
UC IPM

Codling Moth IPM Anecdotes

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Why Local Anecdotes?

- We have diverse site characteristics and microclimates, scales, goals, opportunities & constraints across different apple orchards here in Sonoma county
- Growers have been experimenting and fine-tuning IPM for codling moth in site-specific ways
- Highlight examples of how growers innovate & tailor IPM to specific unique contexts
- All of the following is being shared with permission
- Mention of any products are merely examples, not endorsements

From Ted Richardson, Bella Ridge Farm

- 300 pome fruit trees, mixed production on ~2 acres
- Lots of pollinator & beneficial insect habitat
- Coddling moth damage has ranged from 2-10% over the years

Photos by Ted Richardson

From Ted Richardson, Bella Ridge Farm

- Codling Moth IPM Strategies Ted has experimented with
  - Mating disruption with Pacific Biocontrol Isomate CM plus dispensers for 16 years and Suterra puffers the last 4 years
  - Cyd-x (coddling moth virus) most years
  - One spray of Entrust in some years
  - A Trichogramma wasp release some years
  - Tried beneficial nematodes once

Photo by Ted Richardson

From Ted Richardson, Bella Ridge Farm

- In a larger pear orchard, he found that starting the use of pheromones helped reduce codling moth damage from over 30% to less than 10%

Photo by Ted Richardson

From Ted Richardson, Bella Ridge Farm

Photo by Ted Richardson

- He encourages apple growers at any scale to focus on:
  - Sanitation: pick off all stings on a regular basis
  - Thin fruit to singles
- He has seen good results on a small scale with kaolin clay (Surround) which disappears if used only on the first generation
- Look at pupation sites such as old bark and apple bins

From Dave Hale, Hale's Apple Farm

- He has used IPM at his farm since 1979
- 16 acres of apples currently
- In the last decade, has had minimal codling moth damage in apples at his farm
- "The key to control is understanding the codling moth life cycle, vigilance, and timing of application materials."

From Dave Hale, Hale's Apple Farm

- Dave's IPM Strategies:
  - Pheromone attractant in sticky traps to monitor moth activity
  - He times spray just prior to egg hatch, with a booster applied 10-12 days later
  - The spray material has minimal residual & a follow up is needed for control
  - He continues to monitor & keep fresh pheromone in the traps until mid-September

From Dave Hale, Hale's Apple Farm

- Dave's Notes:
  - Timing: first generation usually appears in April during Gravenstein bloom
  - There can be 3 to 5 activity periods from April – September
  - He has found an IPM system through trial & error that provides excellent control (<1% damage)
  - His trap counts are significantly lower than past years and serve as an indicator of activity

From Dave Hale

From Dave Hale

From Dave Hale, Hale's Apple Farm

- Dave's Notes:
  - He rotates mode of action of spray materials
  - He tries to use bee friendly material for the first generation of codling moth since it usually occurs during bloom
  - The most difficult application is once harvest begins in August: need to stay ahead of the pre-harvest interval of the spray material while providing adequate coverage of the apples that mature in October (it's not easy or consistent)
  - You need to monitor precisely: codling moth activity can be different south of Sebastopol vs. Graton, so site-specific monitoring is important

From Dave Hale

- BE PROACTIVE!

From Dave Hale

- Canneries are no longer present near his orchard which had hundreds of wooden bins where CM would overwinter
- Most of the nearby orchards that were not cared for are no longer a source of insect infestation because they have been removed & converted to vineyards

From Dan Ivaldi (PCA)

- PCA with Wilbur Ellis for 18+ years
- Works with the Duttons on apple management
- There were many years of lower pressure but last year had high moth counts throughout CA including the Central Valley, many growers incurred damage

From Dan Ivaldi (PCA)

- He encourages the use of the degree day model, use the science
- Organic materials are costly and have short residual activity – even though many applications were made last year many crops still had damage

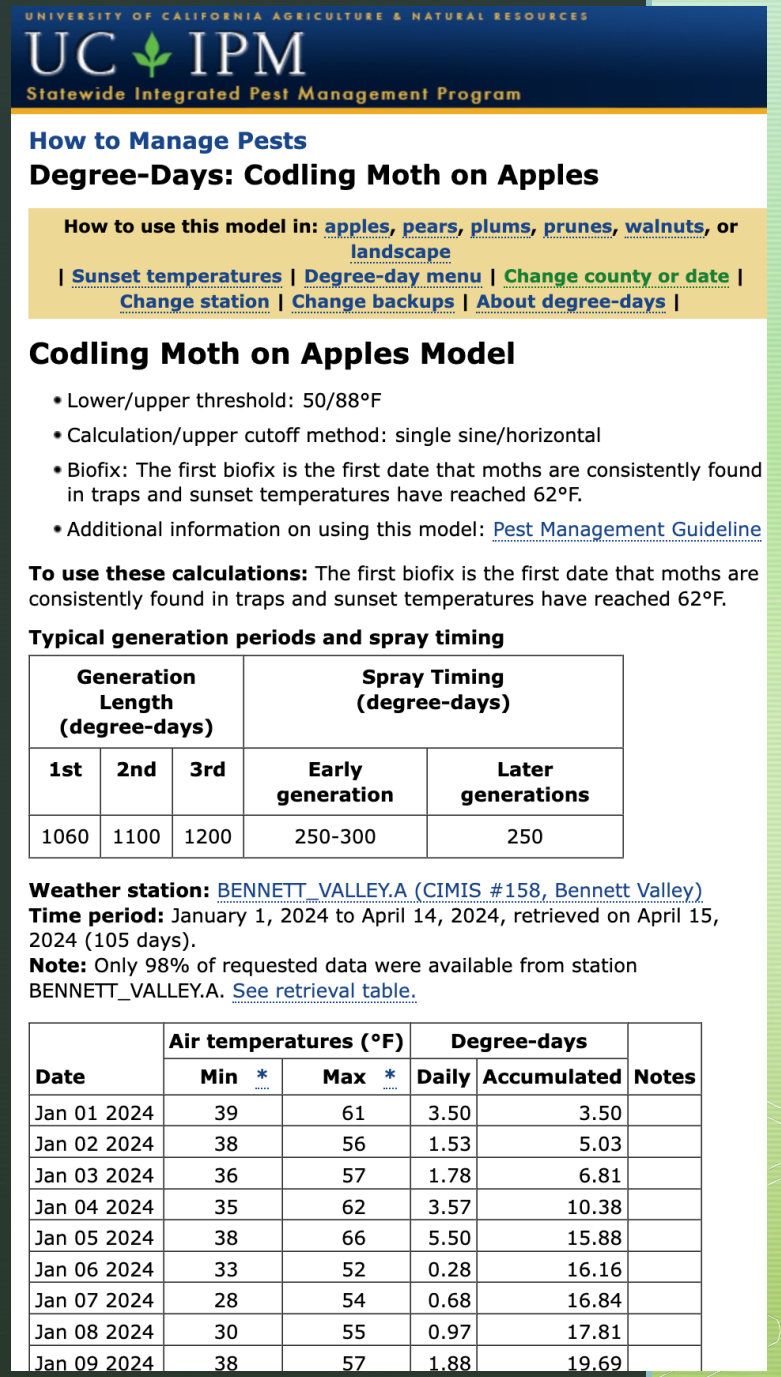
From Doug Snyde (PCA)

- The amount of abandoned orchards makes it very difficult to manage codling moth in the Sebastopol area
- Late season varieties like Romes are hit hard by codling moth, while varieties that are harvested earlier like Gravensteins may have less damage
- The small scale of many orchards and the slopes and hillsides can make pheromone mating disruption for CM quite difficult – in these situations, it can be hard to get good enough coverage and saturation to confuse them
- IPM is always the goal

Resources

- https://ipm.ucanr.edu/calludt.cgi/DDMODEL?MODEL=CM&CROP=apples

Degree Days: Codling Moth in Apples, select Sonoma County



UNIVERSITY OF CALIFORNIA AGRICULTURE & NATURAL RESOURCES
UC IPM
Statewide Integrated Pest Management Program

How to Manage Pests

Degree-Days: Codling Moth on Apples

How to use this model in: apples, pears, plums, prunes, walnuts, or landscape
| Sunset temperatures | Degree-day menu | Change county or date | Change station | Change backups | About degree-days |

Codling Moth on Apples Model

- Lower/upper threshold: 50/88°F
- Calculation/upper cutoff method: single sine/horizontal
- Biofix: The first biofix is the first date that moths are consistently found in traps and sunset temperatures have reached 62°F.
- Additional information on using this model: Pest Management Guideline

To use these calculations: The first biofix is the first date that moths are consistently found in traps and sunset temperatures have reached 62°F.

Typical generation periods and spray timing

Generation Length (degree-days)			Spray Timing (degree-days)	
1st	2nd	3rd	Early generation	Later generations
1060	1100	1200	250-300	250

Weather station: BENNETT_VALLEY.A (CIMIS #158, Bennett Valley)
Time period: January 1, 2024 to April 14, 2024, retrieved on April 15, 2024 (105 days).
Note: Only 98% of requested data were available from station BENNETT_VALLEY.A. See retrieval table.

Date	Air temperatures (°F)		Degree-days		Notes
	Min *	Max *	Daily	Accumulated	
Jan 01 2024	39	61	3.50	3.50	
Jan 02 2024	38	56	1.53	5.03	
Jan 03 2024	36	57	1.78	6.81	
Jan 04 2024	35	62	3.57	10.38	
Jan 05 2024	38	66	5.50	15.88	
Jan 06 2024	33	52	0.28	16.16	
Jan 07 2024	28	54	0.68	16.84	
Jan 08 2024	30	55	0.97	17.81	
Jan 09 2024	38	57	1.88	19.69	

Resources

- https://ipm.ucanr.edu/agriculture/apple/codling-moth/#gsc.tab=0
- https://ipm.ucanr.edu/PMG/PESTNOTES/pn7412.html
- https://ipm.ucanr.edu/agriculture/pear/codling-moth/#gsc.tab=0
- https://ipm.ucanr.edu/agriculture/walnut/codling-moth/#gsc.tab=0
- https://ipm.ucanr.edu/what-is-ipm/#gsc.tab=0
- https://treefruit.wsu.edu/crop-protection/opm/codling-moth/