

# 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](http://newa.cornell.edu)

# newa.cornell.edu

The screenshot shows the homepage of the Network for Environment and Weather Applications (NEWA). The page features a navigation bar with links to 'NEWA home', 'IPM crop forecasts', 'IPM weather tools', and 'NEWA help', along with a 'Sign In' button. The main heading is 'NEWA | Network for Environment and Weather Applications', with a sub-heading stating it is a partnership of New York State Integrated Pest Management, Northeast Regional Climate Center, and UMass Extension. A green banner below the heading reads 'Weather and science driven integrated pest management tools'. The central section is titled 'IPM Forecasts and Weather Data' and includes the instruction 'Get started by selecting your nearest weather station.' Below this is a dropdown menu for selecting a weather station, currently set to 'Amherst (UM ALC), MA'. The page is divided into two main columns. The left column contains a map of the Northeast United States with a search bar and a prompt to 'Click or tap on a station marker to load its overview'. The right column displays the 'Amherst (UM ALC) Overview' with a current temperature of 46°F and a 5-day weather forecast.

Home | NEWA

newa.cornell.edu

WEATHER Create New App Bookmarks Facebook WECO-TNS RECIPES DSS's GNU Mailman-Inst... All Bookmarks

NEWA home IPM crop forecasts IPM weather tools NEWA help Sign In

## NEWA | Network for Environment and Weather Applications

NEWA is a partnership of [New York State Integrated Pest Management](#), [Northeast Regional Climate Center](#), and [UMass Extension](#)

### Weather and science driven integrated pest management tools

## IPM Forecasts and Weather Data

Get started by selecting your nearest weather station.

Select or search by weather station

Amherst (UM ALC), MA

Click or tap on a station marker to load its overview

#### Amherst (UM ALC) Overview

Courtesy of NEWA in Massachusetts

At 2:00 PM today

Base 50°F Degree Days since January 1 3083

Relative Humidity 83 %

Dew Point 40.9 °F

Wind Speed 9 mph

46 °F

Yesterday

Precipitation: 0 in High Temp: 57 °F Low Temp: 36 °F

Today as of 2:00 PM

Precipitation: 0.30 in High Temp: 46 °F Low Temp: 44 °F

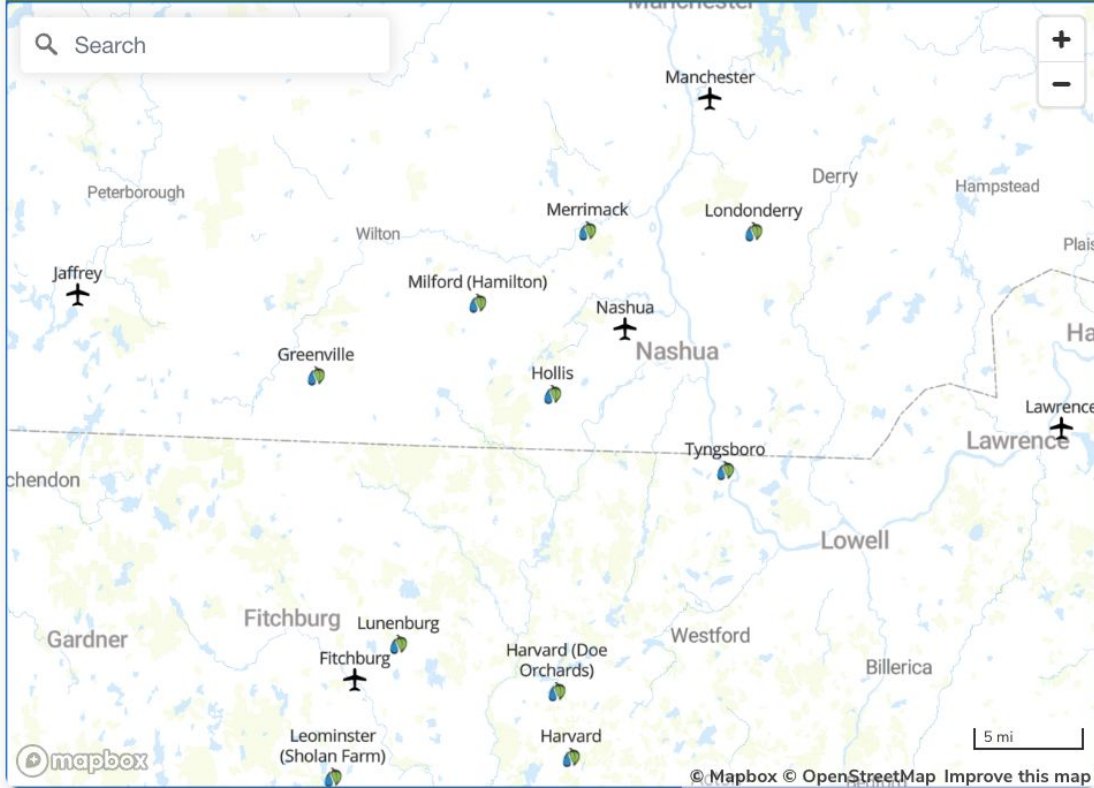
#### 5-Day Weather Forecast

Thursday	Friday	Saturday	Sunday	Monday	Tuesday
11/21/2024	11/22/2024	11/23/2024	11/24/2024	11/25/2024	11/26/2024
46 43	47 37	47 35	48 37	51 34	47 36

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

Browser: All Weather Data Query | NEWA x +  
 URL: newa.cornell.edu/all-weather-data-query  
 WEATHER | Create New App | Bookmarks | Facebook | WECO-TNS | RECIPES | All Bookmarks

NEWA  
 WATCH TUTORIAL

NEWA home | IPM crop forecasts | IPM weather tools | NEWA help | Sign In

## All Weather Data Query

NEWA is a partnership of [New York State Integrated Pest Management](#), [Northeast Regional Climate Center](#), and [University of New Hampshire Cooperative Extension](#)

Display or download hourly weather data, daily summaries, or degree days in tabular or graphical format. Select the location, date range, weather variables, type of data, and output format desired.

**Results for Hollis, NH**  
 Courtesy of NEWA in New Hampshire  
 Last download: 10/31/2024, 11:00 PM  
 Latitude: 42.74  
 Longitude: -71.58  
 Elevation: 104 ft

**Daily Summary** [Download CSV](#)

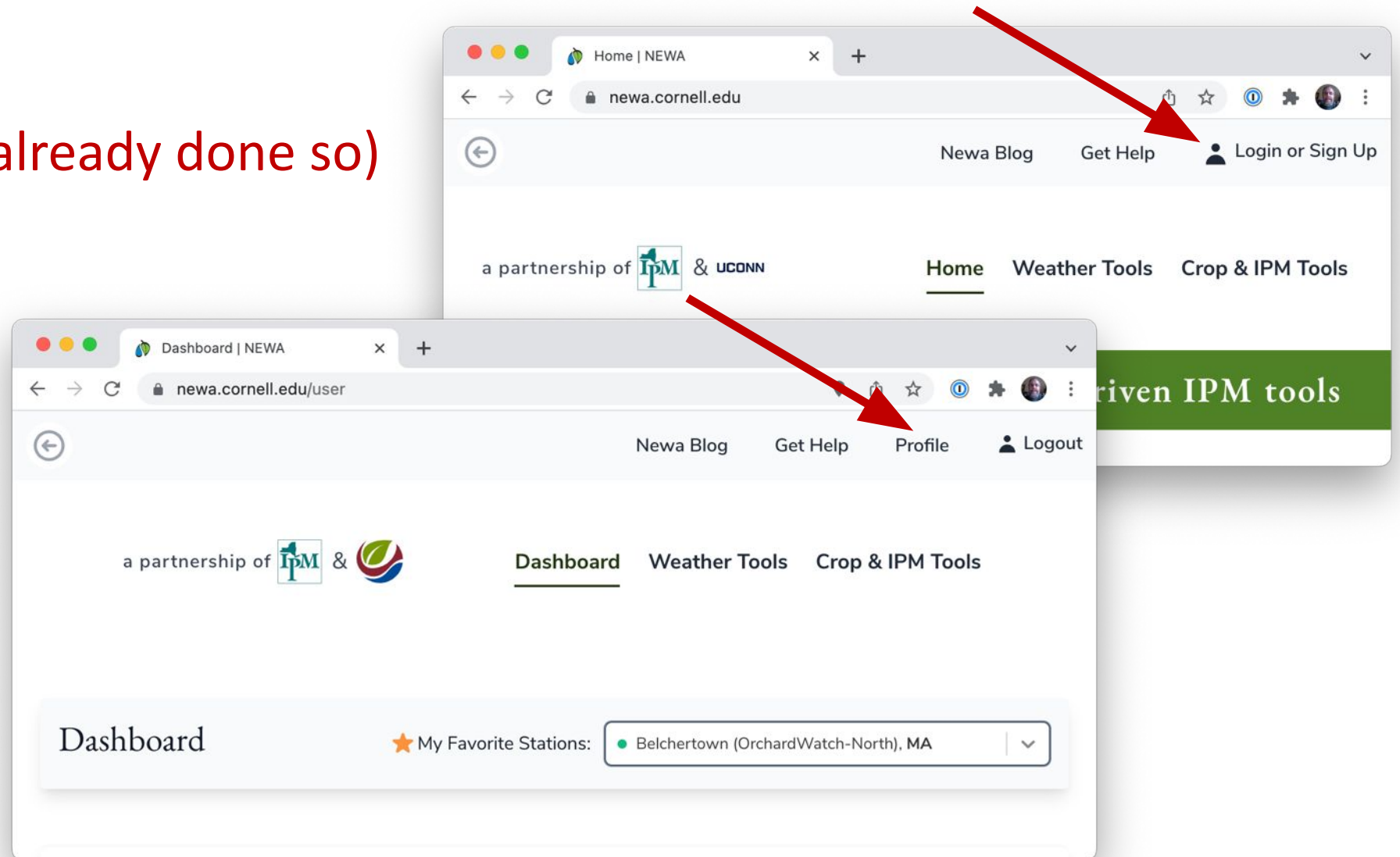
Estimated Data Missing data

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 (anglehrs)	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
<b>Sum or Avg:</b>	52.1	63.8	40.5	1.13	0	744	8253	1.9
<b>Max:</b>	63.2	78.6	50.9	0.47	0	24	391	4.6
<b>Min:</b>	39.1	46.6	28.3	0	0	24	45	0.4

Left sidebar: All Stations (Hollis, NH), Start Date (10/01/2024), End Date (10/31/2024), Show/Hide (Station Selection Map, Hourly Data, Daily Summary)

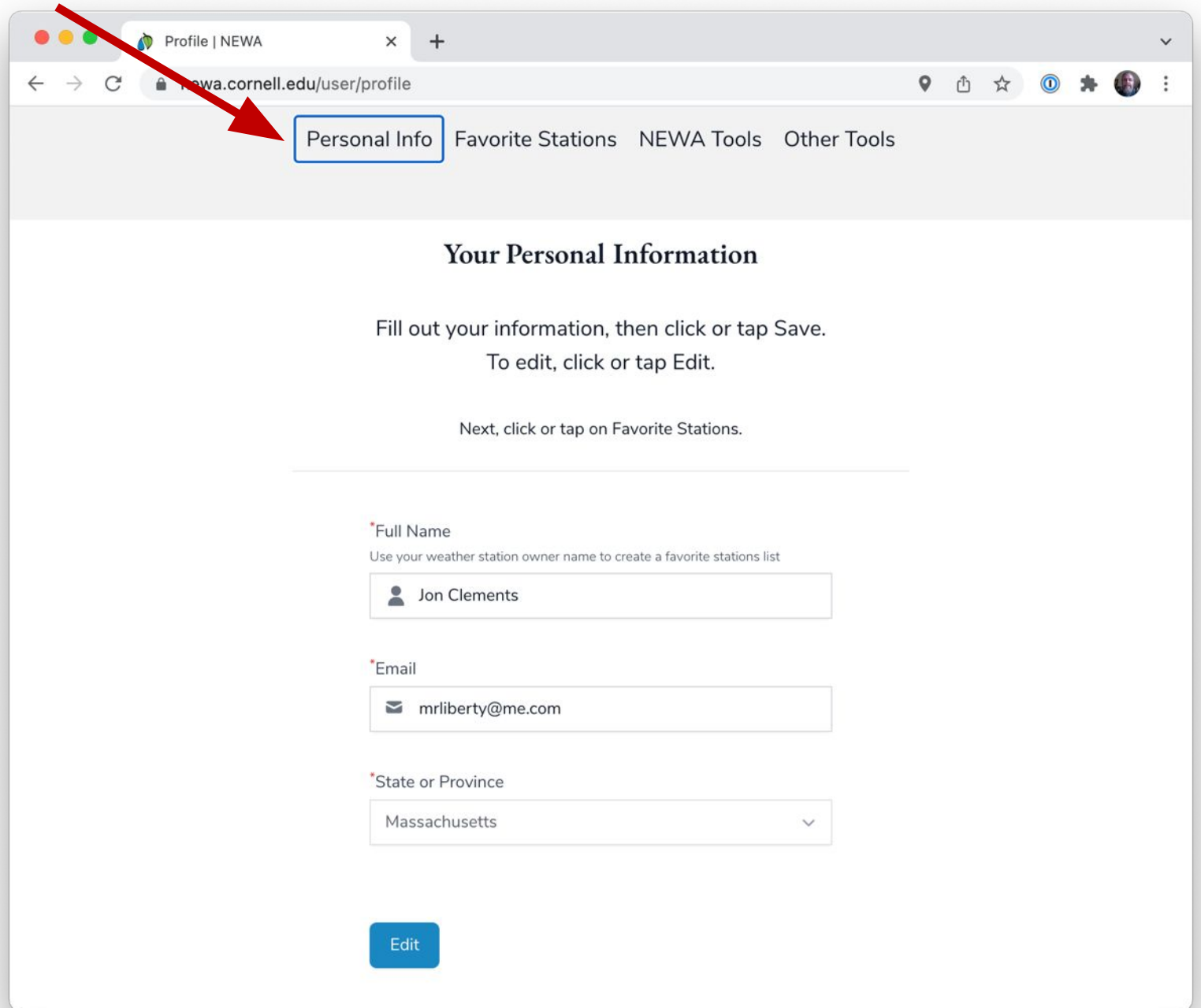
# Sign up and Login (newa.cornell.edu)

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



# Edit Profile

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



The screenshot shows a web browser window with the URL `newa.cornell.edu/user/profile`. The page title is "Profile | NEWA". A red arrow points to the "Personal Info" tab in the navigation menu. The main content area is titled "Your Personal Information" and contains the following text: "Fill out your information, then click or tap Save. To edit, click or tap Edit. Next, click or tap on Favorite Stations." Below this is a form with three fields: "Full Name" (with a subtext "Use your weather station owner name to create a favorite stations list" and a value of "Jon Clements"), "Email" (with a value of "mrliberty@me.com"), and "State or Province" (a dropdown menu with "Massachusetts" selected). A blue "Edit" button is located at the bottom of the form.

Profile | NEWA

`newa.cornell.edu/user/profile`

Personal Info Favorite Stations NEWA Tools Other Tools

### Your Personal Information

Fill out your information, then click or tap Save.  
To edit, click or tap Edit.

Next, click or tap on Favorite Stations.

\*Full Name  
Use your weather station owner name to create a favorite stations list

Jon Clements

\*Email

mrliberty@me.com

\*State or Province

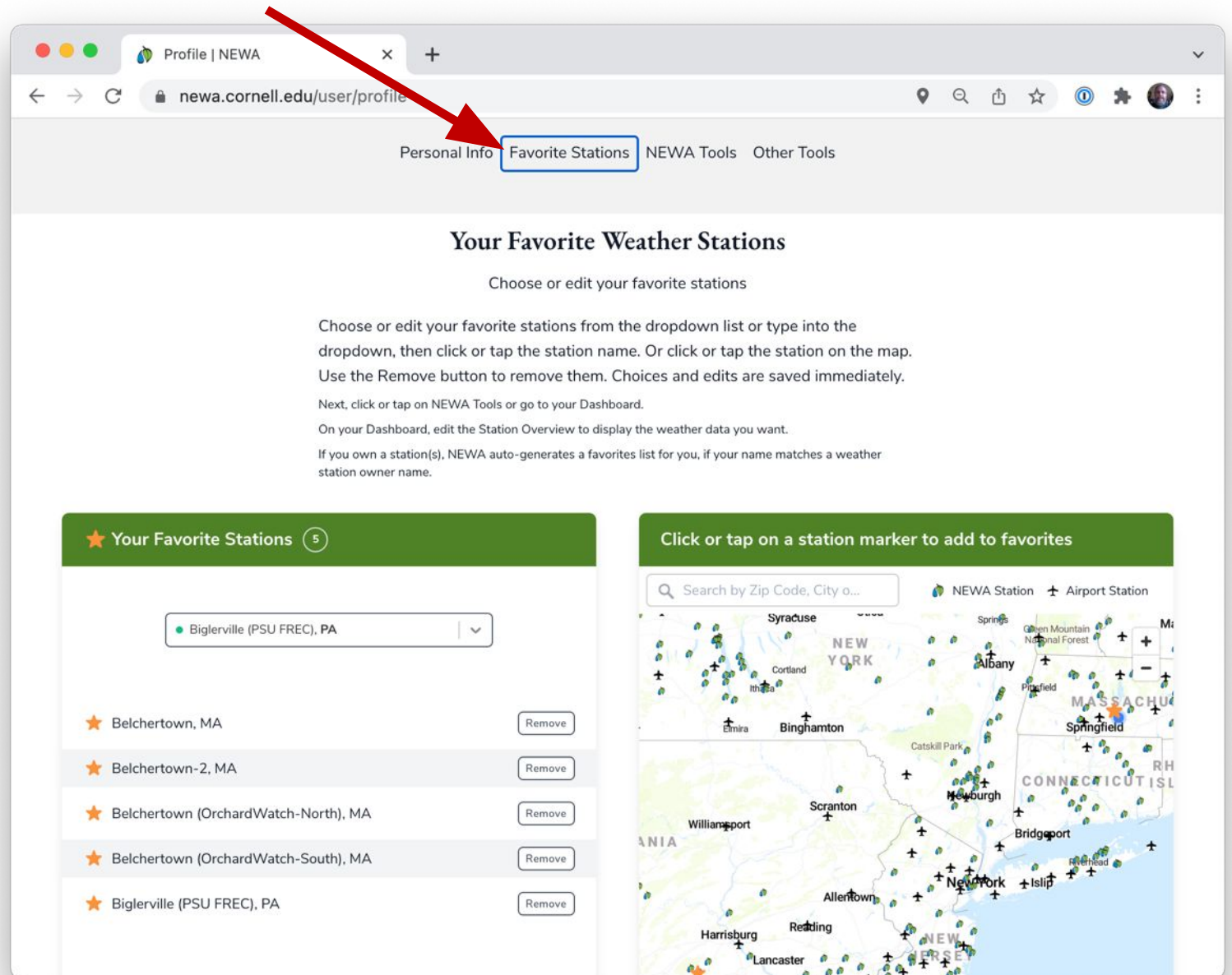
Massachusetts

Edit



# Edit Profile

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



The screenshot shows a web browser window with the URL `newa.cornell.edu/user/profile`. The page title is "Profile | NEWA". The navigation menu includes "Personal Info", "Favorite Stations" (highlighted with a blue box and a red arrow), "NEWA Tools", and "Other Tools".

### Your Favorite Weather Stations

Choose or edit your favorite stations

Choose or edit your favorite stations from the dropdown list or type into the dropdown, then click or tap the station name. Or click or tap the station on the map. Use the Remove button to remove them. Choices and edits are saved immediately.

Next, click or tap on NEWA Tools or go to your Dashboard.

On your Dashboard, edit the Station Overview to display the weather data you want.

If you own a station(s), NEWA auto-generates a favorites list for you, if your name matches a weather station owner name.

#### ★ Your Favorite Stations 5

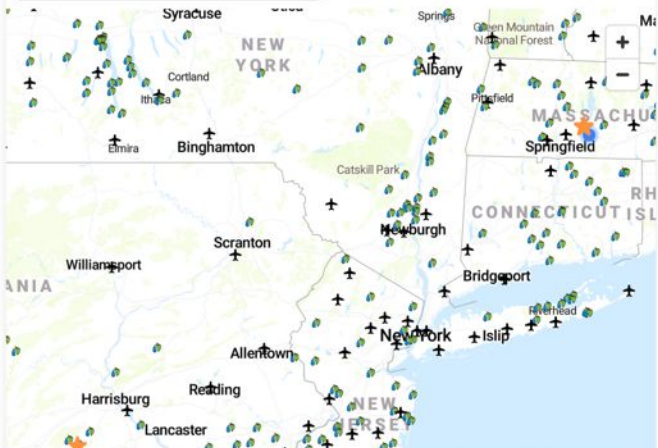
● Biglerville (PSU FREC), PA

★ Belchertown, MA	Remove
★ Belchertown-2, MA	Remove
★ Belchertown (OrchardWatch-North), MA	Remove
★ Belchertown (OrchardWatch-South), MA	Remove
★ Biglerville (PSU FREC), PA	Remove

#### Click or tap on a station marker to add to favorites

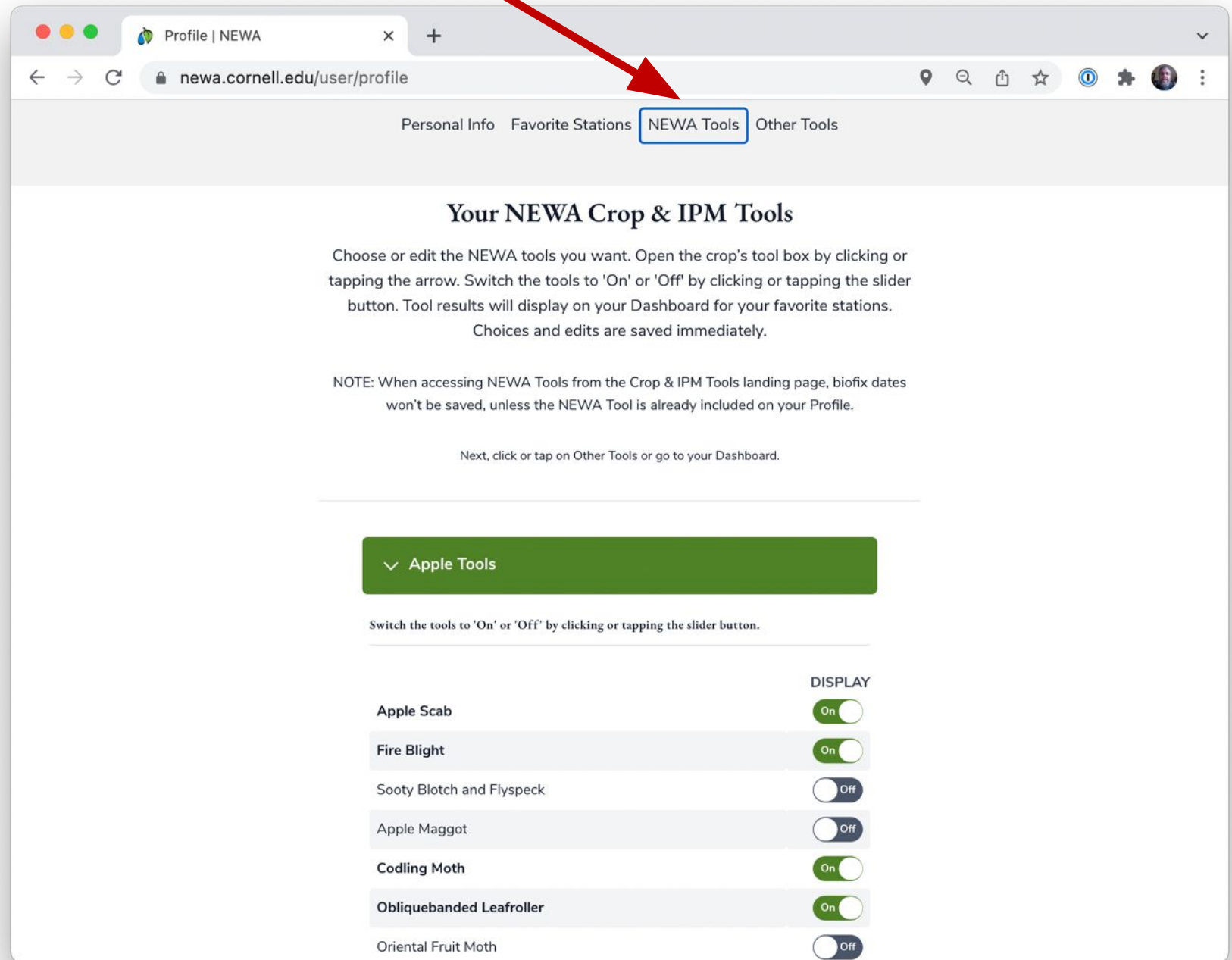
Search by Zip Code, City o...

NEWA Station Airport Station



# Edit Profile

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



The screenshot shows a web browser window with the URL `newa.cornell.edu/user/profile`. The page has a navigation bar with tabs for "Personal Info", "Favorite Stations", "NEWA Tools" (which is highlighted with a blue border and a red arrow), and "Other Tools".

### Your NEWA Crop & IPM Tools

Choose or edit the NEWA tools you want. Open the crop's tool box by clicking or tapping the arrow. Switch the tools to 'On' or 'Off' by clicking or tapping the slider button. Tool results will display on your Dashboard for your favorite stations. Choices and edits are saved immediately.

NOTE: When accessing NEWA Tools from the Crop & IPM Tools landing page, biofix dates won't be saved, unless the NEWA Tool is already included on your Profile.

Next, click or tap on Other Tools or go to your Dashboard.

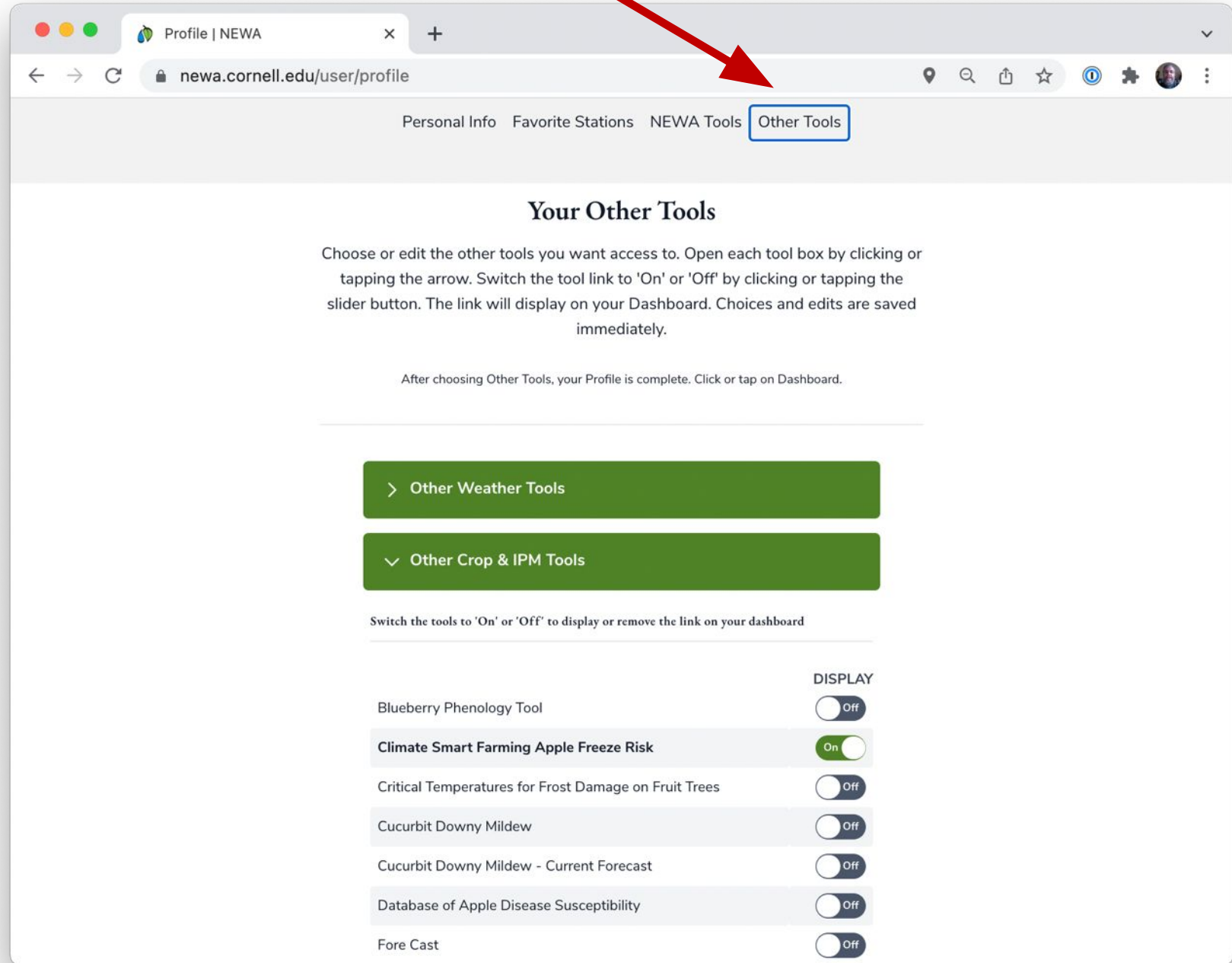
▼ Apple Tools

Switch the tools to 'On' or 'Off' by clicking or tapping the slider button.

	DISPLAY
Apple Scab	<input checked="" type="checkbox"/> On
Fire Blight	<input checked="" type="checkbox"/> On
Sooty Blotch and Flyspeck	<input type="checkbox"/> Off
Apple Maggot	<input type="checkbox"/> Off
Codling Moth	<input checked="" type="checkbox"/> On
Obliquebanded Leafroller	<input checked="" type="checkbox"/> On
Oriental Fruit Moth	<input type="checkbox"/> Off

# Edit Profile

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



The screenshot shows a web browser window with the URL `newa.cornell.edu/user/profile`. The page has a navigation bar with links for "Personal Info", "Favorite Stations", "NEWA Tools", and "Other Tools". A red arrow points to the "Other Tools" link. Below the navigation bar, the page is titled "Your Other Tools" and contains instructions: "Choose or edit the other tools you want access to. Open each tool box by clicking or tapping the arrow. Switch the tool link to 'On' or 'Off' by clicking or tapping the slider button. The link will display on your Dashboard. Choices and edits are saved immediately." Below this, a message states: "After choosing Other Tools, your Profile is complete. Click or tap on Dashboard." There are two green buttons: "Other Weather Tools" (with a right-pointing arrow) and "Other Crop & IPM Tools" (with a downward-pointing arrow). Below these buttons, a section titled "Switch the tools to 'On' or 'Off' to display or remove the link on your dashboard" contains a list of tools with toggle switches. The tools and their toggle states are:

Tool Name	DISPLAY
Blueberry Phenology Tool	Off
Climate Smart Farming Apple Freeze Risk	On
Critical Temperatures for Frost Damage on Fruit Trees	Off
Cucurbit Downy Mildew	Off
Cucurbit Downy Mildew - Current Forecast	Off
Database of Apple Disease Susceptibility	Off
Fore Cast	Off



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](#)

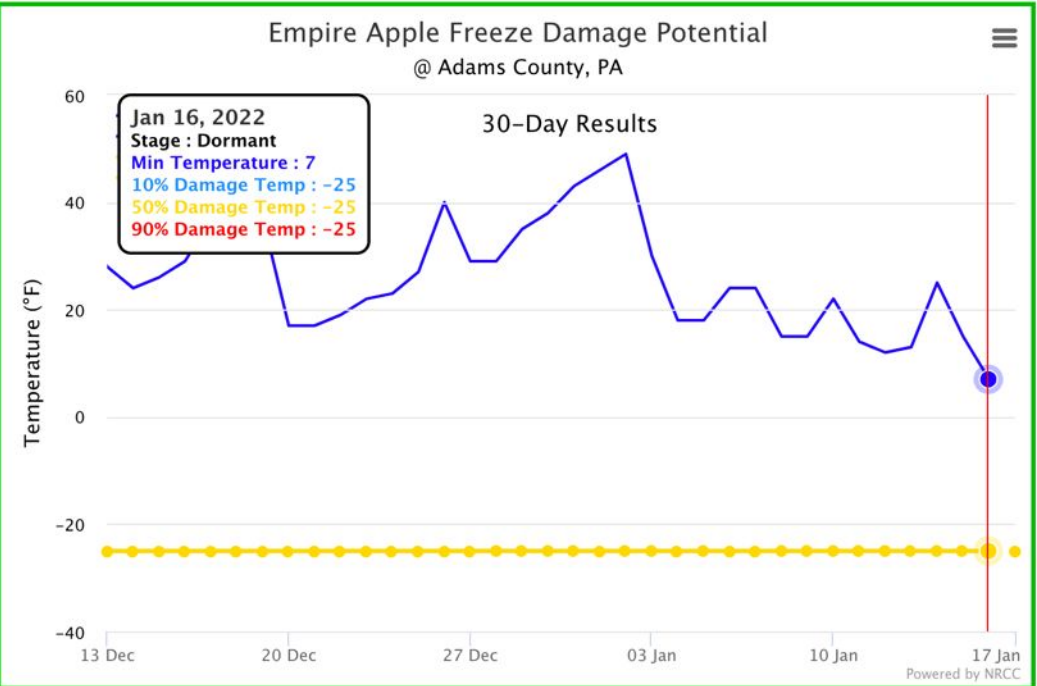
**Date of Interest:**  
01/18/2022

**Apple Variety**  
 Empire  
 McIntosh  
 Red Delicious

Viewing 2021-2022 results.

[30-Day Results](#)  
[Season To Date](#)  
[Climate Change](#)

[Info](#)



# Dashboard

- My Favorite Stations
- Current Conditions
- Weather Forecast

The screenshot shows the NEWA dashboard interface. At the top, there is a navigation bar with the NEWA logo, a partnership logo for IPM and another organization, and links for 'Newa Blog', 'Get Help', 'Profile', and 'Logout'. Below this is a main navigation bar with 'Dashboard', 'Weather Tools', and 'Crop & IPM Tools'. The 'Dashboard' section is active, displaying 'My Favorite Stations' with a dropdown menu open, listing stations in Massachusetts and Pennsylvania. The 'Results for Belchertown-2, MA' section shows current conditions: 27°F at 2:00 PM today, with various weather metrics. The '5-Day Weather Forecast' section shows a forecast for Tuesday through Sunday. The 'NEWA Weather Tools' section includes links for 'Degree Day Calculator', 'Hourly Data', 'Daily Summary', and 'Regional Radar'. Red arrows point from the text on the left to the corresponding elements on the dashboard: 'My Favorite Stations' points to the dropdown menu, 'Current Conditions' points to the 'Belchertown-2 Overview' section, and 'Weather Forecast' points to the '5-Day Weather Forecast' section.

Dashboard | NEWA  
newa.cornell.edu/user

NEWA  
a partnership of IPM & [Logo]

Dashboard Weather Tools Crop & IPM Tools

Dashboard

My Favorite Stations: Belchertown-2, MA

MASSACHUSETTS 4

- Belchertown, MA
- Belchertown (OrchardWatch-North), MA
- Belchertown (OrchardWatch-South), MA
- Belchertown-2, MA

PENNSYLVANIA 1

- Biglerville (PSU FREC), PA

Results for Belchertown-2, MA

Courtesy of UMass Extension  
Last download: 1/18/2022, 2:00 PM

Belchertown-2 Overview [Edit Weather Overview](#)

At 2:00 PM today

☀️ 27 °F

Base 50°F Degree Days since January 1 0

Relative Humidity 46 %

Leaf Wetness 0 minutes

Solar Radiation 40 langleys

Wind Speed 7.3 mph

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

5-Day Weather Forecast

Tuesday 1/18/2022	Wednesday 1/19/2022	Thursday 1/20/2022	Friday 1/21/2022	Saturday 1/22/2022	Sunday 1/23/2022
☀️	☁️	☁️	☁️	☁️	☁️
28 14	39 11	33 11	14 2	20 5	28 13

NEWA Weather Tools

- [Degree Day Calculator](#)
- [Hourly Data](#)
- [Daily Summary](#)
- [Regional Radar](#)

# Dashboard

The screenshot shows the NEWA Dashboard interface. At the top, there's a browser window with the URL `newa.cornell.edu/user`. The dashboard is divided into several sections:

- Weather Data:** A table showing current weather conditions:

Solar Radiation	40 langleys
Wind Speed	7.3 mph
Wind Direction	NNW
- Historical Data:** Two sections for precipitation and temperature:
  - 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:** A green header with links to [Degree Day Calculator](#), [Hourly Data](#), [Daily Summary](#), and [Regional Radar](#).
- Crop & IPM Tools:** A list of green buttons with expandable menus and "Go To Tool" links:
  - Cornell Apple Carbohydrate Thinning Model
  - Apple Irrigation Model
  - Obliquebanded Leafroller
  - Codling Moth
  - Fire Blight
  - Apple Scab
- Other Tools:** Three columns of links at the bottom:
  - Other Weather Tools:** [Select from Profile](#)
  - Other Crop & IPM Tools:** [Climate Smart Farming Apple Freeze Risk](#), [Two-inch Soil Temperature Estimates](#)
  - Other Decision Support Systems:** [Select from Profile](#)

Crop & IPM Tools



# Dashboard

The screenshot shows a web browser window with the URL `newa.cornell.edu/user`. The page features a weather summary at the top left, a 'NEWA Weather Tools' section with links to 'Degree Day Calculator', 'Hourly Data', 'Daily Summary', and 'Regional Radar', and a list of pest management tools. Two red arrows point to the 'Codling Moth' tool entry.

**Weather Summary:**

- 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](#)

**Pest Management Tools:**

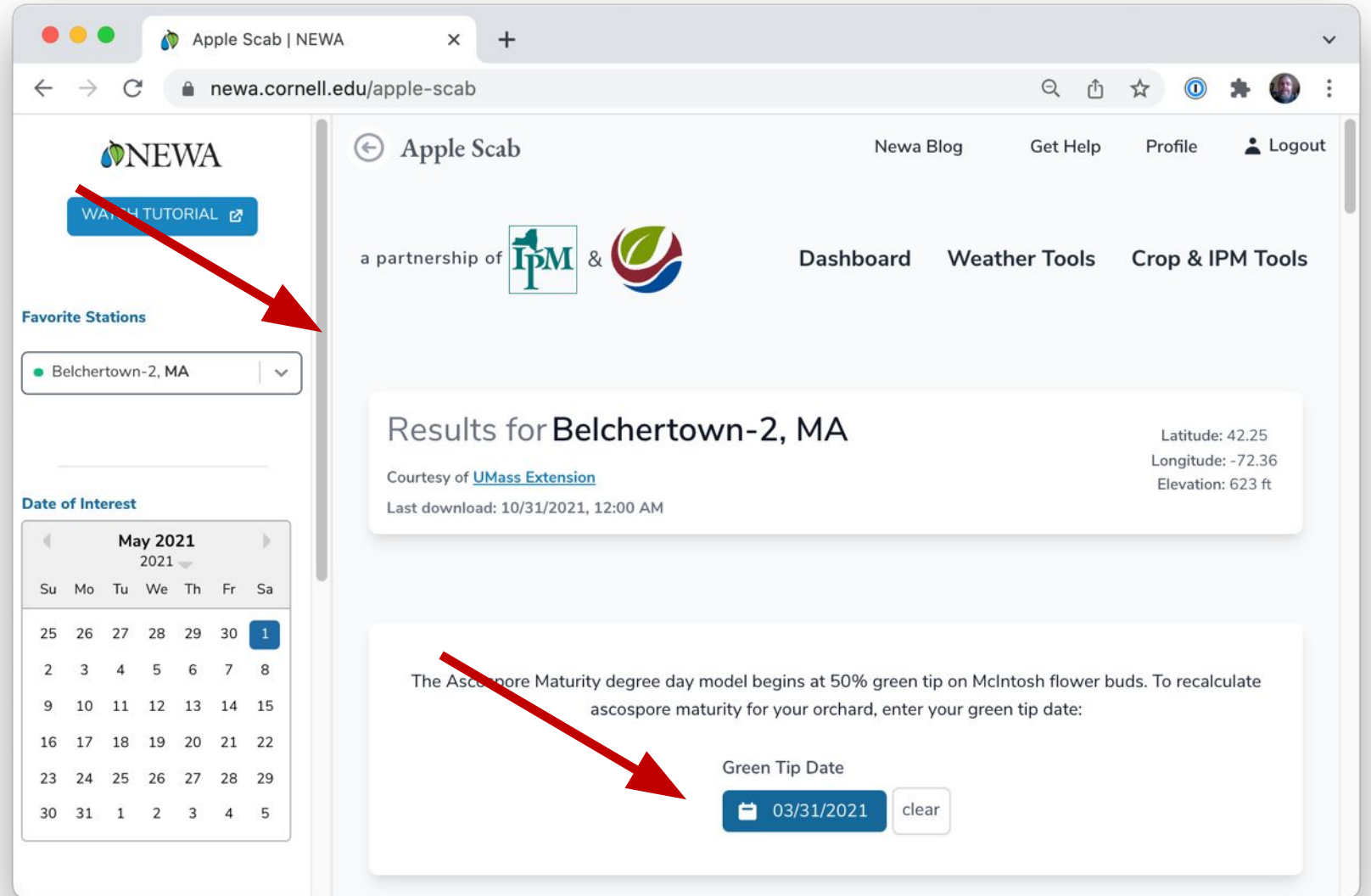
- Cornell Apple Carbohydrate Thinning Model** [Go To Tool →](#)
- Apple Irrigation Model** [Go To Tool →](#)
- Obliquebanded Leafroller** [Go To Tool →](#)
- Codling Moth** [Go To Tool →](#)  
Most larvae still overwintering. Accum. DD (base 43°F BE) since Jan 1: 6
- Fire Blight** [Go To Tool →](#)  
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
- Apple Scab** [Go To Tool →](#)





# Apple Scab

- Set Green Tip Date
- Show/Hide



Apple Scab | NEWA

newa.cornell.edu/apple-scab

NEWA

WATCH TUTORIAL

Favorite Stations

Belchertown-2, MA

Date of Interest

May 2021

Su	Mo	Tu	We	Th	Fr	Sa
25	26	27	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

Apple Scab

Newa Blog Get Help Profile Logout

a partnership of IPM & [Logo]

Dashboard Weather Tools Crop & IPM Tools

Results for Belchertown-2, MA

Latitude: 42.25  
Longitude: -72.36  
Elevation: 623 ft

Courtesy of UMass Extension

Last download: 10/31/2021, 12:00 AM

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

03/31/2021 clear

# Apple Scab

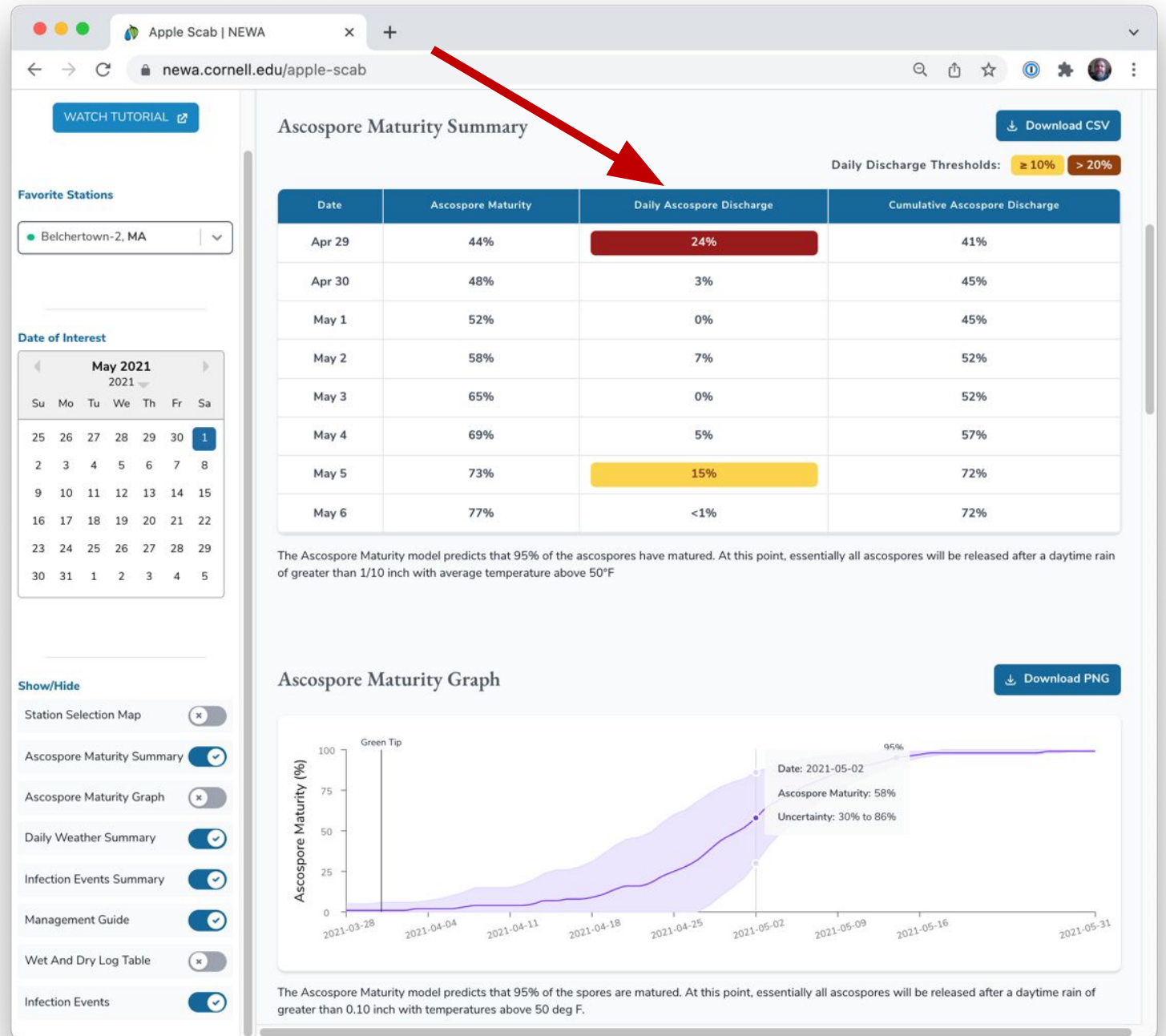
- Green Tip Date
- Show/Hide



A screenshot of the Apple Scab web application. The browser address bar shows 'newa.cornell.edu/apple-scab'. The page header includes 'Apple Scab', 'Newa Blog', 'Get Help', 'Profile', and 'Logout'. Below the header, it says 'a partnership of TPM &amp; [Logo]' and lists 'Dashboard', 'Weather Tools', and 'Crop &amp; IPM Tools'. The main content area is titled 'Results for Belchertown-2, MA' and includes coordinates (Latitude: 42.25, Longitude: -72.36, Elevation: 623 ft) and a 'Last download' timestamp. A text box explains the Ascospore Maturity model and provides a 'Green Tip Date' input field with a calendar icon and a 'clear' button. The date '03/31/2021' is entered in the field. A sidebar on the left contains a calendar and a 'Show/Hide' section with several toggle switches for different features.

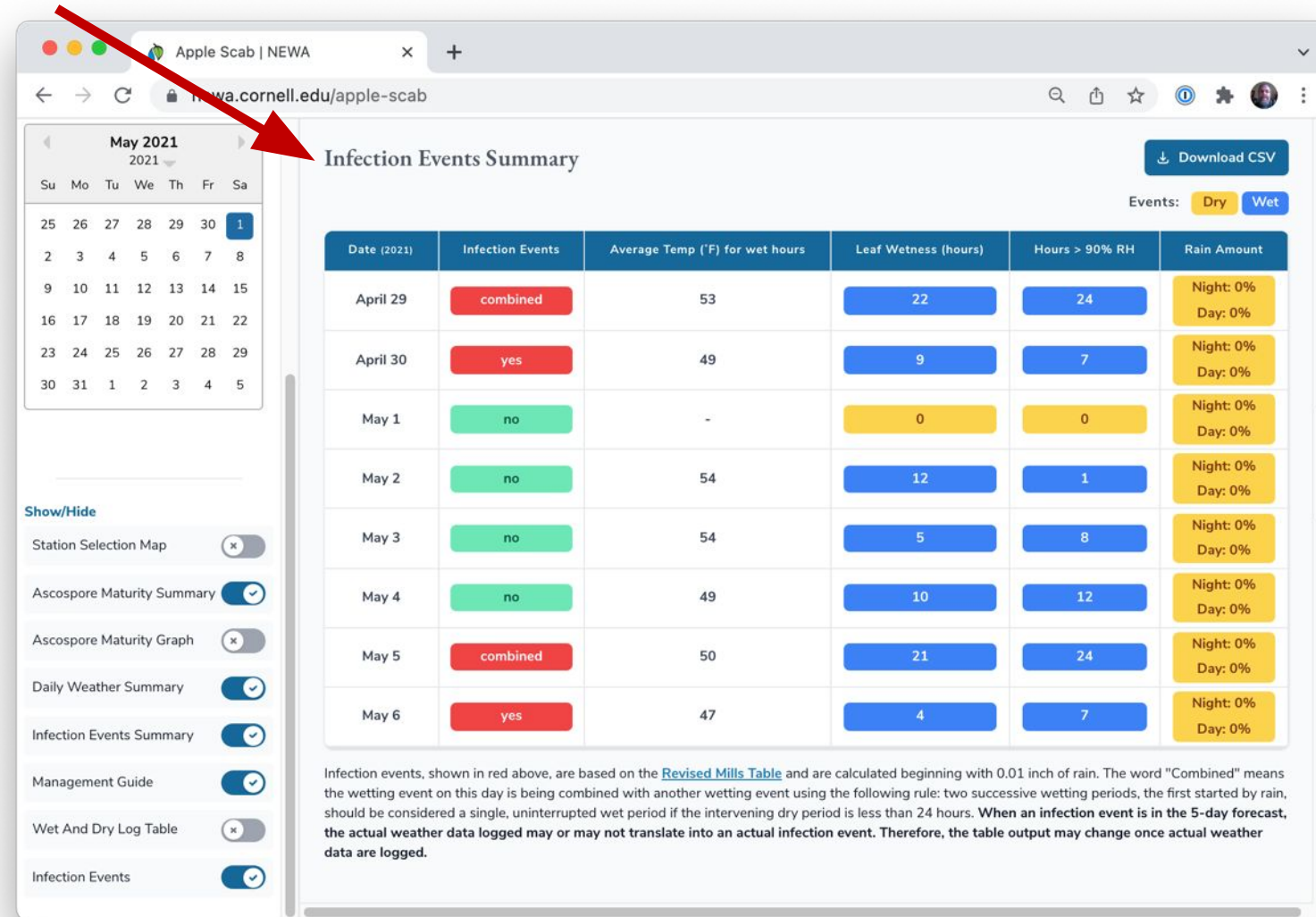
# Apple Scab

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



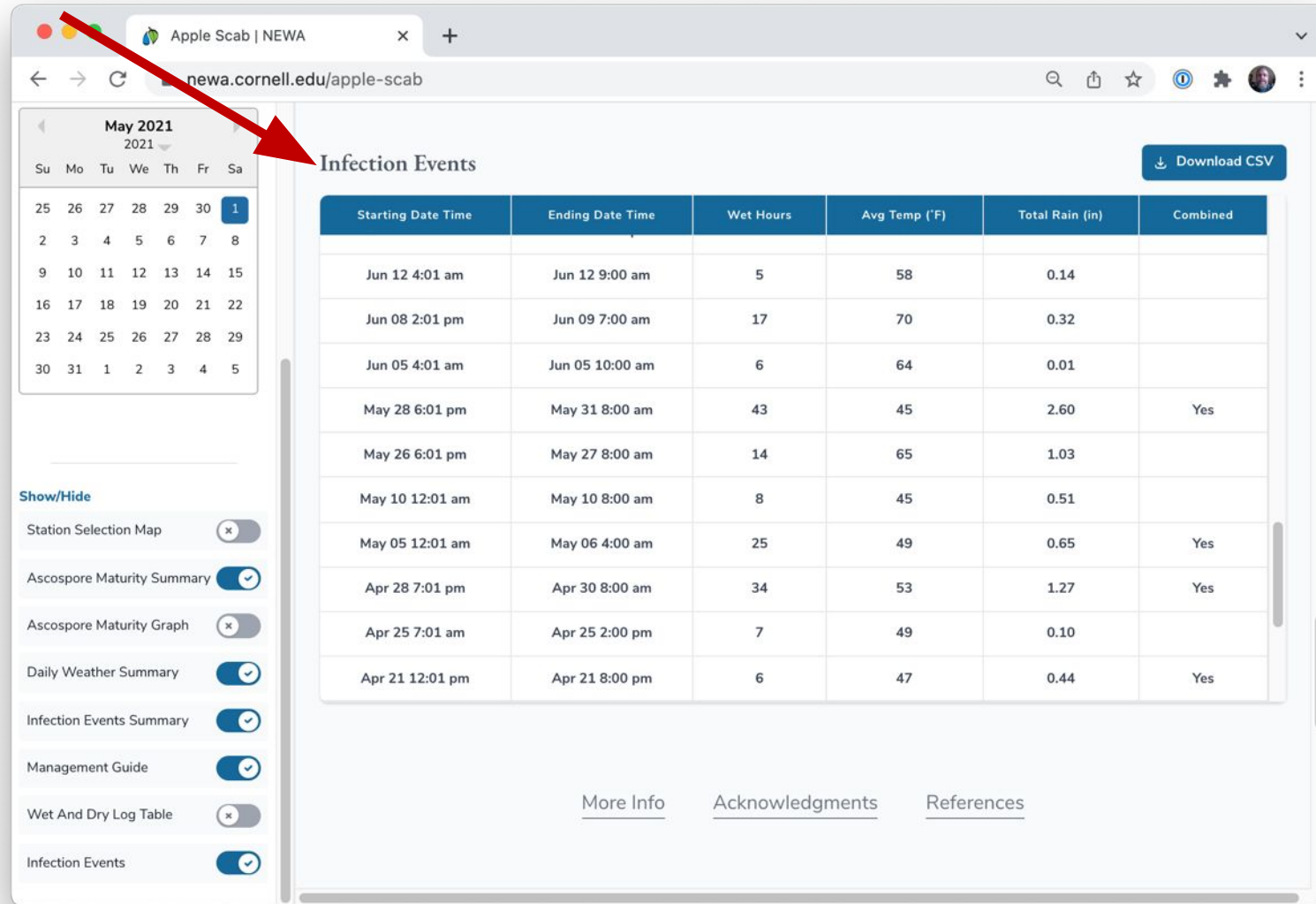
# Apple Scab

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



# Apple Scab

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



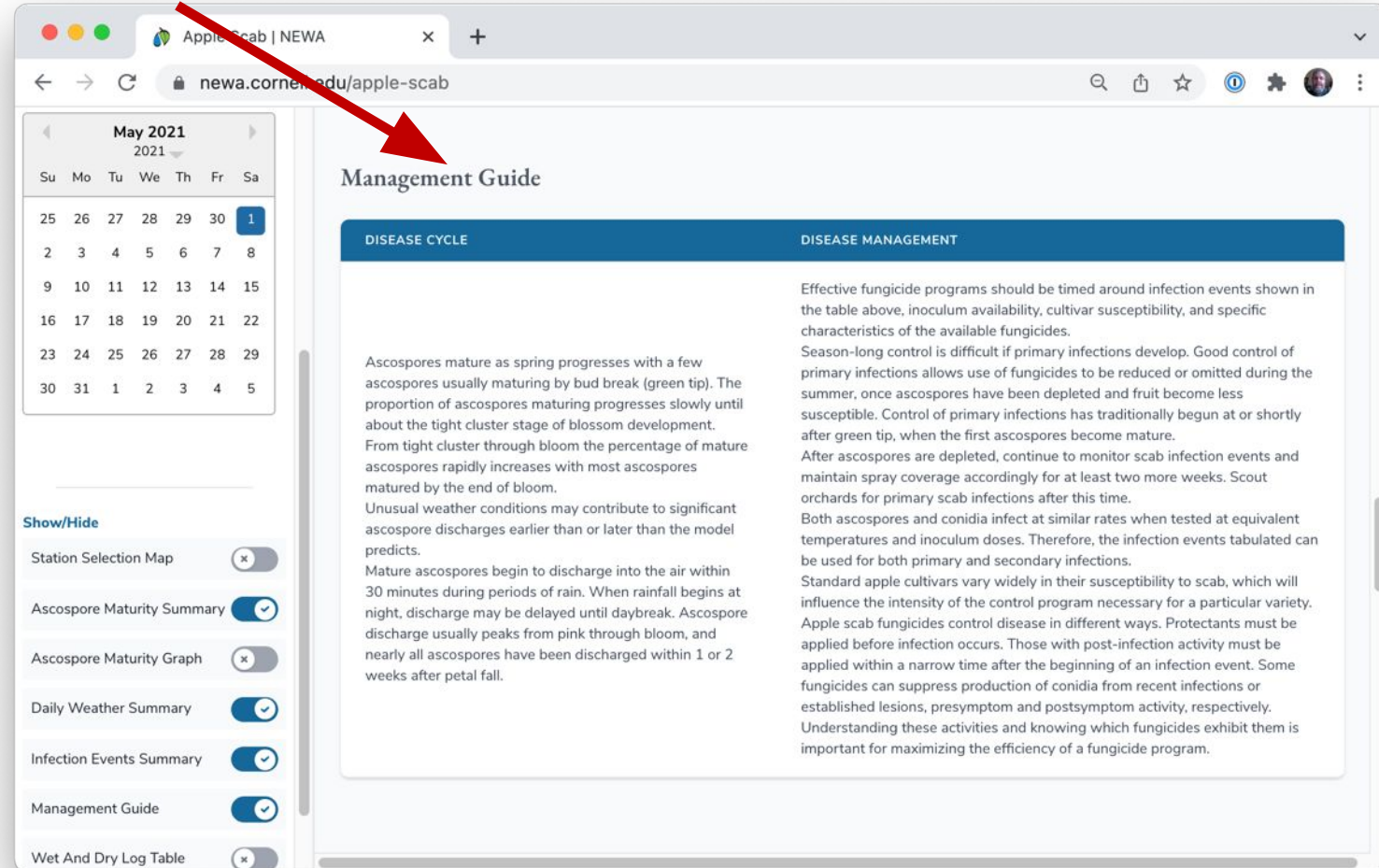
The screenshot shows the Apple Scab website interface. On the left, there is a calendar for May 2021 with a red arrow pointing to the 1st. Below the calendar is a 'Show/Hide' section with several toggle switches. The main content area is titled 'Infection Events' and contains a table with the following data:

Starting Date Time	Ending Date Time	Wet Hours	Avg Temp (°F)	Total Rain (in)	Combined
Jun 12 4:01 am	Jun 12 9:00 am	5	58	0.14	
Jun 08 2:01 pm	Jun 09 7:00 am	17	70	0.32	
Jun 05 4:01 am	Jun 05 10:00 am	6	64	0.01	
May 28 6:01 pm	May 31 8:00 am	43	45	2.60	Yes
May 26 6:01 pm	May 27 8:00 am	14	65	1.03	
May 10 12:01 am	May 10 8:00 am	8	45	0.51	
May 05 12:01 am	May 06 4:00 am	25	49	0.65	Yes
Apr 28 7:01 pm	Apr 30 8:00 am	34	53	1.27	Yes
Apr 25 7:01 am	Apr 25 2:00 pm	7	49	0.10	
Apr 21 12:01 pm	Apr 21 8:00 pm	6	47	0.44	Yes

At the bottom of the page, there are links for [More Info](#), [Acknowledgments](#), and [References](#). A 'Download CSV' button is located in the top right corner of the table area.

# Apple Scab

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



The screenshot shows a web browser window with the URL `newa.cornell.edu/apple-scab`. The page is titled "Apple Scab | NEWA". On the left sidebar, there is a calendar for May 2021 and a "Show/Hide" menu with the following items: Station Selection Map (disabled), Ascospore Maturity Summary (enabled), Ascospore Maturity Graph (disabled), Daily Weather Summary (enabled), Infection Events Summary (enabled), Management Guide (enabled), and Wet And Dry Log Table (disabled). The main content area is titled "Management Guide" and is divided into two columns: "DISEASE CYCLE" and "DISEASE MANAGEMENT".

## Management Guide

### DISEASE CYCLE

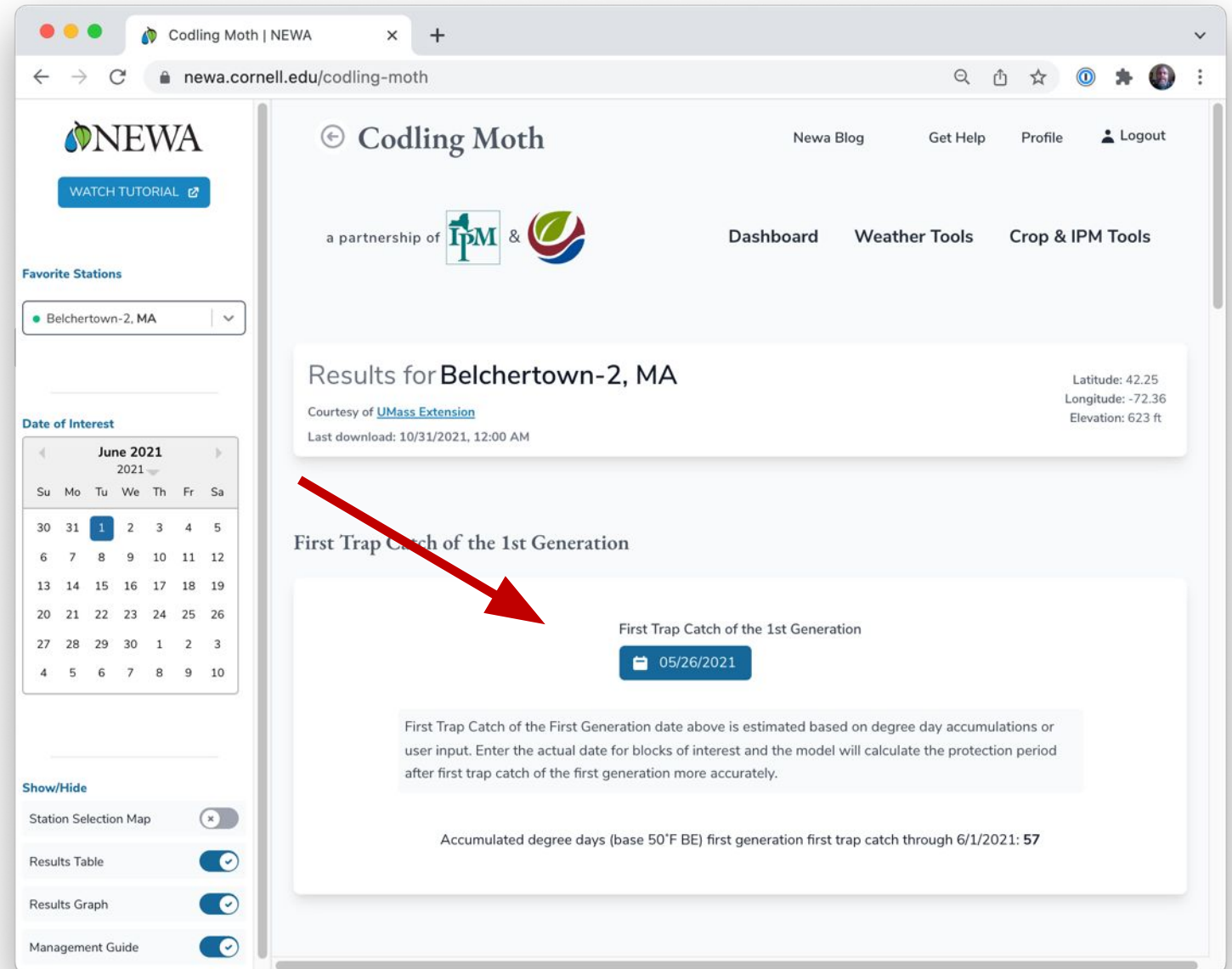
Ascospores mature as spring progresses with a few ascospores usually maturing by bud break (green tip). The proportion of ascospores maturing progresses slowly until about the tight cluster stage of blossom development. From tight cluster through bloom the percentage of mature ascospores rapidly increases with most ascospores matured by the end of bloom. Unusual weather conditions may contribute to significant ascospore discharges earlier than or later than the model predicts. Mature ascospores begin to discharge into the air within 30 minutes during periods of rain. When rainfall begins at night, discharge may be delayed until daybreak. Ascospore discharge usually peaks from pink through bloom, and nearly all ascospores have been discharged within 1 or 2 weeks after petal fall.

### DISEASE MANAGEMENT

Effective fungicide programs should be timed around infection events shown in the table above, inoculum availability, cultivar susceptibility, and specific characteristics of the available fungicides. Season-long control is difficult if primary infections develop. Good control of primary infections allows use of fungicides to be reduced or omitted during the summer, once ascospores have been depleted and fruit become less susceptible. Control of primary infections has traditionally begun at or shortly after green tip, when the first ascospores become mature. After ascospores are depleted, continue to monitor scab infection events and maintain spray coverage accordingly for at least two more weeks. Scout orchards for primary scab infections after this time. Both ascospores and conidia infect at similar rates when tested at equivalent temperatures and inoculum doses. Therefore, the infection events tabulated can be used for both primary and secondary infections. Standard apple cultivars vary widely in their susceptibility to scab, which will influence the intensity of the control program necessary for a particular variety. Apple scab fungicides control disease in different ways. Protectants must be applied before infection occurs. Those with post-infection activity must be applied within a narrow time after the beginning of an infection event. Some fungicides can suppress production of conidia from recent infections or established lesions, presymptom and postsymptom activity, respectively. Understanding these activities and knowing which fungicides exhibit them is important for maximizing the efficiency of a fungicide program.

# Codling Moth

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

A screenshot of the NEWA Codling Moth website. The browser address bar shows 'newa.cornell.edu/codling-moth'. The page features a navigation menu with 'Newa Blog', 'Get Help', 'Profile', and 'Logout'. Below the navigation, there are logos for 'IPM' and another organization. The main content area is titled 'Results for Belchertown-2, MA' and includes a 'WATCH TUTORIAL' button. A calendar for June 2021 is displayed, with the 1st of June highlighted. A red arrow points from the calendar to a date selector showing '05/26/2021'. Below this, there is a text box explaining that the first trap catch date is estimated based on degree day accumulations. At the bottom, it states 'Accumulated degree days (base 50°F BE) first generation first trap catch through 6/1/2021: 57'. On the left side of the page, there is a sidebar with 'Favorite Stations' (Belchertown-2, MA) and 'Date of Interest' (June 2021). At the bottom of the sidebar, there are toggle switches for 'Station Selection Map', 'Results Table', 'Results Graph', and 'Management Guide'.

# Codling Moth

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

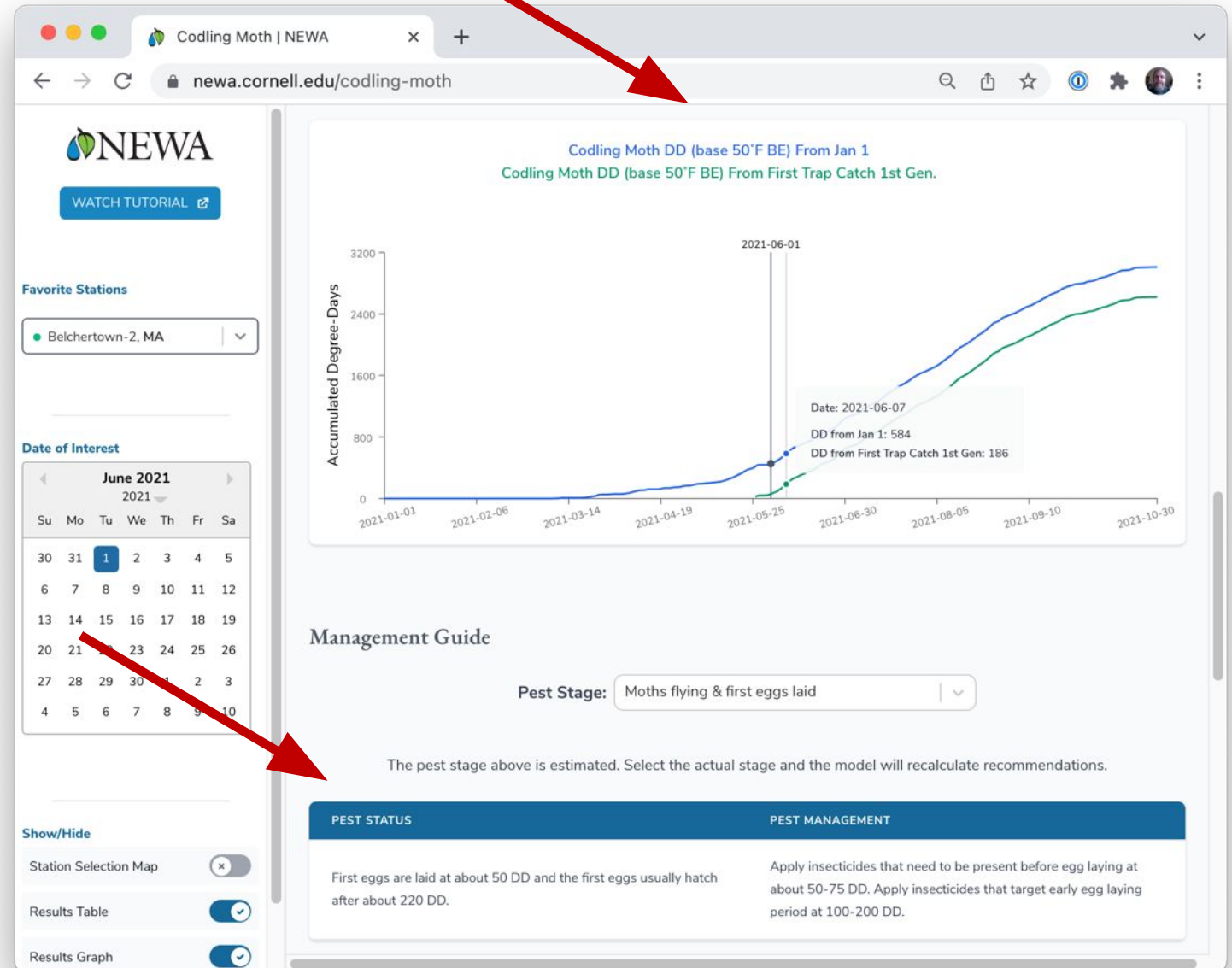
The screenshot shows the NEWA website interface for Codling Moth. The browser address bar displays 'newa.cornell.edu/codling-moth'. The page title is 'Accumulated degree days (base 50°F BE) first generation first trap catch through 6/1/2021: 57'. A 'WATCH TUTORIAL' button is visible in the top left. The 'Favorite Stations' section shows 'Belchertown-2, MA'. The 'Date of Interest' section shows a calendar for June 2021 with the 1st highlighted. The 'Results Table' section contains a table with columns for 'DATE (2021)', 'DAILY', 'FROM JAN 1', and 'FROM MAY 26'. A 'Download CSV' button is located to the right of the table. The 'Show/Hide' section at the bottom left has toggle switches for 'Station Selection Map', 'Results Table', and 'Results Graph', all of which are currently turned on.

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
<b>June 1</b>	<b>12</b>	<b>453</b>	<b>57</b>
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

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



Onion Maggot | NEWA

newa.cornell.edu/onion-maggot

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

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)		GENERATION
	DAILY	FROM JAN 1	
May 17	21	592	Overwintering
May 18	17	609	Overwintering
May 19	18	627	<b>Overwintering</b>
May 20	24	650	Overwintering

**All Stations**

Hollis, NH

**Date of Interest**

May 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

Onion Maggot | NEWA
newa.cornell.edu/onion-maggot

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



WATCH TUTORIAL

**All Stations**

Hollis, NH

**Date of Interest**

May 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

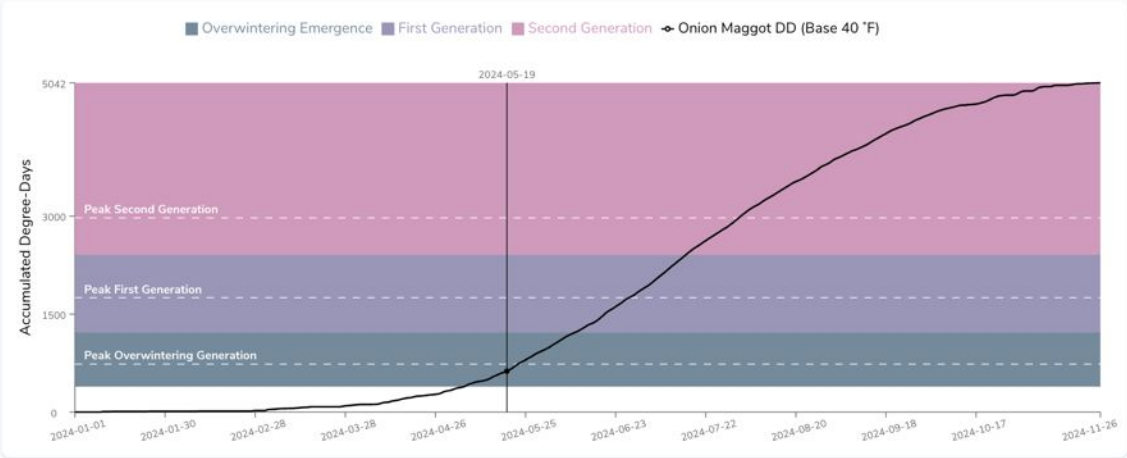
Results Table

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

Dashboard | NEWA  
newa.cornell.edu/user

## Results for Biglerville (PSU FREC), PA

Courtesy of State Horticultural Association of Pennsylvania  
Last download: 1/21/2022, 11:00 AM

Latitude: 39.93  
Longitude: -77.25  
Elevation: 741 ft

### Biglerville (PSU FREC) Overview

At 11:00 AM today

**17 °F**

Base 50°F Degree Days since January 1: 2

Relative Humidity: 53 %

Leaf Wetness: 0 minutes

Solar Radiation: N/A

Wind Speed: 9 mph

Wind Direction: Vrb

Yesterday

Precipitation: 0.1 in | High Temp: 40 °F | Low Temp: 19 °F

Today as of 11:00 AM

Precipitation: 0 in | High Temp: 18 °F | Low Temp: 10 °F

### 5-Day Weather Forecast

Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
1/21/2022	1/22/2022	1/23/2022	1/24/2022	1/25/2022	1/26/2022
☀️	☀️	☁️	☁️	☁️	☁️
22 10	27 5	29 18	30 17	37 27	26 14

### 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 →

# NEWA Weather Tools

The screenshot shows the NEWA website interface. The browser address bar displays 'newa.cornell.edu/all-weather-data-query'. The page title is 'All Weather Data Query | NEWA'. The main content area is titled 'Results for Biglerville (PSU FREC), PA' and includes the following information:

- Courtesy of State Horticultural Association of Pennsylvania
- Last download: 8/31/2021, 11:00 PM
- Latitude: 39.93
- Longitude: -77.25
- Elevation: 741 ft

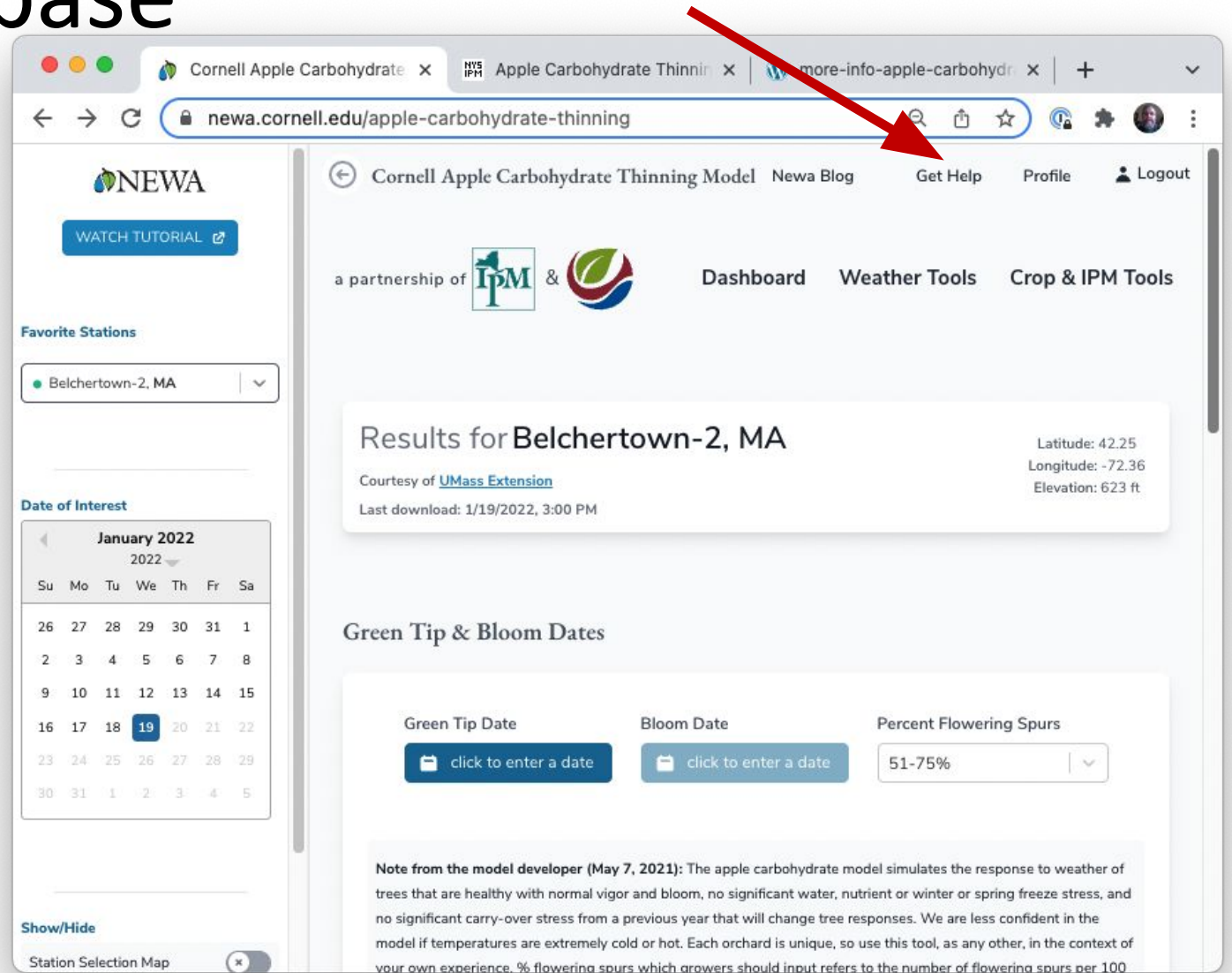
On the left sidebar, the 'Favorite Stations' dropdown is set to 'Biglerville (PSU FREC), PA'. The 'Start Date' is '08/01/2021' and the 'End Date' is '08/31/2021'. The 'Show/Hide' section has 'Station Selection Map' and 'Hourly Data' turned off, and 'Daily Summary' turned on.

The 'Daily Summary' table is displayed with a 'Download CSV' button and 'Estimated Data' / 'Missing data' indicators. The table columns are: 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), and Avg Wind Spd (mph).

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)
08/27/2021	77	89.8	71.4	0.02	17	14	N/A	1.4
08/28/2021	75.7	85.5	68.9	0	14	15	N/A	2.1
08/29/2021	71.7	78.6	66.4	0	16	17	N/A	1.6
08/30/2021	76.3	87.3	69.3	0	16	13	N/A	1.9
08/31/2021	74.5	79.5	69.3	0	13	12	N/A	1.1
Sum or Avg:	75.4	86.3	66.7	2.48	357	273		2.4
Max:	82.6	97.7	72.3	1.06	24	24		5.2
Min:	68.2	75.9	55.9	0	0	0		0.8

# NEWA knowledge base

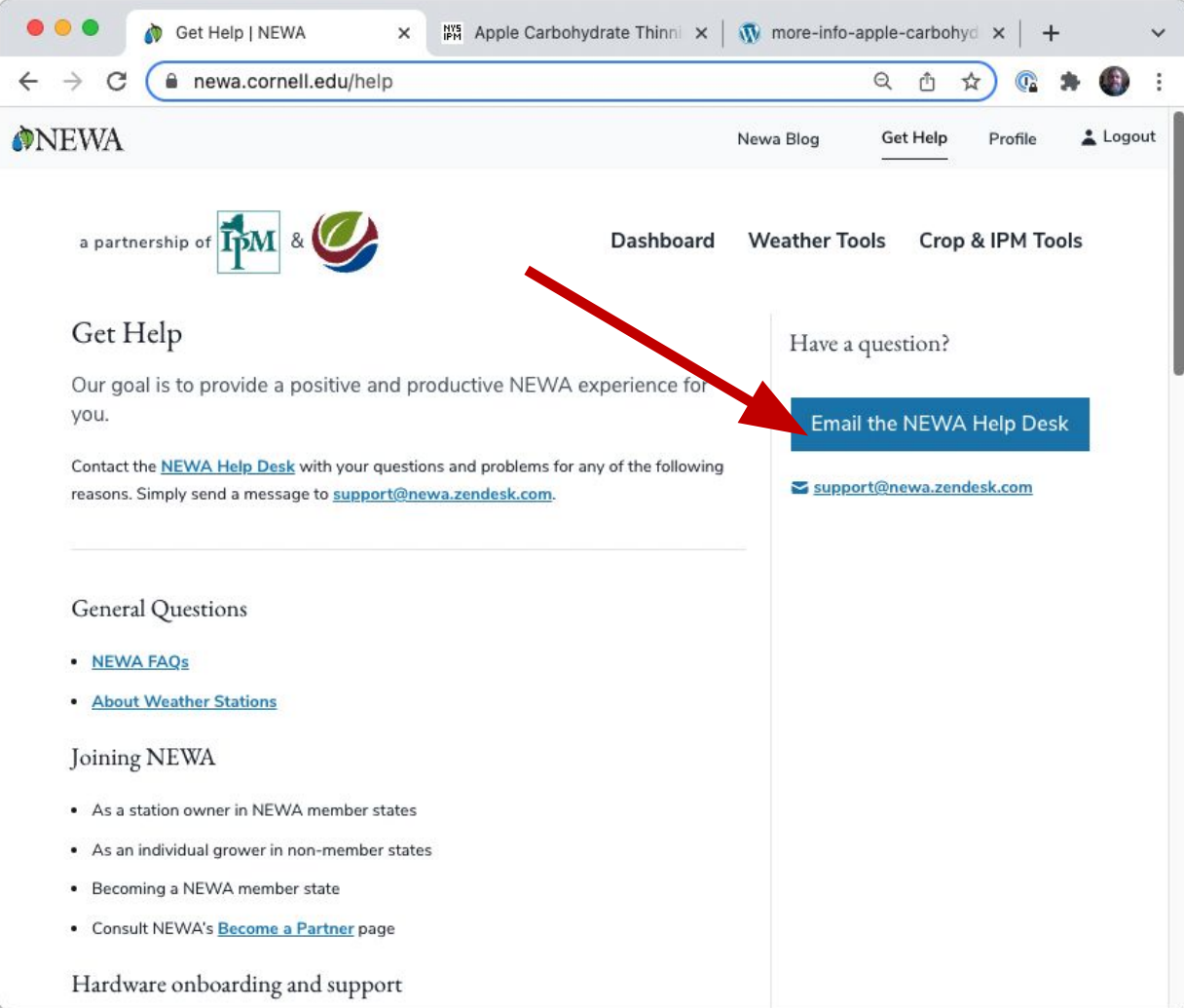
- **Get Help**
- Email the NEWA Help Desk
- NEWA Help Desk



The screenshot shows a web browser window with the URL `newa.cornell.edu/apple-carbohydrate-thinning`. A red arrow points to the search icon in the browser's address bar. The website header includes the NEWA logo, a 'WATCH TUTORIAL' button, and navigation links for 'Cornell Apple Carbohydrate Thinning Model', 'Newa Blog', 'Get Help', 'Profile', and 'Logout'. Below the header, there are logos for 'a partnership of IPM & [university logo]' and navigation links for 'Dashboard', 'Weather Tools', and 'Crop & IPM Tools'. The main content area displays 'Results for Belchertown-2, MA' with coordinates (Latitude: 42.25, Longitude: -72.36, Elevation: 623 ft) and a 'Date of Interest' calendar for January 2022. The calendar shows the 19th as the selected date. Below the calendar, there are input fields for 'Green Tip Date', 'Bloom Date', and 'Percent Flowering Spurs' (set to 51-75%). A note from the model developer is visible at the bottom.

# NEWA knowledge base

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



The screenshot shows a web browser window with the URL [newa.cornell.edu/help](https://newa.cornell.edu/help). The page features the NEWA logo and navigation links for 'Newa Blog', 'Get Help', 'Profile', and 'Logout'. Below the logo, it states 'a partnership of IPM & [IPM logo]'. The main heading is 'Get Help', followed by the text: 'Our goal is to provide a positive and productive NEWA experience for you.' Below this, it says: 'Contact the [NEWA Help Desk](#) with your questions and problems for any of the following reasons. Simply send a message to [support@newa.zendesk.com](mailto:support@newa.zendesk.com).' On the right side, there is a 'Have a question?' section with a blue button labeled 'Email the NEWA Help Desk' and the email address [support@newa.zendesk.com](mailto:support@newa.zendesk.com). A red arrow points from the 'Email the NEWA Help Desk' button in the right sidebar to the 'Email the NEWA Help Desk' button in the main content area.

Get Help | NEWA

newa.cornell.edu/help

NEWA

Newa Blog Get Help Profile Logout

a partnership of IPM & [IPM logo]

Dashboard Weather Tools Crop & IPM Tools

### Get Help

Our goal is to provide a positive and productive NEWA experience for you.

Contact the [NEWA Help Desk](#) with your questions and problems for any of the following reasons. Simply send a message to [support@newa.zendesk.com](mailto:support@newa.zendesk.com).

#### General Questions

- [NEWA FAQs](#)
- [About Weather Stations](#)

#### Joining NEWA

- As a station owner in NEWA member states
- As an individual grower in non-member states
- Becoming a NEWA member state
- Consult NEWA's [Become a Partner](#) page

#### Hardware onboarding and support

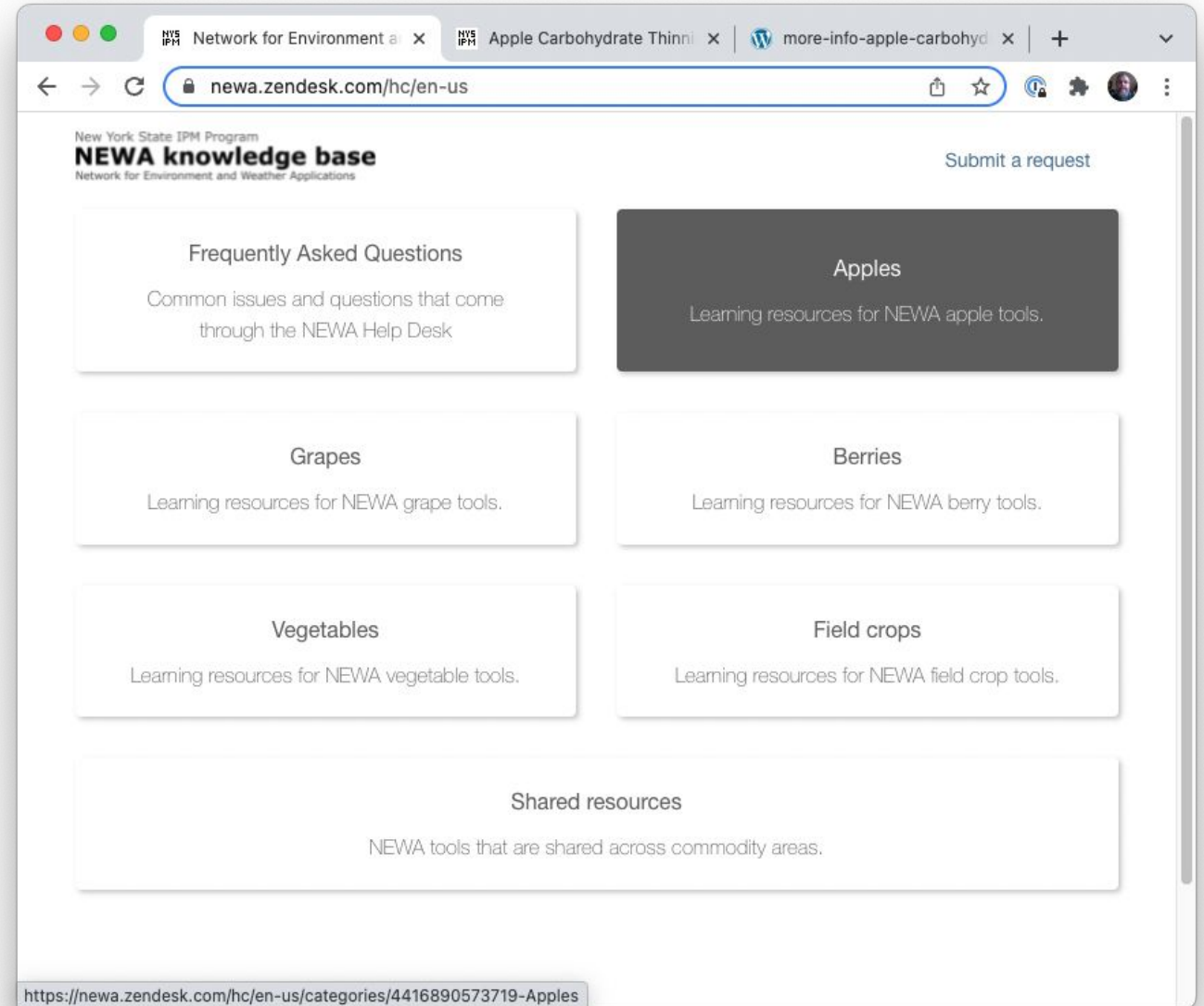
Have a question?

[Email the NEWA Help Desk](#)

[support@newa.zendesk.com](mailto:support@newa.zendesk.com)

# NEWA knowledge base

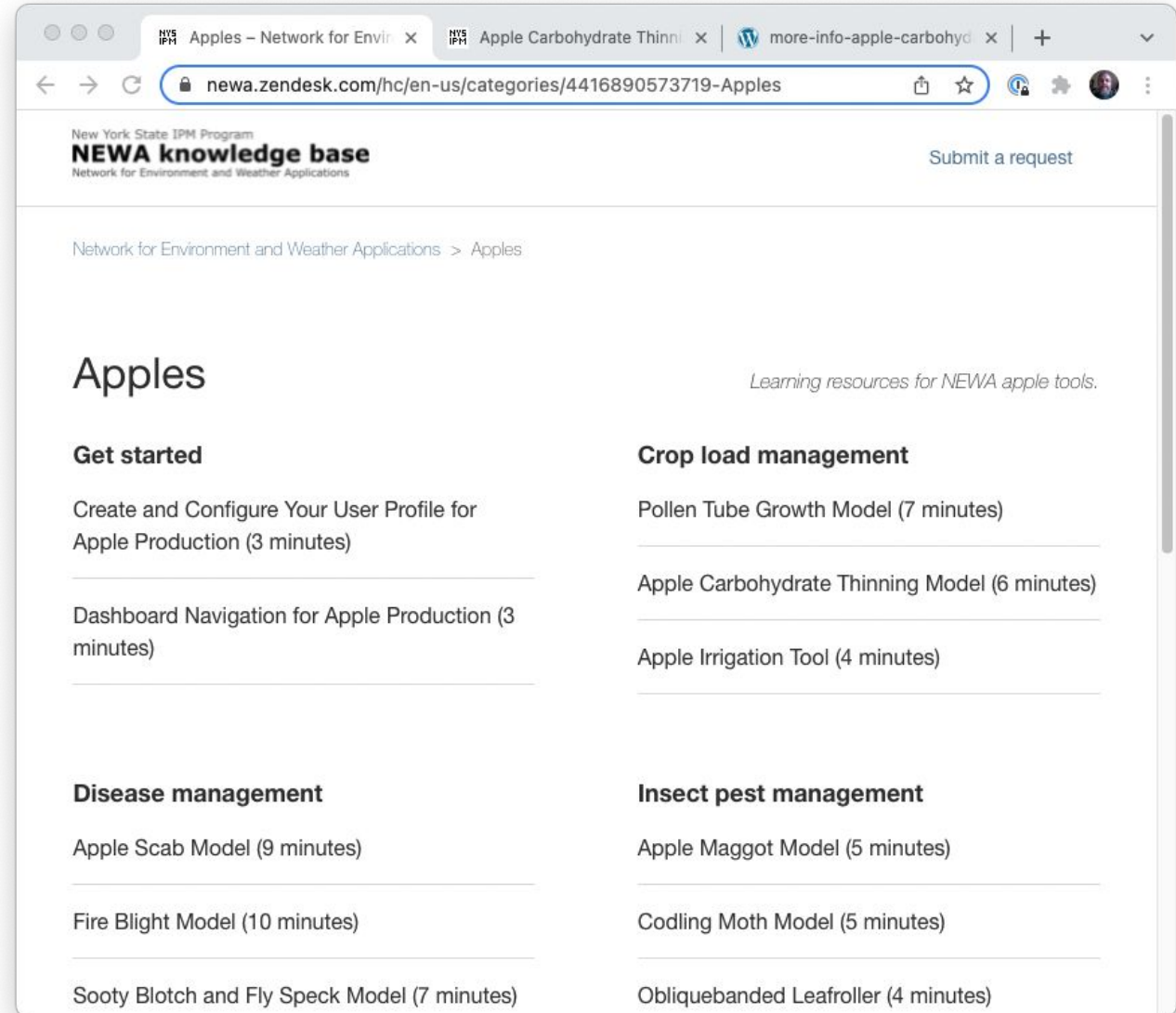
- Get Help
- Email the NEWA Help Desk
- **NEWA Help Desk**





# NEWA knowledge base

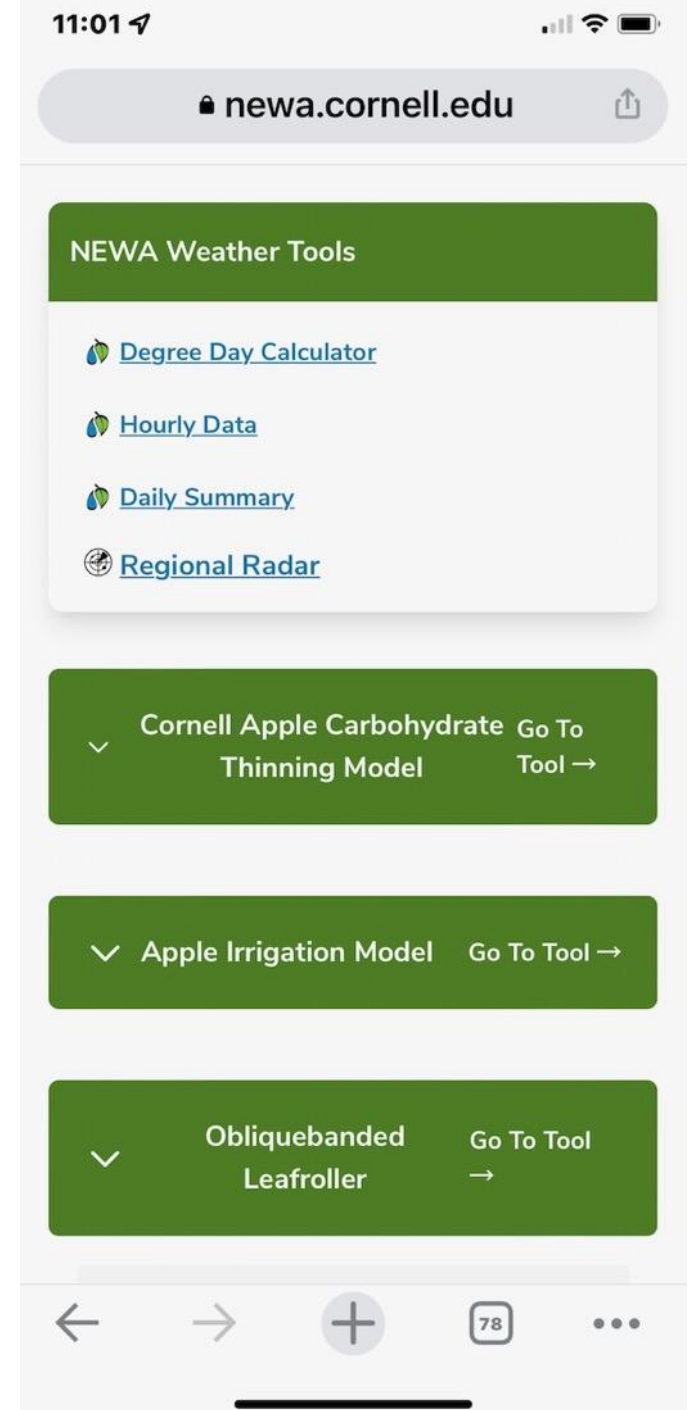
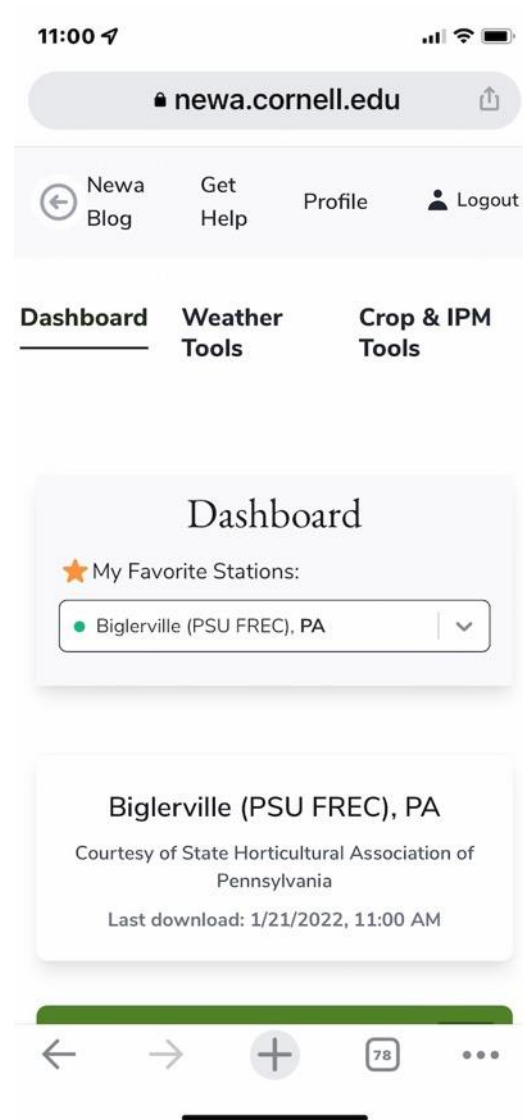
- Get Help
- Email the NEWA Help Desk
- **NEWA Help Desk**



The screenshot shows a web browser window with the URL [newa.zendesk.com/hc/en-us/categories/4416890573719-Apples](https://newa.zendesk.com/hc/en-us/categories/4416890573719-Apples). The page header includes the New York State IPM Program logo and the text "NEWA knowledge base" and "Network for Environment and Weather Applications". A "Submit a request" link is visible in the top right. The main content area is titled "Apples" and includes a sub-header "Learning resources for NEWA apple tools." Below this, there are four columns of resources:

- Get started**
  - Create and Configure Your User Profile for Apple Production (3 minutes)
  - Dashboard Navigation for Apple Production (3 minutes)
- Disease management**
  - Apple Scab Model (9 minutes)
  - Fire Blight Model (10 minutes)
  - Sooty Blotch and Fly Speck Model (7 minutes)
- Crop load management**
  - Pollen Tube Growth Model (7 minutes)
  - Apple Carbohydrate Thinning Model (6 minutes)
  - Apple Irrigation Tool (4 minutes)
- Insect pest management**
  - Apple Maggot Model (5 minutes)
  - Codling Moth Model (5 minutes)
  - Obliquebanded Leafroller (4 minutes)

# 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>

The screenshot shows a web browser window with the URL [newa.cornell.edu/buy-a-weather-station](https://newa.cornell.edu/buy-a-weather-station). The page header includes the NEWA logo and navigation links for 'Newa Blog', 'Get Help', 'Profile', and 'Logout'. Below the header, there are logos for 'IPM' and another partner, and navigation links for 'Dashboard', 'Weather Tools', and 'Crop & IPM Tools'. The main content area is titled 'Buy a Weather Station' and contains the following text:

A modest investment in a weather station will mean consistent savings from enhanced IPM and crop management decision-making.

NEWA collaborates with two weather station vendors to provide hardware, [Onset Data Loggers](#) and [KestrelMet](#). NEWA is an independent operator and does not receive any commission or payment of any sort from the sale of weather station hardware from these vendors.

**Am I in the NEWA network?**

Twenty US states are in the NEWA network. Your membership is covered in full if you live in any of these states so visit our [Partners](#) page to find out more about your membership status.

Not in the NEWA network? Individuals in non-member US states can still join NEWA for an annual membership fee of \$290 for the first weather station. Additional machines can also be added at a pro-rated cost of \$260 each. These fees are paid after your station is connected to NEWA.

Want your state to join NEWA? Visit our [Become a Partner](#) page for more information about state-level NEWA membership.

**Buy a weather station**

[Onset Data Loggers](#) and [KestrelMet](#) provision weather stations pre-configured for full compatibility with NEWA's agricultural production tools. The NEWA network does not accept data from other brands or custom-built devices.

Contact the vendors to find a weather station that fits your business' needs. Knowledgeable sales and support staff are available to answer your questions. Speak with them about maintenance requirements, sensor replacement, and expected lifespan. Also, review the NEWA [Maintenance Guide](#) page for additional information before making your purchase.

**Get Help**

Our goal is to provide a positive and productive NEWA experience. Visit our [Get Help](#) page for more information. Staff are on-hand to answer your questions, provide support for NEWA tools and resources, or help with your weather station.

**Have a question?**

[Contact the NEWA Help Desk](#)

[support@newa.zendesk.com](mailto:support@newa.zendesk.com)

**About Weather Stations**

NEWA works with [Onset Data Loggers](#) and [KestrelMet](#), which are configured for NEWA's agricultural production tools. Visit our [Buy a Weather Station](#) page to contact vendors and understand the steps required for connecting with NEWA resources.

[Learn More](#)

**Become a Partner**

onsetcomp.com

**ONSET**

- 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

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



# Additional sensors - HOBOnet

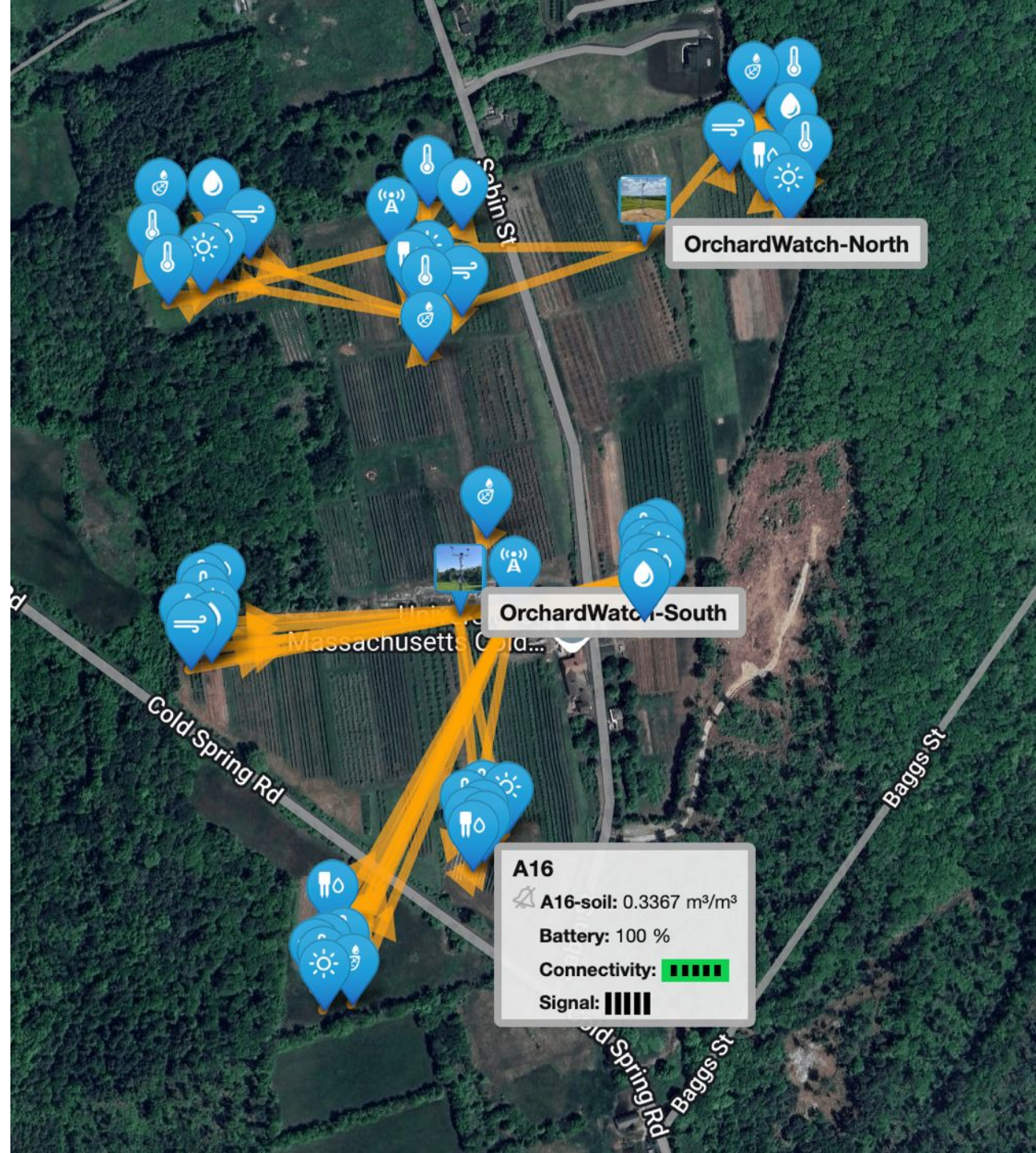
## HOBOnet Wireless Sensor Network

Monitoring with a HOBOnet system can optimize your production and maximize your profits using data-driven strategies.

**HOW CAN WEATHER FORECAST DATA IMPROVE YOUR CROP MANAGEMENT? FIND OUT IN OUR PRECISION AGRICULTURE WEBINAR!**



PLAY VIDEO





# orchardwatch.wordpress.com


Orchard Watch

Welcome to orchard-watch


...how is the orchard feeling today?

### Hobonet notes

Orchard watch has 7 "motes" that measure: air temperature, humidity, rainfall, wetness, solar radiation, wind speed and direction, and soil temperature and moisture content.



OrchardWatch (A16) mote



OrchardWatch-North RX 3000 station

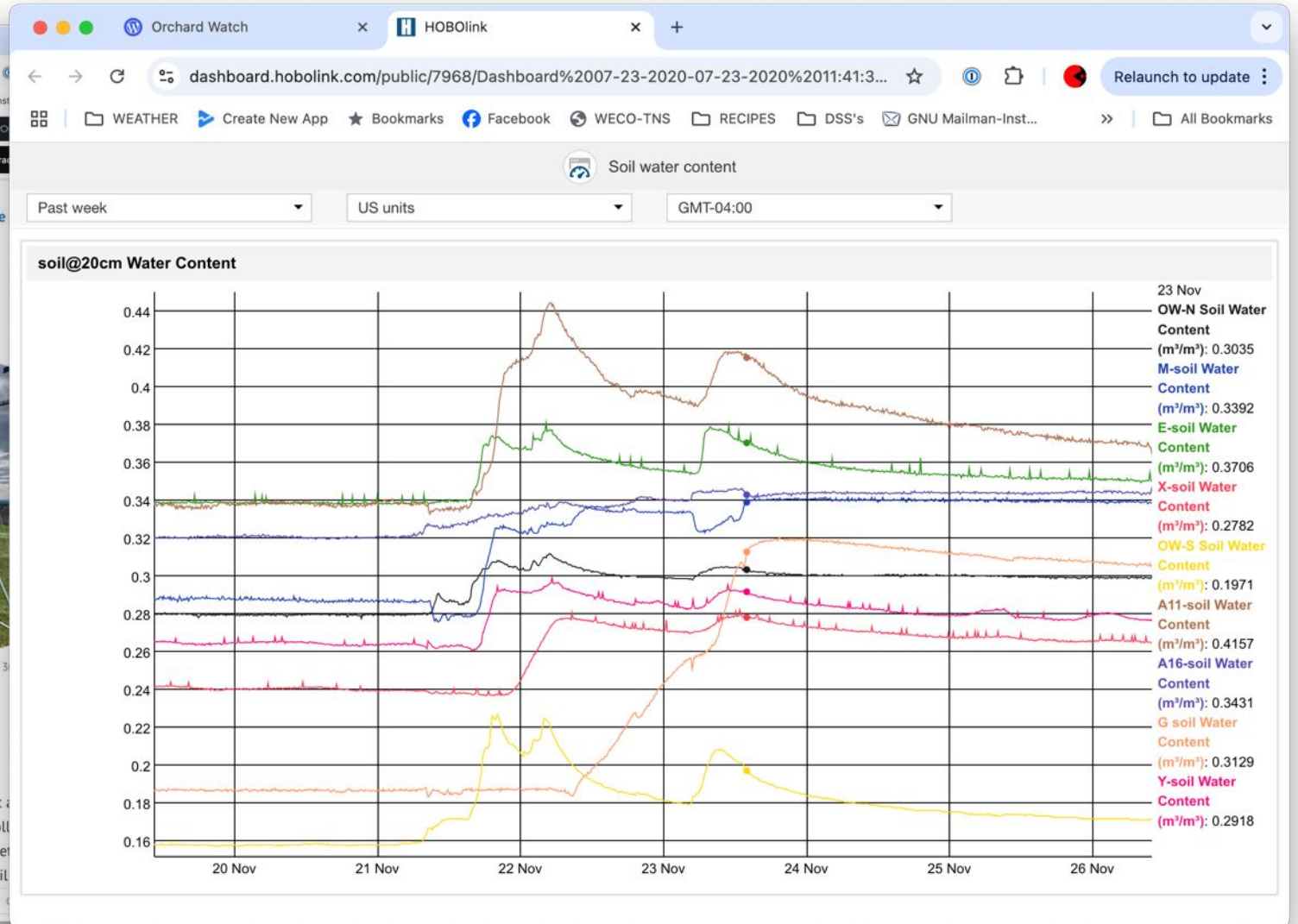
### Hobo RX 3000

RX 3000 "mother" stations collect and watch weather data as well as collect temperature, humidity, rainfall, wetness, wind speed and direction, and soil moisture content.

Public access URL for Orchard Watch

[OrchardWatch-North](#)

[OrchardWatch-South](#)



# Additional sensors - KestrelMet



# Toro Tempus Ag

**TORO** AUTOMATION

Meet the simplicity of irrigation system automation.

2023 NEW PRODUCT CONTEST Winner  
Irrigation Association

DIRECT PLANT SENSING

2021 NEW PRODUCT CONTEST Winner  
Irrigation Association

**SIMPLE, WIRELESS IRRIGATION CONTROL**

2023 NEW PRODUCT CONTEST Winner  
Irrigation Association

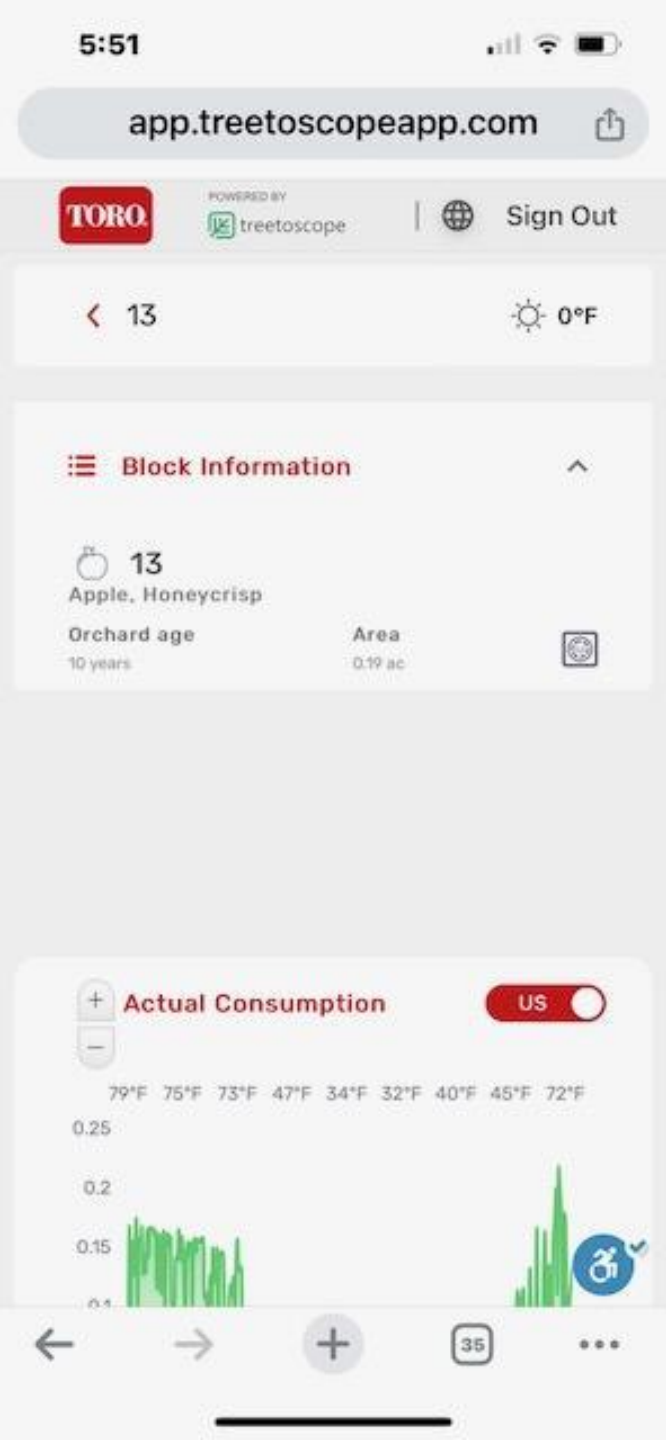
2021 NEW PRODUCT CONTEST Winner  
Irrigation Association

**Toro Transpira and Toro Tempus AG**  
Winners of the 2021 and 2023 New product of the year contest from the Irrigation Association

The advertisement features a hand holding a smartphone displaying the Toro irrigation app interface. In the center, a Toro Transpira sensor unit is shown with a circular inset image of a field. To the right, a Toro Tempus AG wireless irrigation control unit is displayed, including a white sensor probe and a black control box with an antenna. The background is dark with a large red sphere and a dashed white line separating the product images from the text below.



# 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)!



# FOR INNOVATIVE M 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

# outfield.xyz



Outfield Technologies - Orchard

outfield.xyz

WEATHER Bookmarks Facebook FileMaker WebDir... WECO-TNS RECIPES DSS's GNU Mailman-Inst... Other Bookmarks

OUTFIELD CONTACT LOG IN

OR

Outfield solves  
machine learning  
orchard

Receive detailed information about  
your orchards.

S

innovative  
of fruit in their  
hable.

The screenshot shows a web browser displaying the Outfield Technologies website. The main content area features a large image of a computer monitor. On the monitor, the Outfield software interface is visible, showing a map of an orchard with a pink highlighted area. The interface includes a sidebar with filters for 'Orchard', 'Area', 'Field', and 'Variety', and a legend on the right side. The browser's address bar shows 'outfield.xyz' and the page title is 'Outfield Technologies - Orchard'. The browser's bookmark bar contains various links like 'WEATHER', 'Bookmarks', 'Facebook', etc. The website's navigation menu includes 'CONTACT' and 'LOG IN'. The background of the website is a dark green color with a faint image of a vineyard.

