Don’t Let Weather Surprise You: NEWA, forecasting models, sensors, and more?

New England Vegetable & Fruit Conference,
December 17, 2024

Jon Clements

Extension Tree Fruit Specialist

UMassAmherst

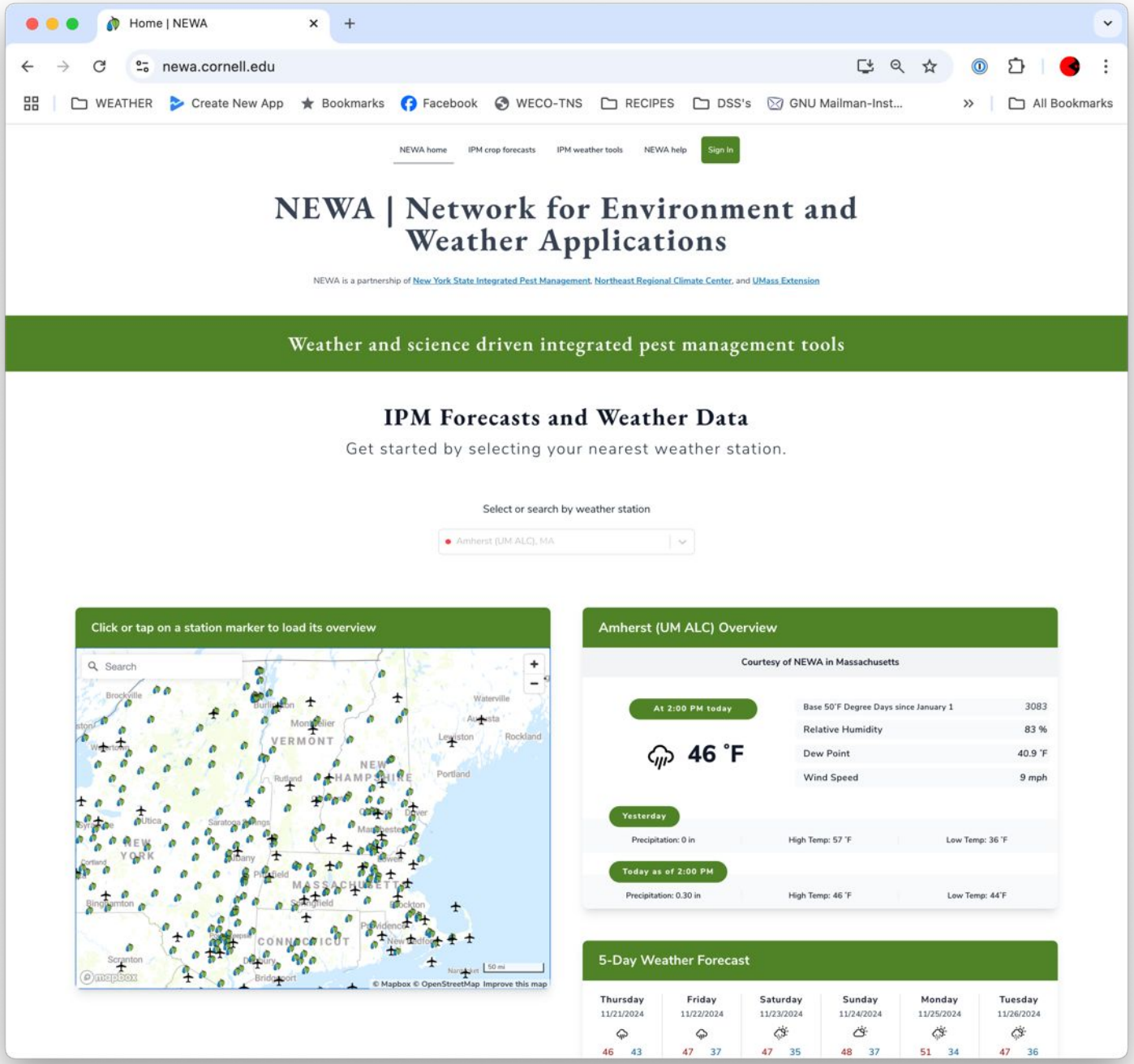
Why?

- Climate change increases need for environmental monitoring
- Site-specific weather observations can’t be disputed (well maybe not?)
- Historical record can come in handy (as long as it is accurate)
- Integrated Pest Management, oh yea…
- Spray records, oh yea…
- Soil moisture for irrigation management
- Precision agriculture is for everyone!

What is NEWA?

- NEWA collects weather data through the Internet from weather stations primarily located on farms and generates real-time weather data summaries, crop production tools, and IPM forecasts.
- NEWA tools promote better IPM, reduced pesticide use, and improved environmental protection.
- **NEWA provides science-driven and accurate data, so that producers can make informed decisions and reduce crop production risk.**
- newa.cornell.edu

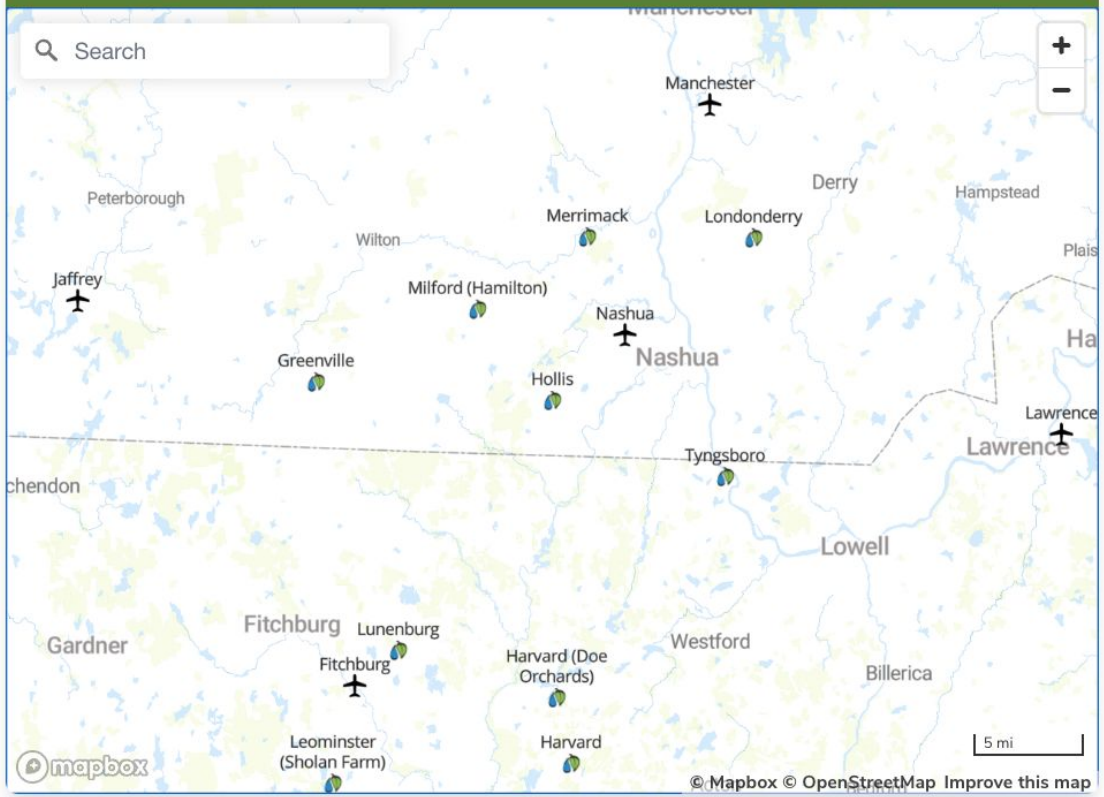
newa.cornell.edu



Select or search by weather station

Hollis, **NH**

Click or tap on a station marker to load its overview



Hollis Overview

Courtesy of NEWA in New Hampshire

At 3:00 PM today

44 °F

Base 50°F Degree Days since January 1	2880
Relative Humidity	100 %
Dew Point	44 °F
Wind Speed	9 mph

Yesterday

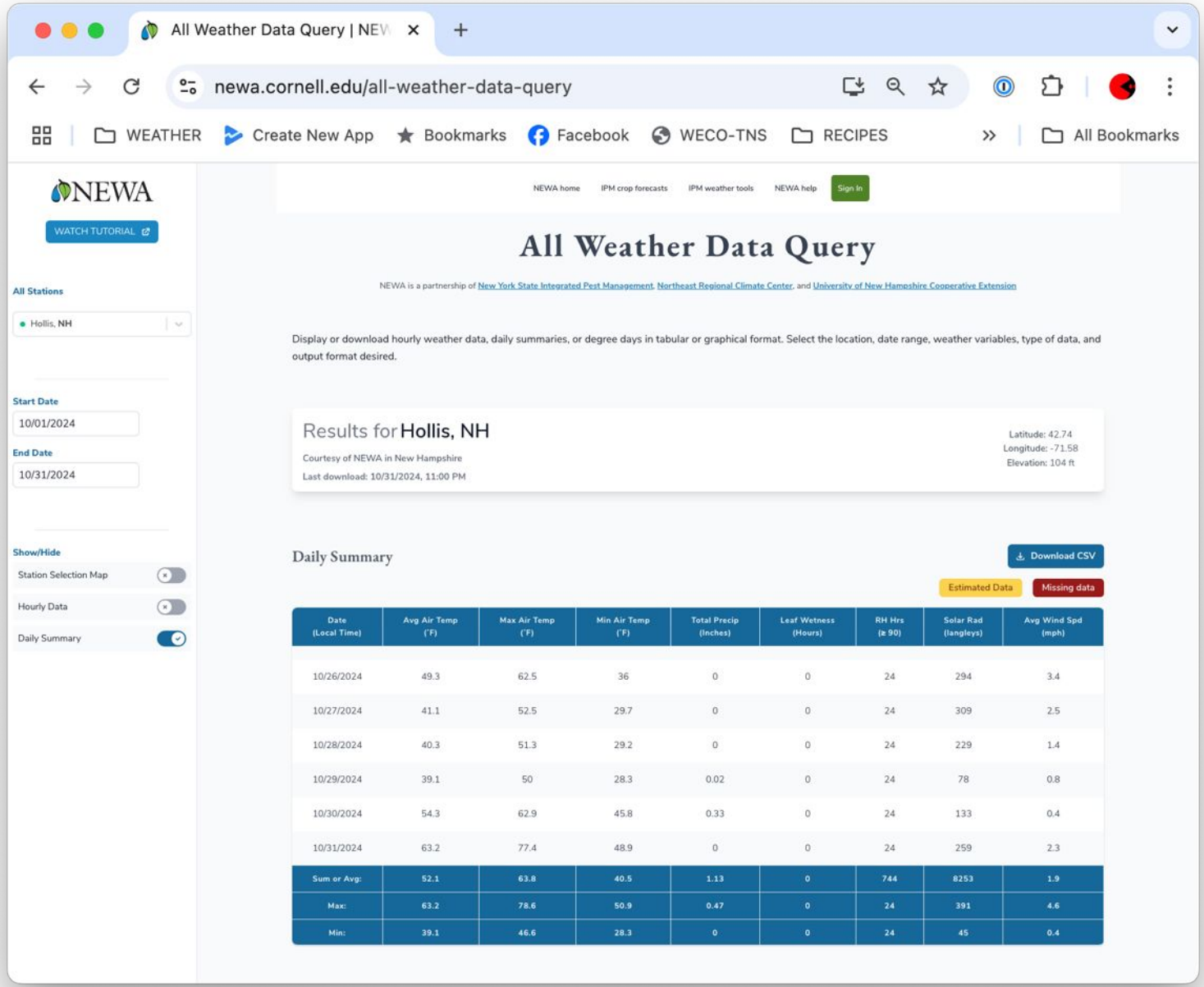
Precipitation: 0 in | High Temp: 55 °F | Low Temp: 29 °F

Today as of 3:00 PM

Precipitation: 0.19 in | High Temp: 45 °F | Low Temp: 43°F

5-Day Weather Forecast

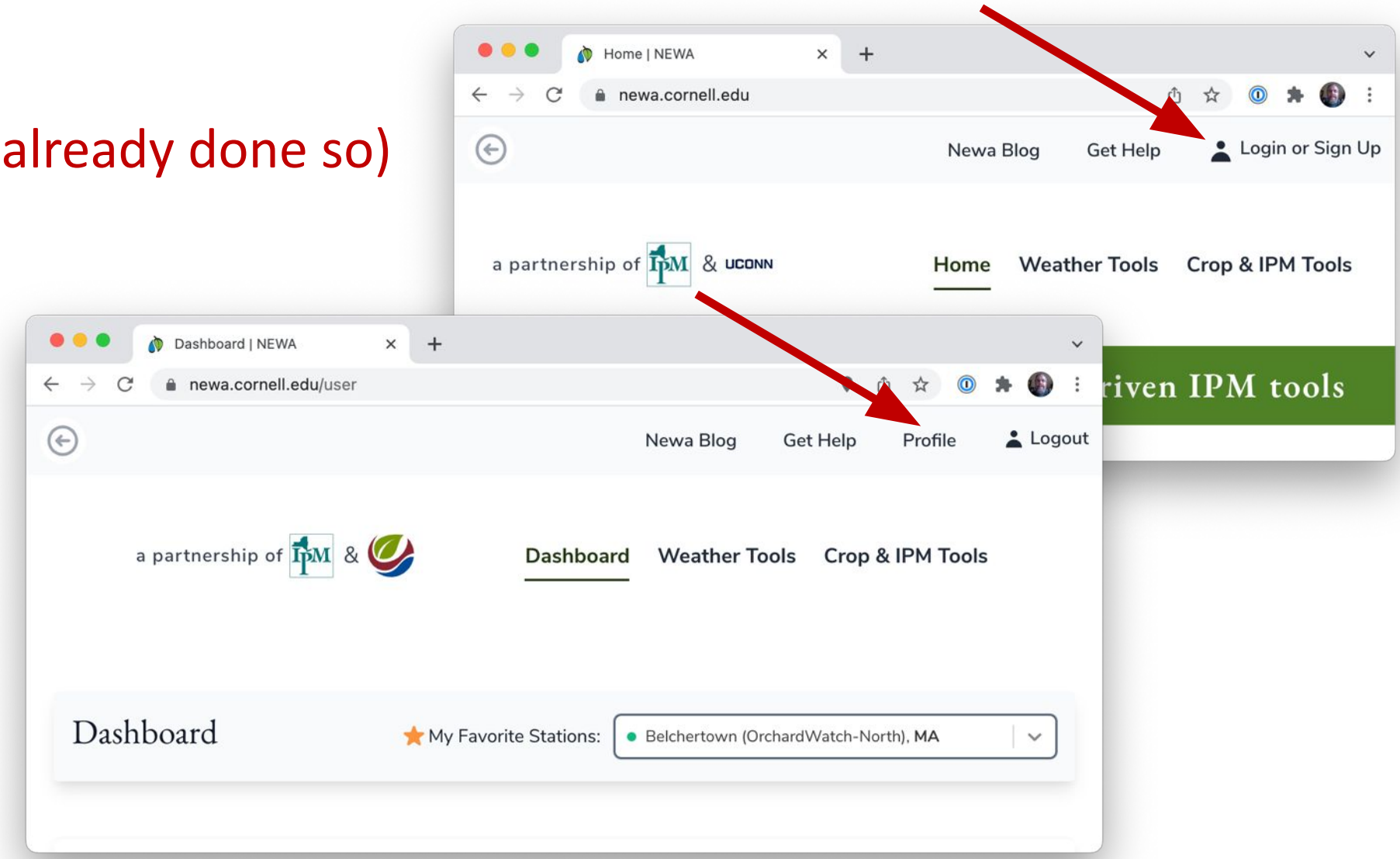
Thursday	Friday	Saturday	Sunday	Monday	Tuesday
11/21/2024	11/22/2024	11/23/2024	11/24/2024	11/25/2024	11/26/2024
45 43	48 39	45 37	47 37	49 33	48 36



Date (Local Time)	Avg Air Temp (°F)	Max Air Temp (°F)	Min Air Temp (°F)	Total Precip (Inches)	Leaf Wetness (Hours)	RH Hrs (≥ 90)	Solar Rad (langleys)	Avg Wind Spd (mph)
10/26/2024	49.3	62.5	36	0	0	24	294	3.4
10/27/2024	41.1	52.5	29.7	0	0	24	309	2.5
10/28/2024	40.3	51.3	29.2	0	0	24	229	1.4
10/29/2024	39.1	50	28.3	0.02	0	24	78	0.8
10/30/2024	54.3	62.9	45.8	0.33	0	24	133	0.4
10/31/2024	63.2	77.4	48.9	0	0	24	259	2.3
Sum or Avg:	52.1	63.8	40.5	1.13	0	744	8253	1.9
Max:	63.2	78.6	50.9	0.47	0	24	391	4.6
Min:	39.1	46.6	28.3	0	0	24	45	0.4

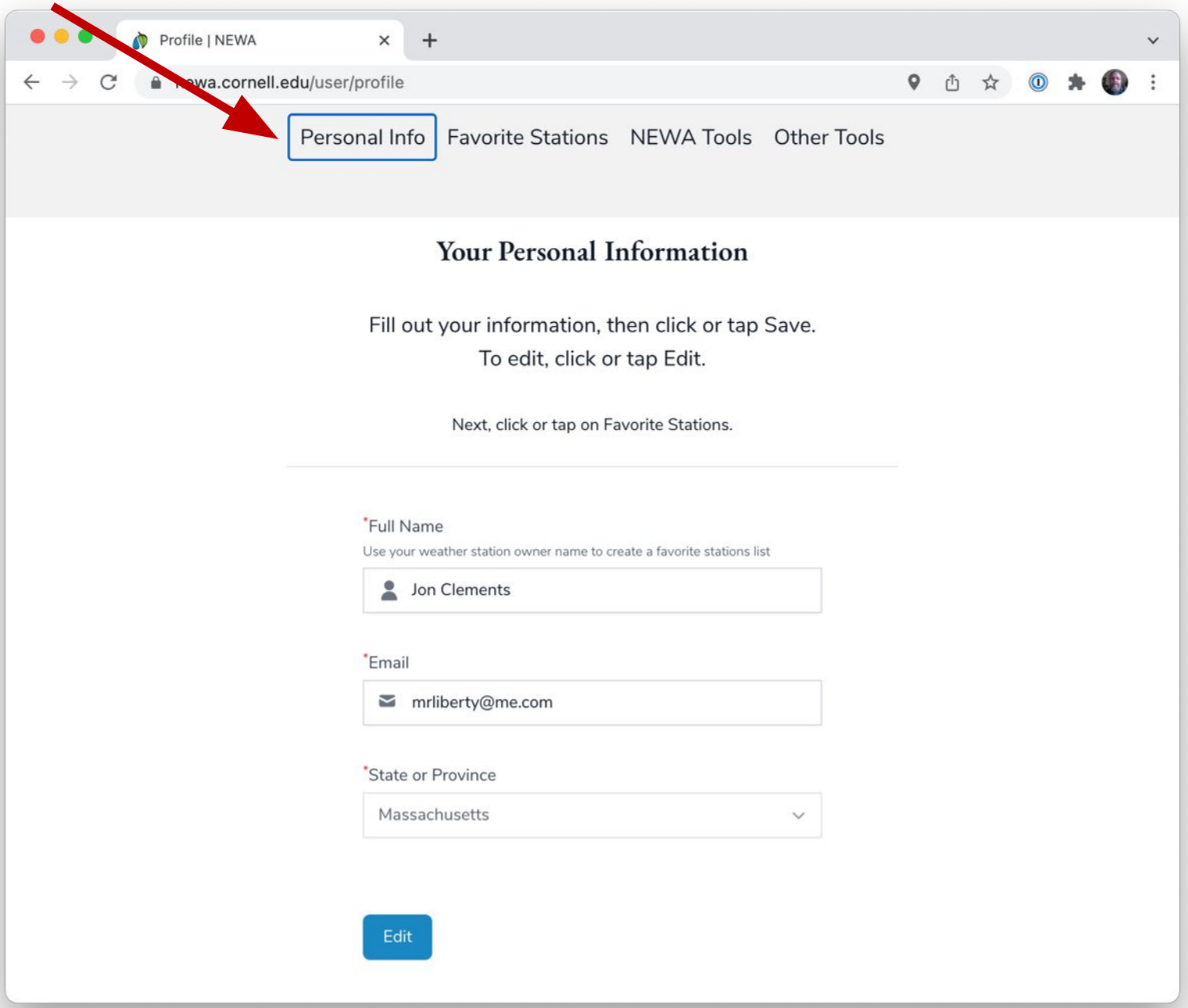
Sign up and Login (newa.cornell.edu)

- Sign up (if not already done so)
- Login
- Edit Profile



Edit Profile

- Personal Info
- Favorite Stations
- NEWA Tools
- Other Tools



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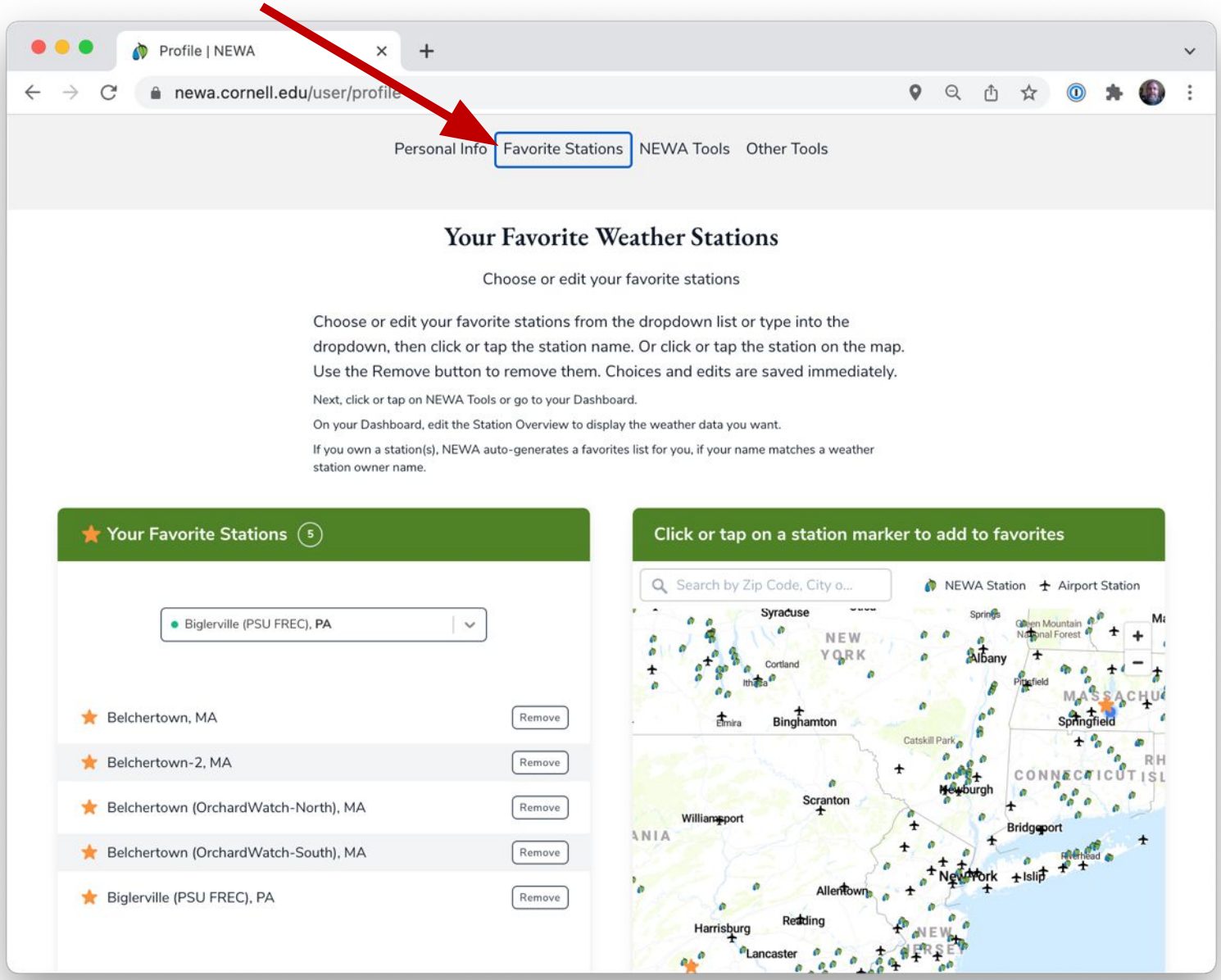

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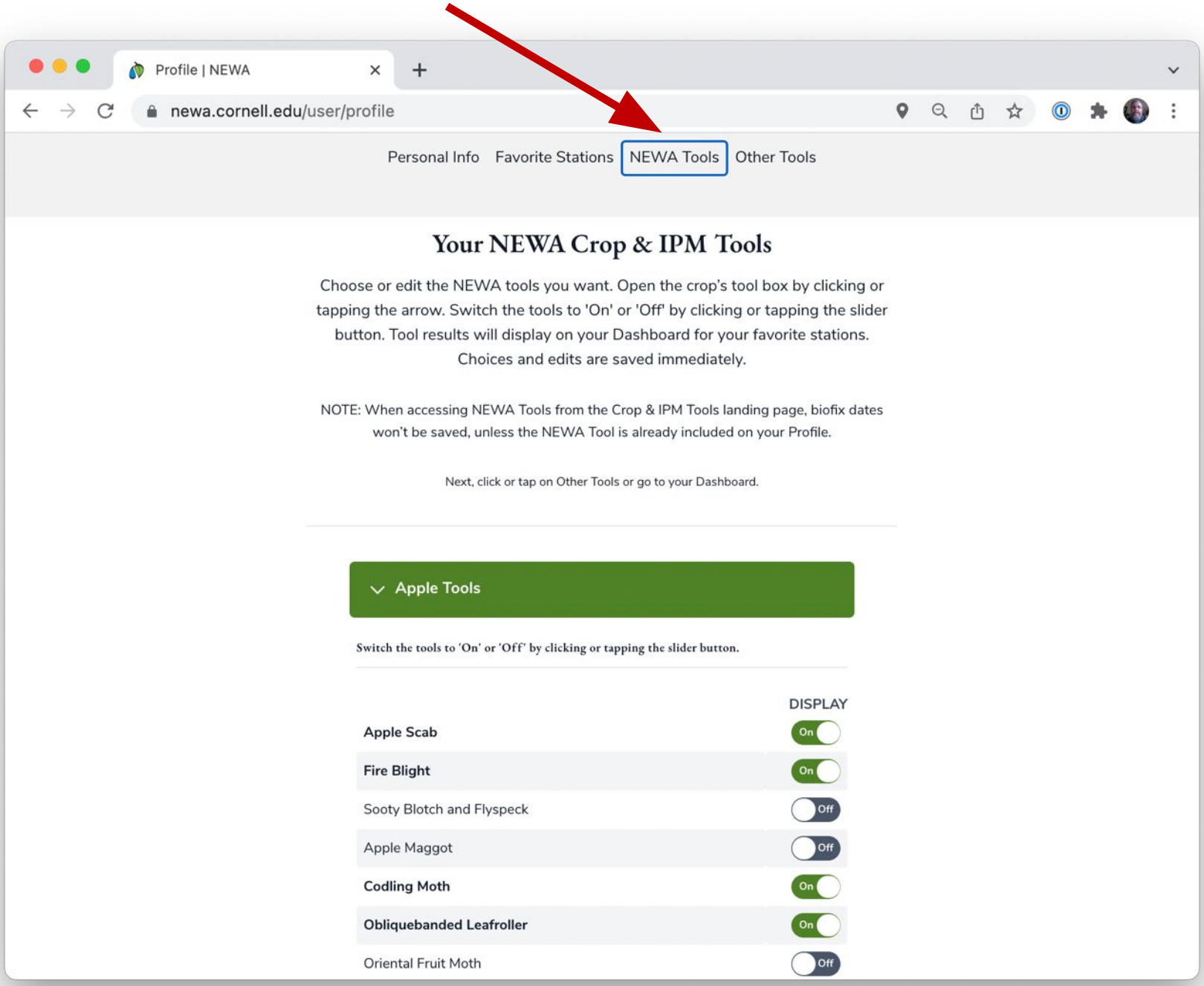

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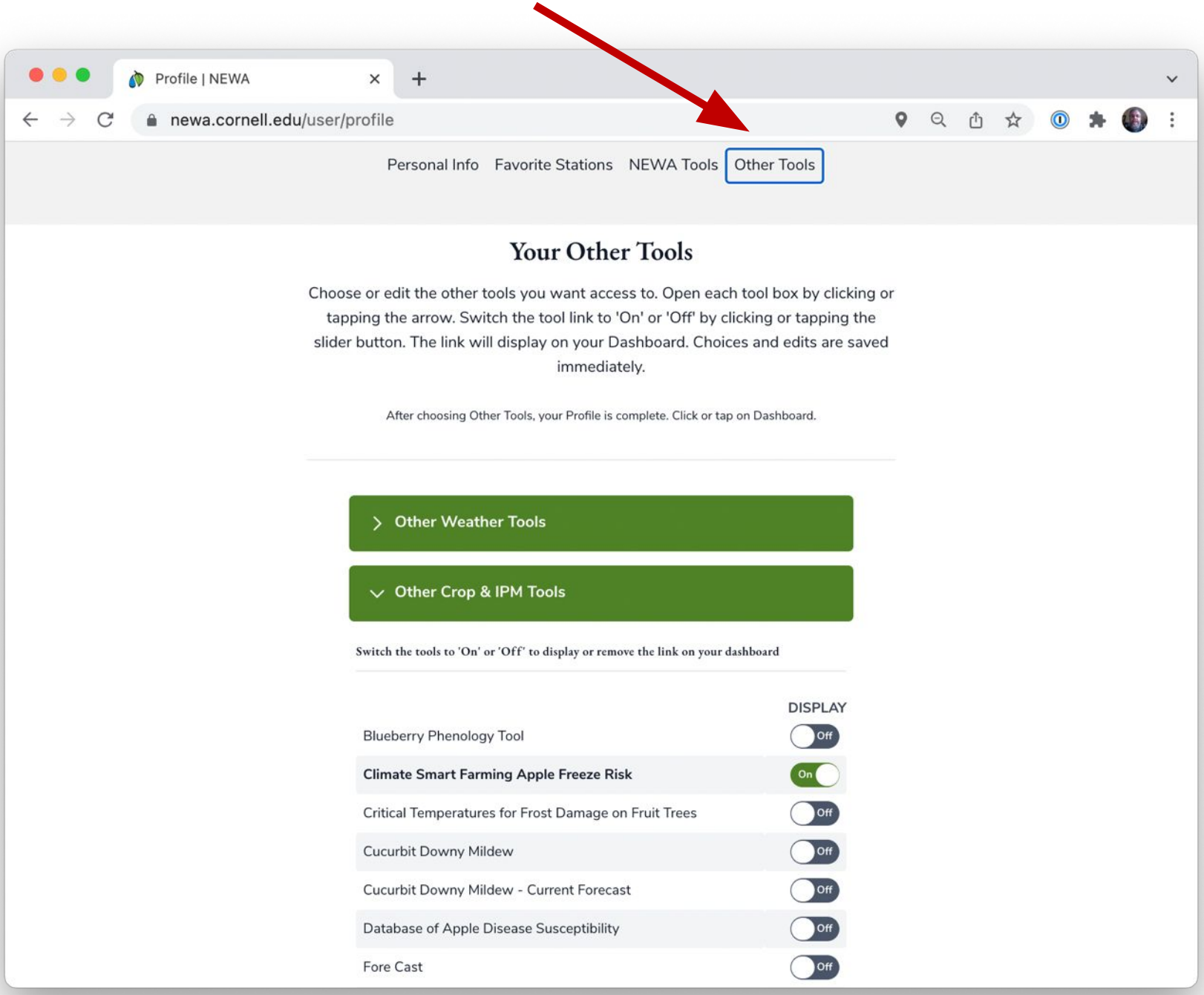
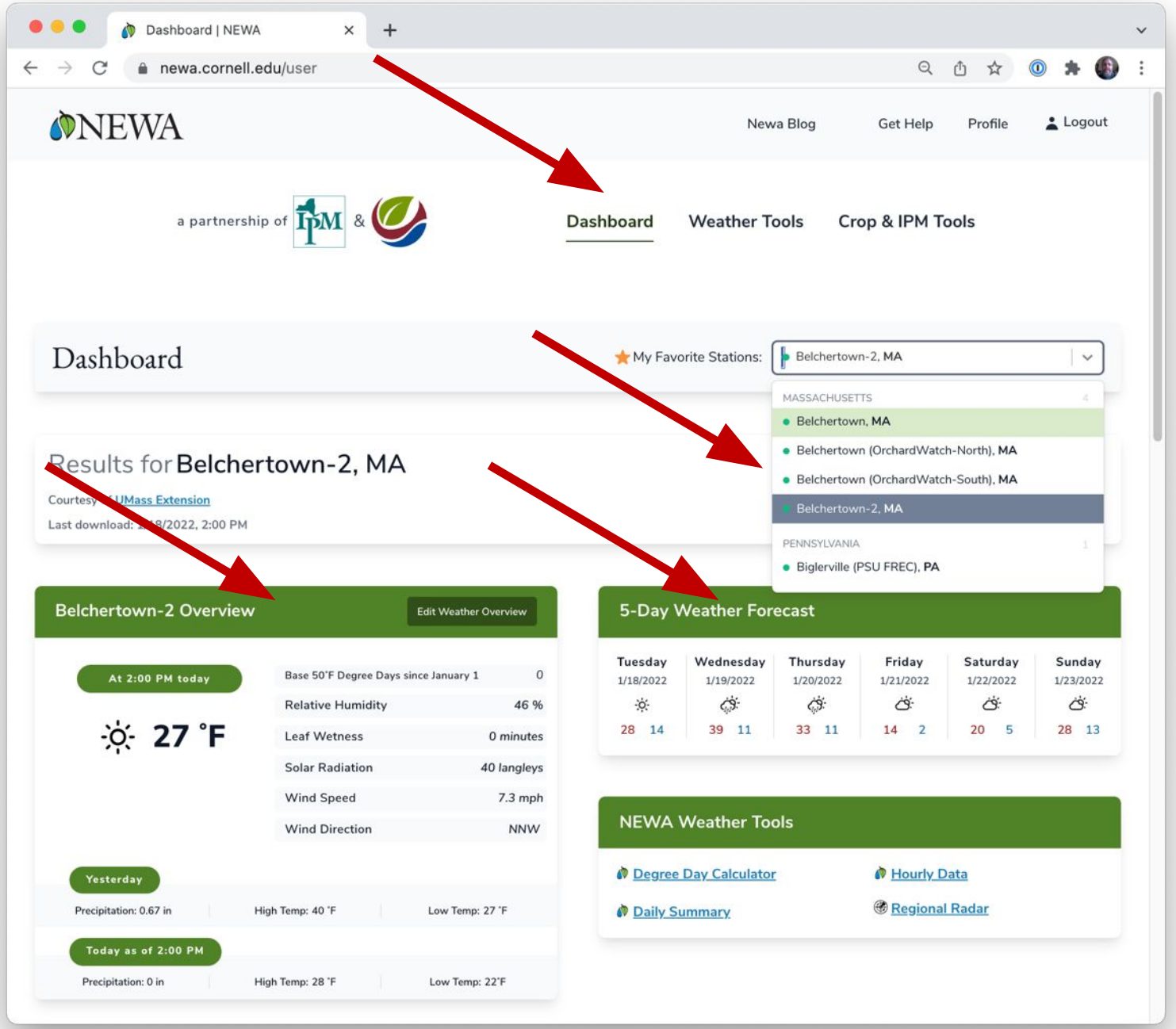


Inbox - jmcext
Dashboard | N
Climate Smart
Facebook
Google Calen
Not Secure
climatesmartfarming.org/tools/csf-apple-freeze-probability/
CSF
Climate Smart Farming
A program of Cornell University
news
about us
contact
Powerful and user-friendly climate tools for farmers in the Northeast
CSF Apple Stage / Freeze Damage Probability
Climate
Tools
Team
Resources
Videos
Current Location:
Adams County, PA
Lat/Lon: 39.85, -77.29
Change Location
Date of Interest:
01/18/2022
Apple Variety
Empire
McIntosh
Red Delicious
Viewing 2021-2022 results.
30-Day Results
Season To Date
Climate Change
Info
Empire Apple Freeze Damage Potential
@ Adams County, PA
30-Day Results
Jan 16, 2022
Stage : Dormant
Min Temperature : 7
10% Damage Temp : -25
50% Damage Temp : -25
90% Damage Temp : -25
Temperature (°F)
60
40
20
0
-20
-40
13 Dec
20 Dec
27 Dec
03 Jan
10 Jan
17 Jan
Powered by NRCC
© Cornell University, 2016. Credits: Tool Developed by Art DeGaetano & Rick Moore.

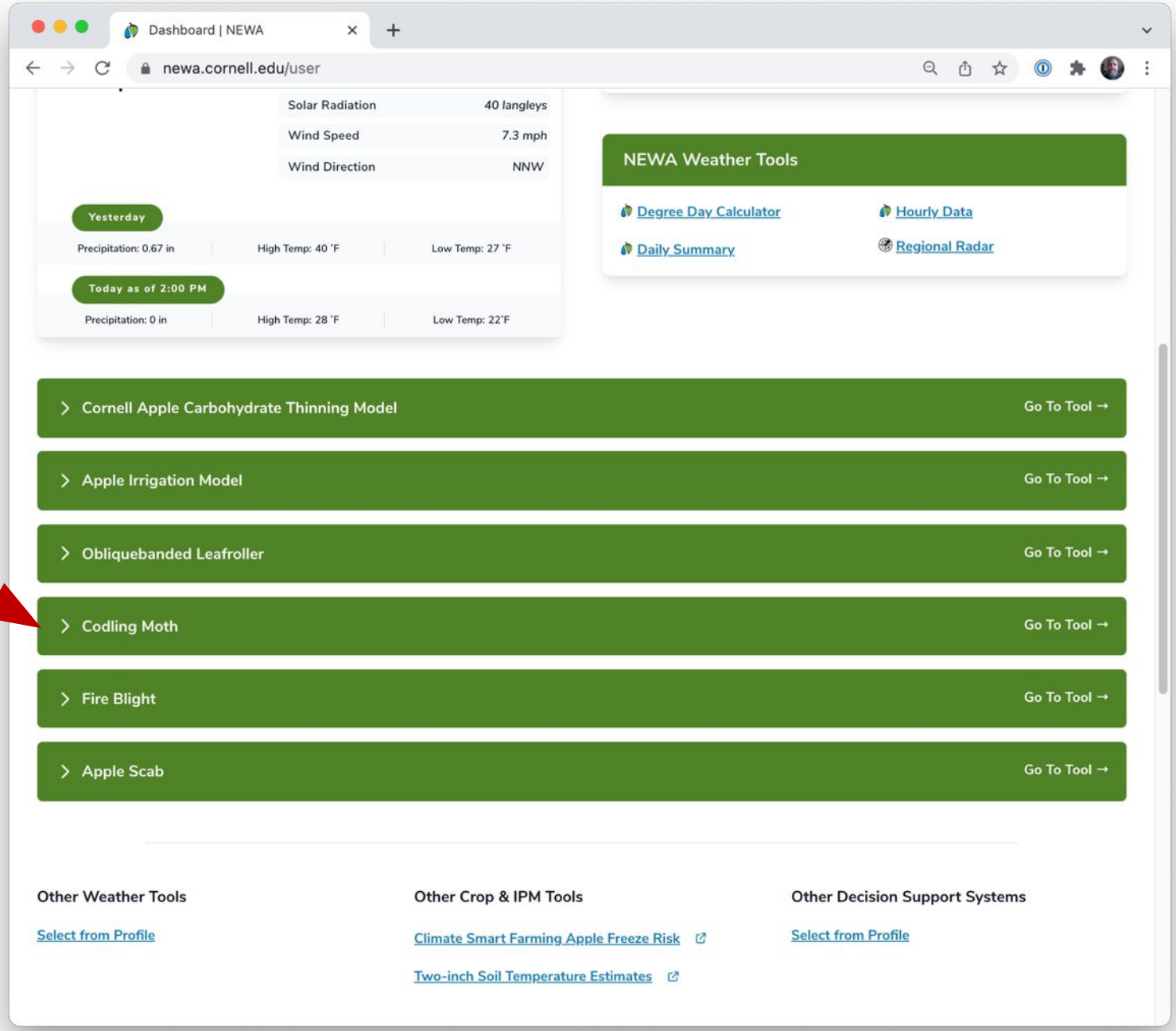
Dashboard

- My Favorite Stations
- Current Conditions
- Weather Forecast

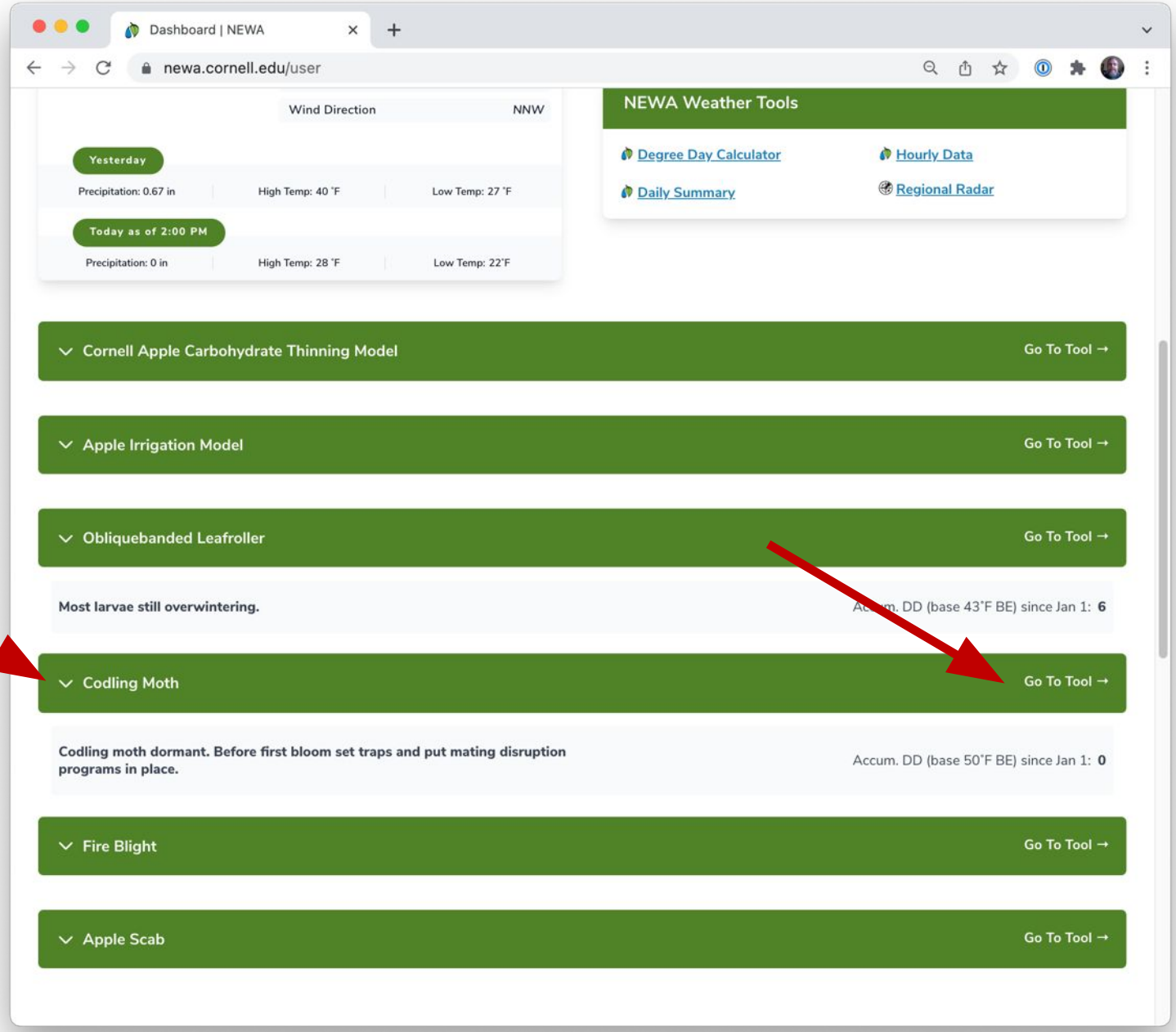


Dashboard

Crop & IPM Tools

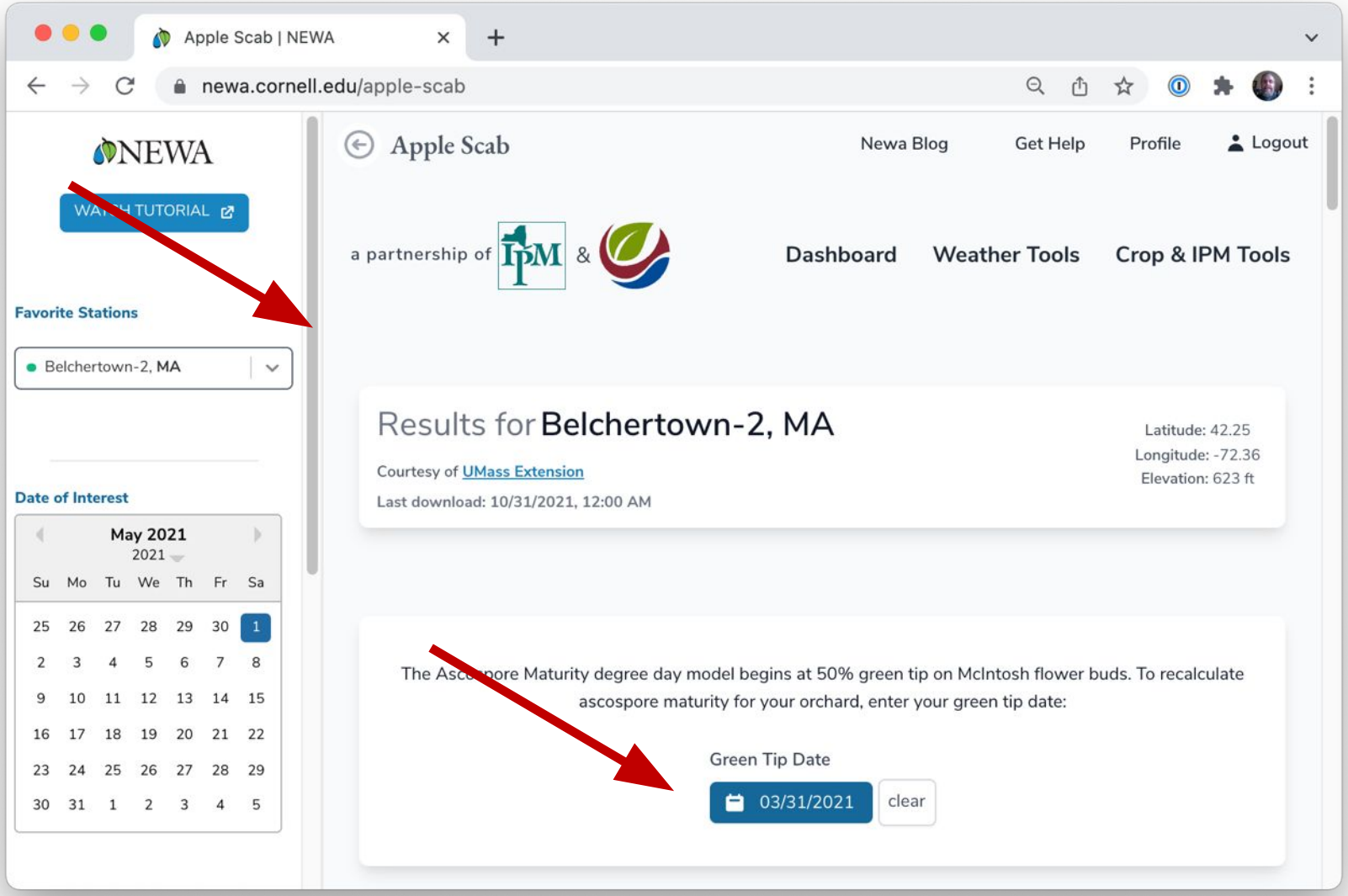


Dashboard


Dashboard | NEWA
newa.cornell.edu/user
Wind Direction NNW
Yesterday
Precipitation: 0.67 in
High Temp: 40 °F
Low Temp: 27 °F
Today as of 2:00 PM
Precipitation: 0 in
High Temp: 28 °F
Low Temp: 22°F
NEWA Weather Tools
Degree Day Calculator
Hourly Data
Daily Summary
Regional Radar
Cornell Apple Carbohydrate Thinning Model
Go To Tool →
Apple Irrigation Model
Go To Tool →
Obliquebanded Leafroller
Go To Tool →
Most larvae still overwintering.
Accum. DD (base 43°F BE) since Jan 1: 6
Codling Moth
Go To Tool →
Codling moth dormant. Before first bloom set traps and put mating disruption programs in place.
Accum. DD (base 50°F BE) since Jan 1: 0
Fire Blight
Go To Tool →
Apple Scab
Go To Tool →

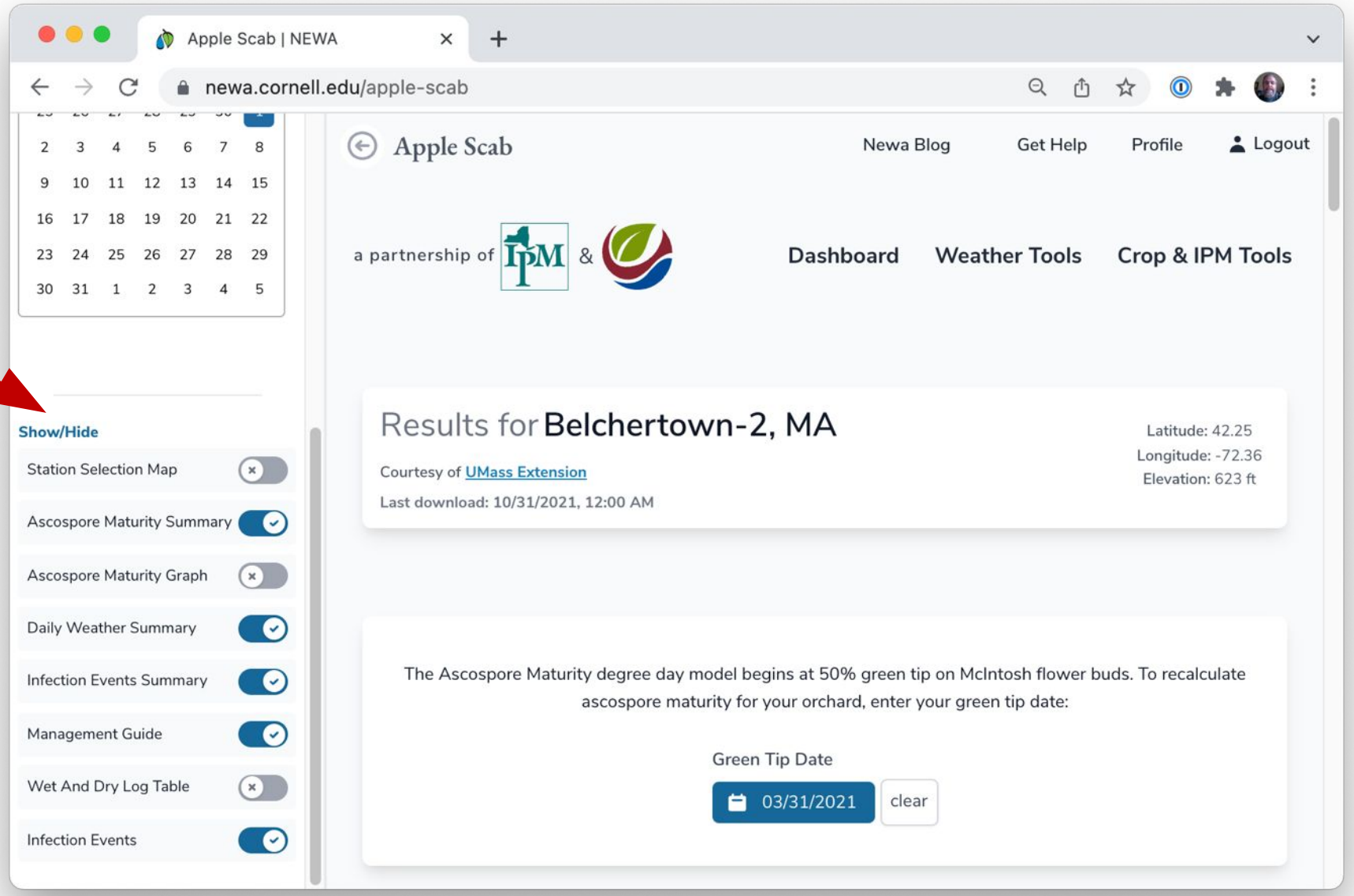
Apple Scab

- Set Green Tip Date
- Show/Hide



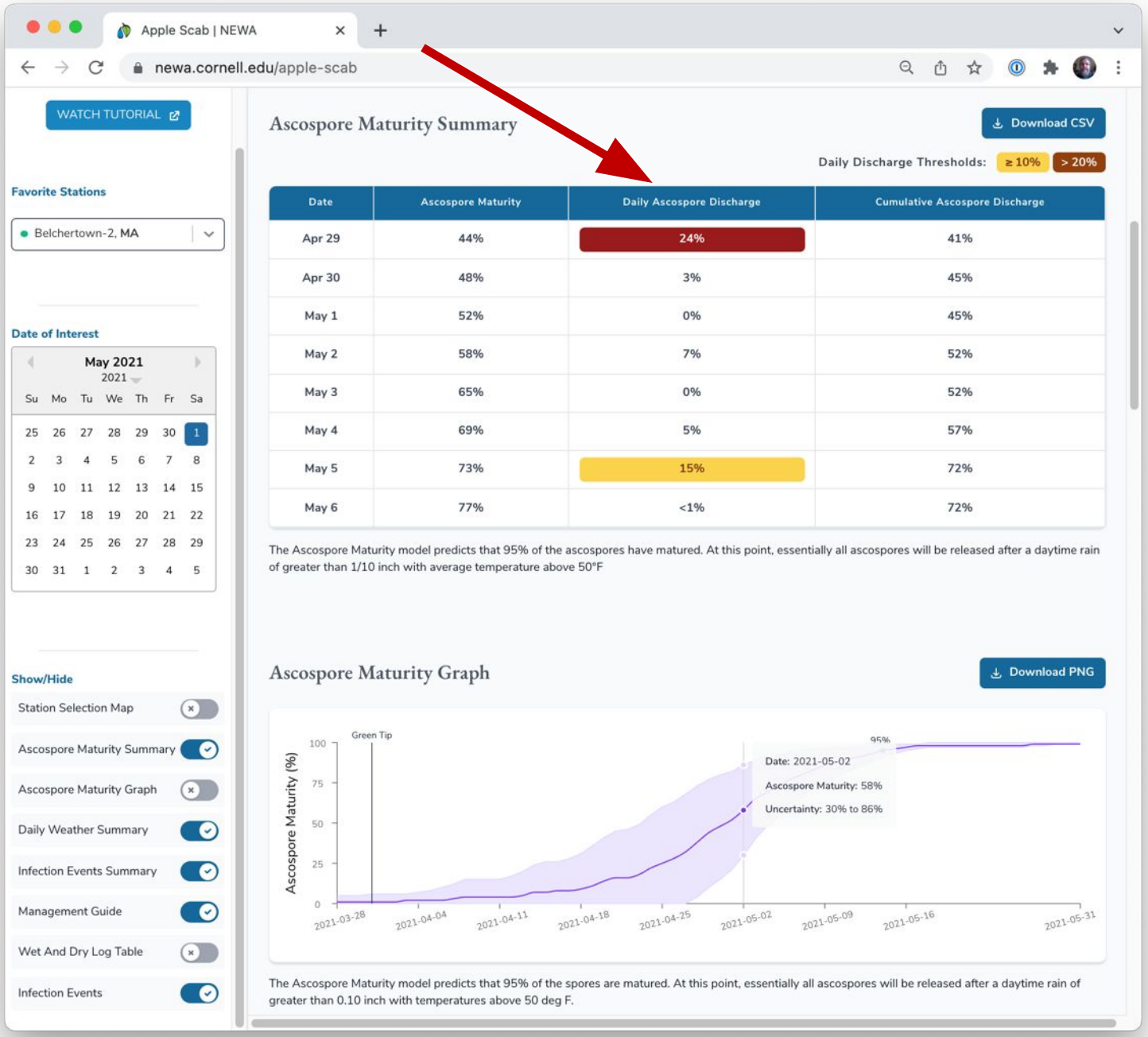
Apple Scab

- Green Tip Date
- Show/Hide



Apple Scab

- Ascospore Maturity
- Infection Events Summary
- Infection Events
- Management Guide



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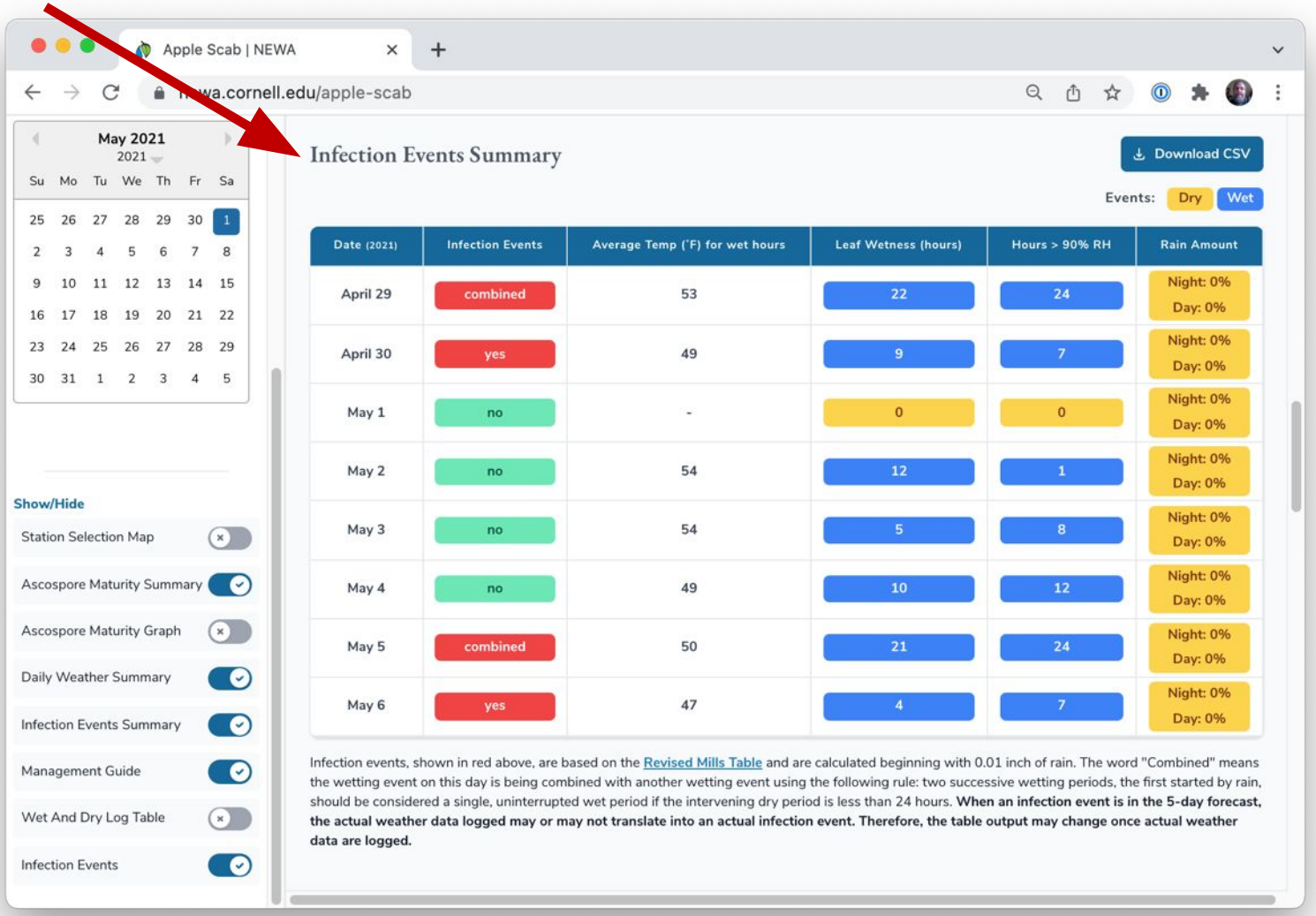

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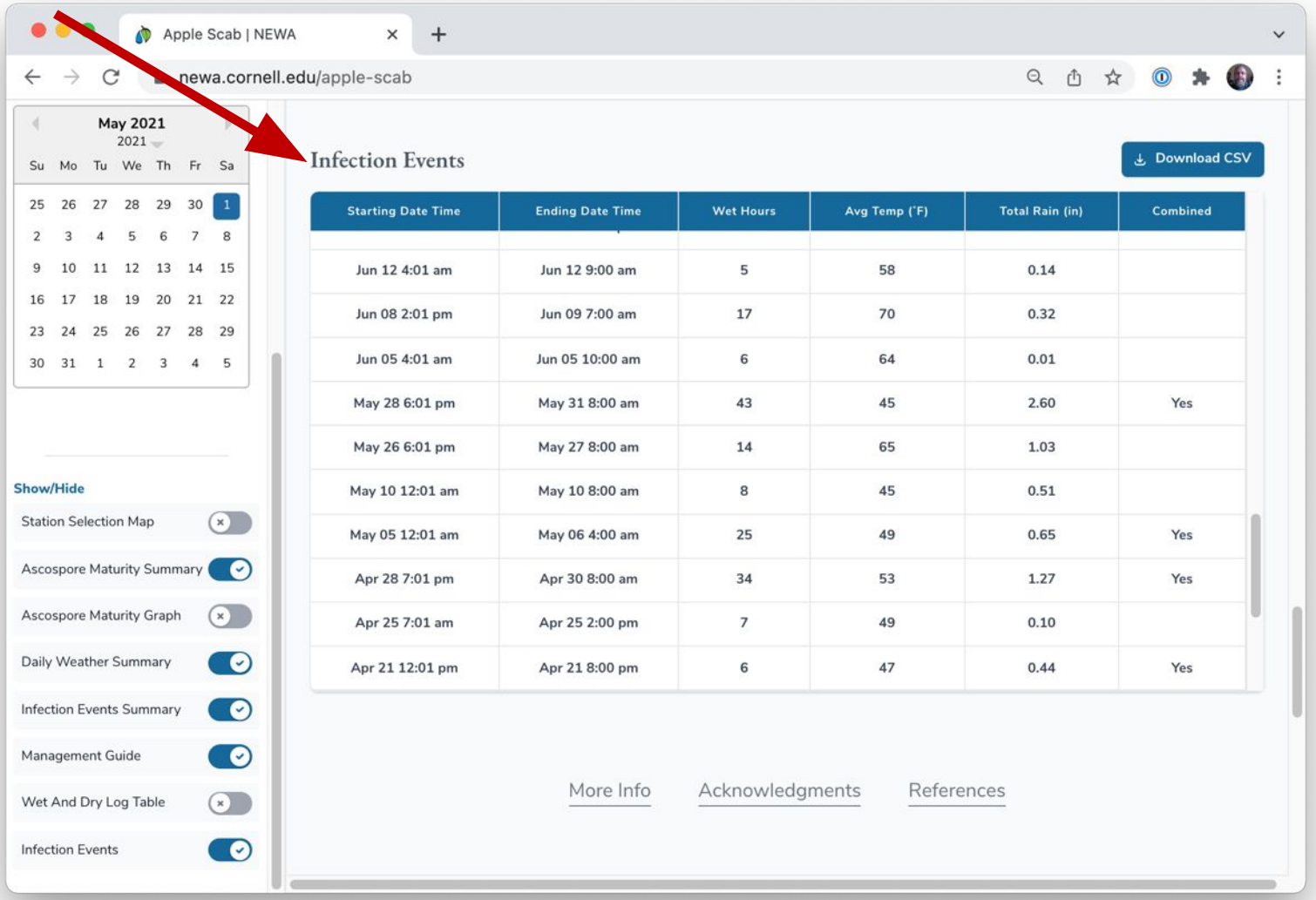

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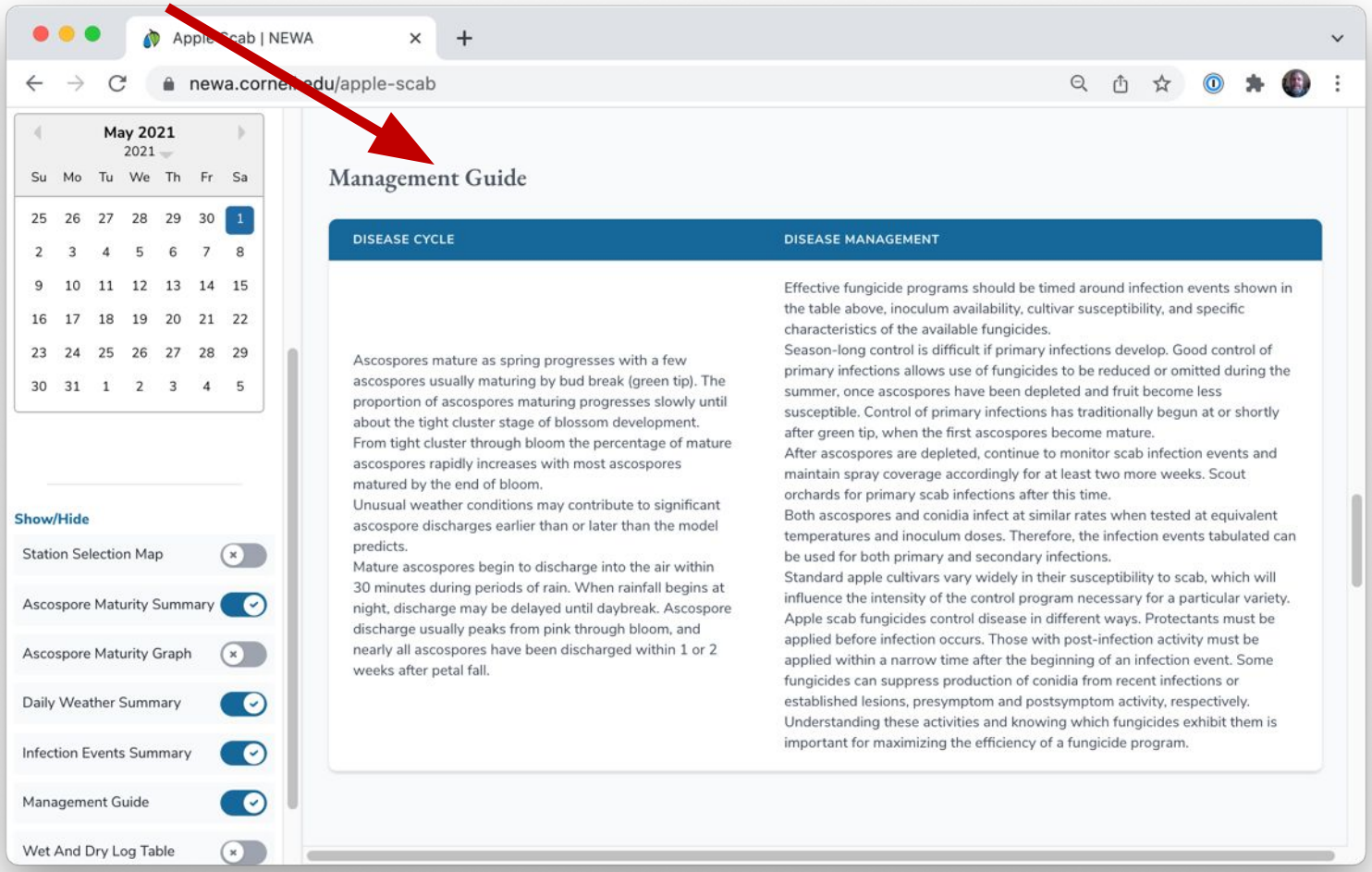
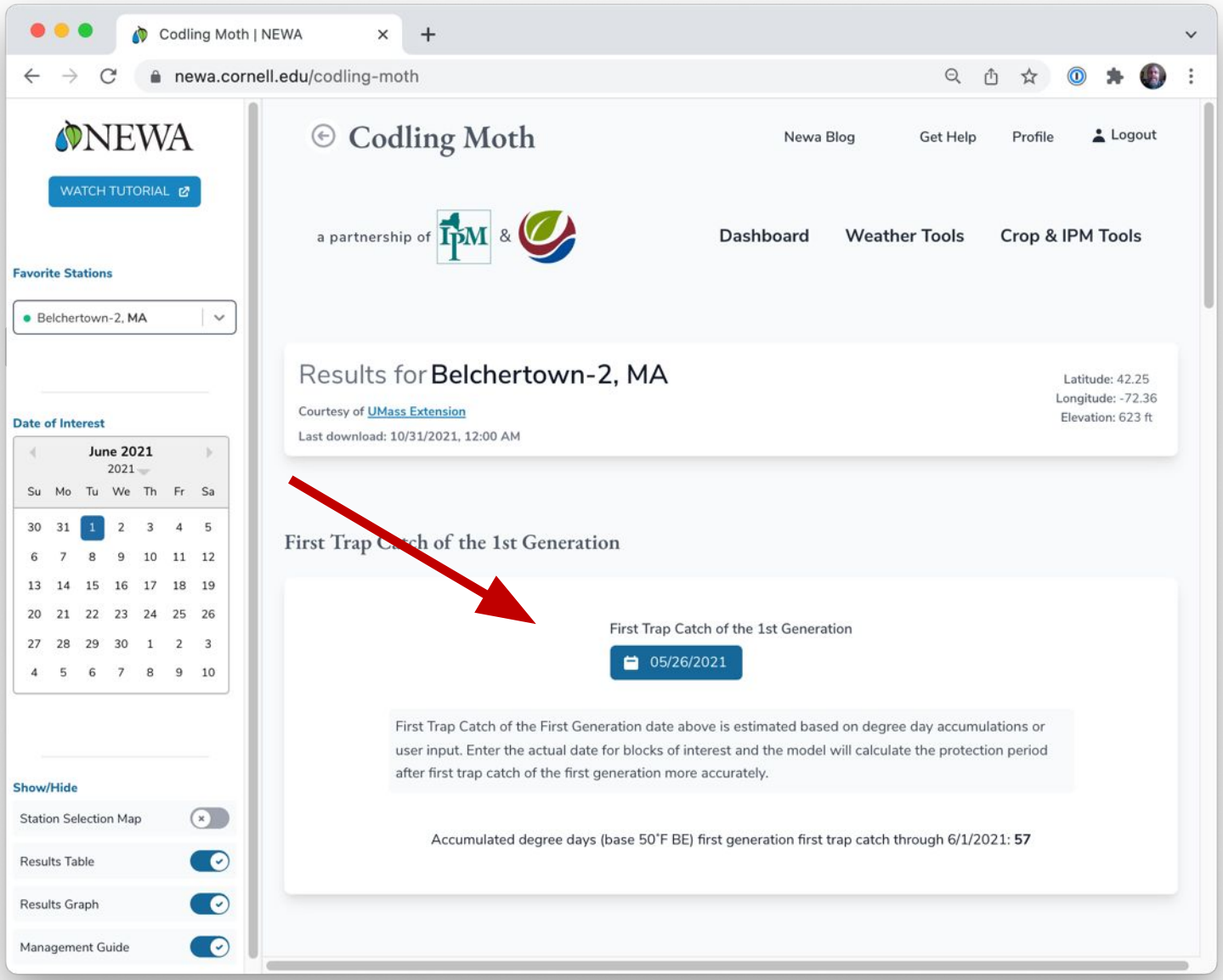


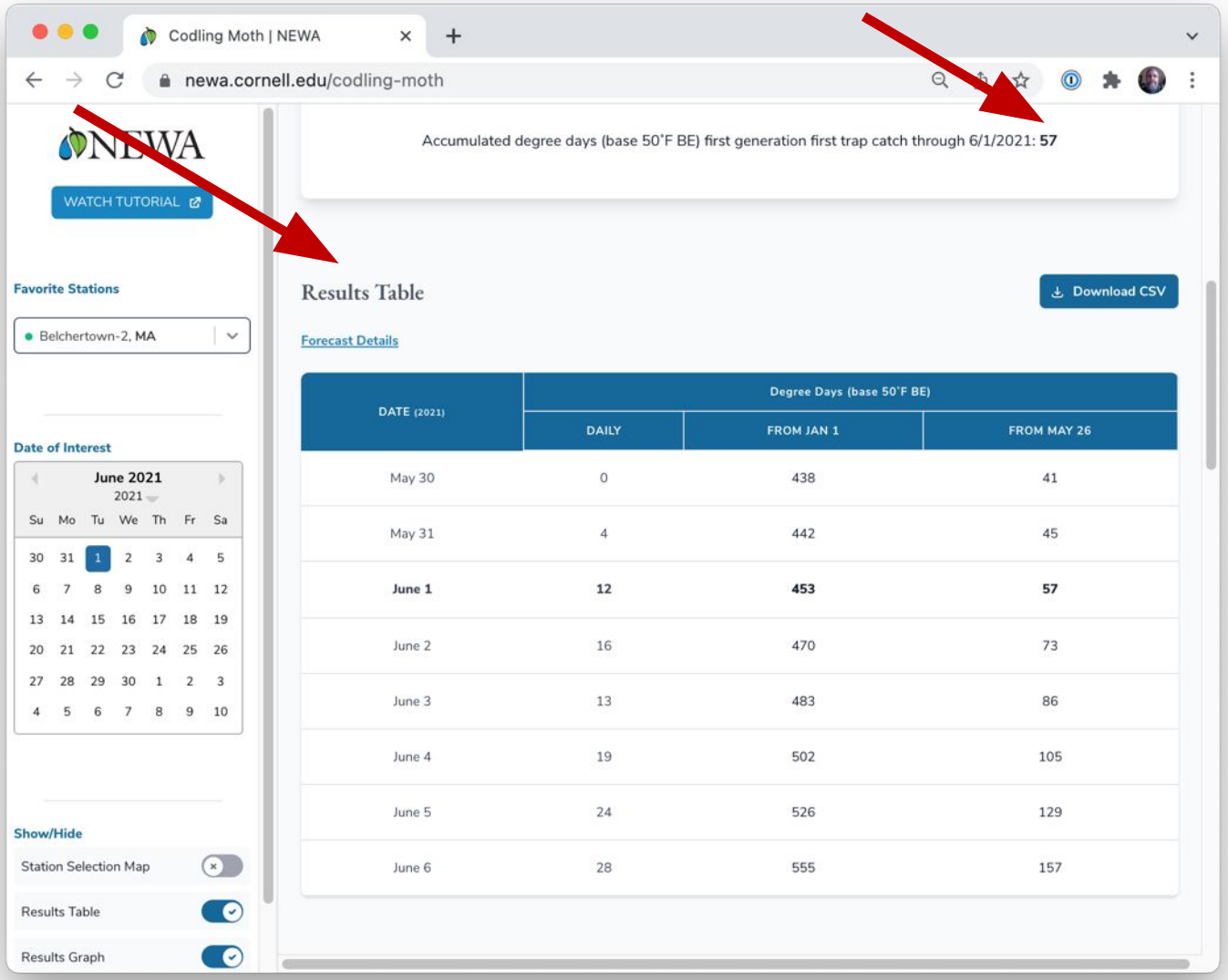
Codling Moth

- First Trap Catch
- Results Table
- Accumulated Degree Days
- Results Graph
- Management Guide



Codling Moth

- First Trap Catch
- Results Table
- Accumulated Degree Days Base 50 F.
- Results Graph
- Management Guide



DATE (2021)	Degree Days (base 50°F BE)		
	DAILY	FROM JAN 1	FROM MAY 26
May 30	0	438	41
May 31	4	442	45
June 1	**12**	**453**	**57**
June 2	16	470	73
June 3	13	483	86
June 4	19	502	105
June 5	24	526	129
June 6	28	555	157

Codling Moth

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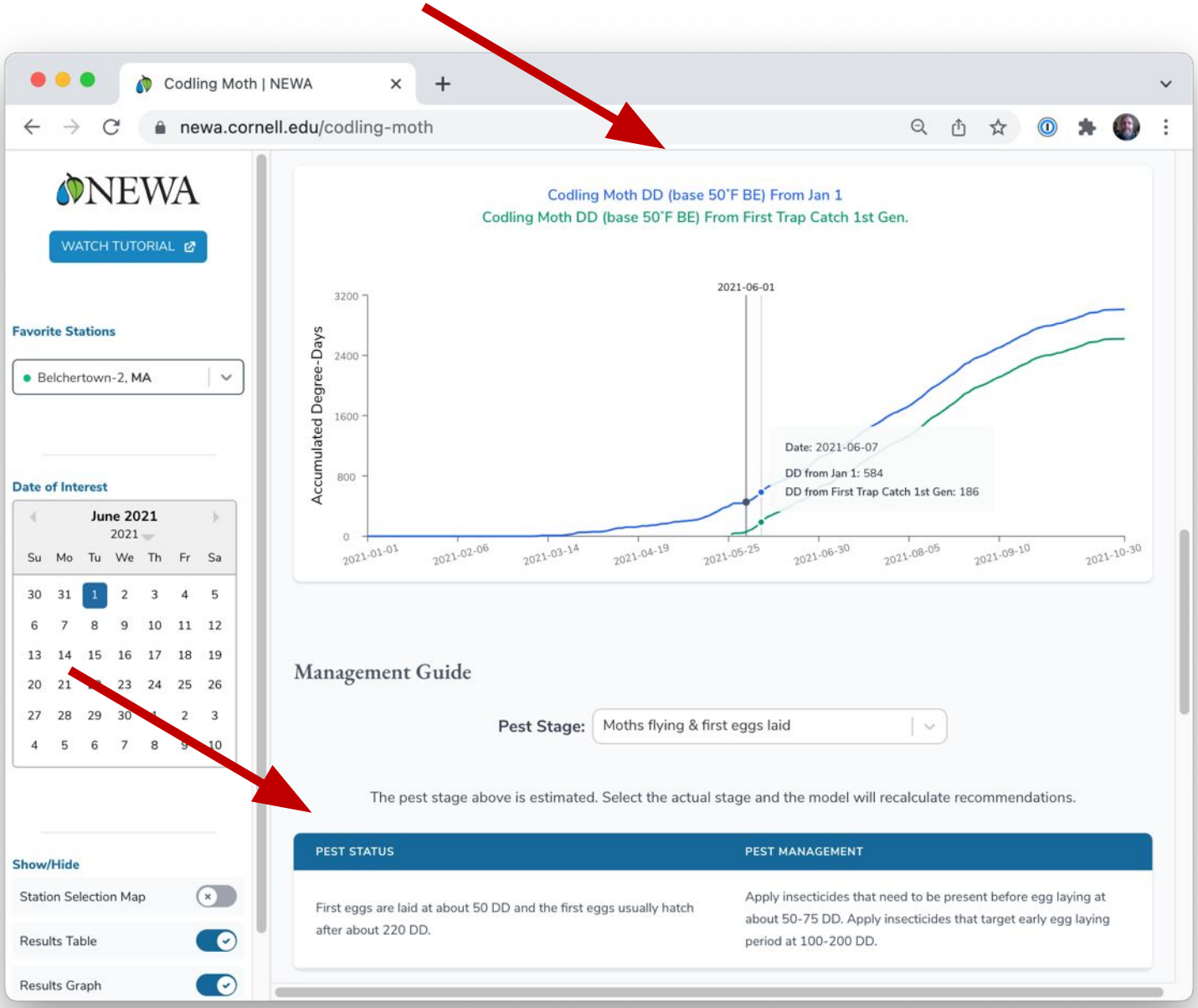
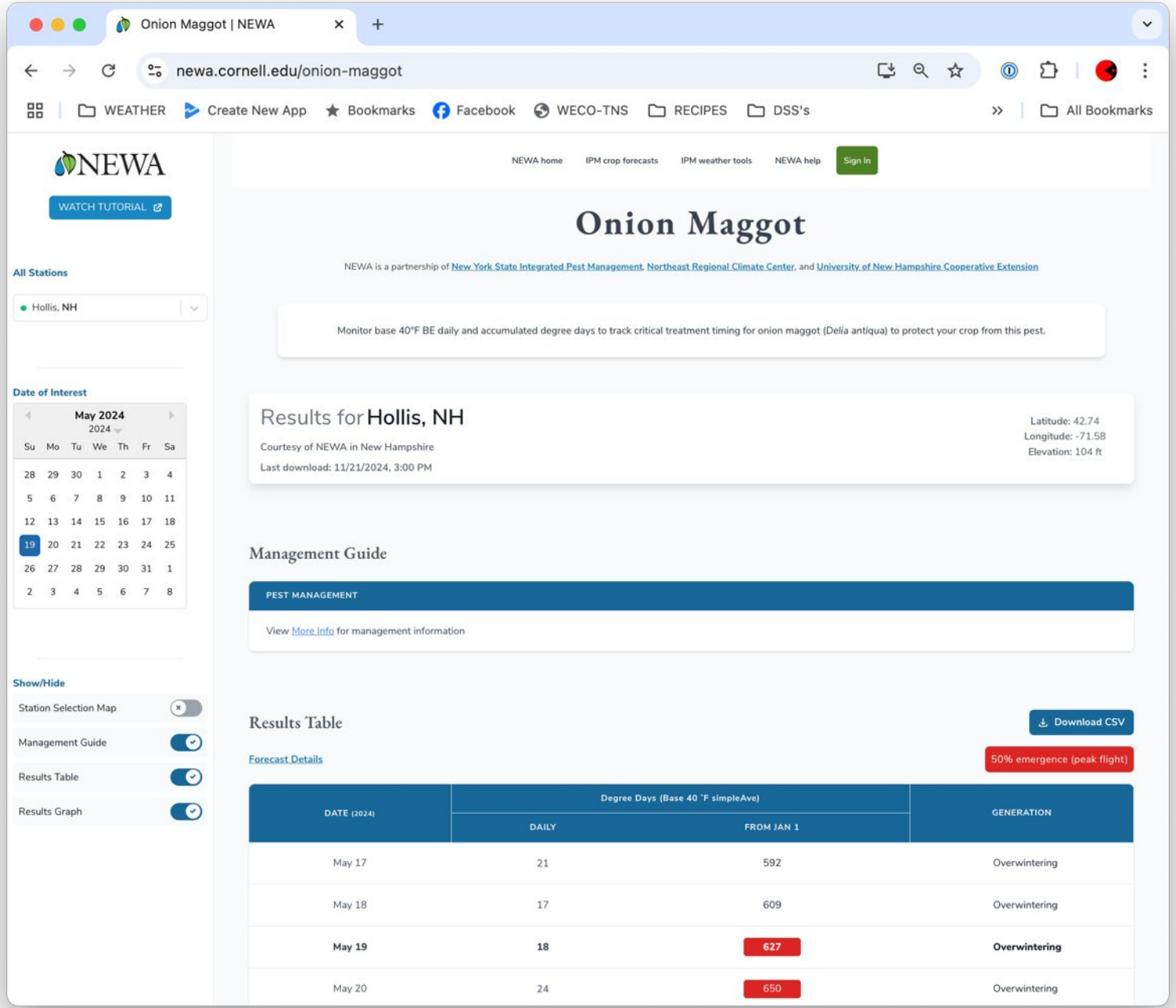



Onion Maggot | NEWA
newa.cornell.edu/onion-maggot
WEATHER
Create New App
Bookmarks
Facebook
WECO-TNS
RECIPES
DSS's
All Bookmarks
NEWA
WATCH TUTORIAL
All Stations
Hollis, NH
Date of Interest
May 2024
2024
Su Mo Tu We Th Fr Sa
28 29 30 1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31 1
2 3 4 5 6 7 8
Show/Hide
Station Selection Map
Management Guide
Results Table
Results Graph
NEWA home
IPM crop forecasts
IPM weather tools
NEWA help
Sign In
Onion Maggot
NEWA is a partnership of New York State Integrated Pest Management, Northeast Regional Climate Center, and University of New Hampshire Cooperative Extension
Monitor base 40°F BE daily and accumulated degree days to track critical treatment timing for onion maggot (Delia antiqua) to protect your crop from this pest.
Results for Hollis, NH
Courtesy of NEWA in New Hampshire
Last download: 11/21/2024, 3:00 PM
Latitude: 42.74
Longitude: -71.58
Elevation: 104 ft
Management Guide
PEST MANAGEMENT
View More Info for management information
Results Table
Download CSV
Forecast Details
50% emergence (peak flight)
DATE (2024)
Degree Days (Base 40 °F simpleAve)
DAILY
FROM JAN 1
GENERATION
May 17 21 592 Overwintering
May 18 17 609 Overwintering
May 19 18 627 Overwintering
May 20 24 650 Overwintering

Onion Maggot | NEWA

newa.cornell.edu/onion-maggot

WEATHER | Create New App | Bookmarks | Facebook | WECO-TNS | RECIPES | DSS's | All Bookmarks

NEWA

WATCH TUTORIAL

All Stations

Hollis, NH

Date of Interest

May 2024
2024

Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

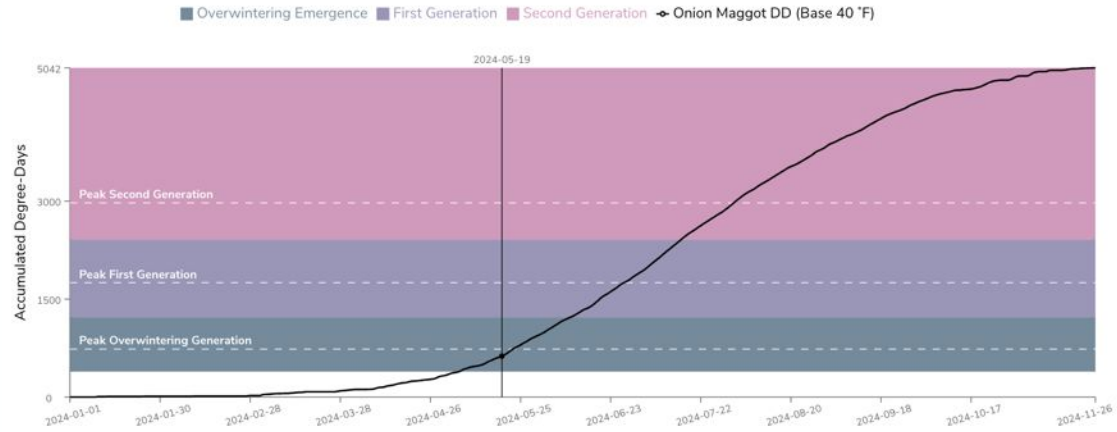
Show/Hide

- Station Selection Map
- Management Guide
- Results Table
- Results Graph

May 20	24	650	Overwintering
May 21	30	681	Overwintering
May 22	36	717	Overwintering
May 23	31	747	Overwintering
May 24	26	773	Overwintering

Results Graph

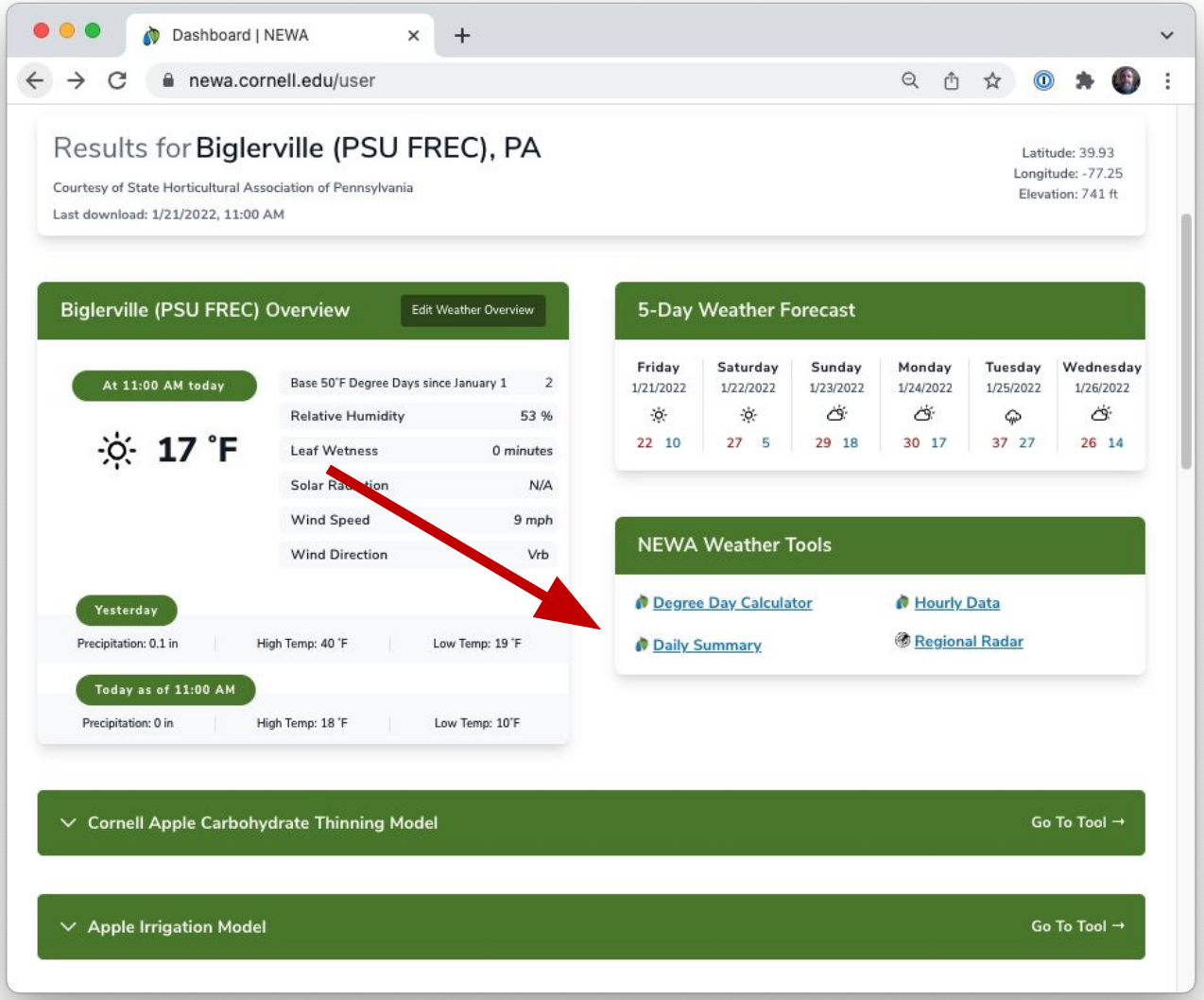
Download PNG



Peak flights (50% emergence) are indicated by the degree day accumulation line intersecting the white dotted lines. The most critical time to protect the crop is during the peak emergence of the overwintering generation when plants are small. Target larvae with insecticide treated seed or an at-planting insecticide drench, or protect plants from egg-laying female flies with row covers. Row covers must be in place well before adults begin to emerge. Use the forecast to predict first emergence.

More Info | Acknowledgments | References

NEWA Weather Tools



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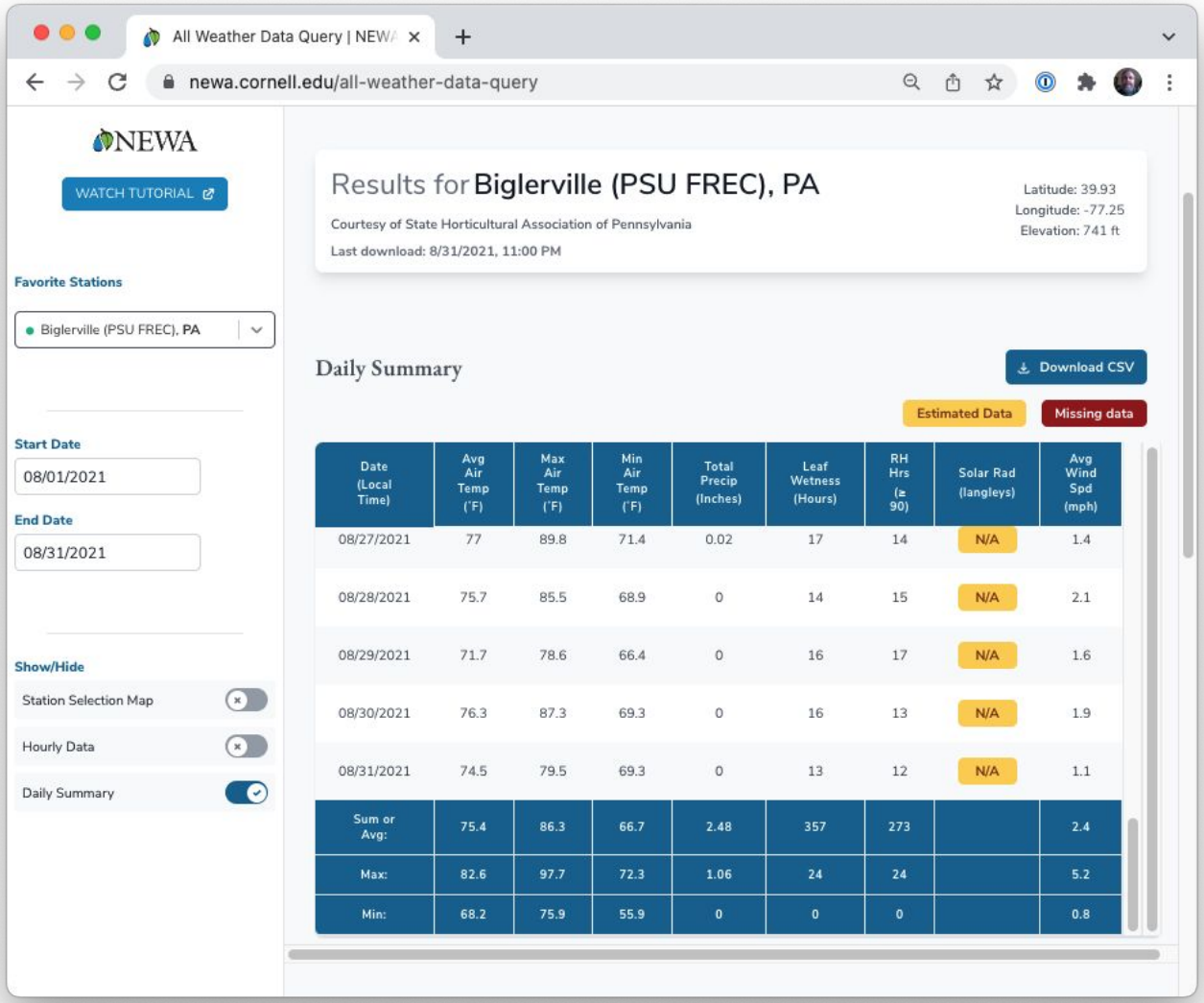
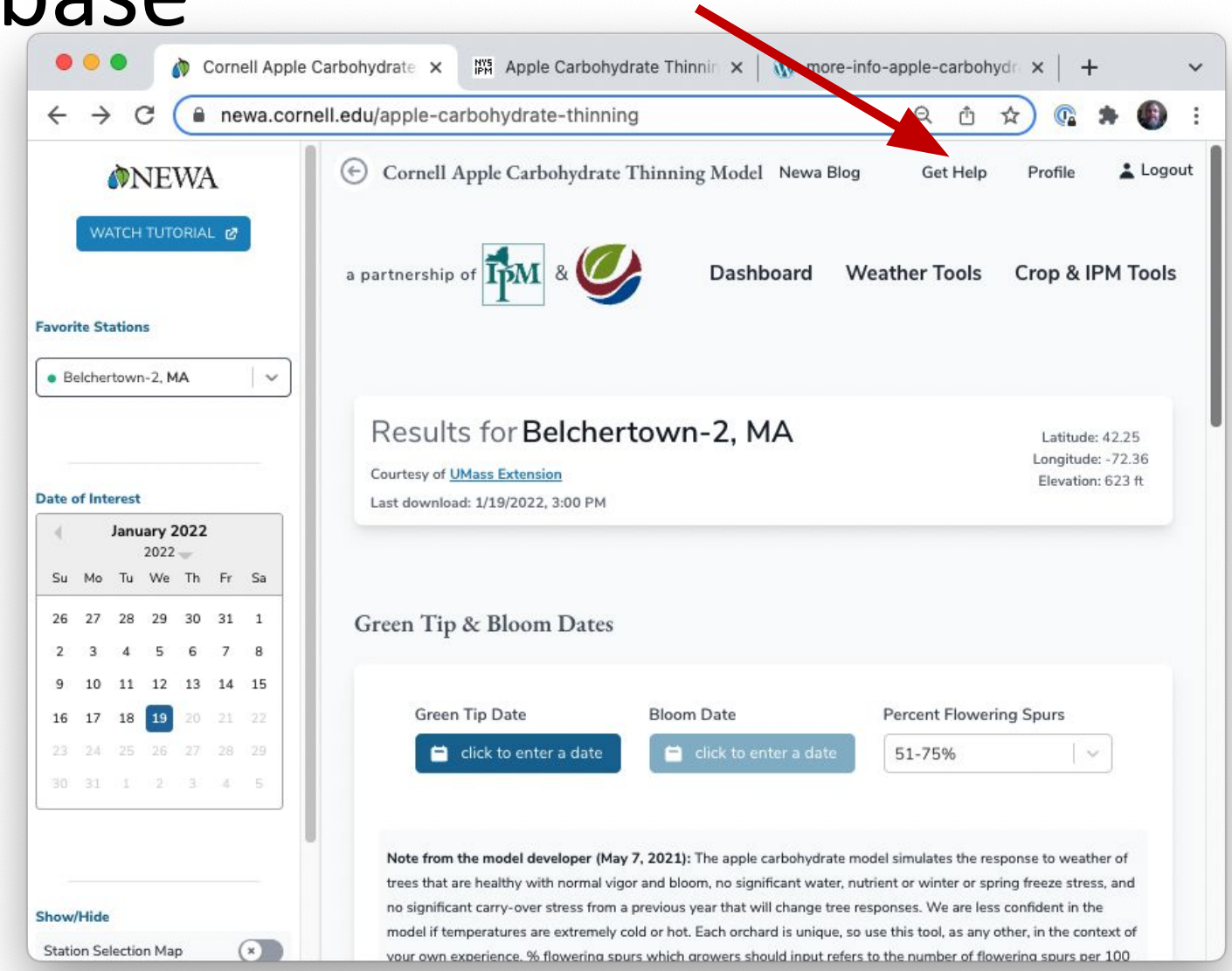


NEWA knowledge base

- Get Help
- Email the NEWA Help Desk
- NEWA Help Desk



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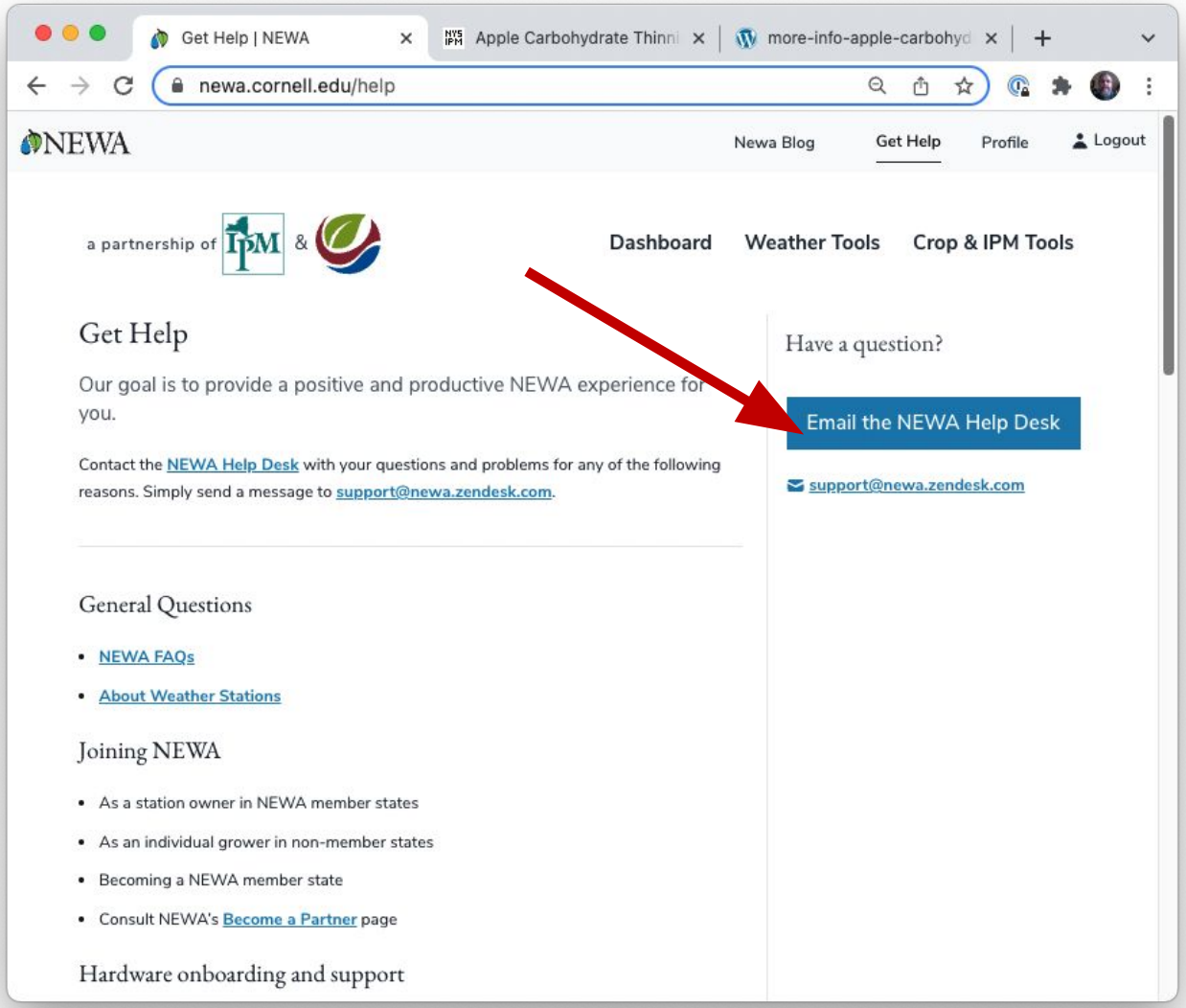

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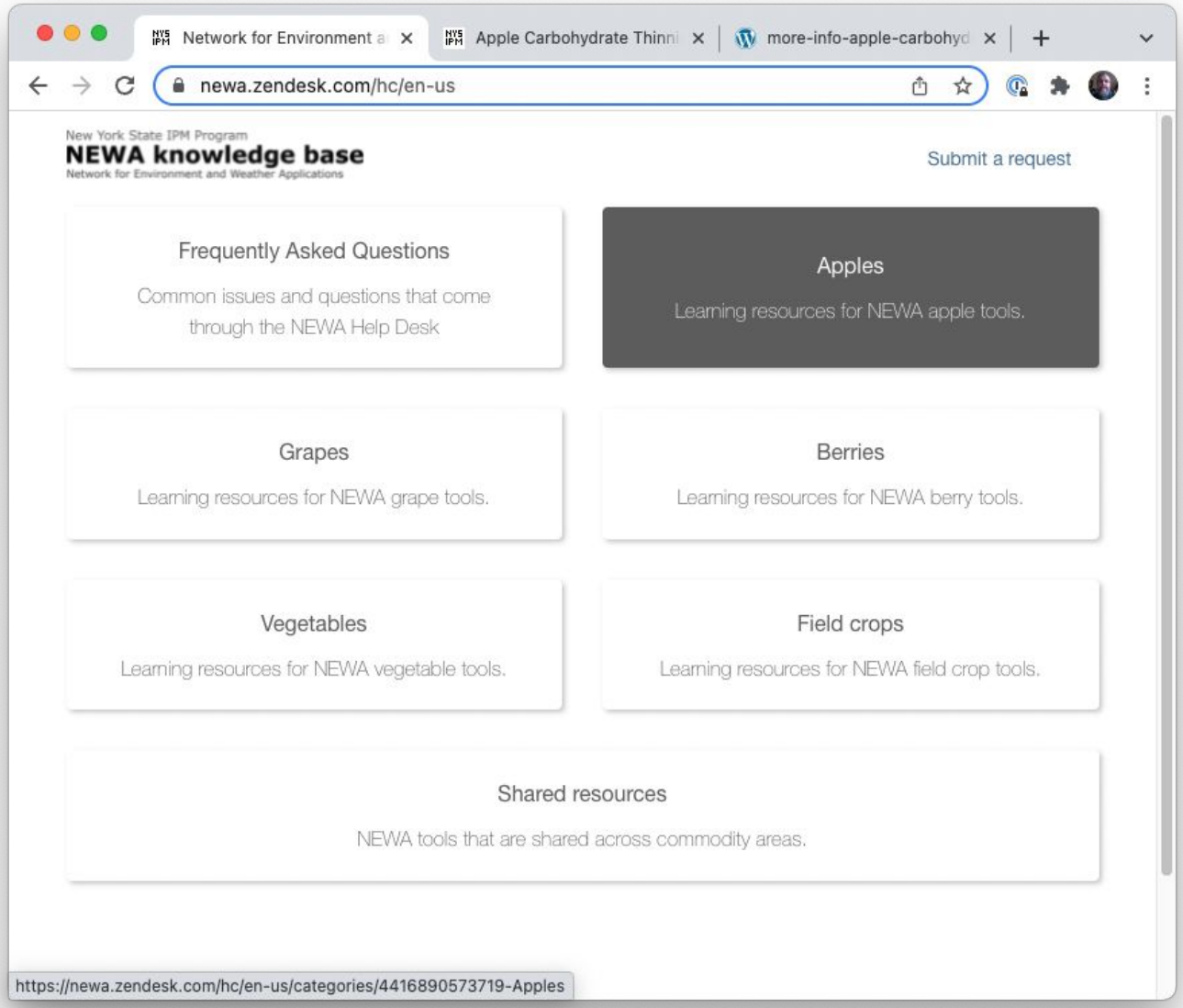

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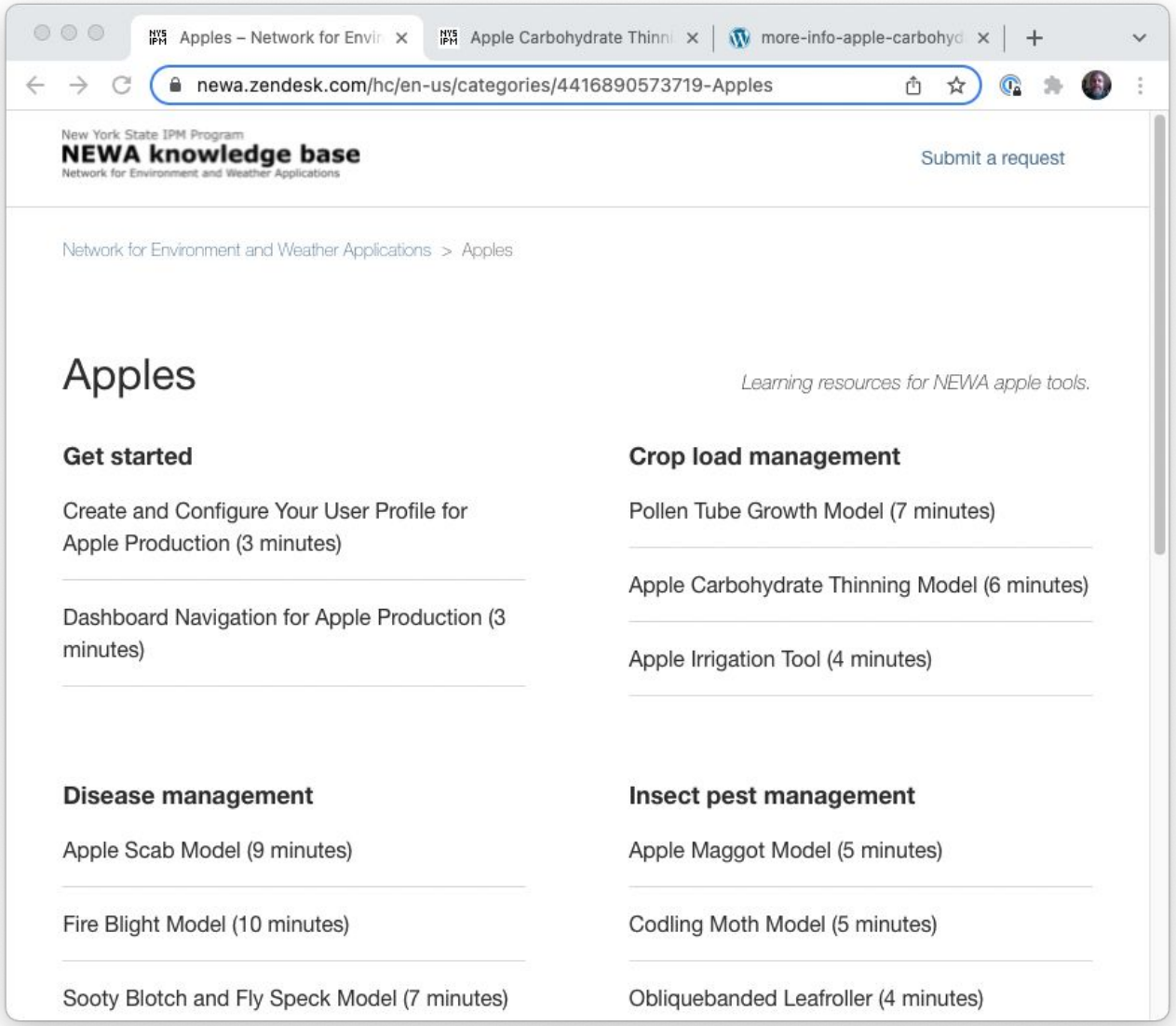
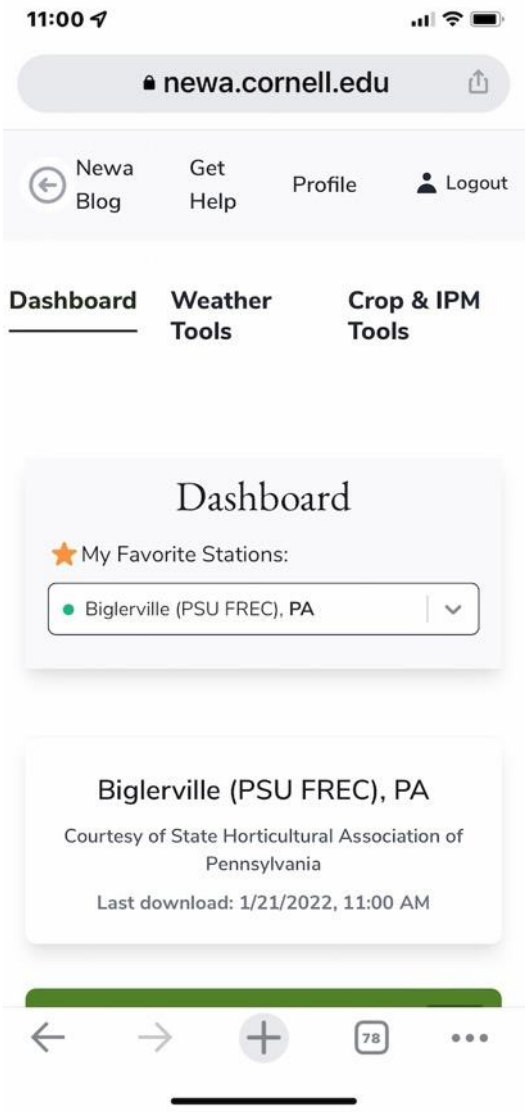
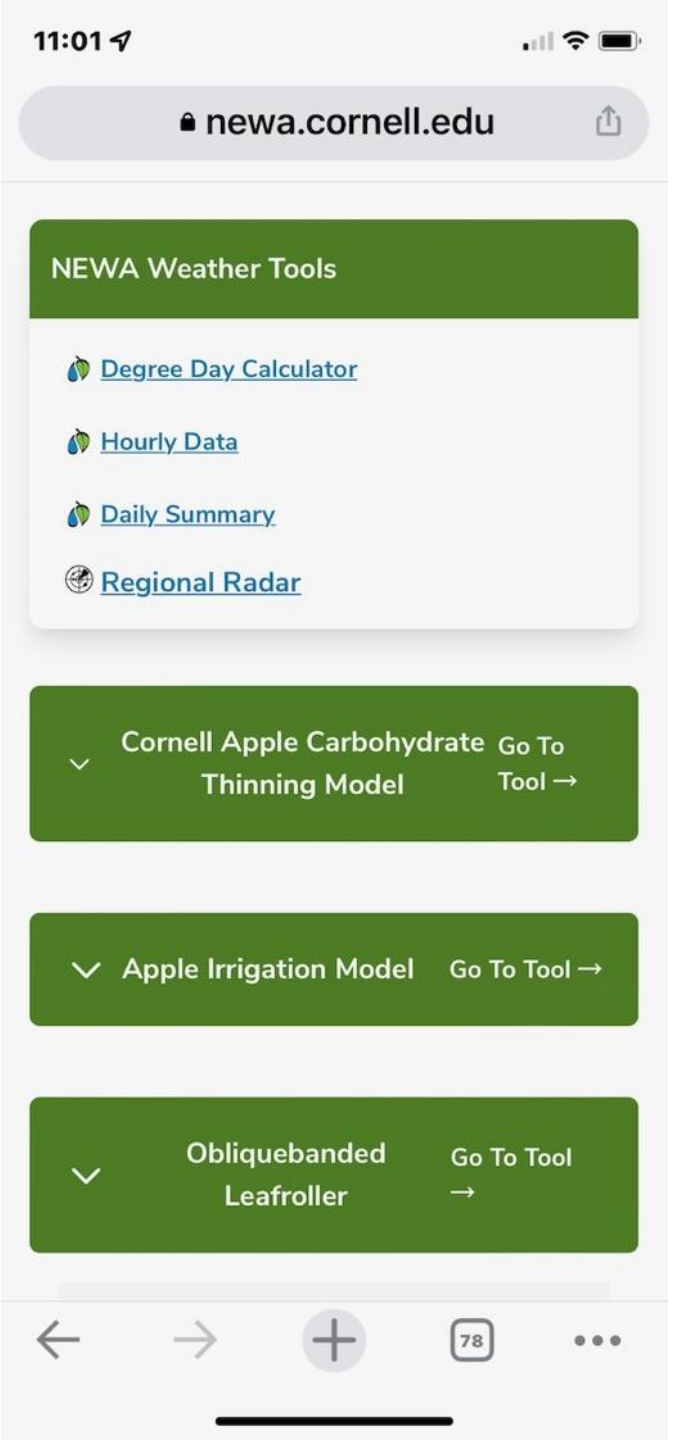


NEWA is Mobile Friendly

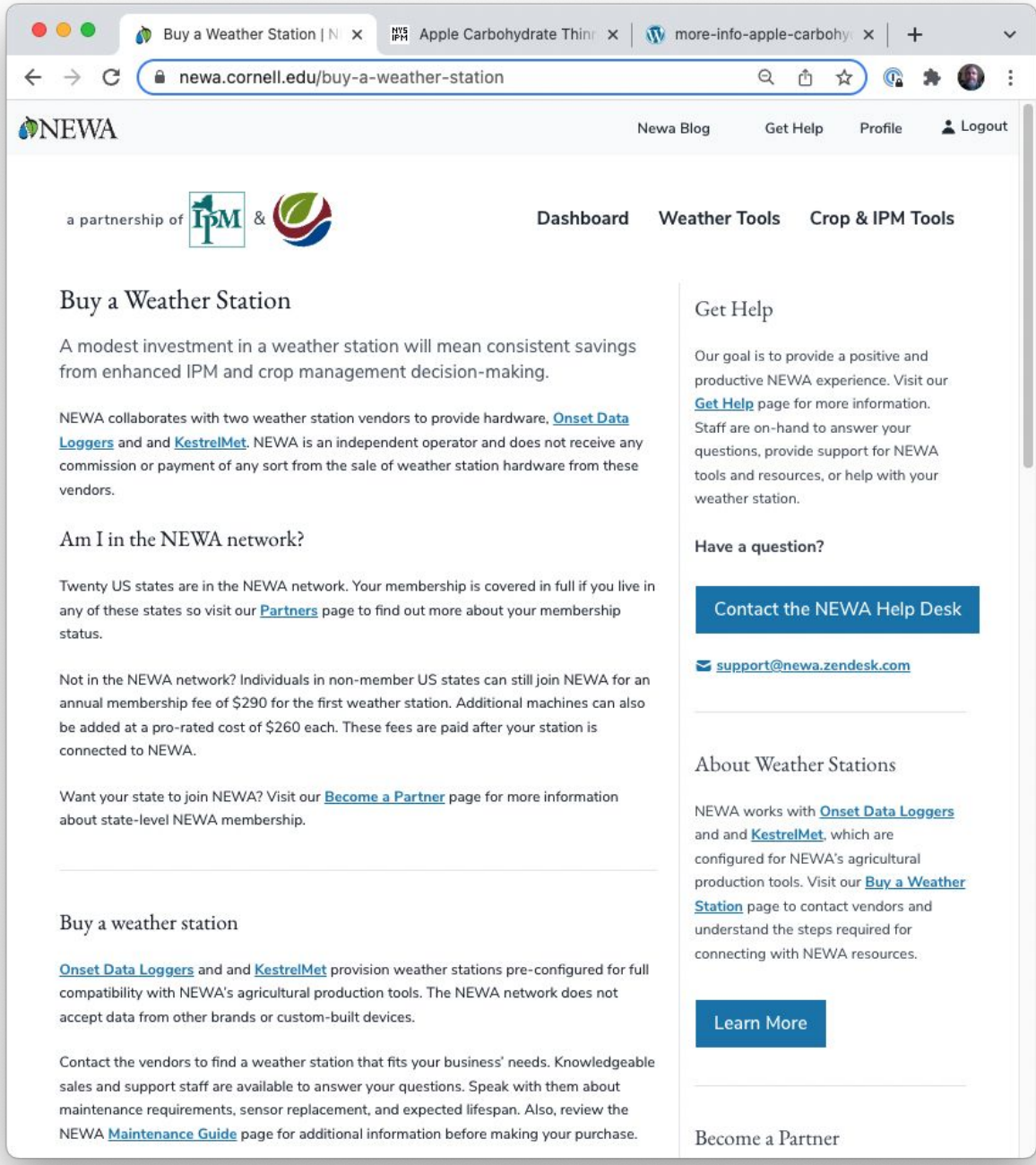




Get a Weather Station!

You have two options…

- Onset
- KestrelMet (formerly Rainwise)
- It's like buying a car, both have different features and limitations
- Contact your NEWA State Coordinator with questions https://newa.cornell.edu/partners



onsetcomp.com

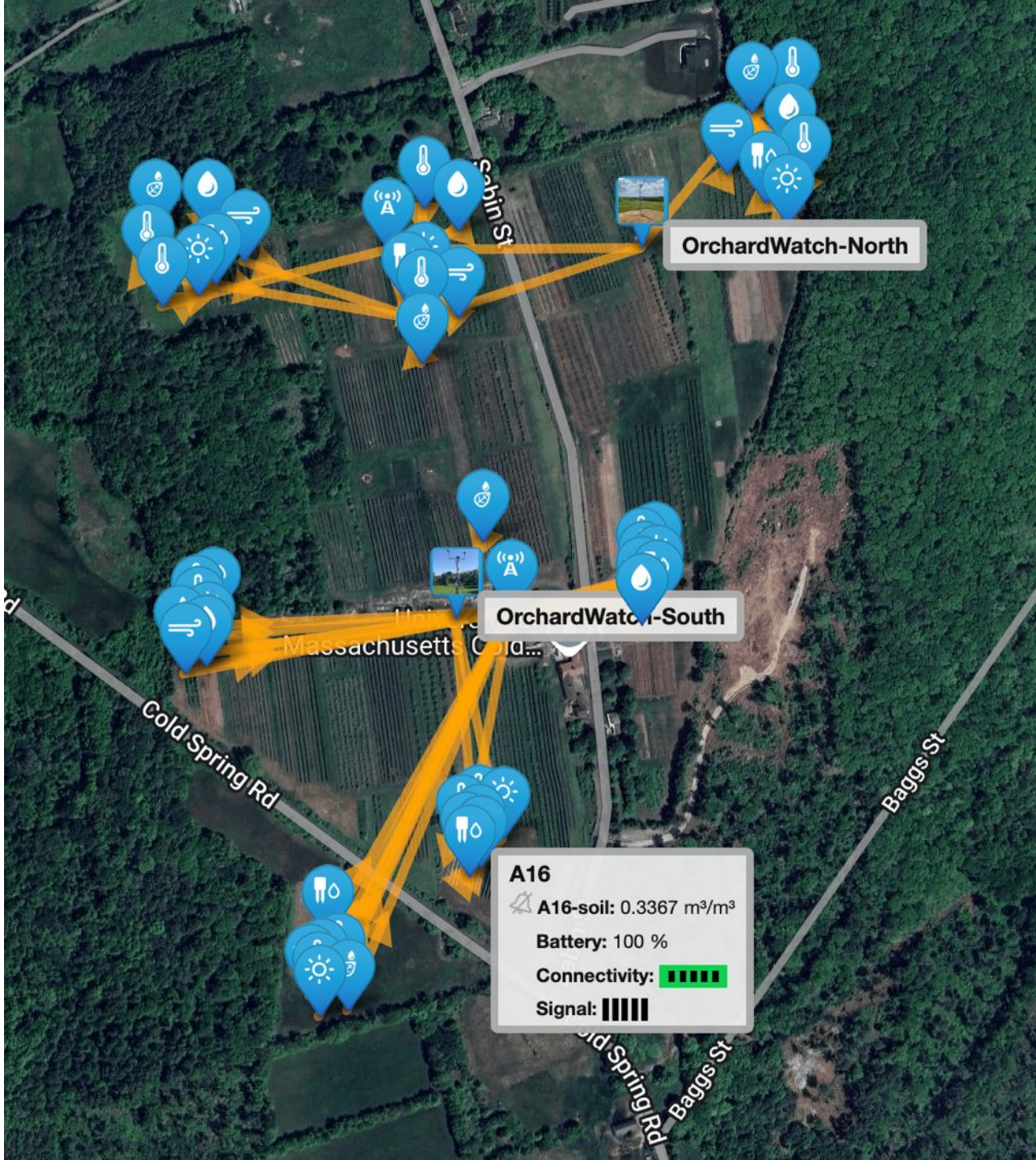
- Wired, wi-fi, cellular connection options
- Sensors are plug and play
- Soil temp, moisture sensors can be added
- Capability to expand with Hobonet (but those do not appear on NEWA)

kestrelmet.com

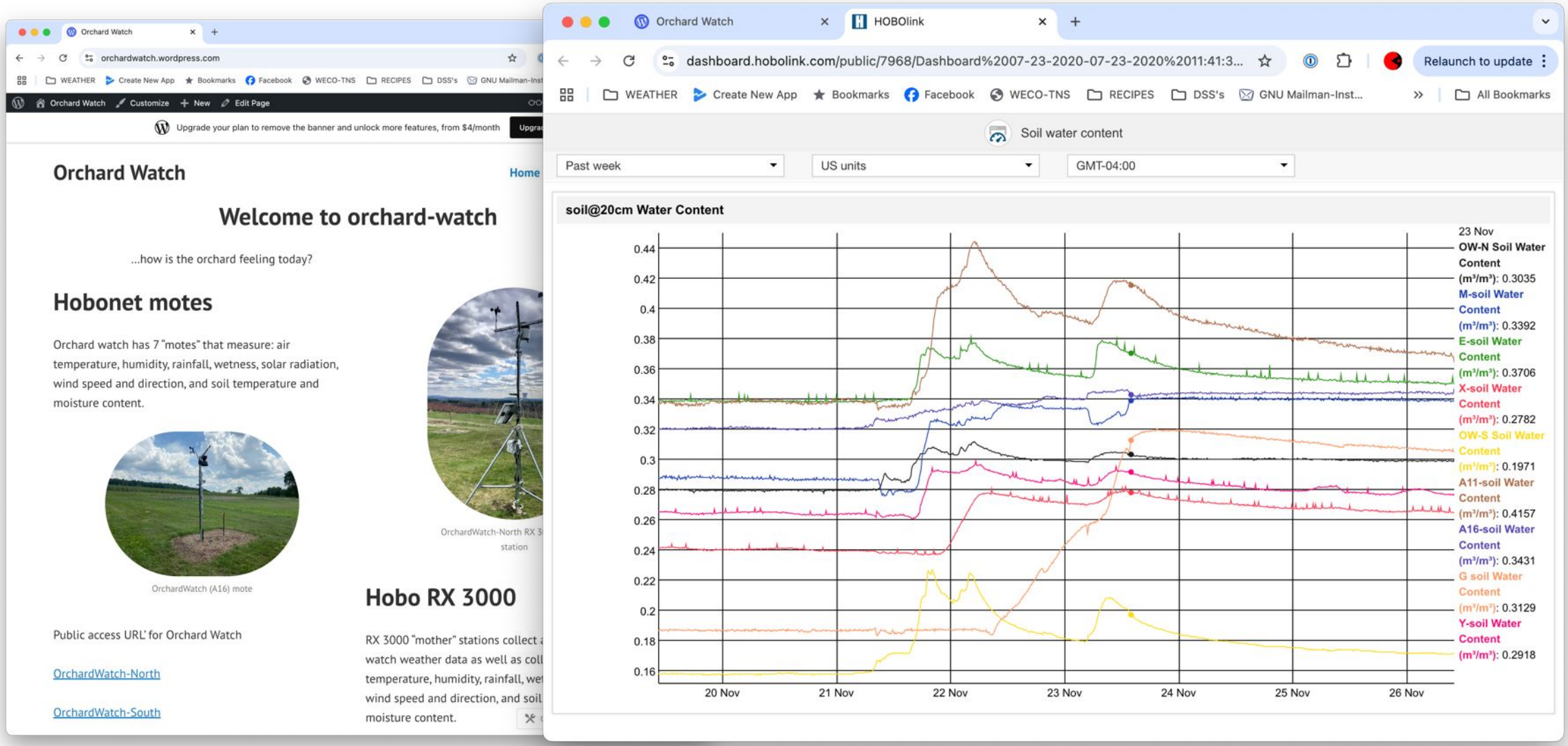
RainWise is now part of KestrelMet

- Cellular only?
- All-in-one design
- Has a nice soil temperature/ moisture array ($$)
- Needs recalibration
- No ability to expand?

Additional sensors - HOBOnet


OrchardWatch-North
OrchardWatch-South
Cold Spring Rd
Baggs St
A16
A16-soil: 0.3367 m³/m³
Battery: 100 %
Connectivity:
Signal:

orchardwatch.wordpress.com



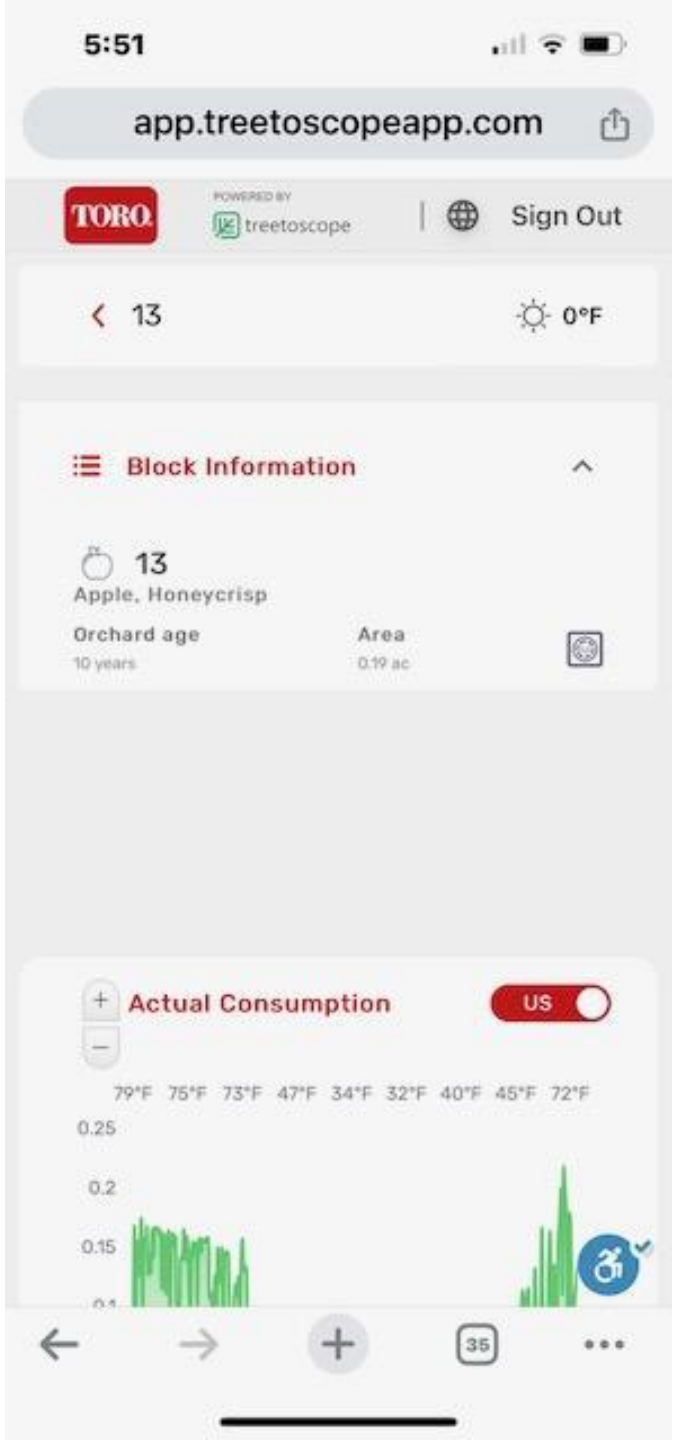
Additional sensors - KestrelMet

Toro Tempus Ag

TORO
TE_IPUS-AG-MS

TORO
TEMPUS-AG-CT

Toro Transpira (“Treetoscope”)



So what's actionable?

- Frost/freeze alerts
- Irrigation management
- Spray records
- Historical weather data
- Integrated Pest Management
- Automation
- 'Smart' orchard/farm?

Take homes?

- Garbage in/garbage out
- Expense (cost/benefit?)
- Time
- Start with a weather station, get on NEWA
- Expand your sensor network (I'd suggest soil moisture)
- Unfortunately, weather is not controllable (yet)!

LIDO
LAIMBURG INTEGRATED
DIGITAL ORCHARD

EN

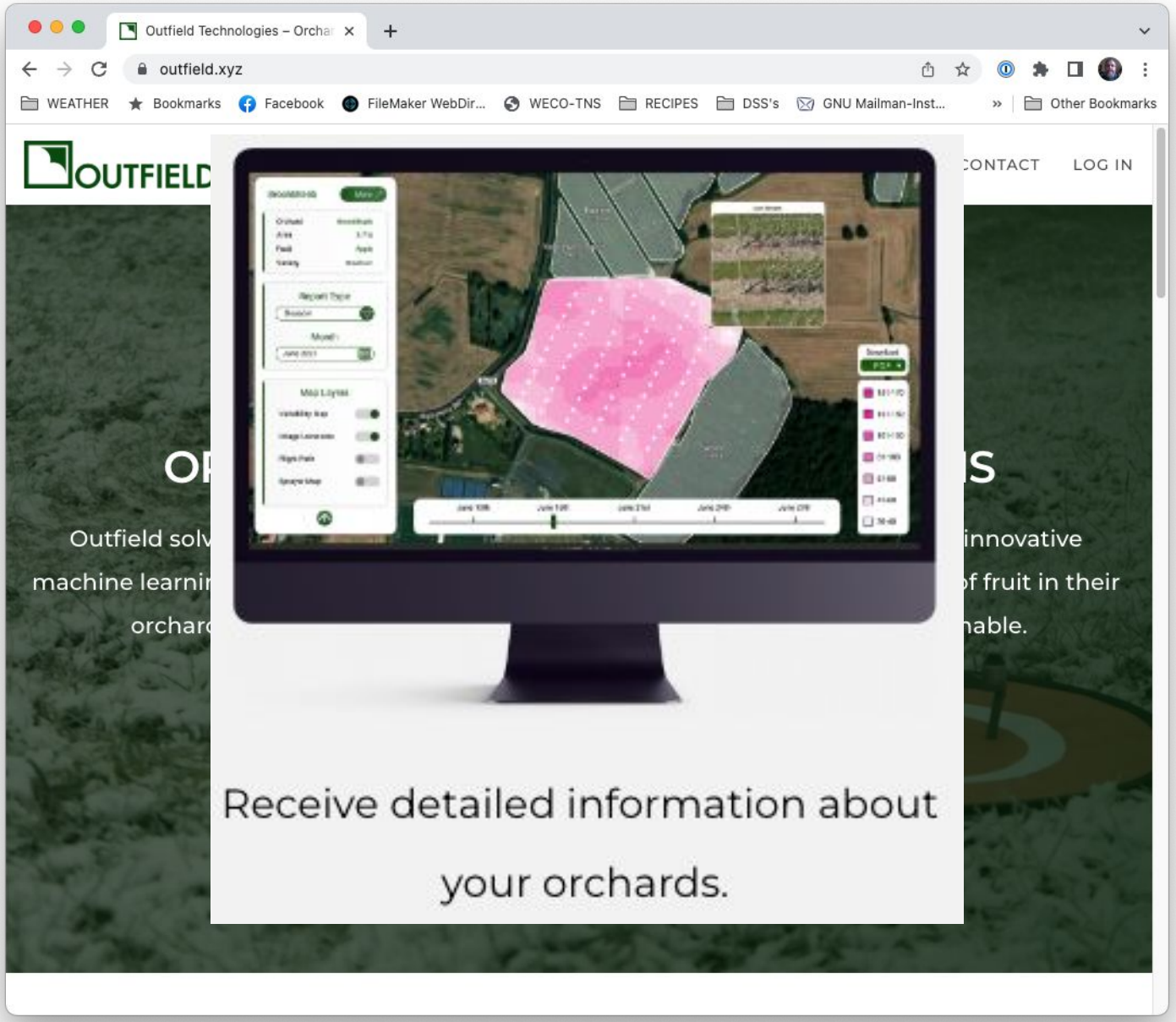
FOR INNOVATIVE MI
MODERN FARMERS, AND VISIONARIES

THE FIELD LAB OF THE FUTURE.

Learn more

Drone model…

- Apply N according to growth
- Growth been defined by “Canopy area” in m^2
- Saving in N fertilizer – Dutoit Agri EC
  - 7% on N fertilizer
- Cost of drone flight R350/ha

fca
truthful crop advice

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