UNIVERSITY OF IDAHO **EXTENSION UPDATE**

Tree Fruit Pest Advisory

University of Idaho, U.S. Department of Agriculture, and Idaho counties cooperating.
Spring 2012 Issue 2

Protect Yourselves

Fire Blight

Tony McCammon

April 23-25 were Warm, Windy, and Wet. Perfect days for Fire blight infection. WSU's Cougarblight model uses these following indicators to measure risk of infection in an orchard.

Low: low risk of infection, only treat areas adjacent to active cankers if a wetting event occurs

Caution: Wetting at this point is not likely to lead to infection, except within a few yards of an actively oozing canker.

High: If unprotected flowers are wetted, infection is possible. You may choose to apply antibiotic within 24 hours before or after the infection (wetting) event.

Extreme: Outbreak may occur if blossoms are wetted, no matter the blight history of your orchard. Apply antibiotic within 24 hours before or after the wetting event.

Trees that had infections last year are more prone to infection this year and should increase risk levels accordingly. Remember a wet event must take place for the blight to occur. Even a dew that last more than two hours during 65 to 70 degree weather can cause an outbreak. Trees are susceptible in the spring when they have open blossoms. But trees with damage caused by hail are susceptible anytime. Therefore have antibiotics on hand to prevent infection. Products include: Copper, bactericides, and biological products are effective in their control. Bordeaux, Kocide, Streptomycin(Agri-Mycin), BlightBan, and Serenade (*Bacillus*) should be used if temperatures and weather are suggesting a possible infection. Remember : Prevention is Everything!

Degree Day "No biofix" (4/29/12)

Sta. Elevation	°Days	1%Hatch
Weiser (2080)	242	May 18
Payette(2150)	300	May 13
Fruitland (2421)	310	May 12
Emmett(2390)	235	May 21
Parma(2309)	272	May 16
Nampa(2713)	272	May 16
Boise (2719)	285	May 16
Mt Home (2992)	279	May 17
Magic Valley (4048)	239	May 25

Look out for:

- Traps are Catching Codling Moths. We have started!
- Look for new colonies of aphids forming; Oil can be used on aphids at 1% rate anytime during the growing season.
- Look out for fire blight infection and watch forecasts that indicate good environments for the spread of it.
- Peach Leaf Curl may show up this spring because we will be more prone to cool wet weather as the possibility for a long spring increases.

Codling Moth Spray Options:

Adapted from Marion Murray

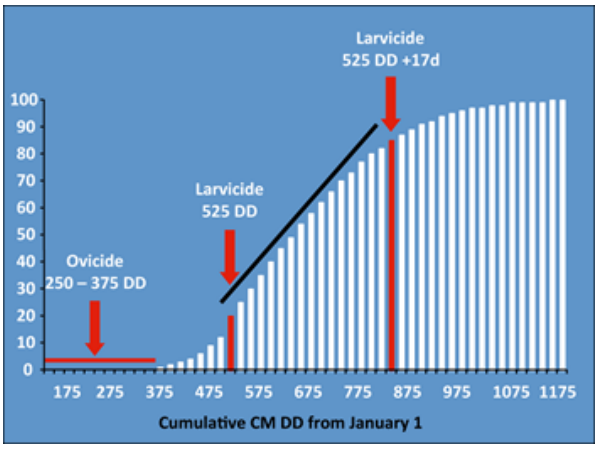
When codling moth adults emerge from pupation, they mate and females lay up to 70 eggs on fruit or on foliage near fruit. Depending on temperature, eggs hatch in approximately in 6-20 days, and larvae bore into the fruit, feeding mainly on the seeds. Southwestern Idaho has 3 to 4 generations of Codling moth each year.

	Date to Start Sprays		
	Option A (Home)	Option B (commercial)	Option C
Caldwell/ Sunnyslope	Oil on May 3 First spray on May 15	Ovicide on April 29 First spray on May 15	May 8, 2012
Parma/Fruitland	Oil on May 4 First spray on May 16	Ovicide on April 30 First spray on May 16	May 9, 2012
Weiser/Payette	Oil on May 10 First Spray on May 22	Ovicide on May 5 First Spray on May 22	May 15, 2012
Magic Valley	Oil on May 14 First Spray on May 25	Ovicide on May 9 First Spray on May 25	May 19, 2012

The table above shows three options for the first spray of the first generation. **Option A** and **B** is a recommendation out of Washington State University. It is a little more complicated, but may result in a slight cost savings and possibly improved control. We usually recommend to start sprays at egg hatch (**Option C**, 375 degree days after biofix), targeting the newly hatched larvae before they enter the fruit. But with Option A and B, you are killing the eggs by appling horticultural oil (1% rate) or a product with ovicidal activity against codling moth eggs **(Esteem, Intrepid, Rimon, or Altacor)** Ideally, applications are on four to five days before they hatch (at 425 degree days). Then, the first traditional insecticide spray would be applied about 7-12 days later (at 525 degree days). The later application of the traditional insecticide is close to the timing of "peak egg hatch" where almost 70% of the eggs hatch in a 1-2 week window of time. Good residue (insecticide) coverage is important at this timing.

By applying an ovicide prior to the onset of the egg-hatch period and delaying the larvicide application to 525 DD the most active larvicide residues coincide with the most active egg-hatch period. In this strategy the ovicide kills eggs that would have hatched in the period starting at 425 DD allowing growers an opportunity to delay the first larvicide application until 525 DD, which is the beginning of the period of peak egg-hatch activity.

After the first insecticide spray has been applied, continue to apply your chosen material(s) at the interval provided on the label.



UNIVERSITY OF IDAHO **EXTENSION UPDATE**

WashingtonCounty

Publication frequency by University of Idaho Extension, Washington County. www.pnwpestalert.net

Editor: Tony McCammon tonym@uidaho.edu Weiser ID 208-414-0415

Names of authors and contributors:

WSU Pest Management Transition Project Newsletter

Marion Murray Utah State University Extension IPM Project Leader WSU Decision Aid System

Tips for the Sustainable Orchardist: Building a Safe Arsenal against Codling Moth

By Tony McCammon with reference to work done by Marion Murray of Utah State University

Orchard management strategies have evolved of necessity as EPA regulations have limited use past effective chemicals. This has decreased the efficacy of controls on key pests. The answer is integrated pest management (IPM). IPM plans have reduced inputs and have increased production despite the reduction of Guthion and other effective products of the past. Today's high density, expensive orchards must have sophisticated operating systems to insure maximum sustainable production over long periods of time. Inputs must be quantified to meet critical needs, and they must be timed for maximum effectiveness.

Integrated pest management (IPM) is a concept that has been used in U.S. agricultural industry for about 40 years. It is "*a comprehensive approach to pest management that uses a combination of cultural, biological, and chemical controls to reduce the status of pests to tolerable levels while maintaining a quality environment*". IPM attempts to combine appropriate and effective pest management tactics to target the problem pests in a crop. With that said, let's walk through an IPM program as a sustainable approach to controlling Codling Moth.

Proper identification of the pest or problem — Before deciding to take any pest control action, be sure you have correctly identified the pest (insect, mite, disease, weed, vertebrate, etc.) It is safe to say that if you have apples or pears you have codling moth. However, trapping is effective in monitoring the pressure of the insects.

Monitor for pests and injury caused by pests or problem — It is very important to look for pests and injury symptoms on a regular basis. It is best to use a consistent sample or survey method. Monitoring pheromone traps for codling moths every 1-2 weeks during the main growing season will help determine control strategies depending on moth pressure.

Control action guidelines — A grower should develop a set of guidelines for each situation that guides his/her decision-making on unacceptable levels of pest injury or pressure. A low level can perhaps be ignored if the loss will not justify the cost of control. The economic and aesthetic values of the situation need to be considered, and will most likely be the primary factors driving pest control decisions.

Time pest controls with "windows of opportunity" — In the life of a Codling Moth only a given period of about 15 days the insect is susceptible to insecticides.

Now multiply that by tens of thousands per tree hatching at different times over a month period and you have a terrible mess. However with Temperature readings average windows of opportunity where large portions of hatchlings are susceptible can be targeted.

Consider all available pest management options and select the "best" ones — The easiest, lowest cost and often most reliable way to avoid many pest problems is to provide a healthy environment that discourages pest activities and/or reduces the host's (plant, animal, or ecosystem) susceptibility to damage. In general, take care of your trees and ask your neighbor to do the same. Also, remove clippings or burn them to reduce overwintering adults.

PEST MANAGEMENT OPTIONS

Many different types of pest management tactics are available for different types of pests. They can be grouped into categories such as cultural, mechanical, biological, and chemical. An IPM approach is not focused on pest elimination, but on reducing pest densities to tolerable levels.

Examples of general pest management tactics for Codling moth in Orchards:

Cultural controls

There are several methods for reducing codling moth that do not require the use of insecticides. Selecting varieties that are less susceptible to damage, such as early maturing apples and pears, can greatly reduce the potential for damage. Once trees are planted, the most effective nonchemical control methods include sanitation, mass trapping, and trunk banding. Pruning trees to a height where the canopy is easy to reach also will facilitate nonchemical management of this pest.

If a backyard tree or orchard has a very high moth population, it may take several seasons diligently practicing these nonchemical control methods to reduce codling moth damage to about 10 to 20% of fruit infested. Nearby orchards or backyard trees in which no control pro-

gram is in place can serve as a continual source of codling moths, thus making it even more difficult to limit damage through nonchemical means alone.

Mechanical controls
Bagging Fruit. Excellent control can be achieved by enclosing young fruit in bags right on the tree to protect them from the codling moth. This is the only nonchemical control method that is effective enough to be used alone and in higher population situations. However, it is quite time consuming to apply the bags so this method is most manageable on smaller trees with fewer fruit. This approach is more suited to low wind areas.
Using traps to mass trap moths, bug zappers (as codling moth fly at night), and mating disruption are other mechanical applications of control. In particular mating disruption has had a lot of use and success as a sustainable approach to reducing pressure in orchards. Small scale orchards have not seen a positive effect in studies.

Biological controls
Although a few predators such as spiders or carabid beetles may feed on codling moth larvae or pupae, naturally occurring biological control is not effective. In commercial orchards, releases of the tiny wasp, *Trichogramma platneri*, has been used successfully to manage codling moth in combination with mating disruption or soft pesticides, but this method has not been tested in backyards.

Chemical controls
The proper timing of insecticide sprays is critical if they are to be effective against codling moth; they should be applied before or just as eggs are hatching. Once the worm has gone into the fruit or nut, it is protected from pesticides. The most effective way to time insecticide sprays is with a pheromone trap and a degree-day calculation. This is what commercial growers use. The trap lets them know when each generation or flight begins. The degree-day calculation lets them know just when egg hatch will occur and when the next generation should begin to fly. You can calculate degree-days with a maximum-minimum thermometer and a degree-day chart or you can use the www.pnwpestalert.net system to be alerted to timing of your sprays.
Home orchards may be able to achieve an acceptable level of control by spraying the first spring generation and using nonchemical methods to maintain a low population for the rest of the season. However, if heavy infestations have occurred in previous years, or there are unmanaged host trees nearby, or if tolerance for damage is very low, the summer generation(s) may also need to be treated.

For Commercial Growers
The following list is not all-inclusive, but includes some of the newer products for codling moth control. As commercial growers must shift away from Guthion and pyrethroids (to avoid mite outbreaks), it is important to understand the alternative options. (USU Marion Murray)

Altacor (rynaxypyr): Altacor has been shown to have excellent control of both first and second generation codling moth. Washington State University (WSU) research has shown that it also kills eggs. It should be applied at 220 DD after biofix. It lasts 14 days.

Assail (acetamiprid): In WSU studies, Assail performed similarly to Imidan (and almost as well as Guthion). Assail is primarily a larvicide, but WSU found that Assail is also highly toxic to codling moth eggs. Assail lasts approximately 14 days and has a PHI of 12 hr, and 7-day PHI. Good coverage is essential. Michigan State University (MSU) reports that the higher rate on the label is most effective, especially for the second generation. This is a fairly broad spectrum product (neonicotinoid).

Belt (flubendiamide): Belt has the same mode of action as Altacor, but is not as effective.

Calypso (thiacloprid): Calypso is similar to Assail in mode of action, efficacy against codling moth, and mammalian toxicity, but has a 30 day PHI. The application rate at the high end works best. This is a fairly broad spectrum product (neonicotinoid).

Clutch (clothianidin): WSU field trials found that Clutch, which works against newly hatched larvae, is not a highly effective material for codling moth.

Delegate (spinetoram): Like Altacor, Delegate is very lethal to codling moth larvae. Field testing at WSU and MSU showed that Delegate has provides excellent control of first and second generation larvae. The larvae must consume the material to die, so Delegate should be applied at the start of egg hatch (220 DD after biofix). It lasts 14-21 days depending on codling moth density and rate. A program rotating Delegate and Altacor has shown to be as effective as Guthion.

Esteem (pyriproxyfen): Esteem is an insect growth regulator and it has activity primarily against the eggs. WSU found that in order for it to be effective, the insecticide must be present BEFORE eggs are laid. Therefore, Esteem should be applied at the petal fall stage. This may not be a good product for locations with high populations, but could be a good supplement to mating disruption.

Intrepid (methoxyfenozide): Intrepid is also an insect growth regulator. WSU studies found that in some cases Intrepid might not kill the larva but the subsequent adult will not be able to reproduce, which is considered a sublethal effect. Intrepid must be ingested by larvae to have a

toxic effect. Intrepid has strong ovicidal activity whether applied after eggs are laid, or if eggs are laid on residues. Intrepid lasts about 14 days, but is not a good alternative to Guthion, but could be used as an early application (petal fall) to kill eggs, delaying the second cover spray.

Backyard Growers

The following list includes the chemical name of the active ingredient (carbaryl, for example). Brand names (Sevin, for example) are not used because there are many different brands that carry the same active ingredient, and individual suppliers do not all carry the same brands, but most should have products with the same active ingredients. Look at the small print on the front of the label for "active ingredient."

Acetamiprid: This active ingredient was made available in 2009 and is a good option for backyard growers. It lasts approximately 14 days and is very effective against codling moth larvae and eggs. Spectracide and Ortho have acetamiprid products.

Spinosad: Spinosad is a low toxicity product that is soft on beneficials. It must be applied every 10 days, and is moderately effective.

Carbaryl: Carbaryl is a broad spectrum insecticide with good efficacy against codling moth and many other pests. It lasts 14 days for heavy populations, and possibly up to 21 days in areas of light infestations. It is a fruit thinner, so using carbaryl 4-6 weeks after petal fall will cause fruit drop. It is toxic to natural enemies and honeybees, and can cause spider mite outbreaks.

Malathion: Malathion is a broad spectrum insecticide that has good efficacy against codling moth, but must be applied every 7 days. Not all malathion products are the same, so be sure to read the label for application information.

Horticultural oil: Oil at the 1% rate can be used during the egg laying stage at the beginning of each generation (for example, 7-10 days after full bloom for first generation) to kill eggs. It has no residual activity, so another material should be used 7-14 days later.

Azadirachtin: These products are softer on beneficial insects and mammals, but not as effective on codling moth.

Bt (Bacillus thuringiensis), Pyrethrum, insecticidal soap, and pyrethrin/rotenone are not effective against codling moth.

Bt and its application in a Home Orchard

Article from WSU Decision Aid System

Bacillus thuringiensis (Bt) is an insect pathogen that produces one or more toxins that are utilized as bacterial insecticides. Bt is effective against lepidopteran larvae such as leafrollers, peach twig borer and cutworms. Bt is not a contact insecticide and must be consumed by the larvae to be effective. When ingested, the Bt toxins are activated and cause holes in the insect's gut membrane. Gut bacteria then get into the insect's blood stream and poison it. Once it has consumed a toxic dose, the larva stops feeding but may remain alive for several days. Bt is most effective against young larvae, as it takes a smaller dose to kill them than it takes for more mature larvae.

Bt has a short effective life of 3 to 7 days. It breaks down in sunlight and high temperatures and must be applied more frequently than traditional insecticides to achieve adequate control. Because larvae must consume Bt products, thorough coverage is essential.

Bt to control leafrollers

Bt products have their best fit in apple and pear IPM as leafroller controls. Several Bt products have been tested over the last decade and few differences have been detected in their relative efficacy assuming that appropriate rates are used.

In the spring, Bt products are best used between bloom and 10-14 days after petal fall. Because the leafroller larva must consume the Bt it is important to have good coverage of foliage and to apply sprays when temperatures are predicted to be 65°F or higher for 3 or more days. Leafroller larvae are not active feeders when temperatures are below 65°F, and long periods of cool wet weather following a Bt application will greatly reduce the efficacy of the treatment.

It is usually necessary to apply more than one Bt treatment to obtain adequate leafroller suppression. We have consistently observed 50-60% control with one application and 80-95% control with two applications 7 to 10 days apart. In the summer Bt treatments last only 5 to 7 days; however, with good coverage, it is possible to obtain good control.

Because all Bt products must be consumed to have activity against insects, they do not affect most natural enemies of insect pests making Bt more selective than other pesticides. Due to its fast degradation it has a much less harmful effect on the environment.

WashingtonCounty

ALWAYS read and follow the instructions printed on the pesticide label. The pesticide recommendations in this UI publication do not substitute for instructions on the label. Pesticide laws and labels change frequently and may have changed since this publication was written. Some pesticides may have been withdrawn or had certain uses prohibited. Use pesticides with care. Do not use a pesticide unless the specific plant, animal, or other application site is specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

Trade Names--To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

University of Idaho Extension

Washington County
485 East 3rd Street
Weiser ID, 83672

NONPROFIT ORG
US POSTAGE PAID
MY CITY ID
PERMIT NO. XX