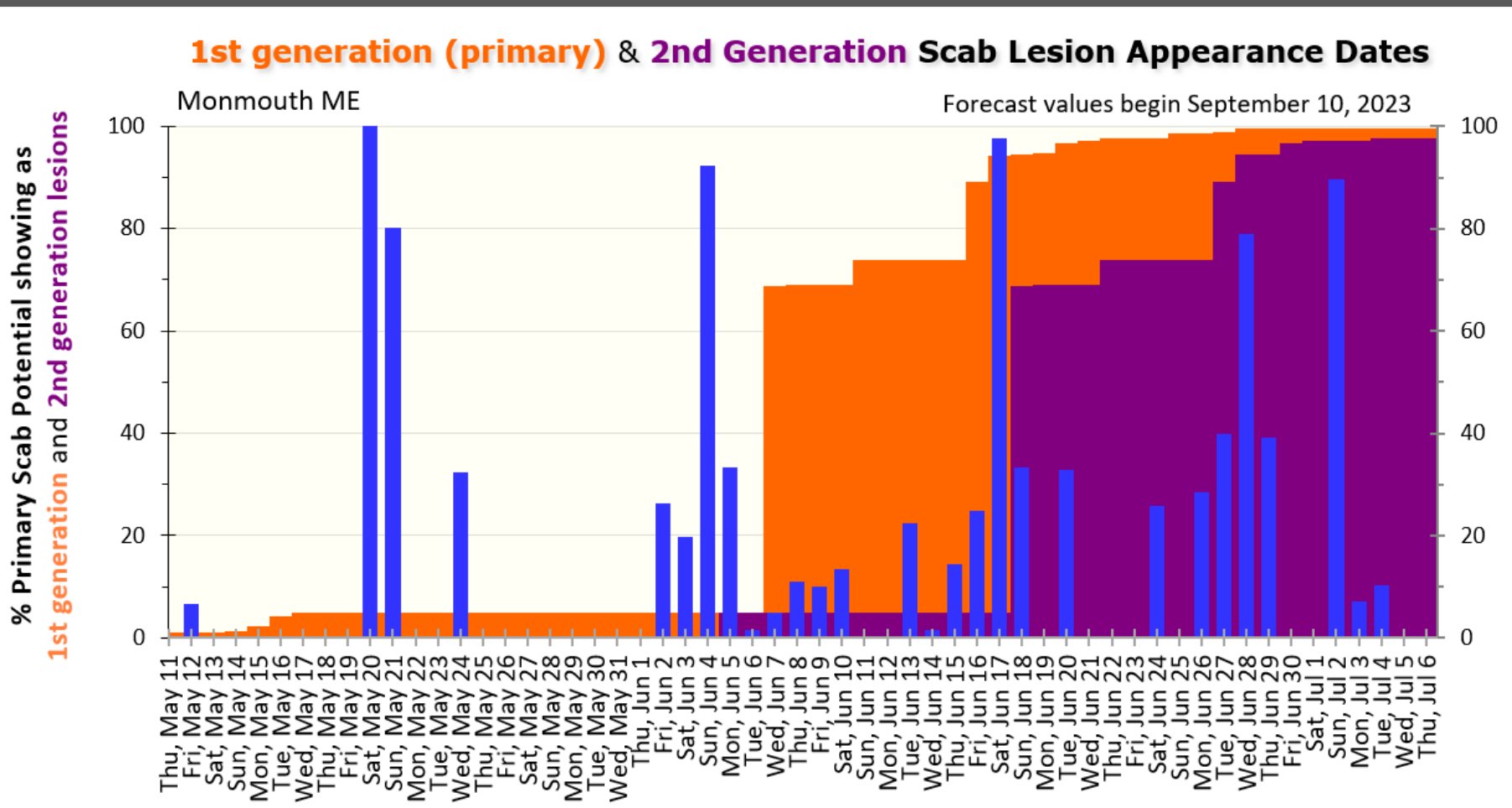


Blue columns show 100ths of inch rain for each date.

Rising thick orange line = cumulative primary scab infection potential developed by that date.

Rising thin gray lines = 90% confidence interval for estimate of cumulative infection potential developed, but not necessarily released, by each date.

Solid red area under orange line shows estimated cumulative percent primary scab infection potential released by end of that date. The red area is below the orange line unless a warm soaking daytime rain allows full expression of infection potential.



Orange area shows the percent of potential 1st generation aple scab infections that have had time to become visible. Absence of visible scab infections after 100% of primary scab potential has had time to appear as 1st generation lesions is good news, but it is not conclusive verification of successful scab control. Light infestation of 1st generation lesions can be difficult to detect. Infections delayed but not killed by fungicide application, or by partial resistance of older leaves, may appear later.

These ratings are **relative** because they do not account for scab spore population density, which is the **MOST** important factor determining absolute infection risk. Estimates also do not account for any secondary scab spores that might be present from earlier uncontrolled primary scab infection periods.

Date	Observed & Forecast Inches Rain	McIntosh bud stage	1 in 20 chance that daily value is equal or less than	Portion of Annual Primary Scab Infection Potential on this day (cumulative scab infection potential in parentheses)	1 in 20 chance that daily value is more than
Fri, May 19	0				
Sat, May 20	1.07		45%	**64%** (69%)	83%
Sun, May 21	0.80	95% Petal Fall	< 1	**< 1** (69%)	< 1
Mon, May 22	0				
Tue, May 23	0	100% Petal Fall			
Wed, May 24	0.32		3%	**5%** (74%)	6%
Thu, May 25	0				
Fri, May 26	0				
Sat, May 27	0	7mm King Fruit			
Sun, May 28	0				
Mon, May 29	0				
Tue, May 30	0				
Wed, May 31	0	10mm King Fruit			
Thu, June 1	0				
Fri, June 2	0.26		5%	**10%** (84%)	15%
Sat, June 3	0.20	12mm King Fruit	3%	**5%** (89%)	8%
Sun, June 4	0.92		2%	**5%** (94%)	8%
Mon, June 5	0.33				< 1
Tue, June 6	0.02				
Wed, June 7	0.05	14mm King Fruit	0	**< 1** (95%)	< 1
Thu, June 8	0.11		0	**2%** (97%)	5%

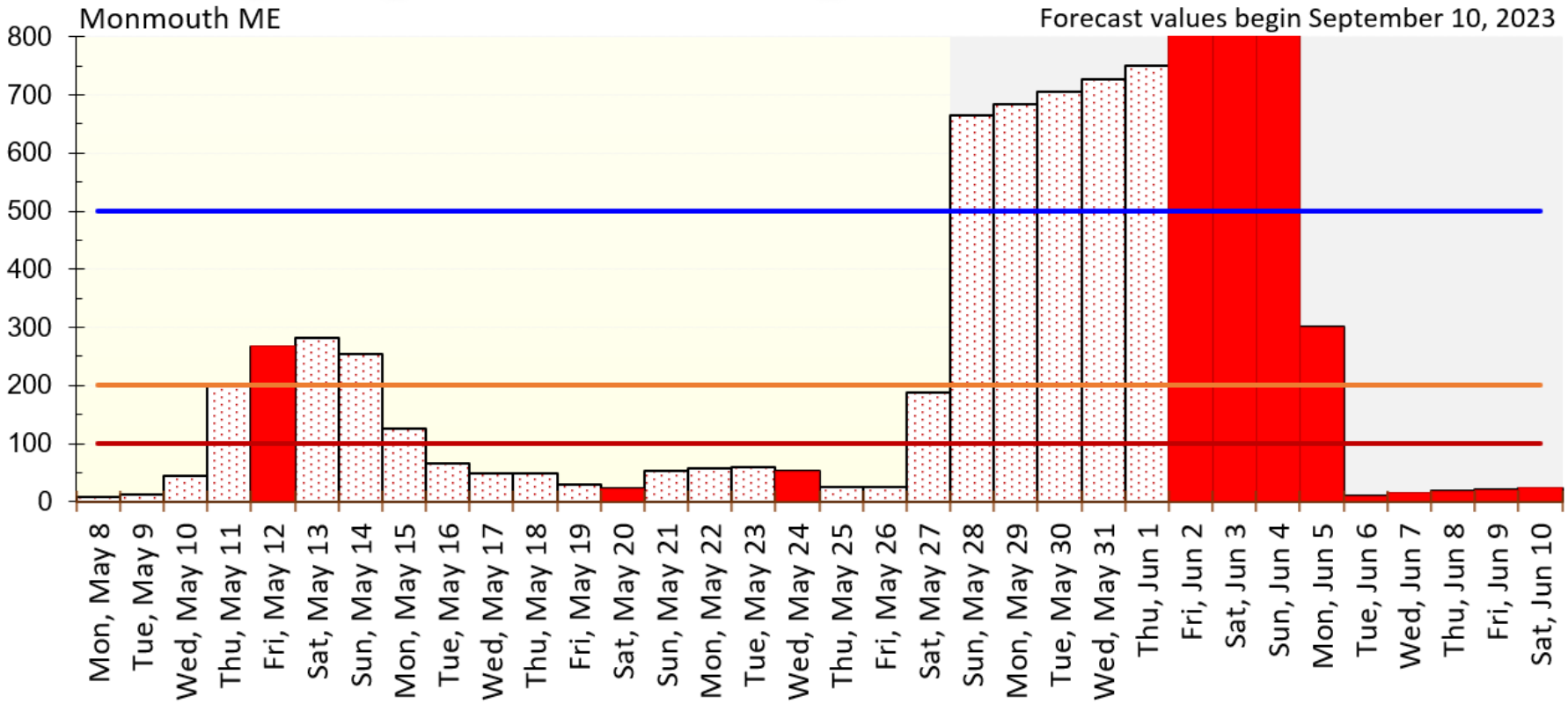
Fungicide guidance for Apple Scab protection

Find most recent spray date in left column

Columns show estimates for end of protection, start of next infection period, and deadline for post-infection control

Full-dose 'Protectant' fungicide (captan, mancozeb, SDHI, Syllit) **SPRAY DATE** 6am application time assumed	**Inches Rain**	END of Protectant fungicide residue protection & limiting factor	**DEADLINE for next Pre-Infection Application** This is the start time for the next infection period that has rain after fungicide depletion time.	**72-hour Deadline for post-infection fungicide** to reach back to start time of subsequent infection period, or back to depletion time of previous fungicide spray (2 cols. to left), whichever is later. Assumes no scab resistance.
Fri, April 14	0	April 16, 9PM rapid growth	**Sun, April 16, 10pm**	Wed, Apr 19, 10PM
Sat, April 15	0	April 22, 6AM 7 days normal growth	**Sun, April 23, 7pm**	Wed, Apr 26, 7PM
Sun, April 16	0.01	April 23, 7PM slow growth	**Sun, April 23, 7pm**	Wed, Apr 26, 7PM
Mon, April 17	0.16	April 26, 6AM slow growth at 9 day limit	**Thu, April 27, 3pm**	Sun, Apr 30, 3PM
Tue, April 18	0.23	April 27, 6AM slow growth at 9 day limit	**Thu, April 27, 3pm**	Sun, Apr 30, 3PM
Wed, April 19	0	April 28, 6AM slow growth at 9 day limit	**Thu, April 27, 3pm**	Mon, May 1, 6AM
Thu, April 20	0	April 29, 6AM slow growth at 9 day limit	**Fri, April 28, 8pm**	Tue, May 2, 6AM
Fri, April 21	0	April 30, 6AM slow growth at 9 day limit	**Fri, April 28, 8pm**	Wed, May 3, 6AM
Sat, April 22	0	April 30, 3PM rain removal	**Fri, April 28, 8pm**	Wed, May 3, 3PM
Sun, April 23	0.15	April 30, 3PM rain removal	**Fri, April 28, 8pm**	Wed, May 3, 3PM
Mon, April 24	0.68	April 30, 8PM rain removal	**Fri, April 28, 8pm**	Wed, May 3, 8PM
Tue, April 25	0.19	May 1, 6AM rain removal	**Fri, April 28, 8pm**	Thu, May 4, 6AM

Cougar Blight heat units vs. High infection risk thresholds



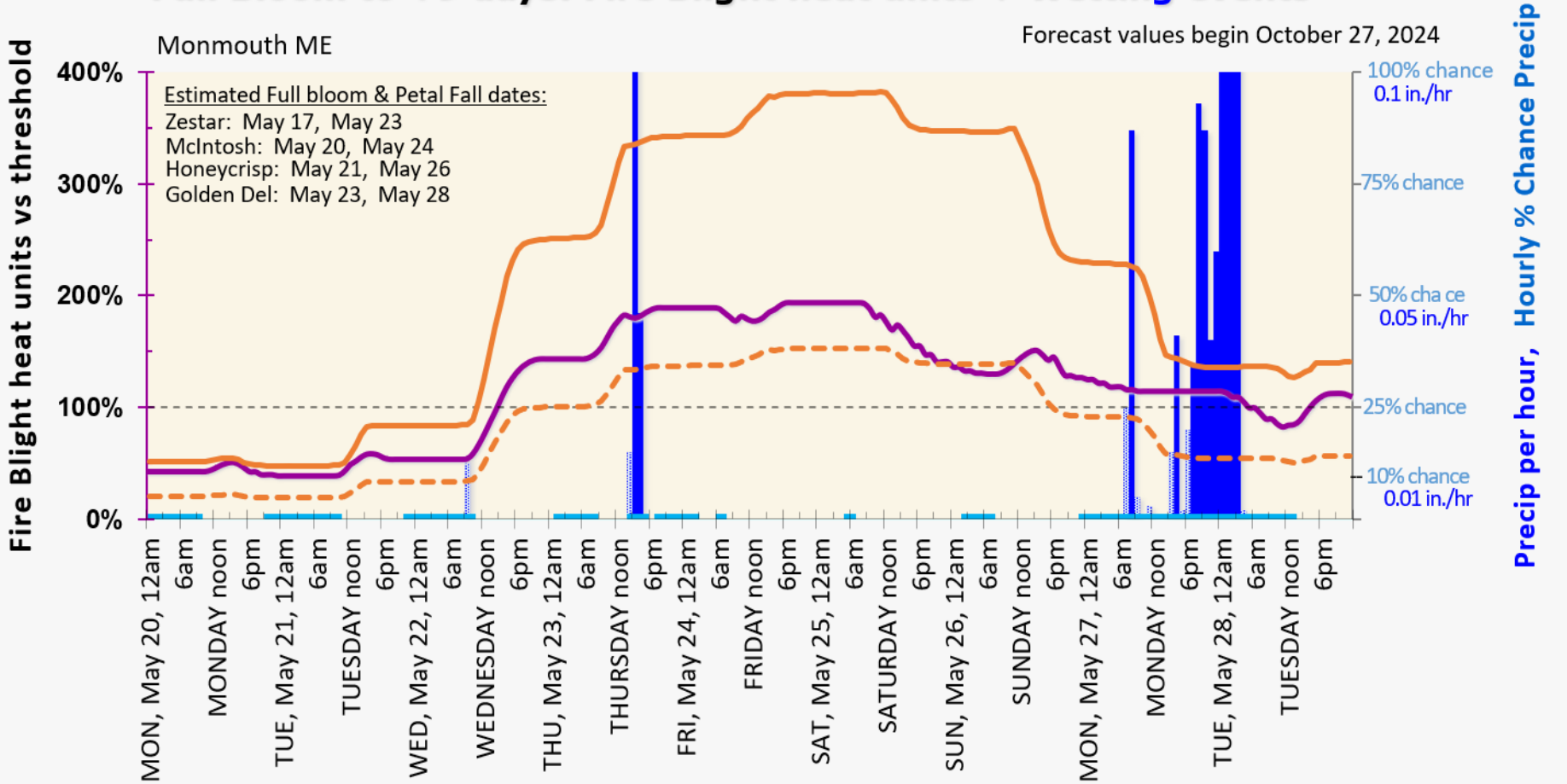
Values do not appear until McIntosh King Bloom date is within forecast range.

Vertical green line marks date of latest update.

Solid Red columns show fire blight heat units on days with rain, and is an estimate of the favorability of weather for fire blight blossom infection on that day. Red dotted white columns show fire blight heat units on days without rain. These columns indicate potential severity of fire blight blossom infection if accompanied by rain or heavy dew.

Gray background indicates dates with reduced risk because most cultivars should have lost open blossoms. However, young trees and late blooming cultivars may still have open blossoms and susecptibility to fire blight blossom infections on those dates.

Full Bloom to +9 days: Fire Blight heat units + Wetting events



Left axis: **Purple line = Eastern FB model heat units as % of infection threshold.**

Upper solid orange line = Cougar Blight FB heat units as % of threshold for blocks that had FB within last two years.

Lower dashed orange line = Cougar Blight FB heat units as % of threshold for blocks with no FB in last two years.

Thin black dashed horizontal line = cumulative heat unit threshold for blossom blight infection.

There is blossom infection risk if there is wetting when heat unit line exceeds 100%

Right axis: Dark blue columns = Precipitation amount per hour. Blue&white stipple = Drizzle at < 0.03 inch per hour.

+--+ = Hourly chance of precipitation. **= Leaf wet hours.** Green dashed vertical line marks start of today.

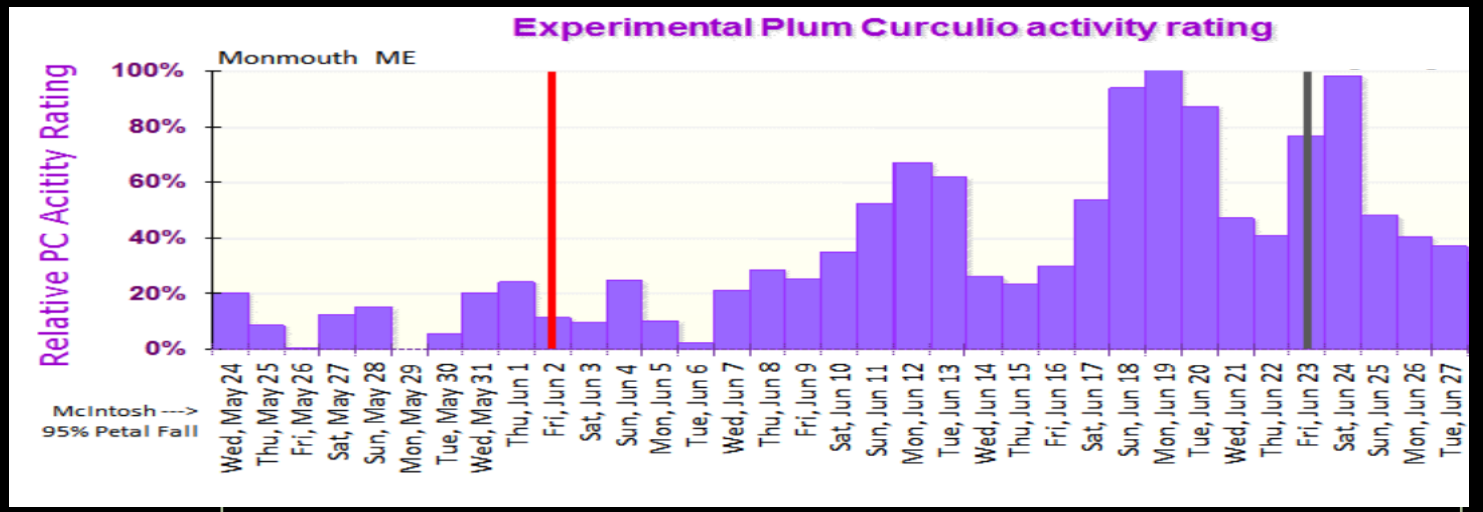
Dates with gray background are after Golden Delicious Petal Fall, and thus lower risk of blossom blight infection.

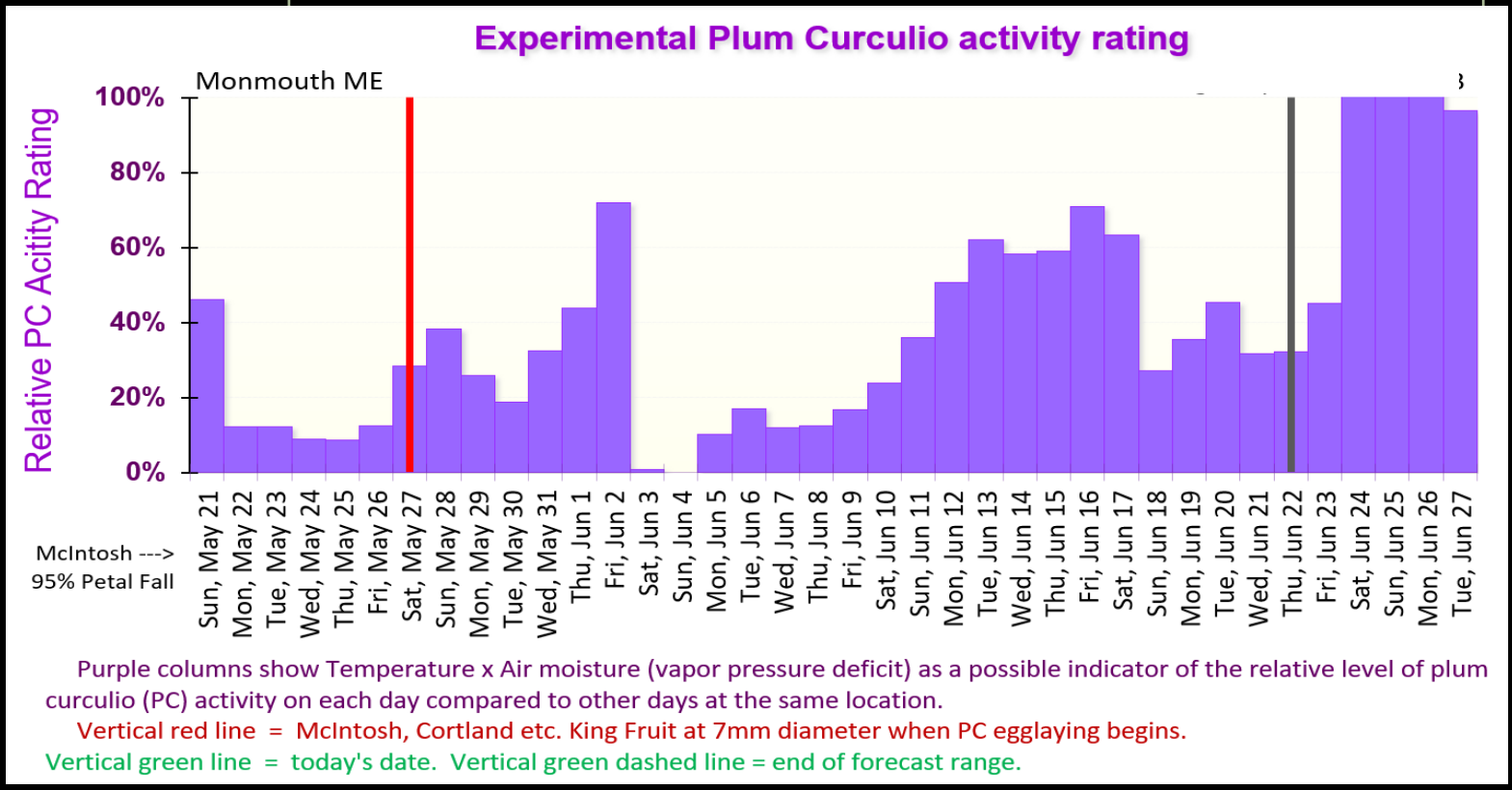
But late blooming cultivars or young trees, or those with "straggler" bloom, may still be susceptible.

- Precip per hour
- Drizzle
- Leaf Wetness
- Eastern FB heat units
- Cougar Blight units
- Precip Chance

Fire Blight

Open blossom dates for common apple cultivars. "Date" is from 8am to 8am the next day.	Cumulative Heat Units (single day units) Inches Rain, & Leaf Wet Hours 8am to 8am next day	I - No active FB within one mile of the orchard in last two years	II - FB active within one mile of orchard in last two years, but not this year	III - Fire blight currently active within one mile of orchard.	Date blossom blight (and shoot blight) symptoms would be obvious if infection occurred
McIntosh 100% Petal Fall on Tue, May 23	59 HU (8) 0.0", 5 hrs	Low (lack of heat)	Low (lack of heat)	Caution (if wetting)	
Wed, May 24	52 HU (5) 0.32", 16 hrs	Low (lack of heat)	Low (lack of heat)	Caution	
Thu, May 25	26 HU (4) 0.0", 6 hrs	Low (lack of heat)	Low (lack of heat)	Unlikely (lack of heat)	
Fri, May 26	26 HU (8) 0.0", 2 hrs	Low (lack of heat)	Low (lack of heat)	Unlikely (lack of heat)	
Sat, May 27	187 HU (169) 0.0", 0 hrs	Caution (if wetting)	Caution (If wetting)	**High (if wetting)**	June 12, (June 25)
Late Cultivar Petal Fall on Sun, May 28	664 HU (483) 0.0", 0 hrs	**High (if wetting)**	**Exceptional! (if wetting)**	**Exceptional! (if wetting)**	June 15, (June 27)
Mon, May 29	685 HU (24) 0.0", 9 hrs	**HIGH (Dew risk)**	**EXCEPTIONAL! (DEW RISK)**	**EXCEPTIONAL! (DEW RISK)**	June 16, (June 28)
Tue, May 30	705 HU (29) 0.0", 8 hrs	**HIGH (Dew risk)**	**EXCEPTIONAL! (DEW RISK)**	**EXCEPTIONAL! (DEW RISK)**	June 16, (June 28)
Wed, May 31	727 HU (191) 0.0", 3 hrs	**HIGH (Dew risk)**	**EXCEPTIONAL! (DEW RISK)**	**EXCEPTIONAL! (DEW RISK)**	June 19, (June 29)
Thu, June 1	750 HU (506) 0.0", 3 hrs	**HIGH (Dew risk)**	**EXCEPTIONAL! (DEW RISK)**	**EXCEPTIONAL! (DEW RISK)**	June 22, (July 1)
Fri, June 2	1023 HU (298) 0.33", 16 hrs	**EXCEPTIONAL!**	**EXCEPTIONAL!**	**EXCEPTIONAL!**	June 23, (July 1)
Sat, June 3	995 HU (0) 0.20", 24 hrs	**EXTREME!**	**EXCEPTIONAL!**	**EXCEPTIONAL!**	June 23, (July 1)
Sun, June 4	804 HU (0) 1.14", 24 hrs	**EXTREME!**	**EXCEPTIONAL!**	**EXCEPTIONAL!**	June 23, (July 1)
Mon, June 5	301 HU (4) 0.05", 21 hrs	Caution	**HIGH**	**EXCEPTIONAL!**	June 23, (July 2)





Purple columns show Temperature x Air moisture (vapor pressure deficit) as a possible indicator of the relative level of plum curculio (PC) activity on each day compared to other days at the same location.

Vertical red line = McIntosh, Cortland etc. King Fruit at 7mm diameter when PC egglaying begins.

Vertical green line = today's date. Vertical green dashed line = end of forecast range.

Background Information for this page

Return to Apple list for Monmouth ME

Need for protection against plum curculio egglaying begins around 7mm fruit diameter on Sat., May 27.
A final plum curculio insecticide application on Friday, June 16 is expected to give adequate protection until the end of the immigration period on Thursday, June 22 (indicated by yellow highlight).
If using Surround deterrent, rough estimate for decline in plum curculio egglaying is Sunday, July 2.

Weather data for Monmouth ME. Forecast values begin September 10, 2023

95% McIntosh Petal Fall estimated or reported as: May 21, Sunday

Full-dose Plum Curculio insecticide application date	Cumulative Plum curculio degree days	Inches Rain	Estimated end of protection	Percent of PC control period (& PC degree days) completed by end of protection
	95% McIntosh			
Sun, May 21	Petal Fall	0.80	June 2, Fri	48% (148)
Mon, May 22	6	0	June 3, Sat	48% (149)
Tue, May 23	11	0	June 4, Sun	48% (149)
Wed, May 24	15	0.32	June 4, Sun	48% (149)
Thu, May 25	18	0	June 5, Mon	49% (152)
Fri, May 26	23	0	June 5, Mon	49% (152)
Sat, May 27	38	0	June 6, Tue	51% (158)
Sun, May 28	59	0	June 7, Wed	53% (163)
Mon, May 29	71	0	June 8, Thu	54% (166)
Tue, May 30	79	0	June 9, Fri	56% (172)
Wed, May 31	93	0	June 10, Sat	58% (178)
Thu, June 1	115	0	June 10, Sat	58% (178)
Fri, June 2	136	0.26	June 10, Sat	58% (178)
Sat, June 3	136	0.20	June 13, Tue	71% (218)
Sun, June 4	136	0.92	June 14, Wed	74% (229)
Mon, June 5	139	0.33	June 17, Sat	86% (266)
Tue, June 6	145	0.02	June 17, Sat	86% (266)
Wed, June 7	149	0.05	June 17, Sat	86% (266)
Thu, June 8	153	0.11	June 18, Sun	89% (273)
Fri, June 9	158	0.10	June 18, Sun	89% (273)
Sat, June 10	164	0.13	June 18, Sun	89% (273)
Sun, June 11	178	0	June 20, Tue	95% (292)
Mon, June 12	193	0	June 20, Tue	95% (292)
Tue, June 13	203	0.22	June 20, Tue	95% (292)
Wed, June 14	215	0.02	June 20, Tue	95% (292)
Thu, June 15	228	0.14	June 20, Tue	95% (292)
Fri, June 16	243	0.25	June 24, Sat	100% (347)
Sat, June 17	252	0.98	June 26, Mon	100% (385)

Apple maggot

Rough guess at date to clean apple maggot fly traps and count from zero to compare against threshold for respray decision.

Product names in red letters have "Good" rating vs. apple maggot.

Product names in blue letters have a "Fair" rating.

Apple Maggot Emergence after Depletion for Respray Timing

Full-dose Apple Maggot insecticide application date	Estimated % cumulative apple maggot trap captures	Inches Rain	Imidan 1.5" rain days 1-7, 1.0" rain days 8-14.	Assail 1.0" rain days 1-14.	Pyrethroids 1.0" rain days 1-10.	Delegate, Sevin 2.0" rain days 1-6, 0.5" rain day 7-10.	Avaunt, Exirel 1.0" rain days 1-6, 0.5" rain day 7-10.
Wed, August 1	22%	0.44	August 8, Wed	August 4, Sat	August 4, Sat	August 7, Tue	August 4, Sat
Thu, August 2	25%	0	August 9, Thu	August 4, Sat	August 4, Sat	August 8, Wed	August 4, Sat
Fri, August 3	28%	0.37	August 10, Fri	August 9, Thu	August 9, Thu	August 9, Thu	August 9, Thu
Sat, August 4	30%	0.8	August 14, Tue	August 14, Tue	August 14, Tue	August 13, Mon	August 13, Mon
Sun, August 5	32%	0	August 14, Tue	August 14, Tue	August 14, Tue	August 13, Mon	August 13, Mon
Mon, August 6	35%	0	August 14, Tue	August 14, Tue	August 14, Tue	August 13, Mon	August 13, Mon
Tue, August 7	38%	0.07	August 14, Tue	August 14, Tue	August 14, Tue	August 13, Mon	August 13, Mon
Wed, August 8	40%	0.02	August 15, Wed	August 14, Tue	August 14, Tue	August 14, Tue	August 14, Tue
Thu, August 9	43%	0.58	August 18, Sat	August 18, Sat	August 18, Sat	August 17, Fri	August 17, Fri

Apple Maggot (AM)

Rough estimate for first apple maggot fly trap capture: Friday, July 13.

Estimated 5% AM adult emergence: July 25.

Estimated date for 50% adult AM emergence & trap captures: August 13, Monday
Peak weekly AM trap captures: August 19, Sunday
98% adult AM emergence & trap captures: September 6, Thursday
AM emergence and cumulative trap catch dates are only general guidelines
because local soil type and soil moisture conditions that affect emergence are not included in the calculation.

Borers - Roundheaded Appletree Borer (RAB) & Dogwood Borer

RAB adult emergence begins: June 8. Peak emergence: June 24.

RAB egglaying begins: June 18. Peak egglaying period roughly: July 7 to July 24.

First RAB eggs hatch roughly: July 3. Peak hatch roughly: July 22 to August 13.

First Dogwood borer egg hatch roughly: July 6. Peak hatch roughly: August 11.

Codling Moth (CM)

1st generation, estimated first sustained trap catch biofix date: May 27, Sunday.
Codling moth development as of Sunday, October 21:
2nd gen. generation adult emergence at 98% and 2nd gen. generation egg hatch at 91.3704066593409%.

Insecticide targetted against plum curculio and apple maggot may also prevent codling moth damage.
If targetted codling moth control is needed, key management dates are shown below.

Optimum date to apply RIMON or ESTEEM ovicide/larvicide Insect Growth Regulator (IGR) is shortly before CM egglaying begins
(100 CM degree days after start of 1st gen. flight): June 8. Friday.
For INTREPID IGR, the optimum first application timing is just before first hatch (150-200 DD): June 13 to June 16.

For conventional larvicide, Bt, Grandevo, or granulovirus (Cyd-X, Madex etc.),
best timing for first of multiple applications against 1st generation CM is at 3% CM egg hatch (250 DD):
June 19, Tuesday.

Key Dates for European Red Mites

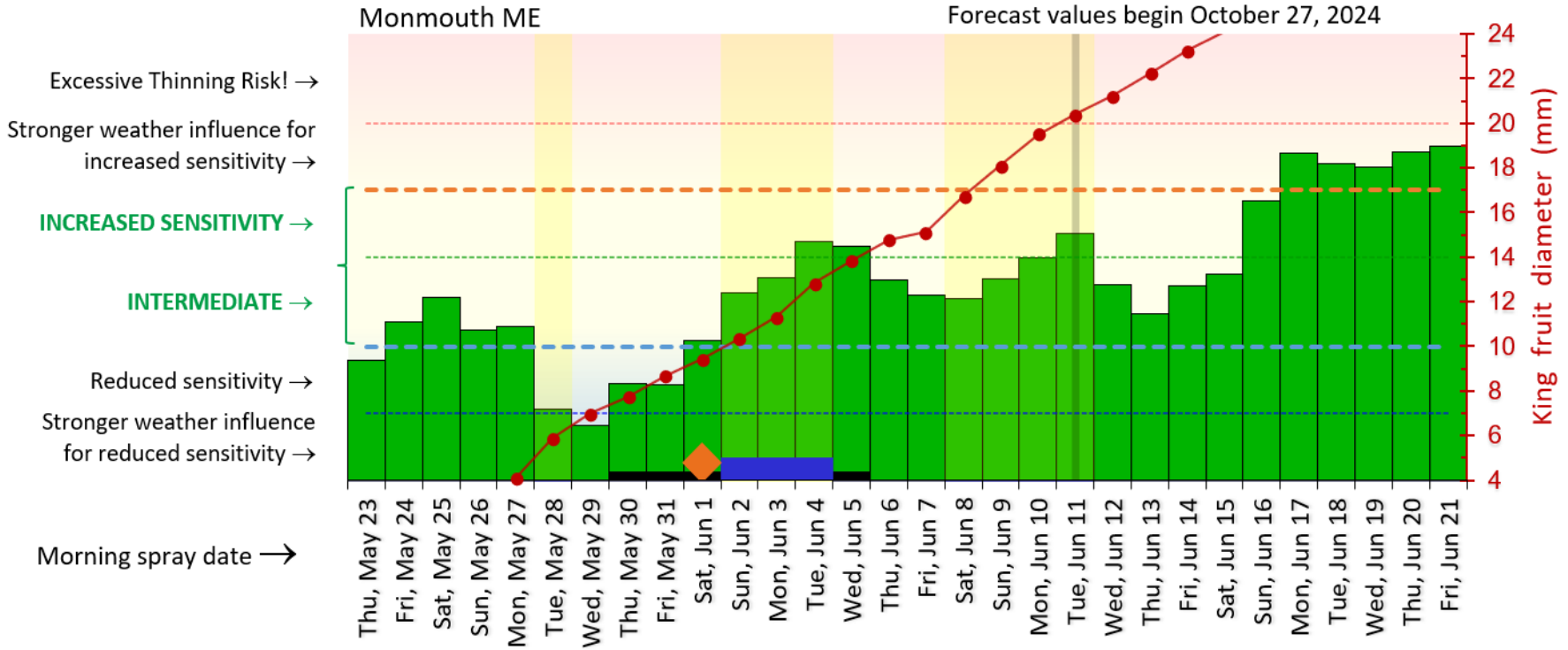
Estimated hatch date of overwintered European red mite (ERM) eggs
and decline in efficacy of suppression by prebloom oil is
Saturday, May 12

Optimum monitoring period for 1st generation ERM:
Saturday, May 26 (Petal Fall)
to Saturday, June 2 (early adults ready to lay eggs for 2nd generation)

Optimum monitoring period for 2nd generation ERM:
Friday, June 22 (nymphs hatched)
to Friday, June 29 (egglaying starts for 3rd generation)

Optimum monitoring period for 3rd ERM generation is:
Thursday, July 5 (nymphs hatched)
to Saturday, July 14 (egglaying starts for 4th generation)

Weather Influence on HONEYCRISP Thinning Sensitivity



Measurement dates: May 28 = 5.9 June 3 = 11.3 June 7 = 15.1

Left axis: Green columns show thinning sensitivity rating for apples on unstressed trees. Rating accounts for nighttime temperature and daytime cloud cover for the 4-day window after a morning thinner application. For evening application, use rating for the following day.

Horizontal dashed lines mark transitions between sensitivity categories.

Best thinning response is expected from applications made on a day when the green column reaches "Intermediate" or "Increased Sensitivity".

Right axis: Red line with circles = estimated avg. diameter of pollinated Honeycrisp king fruit. **MEASURE YOUR FRUIT** - estimate is only for planning.

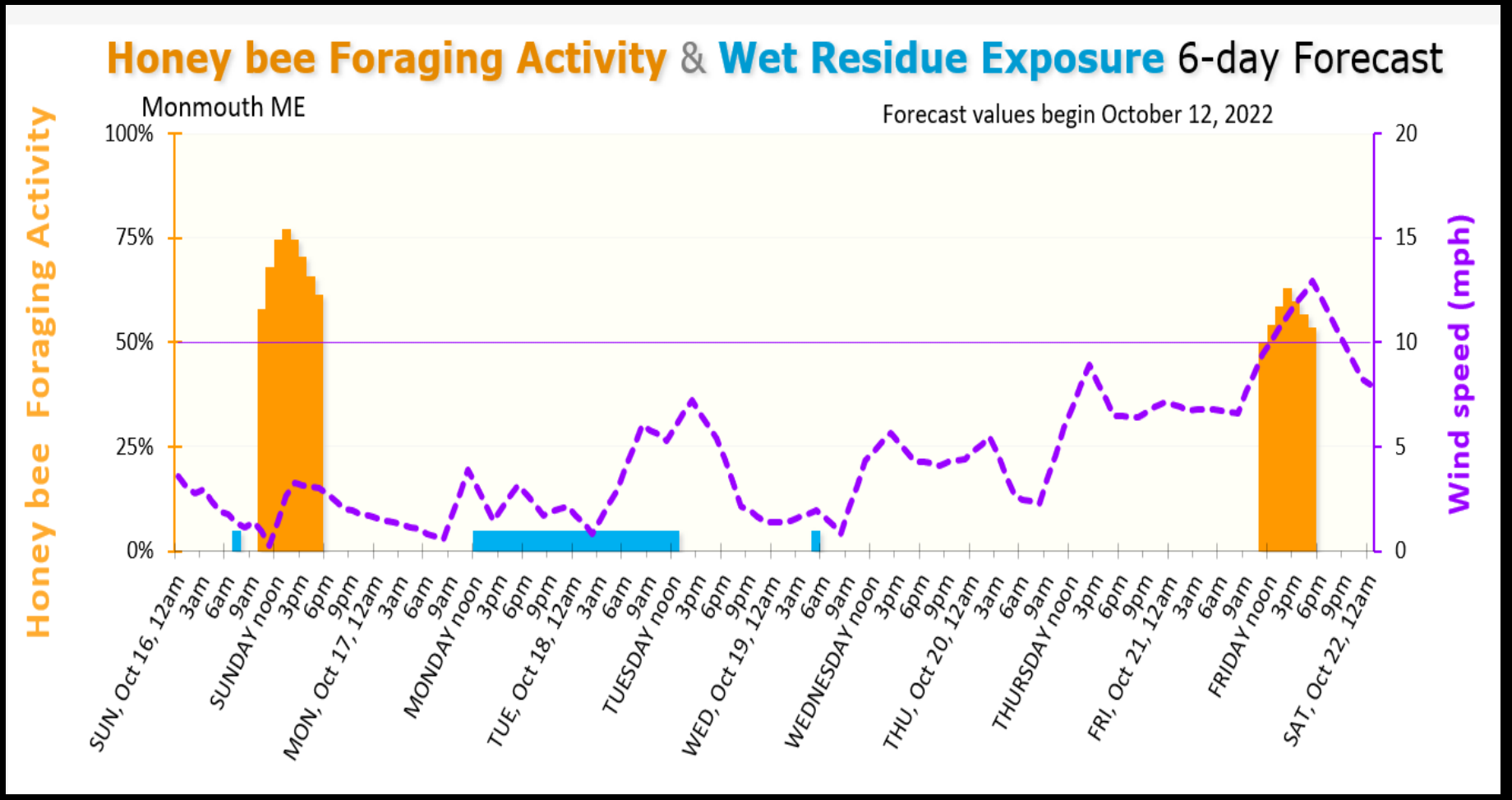
Yellow columns mark the **EARLY** (5-6mm), **MID** (10-13mm), and **LATE** (16-20mm) postbloom thinning windows. Sensitivity peaks at 10-13 mm. Beyond 16mm, fruit lose sensitivity to NAA. Beyond 17mm, carbaryl and Maxcel have declining effect. The thinning window for Accede is 15–20mm. Sensitivity to Accede declines after 20mm (vertical gray line). Weather to create carbohydrate stress is required for effective chemical thinning.

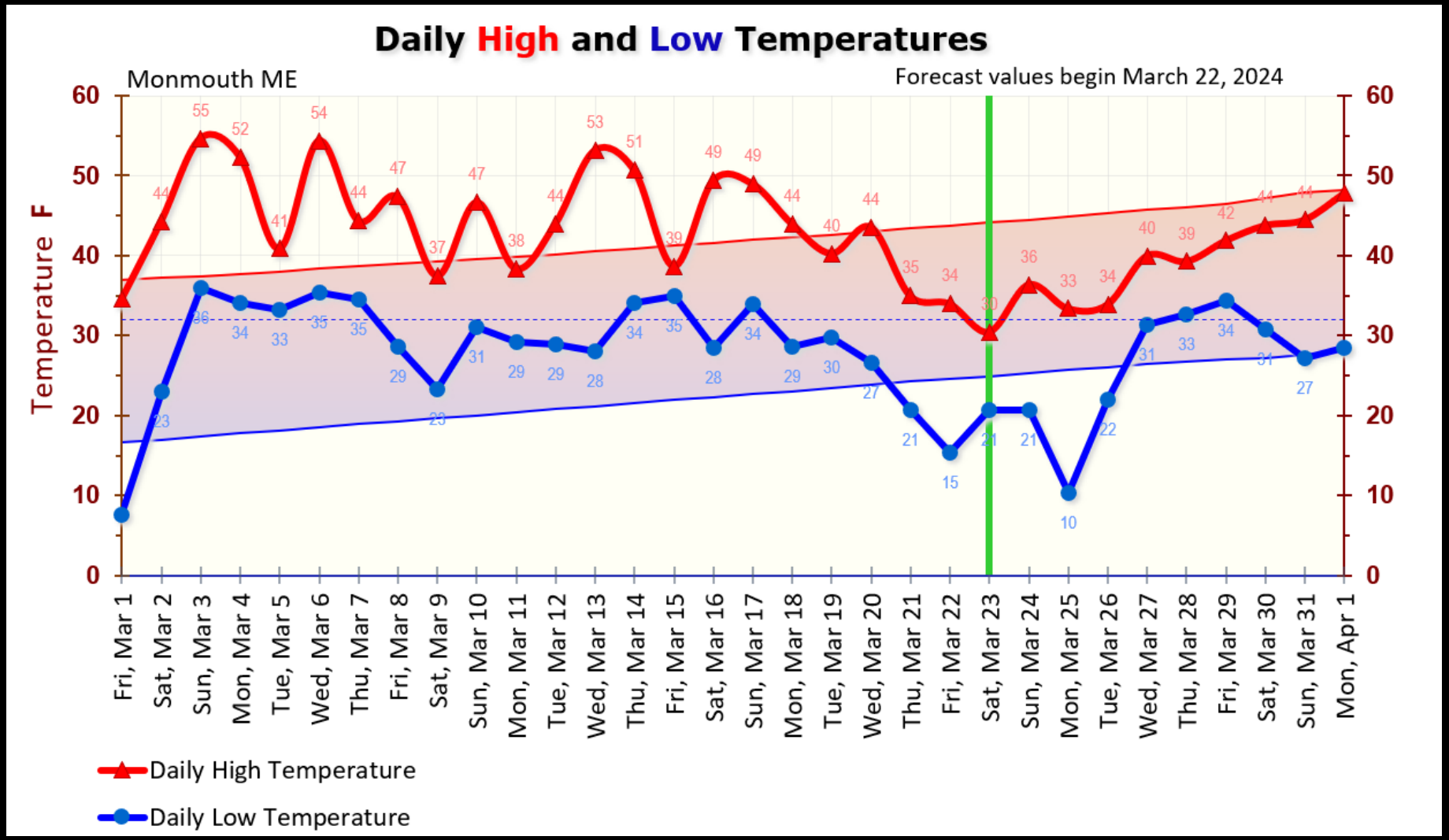
Horizonal black ▬ & blue ▬ lines mark dates with KF diameter at 7–14 & **10–13mm**. Peak thinning occurs when 7–14mm fruit diameter (esp. 10–13mm) coincides with weather conditions for INTERMEDIATE to INCREASED SENSITIVITY .

◆ = date when fruit have reduced sensitivity after two or more days of temperatures >75F. ↑ = forecast start. ↑ = end of full data thinning weather forecast.

Date	Early Season Biological Events and Management Activities
Before bud break	**Check tractor and sprayer** for needed repairs. Replace worn nozzles, weak hoses, damaged or blocked filters, and inaccurate pressure gauges. Check for tank leaks, adequate agitation and pump function. Check commonly used dosage calculations. Review safety guidelines, check safety equipment. **Calibrate** sprayers, test spray pattern, test pH of spray water source.
April 27, Fri	McIntosh trees at 50% **Green Tip** (observed) Where **copper** deficient, foliar application recommended at green tip to 1/4" green. Later application can cause leaf burn and possibly lead to fruit russetting from residue. If monitoring **tarnished plant bug**, traps should be set by now or as soon as possible. If using traps to monitor **leafminers**, traps should be set by now or as soon as possible. **Cutworm** defoliation of emerging buds can be a problem on young trees as early as green tip, especially where there is high ground cover growth near the trees.
May 2, Wed	McIntosh trees at **Half-Inch Green** Beginning of optimum time window for oil application to smother European red mite eggs before they hatch. More than 3 **thrips** per fruit bud can decrease fruit set. Effective timing for Lorsban trunk application to get season-long suppression of **insect borers**.
May 3, Thu	First primary scab infection period on or after Half Inch Green. Infection risk increases as green tissue expands.

Date	Late Season Biological Events and Management Activities
July 7, Sat	**Plum curculio** egglaying begins natural decline. If using Surround repellence instead of insecticide mortality to prevent PC damage, coverage should be maintained from Petal fall until at least this date.
June 29, Fri	Start of 2nd generation **Spotted tentiform leafminer** flight
July 4, Wed	**Glyphosate (Roundup) herbicide** application more than 45 days after full bloom to soil around apple trees with root suckers, especially young trees, poses increased risk of damage from systemic uptake through root suckers into the trunk and root system. Apple trees without root suckers may also become more sensitive to trunk contact by glyphosate with late season application, especially trees under drought or other stress.
July 1, Sun	**Japanese beetle adults** begin feeding on foliage (rough guess). Honeycrisp apples seem to be one of their favorite foods.
July 13, Fri	Date by which 2nd generation lesions from the final primary scab infection period have had time to begin appearing. Finding fewer than 5 leaves with fresh lesions per 100 fruit clusters and vegetative shoots after this date indicates that scab control has been successful. Finding more than 5 leaves with fresh scab lesions per 100 clusters/shoots at this time in a commercial orchard suggests that fungicide selection and spray intervals need to be adjusted to suppress spore production, and to protect fruit and foliage for at least 4 weeks until active scab lesions exhaust their supply of spores.
July 3, Tue	If using pheromone traps to estimate populations and time treatment for **Oriental fruit moth** larvae, time to set traps. First trap capture expected in 7 days.
July 5, Thu	Where preventive control of small **Obliquebanded leafroller** larvae is needed, date for first application of Assail, Calypso, Intrepid, SpinTor, a Bt product, or other insecticide effective against OBLR.

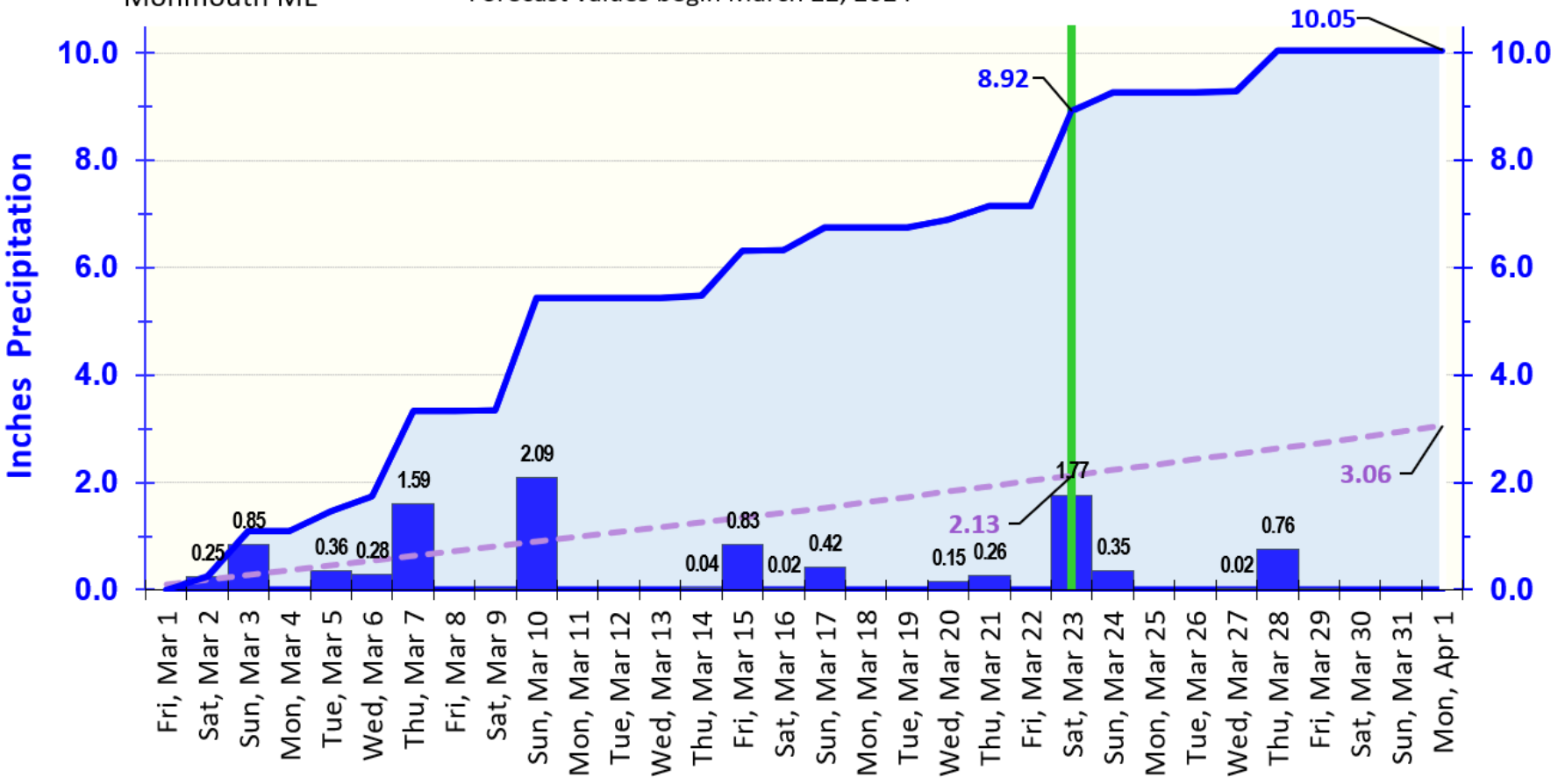

Honey bee Foraging Activity & Wet Residue Exposure 6-day Forecast
Monmouth ME
Forecast values begin October 12, 2022
Honey bee Foraging Activity
Wind speed (mph)
100%
75%
50%
25%
0%
20
15
10
5
0
SUN, Oct 16, 12am
SUNDAY noon
MON, Oct 17, 12am
MONDAY noon
TUE, Oct 18, 12am
TUESDAY noon
WED, Oct 19, 12am
WEDNESDAY noon
THU, Oct 20, 12am
THURSDAY noon
FRI, Oct 21, 12am
FRIDAY noon
SAT, Oct 22, 12am


Daily High and Low Temperatures
Monmouth ME
Forecast values begin March 22, 2024
Temperature F
60
50
40
30
20
10
0
Fri, Mar 1
Sat, Mar 2
Sun, Mar 3
Mon, Mar 4
Tue, Mar 5
Wed, Mar 6
Thu, Mar 7
Fri, Mar 8
Sat, Mar 9
Sun, Mar 10
Mon, Mar 11
Tue, Mar 12
Wed, Mar 13
Thu, Mar 14
Fri, Mar 15
Sat, Mar 16
Sun, Mar 17
Mon, Mar 18
Tue, Mar 19
Wed, Mar 20
Thu, Mar 21
Fri, Mar 22
Sat, Mar 23
Sun, Mar 24
Mon, Mar 25
Tue, Mar 26
Wed, Mar 27
Thu, Mar 28
Fri, Mar 29
Sat, Mar 30
Sun, Mar 31
Mon, Apr 1
44 55 52 41 54 44 47 37 47 38 44 53 51 39 49 49 44 40 44 35 34 30 36 33 34 40 39 42 44 44 48
23 36 34 33 35 35 29 23 31 29 29 28 34 35 28 34 29 30 27 21 15 21 21 10 22 31 33 34 31 27 28
Daily High Temperature
Daily Low Temperature

Daily & Cumulative & Climatic Average Precipitation

Monmouth ME

Forecast values begin March 22, 2024



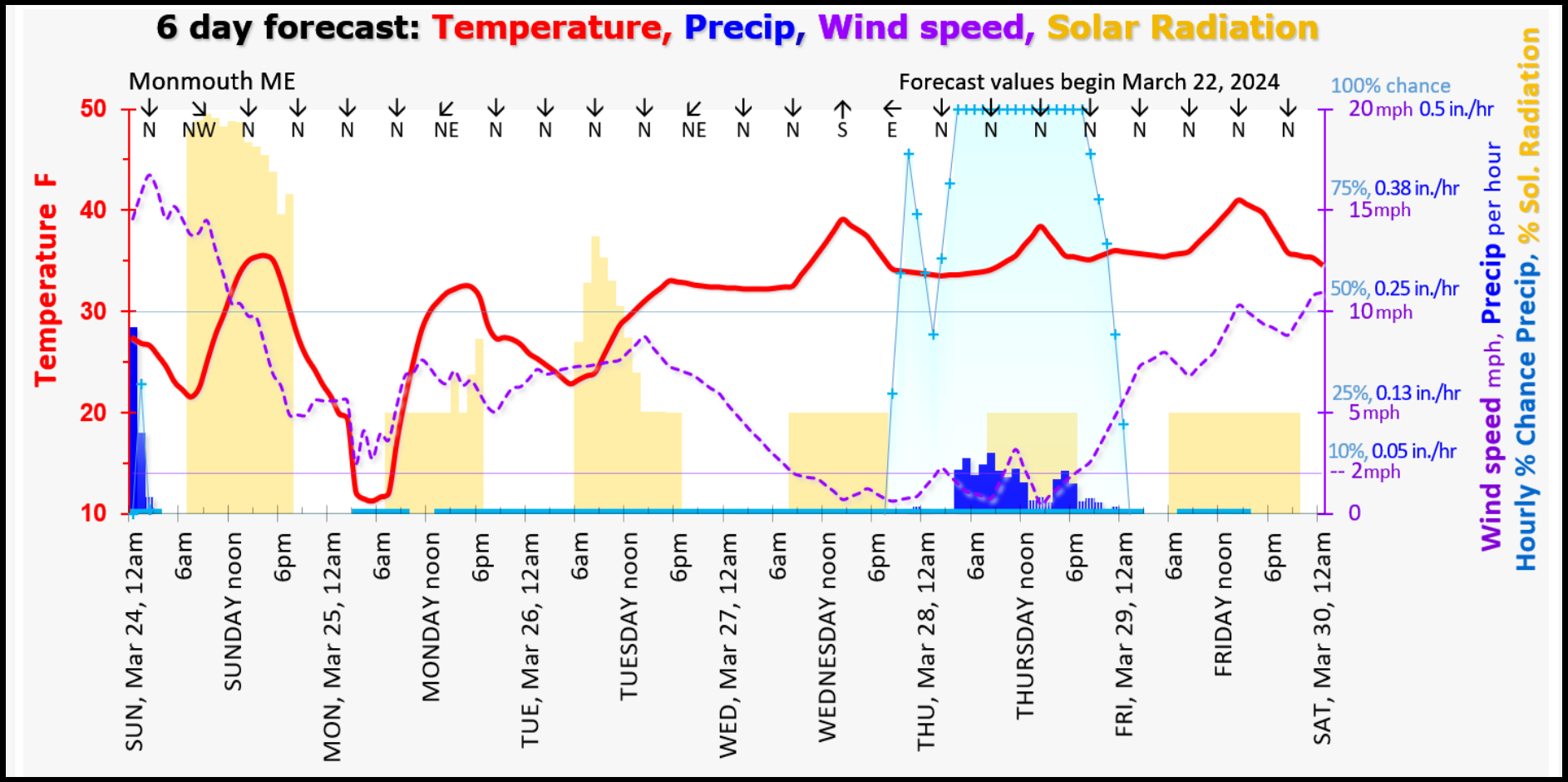
Blue columns = **Daily observed and forecast amount of precipitation.**

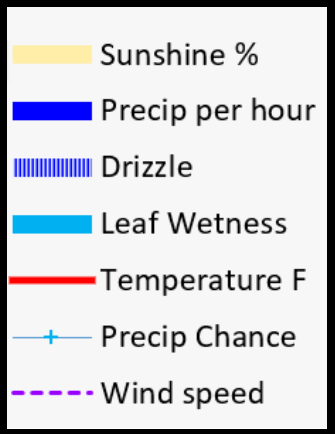
Blue line and shaded area **= Observed cumulative precipitation.**

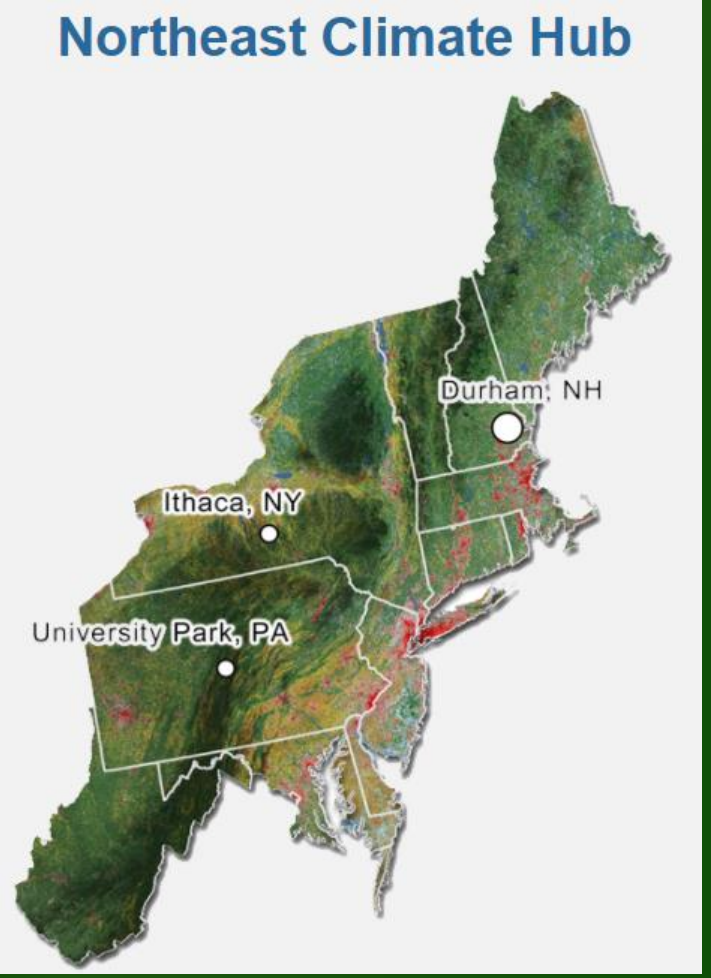
Straight dashed purple line = **Climatic average cumulative precipitation over the same 32-days.**

Vertical green line = **Today's date and beginning of forecast values.**

Difference between Observed & Forecast vs. Climatic average for the entire 32 days on chart (% of normal):	+ 6.99 inches (328%)
Difference between Observed & forecast precip vs. Climatic average for the first 23 days on chart ending tomorrow:	+ 6.79 inches (419%)
Difference between Forecast vs. Climatic average precip from start of tomorrow to end of 9th day forecast:	+ 0.20 inches (122%)


6 day forecast: Temperature, Precip, Wind speed, Solar Radiation
Monmouth ME
Forecast values begin March 22, 2024
Temperature F
50
40
30
20
10
N NW N N N N NE N N N N NE N N S E N N N N N N N N
100% chance
20 mph 0.5 in./hr
75%, 0.38 in./hr
15 mph
50%, 0.25 in./hr
10 mph
25%, 0.13 in./hr
5 mph
10%, 0.05 in./hr
2 mph
0
Wind speed mph, Precip per hour
Hourly % Chance Precip, % Sol. Radiation
SUN, Mar 24, 12am
6am
SUNDAY noon
6pm
MON, Mar 25, 12am
6am
MONDAY noon
6pm
TUE, Mar 26, 12am
6am
TUESDAY noon
6pm
WED, Mar 27, 12am
6am
WEDNESDAY noon
6pm
THU, Mar 28, 12am
6am
THURSDAY noon
6pm
FRI, Mar 29, 12am
6am
FRIDAY noon
6pm
SAT, Mar 30, 12am


Sunshine %
Precip per hour
Drizzle
Leaf Wetness
Temperature F
Precip Chance
Wind speed



"Farming will never see a shortage of challenges, but there is no shortage of solutions."

~ USDA Northeast Climate Hub

As the Northeast becomes warmer, wetter/drier, with more variability & extremes:

Site-specific weather data will become increasingly important for farm decisions.

Future agricultural adaptation will occur in a decision environment of high complexity with an increasing pace and intensity of climatic change.

~ USDA, 2012

Personalized Decision Support

Information into Knowledge **+ Delivery & Presentation =** **Intelligent Services**

Image Credit: Samsung Corp. investor update http://aod.teletogether.com/sec/20131106/eng_view.asp

Growers already have the experience, judgement, decision making, and implementation skills.

Better input = Better output