

Fruit Pest Advisory

University of Idaho, U.S. Department of
Agriculture, and Idaho counties cooperating.

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Protect Yourself

Suckers are out —Tony McCammon

Many aphids are rearing their ugly heads this year due to the mild winter we had in Idaho. Many beneficial insects are feeding as well so monitor your populations carefully and establish an action threshold. If leaves are severely curled apply a fruit systemic spray such as Admire.

Examine peach leaves for Shothole or Peach Leaf Curl. The wet spring is conducive to the spread of these diseases.

Thinning has arrived, or for many may be past due. Thin Apples when they are ½ inch in diameter. Thin Peaches as soon as fruitlets have formed. Try to keep fruit 4-6 inches apart to reduce weight load on branches and for the ease of spraying fruit.

Western Cherry Fruit fly yellow sticky traps should be out. Adults will be emerging soon. Monitor traps to determine your insect pressure.

Fire Blight Pressure RISK on Pears and Apples has been HIGH over the past couple weeks. However most flowers have already been pollinated and infection is probably low. Avoid pruning during wet weather, monitor the tips of your trees for the next 10 to 15 days for shepherd crook infection.

Degree Day "No biofix" (5/9/16)

Station (Elev.)	°Days	1% Hatch
Southwest		
Parma (2309)	463	4-May
Boise (2719)	464	4-May
Nampa (2713)	419	7-May
Fruitland (2360)	420	7-May
Southern		
Mt. Home (2992)	401	8-May
Hagerman (3197)	415	6-May
Twin Falls (3921)	290	23-May
Rupert (4154)	257	29-May
Magic Res. (4907)	201	4-June
Eastern		
Pocatello (4605)	283	26-May
Idaho Falls (4709)	191	6-June
Rexburg (4870)	175	10-June

Integrated “Codling” Management

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 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.



PEST MANAGEMENT OPTIONS

These are the management tactics available. They are 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:

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 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.

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.

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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.

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.

Time pest controls with “windows of opportunity” — Codling Moth are susceptible to control for a given period of about 15 days. By monitoring temperatures, you can identify average windows of opportunity to target large portions of hatchlings .

Consider all available pest management options and select the “best” ones — Start here, Take care of your trees and ask your neighbor to do the same. Also, remove clippings or burn them to reduce overwintering adults.



Predatory lady bird beetle larvae. Twin Falls, ID
Tony McCammon

1. 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.

2. 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 for each of the three or four generations. 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. In order to reduce the chance of resistant buildup in codling moth chemicals with different mode of action should be used for each generation. To ensure this, many chemicals will have a limit of applications per year specified on the label. With this in mind I have listed the following chemical options with the mode of action number in parenthesis. Also this is not an inclusive list of all available options, these are the options that fit best in a IPM program that reduce the risk of beneficial insect damage.

3. Conventional Ovicides and Larvicides

Chloranthraniliprole (28)(Altacor, Voliam Flexi, Voliam Xpress) - 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. 4 application per year max. 3.0 to 4.5oz in 100 gal. of water.

Methoxyfenozide (18)(Intrepid) - Intrepid is 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. Works well with mating disruption. Intrepid lasts about 14 days, 16 oz per acre in 100 gal of water.

Novaluron (15)(Rimon) - Rimon can add an early advantage when applied in combination with a larvicide based program by killing eggs and consequently larvae that would have hatched.

Pyriproxyfen (7)(Esteem)- 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.

Acetamiprid (4)(Assail) - 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 homeowner products contain this active ingredient.

Spinetoram (5)(Delegate): 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 rate of fruit growth.

Spinosad (5)(Entrust, Success)- Spinosad is a low toxicity product that is soft on beneficials. It must be applied every 7-10 days, and is moderately effective.

Formulations of this are available for home orchardist and organic use.

Granulovirus (NA)(Carpovirusine, virosoft, Cyd-X) - See the article on page 5.

4. Backyard/Home Orchard Options

Horticultural oil (NA)- 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 (NA)(Neemix, Aza-direct, Azatin XL) - These products are softer on beneficial insects and mammals, but not as effective on codling moth. However, its oily texture has had some effectiveness as an ovicide and it could be a cheap IPM alternative for second and third generations or in low pressure orchards.

Bacillus thuringiensis Bt (11)(Agree WG, Deliver, Javelin WG, Thuricide) - Also an option for organic growers looking to protect beneficial insects. It works as a moderately effective larvicide.

Kaolin clay (NA)(Surround) Applied as a spray to leaves, stems, and fruit, it acts as a repellant to some insect pests. Some formulations are Organic Certified. (See page 5)

Codling moth virus- an alternate option:

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Growers looking for an organic option, or wanting to reduce the amount of conventional pesticide sprays, should consider codling moth granulosis virus. Used alone, this biocontrol option will not give great control, but it could be used alternatively with oil or with Entrust (spinosad) to remain organic, or with conventional pesticides to reduce chemical sprays.

Codling moth virus can be purchased online as Cyd-X, Virosoft, or Carpovirusine. It is a naturally occurring virus that is very toxic to the larvae. In order to work, the virus must be ingested (like spinosad). Codling moth larvae are on the surface of the fruit for a very short amount of time, so thorough coverage is a must. Also, it breaks down easily and must be reapplied every 5-7 days. Entomologists at Michigan State University (MSU) recommend that the best approach for using the virus is through frequent applications of a low rate. Growers using conventional insecticides might

want to consider replacing one or two sprays with a virus spray. Not only will this reduce pesticide inputs into the environment, but also help to prevent resistance.

MSU provides the following management options:

1. Target the first generation strictly with CM virus. Most fruit that is successfully attacked by larvae falls to the ground early, and is not part of the harvested crop (although larvae that survive to pupation emerge in a later generation).
2. Use a chemical insecticide (oil or Entrust for organic) for your first spray of each generation (at 1% egg hatch) and then switch to the codling moth virus for the second spray, when there are more eggs. Another rotation could follow, or you could apply the virus weekly for the remainder of the generation.

Impact of kaolin on Codling moth migration

Studies at WSU showed that a border spray of 3 rows with kaolin can reduce CM migration significantly, even in the face of high population pressure, as long as the coverage is thorough and without gaps. Kaolin works as a deterrent as females do not lay their eggs on surfaces covered with kaolin. We suggest to treat only border rows as the kaolin can flare spider mites and interferes with natural enemies (they spend more time cleaning themselves than attacking pest insects and mites). CM migration into an orchard from outside decreases sharply after the first few rows. In sloped orchards, however, CM may be able to fly over the top of the orchard border rows (instead of from tree to tree), thus migrating further than in flat orchards. (Ute Chambers & Vince Jones, TFREC) - See more at: http://das.wsu.edu/news/story/2014/05/01/Leafroller_and_Codling_Moth_Movement_During_the_Season#sthash.GO6qrSKL.dpuf

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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.

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