

Apple codling moth (*Cydia pomonella*) is a major pest of apples and pears in the Pacific Northwest. If left unchecked, complete crop loss is likely. Research on the biology and development of codling moth in different climates has advanced management practices for growers. The websites and tools used in this exercise are the tools used by apple and pear growers to time pest management to be most effective with the least amount of non-target impact on beneficial predators and the environment.

Instructions: Use the websites listed to answer questions about the biology and development of the codling moth.

Part I. Biology

WSU codling moth website: <http://jenny.tfrec.wsu.edu/opm/displayspecies.php?pn=5>

1. What are the four life stages of codling moth? Describe each.
2. In which stage does the codling moth overwinter in the Pacific Northwest?
3. How long does it take for newly emerged female adults to begin laying eggs?
4. How many days does it take for egg hatch/larval emergence?
5. In general, how long will the larvae be in the **feeding** stage?
6. How many generations per year are typical in Oregon in a **warm year vs. a cold year**?
7. Which life stage is most susceptible to control with pesticides? Why?

Part II. Using a Degree Day Model – Regional Comparison

Apples are grown in many regions of the United States. Two major growing areas in the Pacific Northwest are Milton-Freewater (north of Pendleton) and Medford (southern Oregon). Use the links below to answer the following questions:

WSU codling moth website: <http://jenny.tfrec.wsu.edu/opm/displayspecies.php?pn=5>

OSU IPPC Degree Day Model website: <http://uspest.org/cgi-bin/ddmodel.us>

1. What does the term “biofix” mean, with regard to degree day models in general?
2. What is the upper and lower developmental threshold for apple codling moth? What does this mean (at either end?)
3. What is a pheromone trap, and how are they used to manage codling moth?

Management Strategies

In Washington and Oregon, what stage of development for the codling moth should applications of insecticides be made to the orchards for reliable control at a susceptible life stage? How many degree days have accumulated at time of most effective spray?

a. First generation:

b. Second generation:

Degree-day Calculations: Milton-Freewater

Using the IPPC website, calculate the degree day model for January 1 – August 31 of last year, using model “Codling Moth WSU revised 06 (Knight)”. Select a weather station in Milton Freewater and record the station Identification Number/Name here: _____.

Press “Calc/Run”.

Open a second tab and do the same for a weather station in Medford, Oregon. Record the station Identification number/Name here: _____.

Fill in the table of comparison on the following page and answer the questions.

Station ID: M-F: _____ Medford: _____

Date of estimated first catch:		
Critical Date Range for 1st generation spray:		
Critical Date range for 2nd generation spray:		

4. What would be the difficulty in managing codling moth if growers did not have knowledge of moth phenology?

5. How does degree-day model information change decision-making in pest management for the benefit of the grower?

