

## **Project Happy Apples: Assisting Backyard Growers in Codling Moth Management**

### **Abstract**

Project Happy Apples began as an effort to assist backyard growers in managing codling moth in their fruit trees. We developed a process using emails and a web page to provide timely information related to the life cycle of codling moth and relevant integrated pest management (IPM) strategies. The content of our updates included pertinent photos, costs of tools, and suggested dates of action. Results from a survey of participants suggest that they were more confident, knowledgeable, and successful in using IPM strategies in their own backyards as a result of our project.

**Keywords:** [codling moth](#), [integrated pest management](#), [fruit tree pests](#), [home orchards](#)

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### **Introduction**

As backyard food production continues to be a growing trend with backyard growers, so does their interest in growing fruit trees. One of the more devastating pests in apple and pear trees in Oregon and on an international level is codling moth (*Cydia pomonella* L.) (Witzgall, Stelinski, Gut, & Thomson, 2008). Those in university extension have assisted fruit tree growers with pest management using different forms of technology and communication methods; however, the emphasis primarily has been on assisting growers in commercial orchards (DiPietro & Miller, 2009; Pfeiffer & Love, 2007). In our experience of fielding hundreds of clients' questions related to codling moth management, we have found that most backyard growers have difficulty wading through the pest management-related technical specifications and degree-day model information intended for use by commercial growers. Backyard growers may be able to grasp the idea that successful management is directly related to temperature and the life cycle of codling moth but may lack confidence regarding knowing when and how to manage for this pest. In an effort to assist backyard growers in managing codling moth on a regional level, we initiated Project Happy Apples. The goal of our project is threefold: to help project participants increase their knowledge of when to monitor and manage for codling moth, to increase participants' confidence in purchasing tools and implementing integrated pest management (IPM) strategies, and to help participants reduce codling moth populations in their fruit.

### **Methods**

We began Project Happy Apples in 2015 by collecting names of backyard growers interested in receiving timely email notifications. Every time someone contacts us to inquire about codling moth management we offer to add the individual's name to our distribution list. We also set up a web page dedicated to Project Happy Apples (Figure 1) for those who prefer direct access instead of emails, and we provide an email opt-in on the web page. During the first two and a half years or so of the project (April 2015 through November 2017), 479 participants signed up for inclusion on the distribution list. We promote the project using social media and local media, including newspapers. We created the project name as well as an accompanying logo to help promote the project.

**Figure 1.**

Screen Shot of Project Happy Apples Web Page

The screenshot shows the Project Happy Apples web page. At the top, there is an OSU Oregon State University logo and navigation links for 'Outreach & Engagement | OSU Extension | Donate'. Below this is the 'OSU Extension Service Deschutes County' header. A navigation menu includes 'About Extension', 'Resources', 'Catalog', 'Programs', 'Get Involved', 'Employees', 'News', and 'Statewide Locations'. The main content area is titled 'Project Happy Apples' and includes a description of the program, a 'Timely Tips for Fruit Tree Growers' section with five updates from March to July 2017, and sections for 'Host Plants', 'Life Cycle of Codling Moth', 'Damage', 'Management', and 'Additional Resources'. A circular logo for 'PROJECT HAPPY APPLES' is also visible. A right-hand sidebar lists various resources and social media links.

Using fruit trees in our Extension demonstration garden, we set up monitoring devices to track the flight of the codling moth. We recorded moth catch data frequently as those data were used in determining when to apply sprays. In the email communications and on the web page, we encourage backyard growers to set up their own monitoring devices. Additionally, timely updates are created and sent out to the email distribution list as pdf files and uploaded on the web page. An average of four to five updates are sent each season. The updates are specific and simple. Information may include the following content:

- photos of monitoring devices or tools, an adult or larval codling moth, blossom stage or damage to the fruit (Figure 2);
- a list of tools and supplies to buy for monitoring and management, along with their associated costs, and a list of local or online retailers;
- specific dates for when to take action for monitoring and management based on blossom petal fall and degree-day calculations for the region (Figure 3);
- pros and cons of different types of IPM; and
- a list of additional resources.

**Figure 2.**

Example Excerpt from an Update Sent to Project Participants

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Madras Garden Depot (Madras) and Landsystems Nursery (Bend). Make sure you are buying both the trap and the lure as sometimes they are sold separately. One trap and lure provides monitoring for ten trees. They cost anywhere from \$13-20 for one to two traps. If you need larger quantities you can get them online at Gemplers, <http://www.gemplers.com/search/codling+moth+trap>.



Pear blossoms beginning to open.

Another strategy for knowing when to spray your trees is by using tree blossom petal fall. This is a simple technique that is very effective in knowing when to spray your trees. More on this next week.

**MOTH STATUS UPDATE:**  
We have set out (a little early) a codling moth monitoring trap with lure at the OSU Demonstration Garden in Redmond. To date (4/26/17) there are no moths present.

**BLOSSOM STATUS UPDATE:**  
At the Demo Garden, the Asian pear has set some blossoms, none of them are open (4/25/17) but some are close to opening. The apple

blossoms on our honeycrisp are still developing. Go out and check your blossom status on your tree(s).

**MANAGEMENT OPTIONS—GET READY:**

Now is the time to purchase your management tools. If you do not want to use chemical control you should consider bagging your fruit. You can use these mini organza drawstring bags (purchased at Michaels or Hobby Lobby) and place them around the fruit when pea sized (1/2 to 3/4")—make sure they are big enough for mature size fruit. Brown paper bags can also be used. Ideally these will minimize or reduce the moth from laying its eggs on the fruit and the larvae getting into the fruit. We have used these in the past and had moderate success even with a late start of putting them on the fruit.



Fruit bagging on Asian Pear.

There are several types of insecticides that can be used for codling moth management. You can purchase a horticultural dormant oil to be used in smothering newly laid eggs. You can purchase Neem oil, spinosad, or CYD-X to control the larval stage. Horticultural oils, neem oil and spinosad are all readily available at local garden centers. Neem oil is a natural occurring pesticide



**Figure 3.**

Example of Action Items Included in an Update Sent to Project Participants

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found in the seeds from the neem tree. Spinosad is a natural substance made by a soil bacterium. Some brand names that have neem oil or spinosad are listed as Organic Materials Review Institute (OMRI). Both of these products are derived naturally but **STILL TOXIC** so read and follow the labels accordingly.

CYD-X a microbial insecticide (granulosis virus) is another option for codling moth control. It is very host specific therefore non-toxic to bees and other non-target insects but more costly than other products. Another advantage to this product is that it has no pre-harvest interval, so you can continue to apply up until the time of harvest. It is a virus that kills the codling moth larvae. To use CYD-X you mix it with non-chlorinated water at pH near 7.0. The first method takes into account when the tree is in full bloom. Simply look at the flower clusters. CYD-X is available online at [GrowOrganic.com](http://GrowOrganic.com) for around \$49.99 for 1.5 ounces.

We will be very specific on our instructions of when to apply listed insecticides in order to protect our bees/pollinators and other non-target organisms, as this is a priority to us!

**ACTION ITEMS:** We will send out updates as we get closer to these dates if they change. Here are our projected dates as of today.

**May 7-12** Set out Monitoring traps

**May 15th** - biofix date

**June 9th**— apply a horticultural oil to smother newly laid eggs

**June 15th**—begin spraying (neem oil and/or spinosad and/or CYD-X) to control larvae assuming that the last petals have fallen off the tree.

If you are bagging your fruit instead of using a spray, this can begin once the fruit is 1/2 to 3/4 of an inch in diameter. (more on this later).

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## Results

An 11-question postseason survey was sent in November, 2016, and was completed by 32 participants. Questions related to ease of use, knowledge gain, pesticide use, costs, time spent managing, and overall experience as a project participant. Survey results suggested that project goals were being met (Detweiler & Stephan, 2017). The plurality of respondents, 25%, learned about the project through the newspaper. Ninety-one percent of respondents found the content of the emails to be useful in making pest management decisions for codling moth. Eighty-one percent of respondents agreed or strongly agreed that because of reading the monthly emails they found themselves having an increased level of confidence in making pest management decisions. Sixty-nine percent of respondents agreed or strongly agreed that they were successful in reducing the codling moth population in their yards as compared to what would have been the case had they taken no action. Sixty-six percent of respondents agreed or strongly agreed that their pest management practices were more effective than they had been prior to participating in the project. Ninety-seven percent of respondents felt slightly higher to much higher levels of knowledge about when to put up physical barriers for the management of codling moth. Ninety-one percent of respondents felt slightly higher to much higher levels of knowledge about when to apply an insecticide for codling moth.

## Implications

Results suggest that our project has been successful in increasing participants' knowledge about when to use IPM strategies and confidence in making pest management decisions. The dates for managing codling moth vary from year to year as their life cycle is dependent on weather. Our project helps take the guesswork out of knowing when to manage for codling moth. One lesson learned during the first year of our project was that

writing updates took longer than expected, putting us behind schedule in sending timely emails. Therefore, we determined that it is best to have all update information ready to go at the start of the season so that it can be released when needed. We also recommend creating a list of photos to be taken throughout the year for inclusion in updates. In the second and third years of our project, we were better prepared and timelier in sending out updates. Ideally, now that project participants are armed with knowledge on timing and tools, they will integrate successful IPM programs, reduce pesticide use, and reduce codling moth damage in their home orchards. Our directive approach can be adopted and used for assisting backyard growers in other areas and with other common garden pests.

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### References

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