

Fruit Pest Advisory

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

Spring 2014 Issue 2

Protect Yourself

Fire Blight—Tony McCammon

May 3-4 were Warm, Windy, and Wet. Perfect days for Fire blight infection. The rest of this week suggests Extremely probable infection. Products include to prevent infection 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. If your blossoms are open, have had bad years of Fireblight in the past, or have susceptible varieties I recommend protection this week. Remember : Prevention is Everything!

If infection occurred on April 19-20 your trees will have already started to show signs. New tips turning to a shepherds crook and browning are signs that you need to cut out infection. May infection will show up this week.

Rosy Apple Aphids have hatched and will build populations as the weather warms. At this time of year, they are tucked away at the bases of blossom clusters, feeding on newly expanding



leaves. As they feed, their saliva causes the developing fruit to become distorted.

If you have not made an application and know that this aphid is a problem in your trees, make an inspection for activity. Shake a limb over a cloth tray to look for dislodged, rosy-colored aphids, and look for damage (curled leaves) on at least 10 terminals per tree, especially toward the center of the tree. If you find one colony per tree, make an application at petal fall.

Degree Day "No biofix" (4/13/14)

Station (Elev.)	°Days	1% Hatch
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Southwest

Parma (2309)	338	16-May
Boise (2719)	343	16-May
Nampa (2713)	305	18-May
Fruitland (2360)	312	17-May

Southern

Mt. Home (2992)	313	17-May
Hagerman (3197)	288	20-May
Twin Falls (3921)	229	28-May
Rupert (4154)	197	4-June
Magic Res. (4907)	98	20-June

Eastern

Pocatello (4605)	230	1-June
Idaho Falls (4709)	161	8-June
Rexburg (4870)	124	17-Jun

Look out for:

- Insect activity (codling moth, fruitworm, aphids, leafhopper, and beneficial insects) continues to be at a low due to cold weather.
- Pear Blister Mite has been identified by Master Gardeners in a Diagnostic Clinic in Canyon County.
- Watch for powdery mildew lesions on apple, cherry, and peach leaves.
- Peach Leaf Curl may show up this spring because of the cool wet weather.

Lygus are jumping from alfalfa to your orchard

Lygus bugs occur on a wide range of crops. They damage crops by feeding on developing flower buds, fruit, and seeds. Lygus bugs are most often a problem in fruit orchards with ground cover comprised of broadleaf weeds, or in orchards near alfalfa fields or other host plants. Lygus bugs primarily injure fruit early in the season, from pre-bloom through early fruit development. Therefore, control actions are typically targeted for this time. There are three to four overlapping generations each year.

Pome Fruit

Adult lygus bugs that feed on developing flower buds and young fruit in the spring cause the most severe damage. This feeding can result in the following injuries:

- Severely damaged flower buds shrivel and die before they open, and buds may exude a small drop of gummy liquid. Usually the damage is not serious unless lygus bug populations are high.
- Dead cells on the fruit surface fail to grow leaving crescent-shaped pustules (to ¼ inch long), deep pits, and irregular depressions.

Stone Fruit

Cat-facing injury caused by the lygus bug is usually much more severe on stone fruit than pome fruit. Injury appears as:

- Raised and sunken corky areas on the fruit surface
- Russeting and gummy sap

Management

Managing alternate plant hosts and relying on natural enemies are generally more effective long-term measures than use of insecticides. Alternate crop hosts and weed hosts on orchard borders and in ground covers should be carefully monitored in the spring and late summer to fall to detect a buildup in pest populations. Lygus bugs can quickly move into orchards in large numbers when nearby alfalfa fields are cut.

Management of Alternate Plant Hosts

Lygus bugs, stink bugs, and Boxelder bugs all use plant hosts in addition to fruit trees for feeding, reproduction, and overwintering. Most potential problems can be reduced by appropriately managing or removing the alternate hosts.

Perennial grasses or other herbaceous cover crops that don't usually harbor plant bug pests are recommended as an alternative to host weeds. Proper ground cover management is especially critical in peach and nectarine orchards where cat-facing injury can be severe. Dry vegetation, mowing, herbicide treatment, and cultiva-

tion can all cause bugs in the ground cover to move into trees in search of alternate food. Avoid mowing, cultivation, and herbicide application during periods when bug populations are high and fruit is most susceptible to injury, such as during bloom, when fruit is young, and near fruit maturity.

Biological Control

A number of naturally occurring parasitoids and predators attack lygus bugs:

- Several parasitic wasps attack eggs, nymphs, and adults
- Predators such as big-eyed bugs, damsel bugs, assassin bugs, some beetles, and crab spiders can help control lygus bug nymphs on host plants outside the orchard or on the ground cover

Insecticides

Insecticides can provide quick and effective control of piercing-sucking bug pests when their use is targeted for substantial populations at a susceptible stage of fruit development. However, repeated insecticide applications have been shown to quickly create resistance and will dramatically reduce natural enemies. Therefore, insecticides should not be used unless necessary to prevent substantial fruit damage.

Recommended chemicals:

endosulfan(Thionex), Chlorantraniliprole(Voliam Flexi) flonicamid(Beleaf) oraginc, fenpropathrun(Danitol)

Note: Check product label for registered crop uses. Avoid applications during bloom as all products are toxic to pollinators.

Application timing:

- At petal fall, if bugs are found feeding on developing fruit
- Before harvest, if large numbers of bugs are found feeding on maturing fruit



UNIVERSITY OF IDAHO EXTENSION UPDATE

Twin Falls County

Publication frequency by University of Idaho Extension, Twin Falls County. www.pnwpestaalert.net

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WSU Decision Aid System

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.



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.



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.

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 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.

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.

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 repellent to some insect pests. Some formulations are Organic Certified. (See page 5)

Codling moth virus- an alternate option:

Marion Murray, Utah State University Entomologist

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



TwinFallsCounty

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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INTERMOUNTAIN Commercial Tree Fruit Production Guide

2013

A publication by Utah State University, Colorado State University, and University of Idaho

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COOPERATIVE EXTENSION

Colorado State University
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www.intermountainfruit.org

Codling Moth Options for Control

	Date to Start Sprays		
	Residential Plan A	Commercial Plan A	Original spray schedule 1% Egg hatch
Treasure Valley (Nampa)	Oil on May 16 First spray on May 28	Ovicide on May 14 First spray on May 28	May 17
Magic Valley (Twin Falls)	Oil on May 22 First Spray on June 9	Ovicide on May 20 First Spray on June 9	May 28
Eastern Idaho (Idaho Falls)	Oil on June 4 First Spray on June 18	Ovicide on June 2 First Spray on June 18	June 8