



codling moth management

Posted by [Steve Gougeon & Jen Williams](#)

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[Steve Gougeon & Jen Williams](#)

[codling moth management](#)

February 12, 2013 04:45AM

Registered: 11 years ago

Posts: 12

This is a pest for which we are still working on the best control method. We have tried Bt, and mating disruption using pheromone lures, both combined with as much orchard sanitation as we can manage, but are not happy with our level of management. We have not tried mating disruption and Bt together, which is the plan this year. We have a lot of outside pressure; living in a place called Apple Valley, there are untended apple trees surrounding us that harbor pests. Mating disruption delayed signs of codling moth but did not prevent late-season, second generation damage, presumably due to the pressure from the outside. Does anyone have any methods, or a combination, that have worked well for them?

Jen & Steve

[Bear Swamp Orchard](#)

Zone 4b in Massachusetts

Edited 1 time(s). Last edit at 02/12/2013 04:21PM by Michael Phillips.

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[Michelle and Chris McColl](#)

[Re: codling moth management](#)

February 19, 2013 02:45PM

Registered: 11 years ago

Posts: 49

We have quite good success controlling Codling Moth in most years, using a combination of mating disruption (1000 ties per hectare, put out at petal fall, placed within one metre of the top of the tree) and Bt sprays (four or five sprays at weekly intervals, starting when the fruit is pea-sized to marble sized, sprayed in cool of evening or in overcast weather).

But there is a difference in the degree of control between our two orchards:

(1) at the Kalangadoo orchard, where the land is flat (only about 2 metres variation in elevation across the entire orchard), we treat the entire orchard only every second year. In the "in between" years we only apply pheromone ties around the packing shed, and in a 100m x 30m block of Gala between the shed and the road as there is a conventionally managed orchard across the road. In these years we also place ties in the willow trees around the orchard perimeter, especially along the western edge as this is where the prevailing wind comes from and we are trying to draw males out of the orchard and away from any females. (We still apply the Bt sprays as there are three or four different species of caterpillars that are troublesome at that same time). Codling Moth damage at this orchard is a fraction of a percent pretty well every year, even in those years when we use only about 20% of the number of ties.

(2) at the OB Flat orchard (about 40km to the south, and closer to the coast), there is about a 20 metre variation in elevation across the orchard. We apply the full rate of pheromone ties every year, spray the entire orchard four or five times with Bt, but still suffer more Codling Moth damage than we would like. It is generally worse on the hill top, and sometimes around the orchard perimeter. Damage from Codling Moth at this orchard is generally 1% to 3%.

We suspect the difference is due to the hills at OB Flat. Maybe the silhouette of the apple trees is more obvious on the hill tops, and so the Codling Moth concentrate there? Or does the pheromone sink to the low ground away from the hill tops? Neither orchard has neglected trees nearby. The only difference we are aware of is the topography.

P.S. Please see our more recent post under "Raising Frogs to Control Bugs" in Ecosystem Connections. There could be a reason other than topography to explain why Codling Moth damage is less severe at Kalangadoo.

Edited 1 time(s). Last edit at 02/20/2013 02:06AM by Michelle & Chris McColl.

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[Clair Kauffman](#)

[Re: codling moth management](#)

March 05, 2013 08:15PM

Registered: 11 years ago

Posts: 22

Has anyone used pheromone foggers instead of the ties? Am curious about whether they are more effective.

On a different note, I heard Certis USA is releasing an insecticidal virus labeled Madex HP that is supposed to be effective for both codling moth and oriental fruit moth.

We have used some Cyd-X. However, it failed miserably in 2012. Our thinking is that we killed the virus by tank mixing with lime sulfur. Can anyone confirm that this factored into our problem?

Clair Kauffman

Zone 6b, Lancaster, Pennsylvania

[Reply Quote](#)

[Terence Welch](#)

[Re: codling moth management](#)

July 20, 2013 06:26PM

Registered: 11 years ago

Posts: 15

We spray Cyd-X 4 times for each generation of codling moth, spaced 1 week apart, 2 generations in this section of California. Per Certis USA's (the manufacturer) recommendation, we add dried milk to the mix at 1 lb. per acre (to give the virus some shade, avoiding premature breakdown from UV light). Certis USA also recommends a sweetener, molasses, to attract the codling moth larva as it hatches. The theory is that it will smell the molasses as it hatches, grab a mouthful, and drink down some virus at the same time. We can't find molasses at any reasonable price, so I use C&H sugar at 6 to 8 lbs per acre. Anybody else working with Cyd-X, adding milk, (or perhaps whey) and sweetener?

We are combining Cyd-X with pheromone disruption, which works well in flat terrain. On slopes, if we skimp on the last few Cyd-X sprays, the CM's do some damage. I'll be spraying the full complement of 8 sprays on those sloped orchards.

A friend has a small 4 acre orchard on a slope. He uses Cyd-X without pheromone disruption, and has reduced CM damage from 75% to 10%, which he considers success.

Bacillus thuringiensis (BT) in our area has a poor reputation controlling codling moth.

Since Cyd-X is a live organism, I would never mix it with something as caustic as Lime Sulfur. In general, it's best to assume that Lime Sulfur will kill any organism, or precipitate any chemical, until proven innocent. The only materials we mix with Lime Sulfur is oil (petroleum-type), and wettable powder sulfur (Kumulus, Cosavet, etc.).

Certis USA says that Cyd-X can be mixed with calcium chloride (Moraleaf), which we spray for bitter bit. Certis said that as long as the tank mix pH stays at 7 or slightly acidic, the Cyd-X should be OK. We've got our doubts that this is a good combination. When calcium chloride is tank mixed, it heats up the water, which means an energy intensive chemical reaction is taking place. Anybody able to tell what is happening, and what the result would be for live organisms?

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[Tim Bates](#)

[Re: codling moth management](#)

July 24, 2013 01:14AM

Registered: 11 years ago

Posts: 58

Interesting tactics. On advice from Bob Cantisano in the late 80's I stuck with Pheronomes with various other things Bt, Granulosis Virus which I believe is in Cyd-X. Eventually I am down to Pheros and Trichogramma wasps. Yes, I use the "foggers". It was getting way too costly to use ties in my big trees at 2 a tree, 2 times a year and up and down the ladders to put them up. My damage is around 2-6% with a two varieties that get 10-15%. I am very happy to live with that since we make vinegar, syrup and hard cider with the culls. I have a hard time understanding why a lot of people have not switched to "puffers" as we call them in California. They were disallowed for two years around 2007--man was I bummed to go back to "hanging". It is almost half the cost as hanging ties and works easily as well...here anyway. One of the main reasons I can live with it is I don't have to spray in the summer which can be VERY hot by 10 AM and wearing protective gear makes for a sweaty proposition. The cost of Cyd-X--Jeez Louise. I can "do" the whole orchard by myself in less than 6 hours. Bob above said the levels will go down over time and they did. But definitely not less than 1%. Now Terence--adding C&H sugar is not very organic. Whey is a great thing to use when you can get it or buy SKH Casien in powdered form.

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[Terence Welch](#)

[Re: codling moth management](#)

July 27, 2013 06:40PM

Registered: 11 years ago

Posts: 15

Cyd-x is expensive, but we buy it for a little more than \$10 per ounce. The first spray to establish the virus population can be 2 oz/acre, but we will likely drop from 1 oz per acre to 1/2 oz per acre next year for the remaining 3 sprays in each generation of CM. Total annual cost per acre should be \$75/acre or so, easily recoverable as it translates to an increase in production of about 2 to 3 boxes of apples sold on the fresh market.

Am I the only person reading Tim's response who doesn't know what Pheros is? Can't find it when googling either. Also could not find the source for S-K-H casein, is Agri-Pacific still in business? Site seems down. Who can we buy it from?

Ah, C&H sugar. I grew up with fantastic TV commercials showing smiling Hawaiian children with beautiful white teeth chewing on sugar cane. How bad can it be? Having lived in Hawaii before the shutdown of the sugar industry, and toured in other tropical countries, it's pretty environmentally devastating. So does anyone have a suggestion for a larva-attracting-sweetener that would be economically possible and less devastating to the environment?

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[Colin Lundy](#)

[Re: codling moth management](#)

May 27, 2015 04:40AM

Registered: 8 years ago

Posts: 12

I'm hoping to revive this old discussion as I try to get a hold on my codling moth troubles.

I know the research says that pheromones are only effective for codling moth in blocks of at least 5 acres, but I want to try and see if I can use pheromones to draw moths to delta traps to reduce the pest pressure. I have only 1 acre. Any thoughts on how to make the most of this? Words of wisdom? Advice?

Also, I have heard that on a small scale one can wrap corrugated cardboard around the trunk and main scaffold branches of the tree and codling moth larvae will crawl in to pupate. Then the cardboard can be removed and burned while they are pupating - a strategy for reducing subsequent generations. Anyone have experience or thoughts on this? I am especially interested to know about timing - when to place the cardboard "traps" and when to remove?

Finally, I am unfamiliar with the pheromone puffers/foggers. Are they effective in a small orchard? Sounds like I would need only one or two and it would last all season - but I don't know anything about them. Brand, manufacturer, price, etc. etc.

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[Scott Overby](#)

[Re: codling moth management](#)

June 12, 2015 07:34PM

Registered: 9 years ago

Posts: 5

Using puffers on small blocks could potentially be less effective than the ties, since you will have fewer source points of the pheromone. Be aware that pheromone traps only attract males, so using them to 'trap out' CM MAY not be very effective.

USDA research ([\[ars.usda.gov\]](http://ars.usda.gov)) found that adding sugar and brewer's yeast increased the effectiveness of the granulosis virus. I am going try it this year. We're about a week from spraying for GV.

[Reply Quote](#)

[Mike Biltonen](#)

[Re: codling moth management](#)

June 12, 2015 10:57PM

Registered: 10 years ago

Posts: 298

According to the manufacturer of puffer technology, small blocks and irregularly sized blocks are more difficult to get control than larger, regularly sized blocks. Even larger, irregularly sized blocks can be problematic. But if enough puffers are used and they are placed on the windward side of the block, then they can be effective. But ties or dispensers placed regularly through the block can be of equal or more (you just need more) effectiveness. I never liked using disruption technology without some other form of control. There is also some very interesting research out of California regarding puffer volatile disbursement within the orchard canopy depending on puffer density and placement. I'll see if I can find some links.

[Mike Biltonen, Know Your Roots](#)

Zone 5b in New York

[Reply Quote](#)

[Michelle and Chris McColl](#)

[Re: codling moth management](#)

June 14, 2015 12:14PM

Registered: 11 years ago

Posts: 49

Colin, we have had success controlling Codling Moth in small orchards of one acre or less using pheromone ties. It seems important to put pheromone ties in trees beyond the edge of the orchard, especially on the prevailing upwind side of the orchard, to make sure there is pheromone on the orchard perimeter. The scent probably also draws some males out of the orchard.

If your orchard is distant from other pome fruit trees, this should work. However if you have neighbours nearby with Codling Moth infested trees, it probably won't work. Apparently a mated female Codling Moth will fly 200 to 300 metres (maybe more with a good tail wind?).

Delta traps are certainly useful in monitoring moth activity and helping to work out spray timing, but using delta traps to reduce pest pressure is probably not the best idea. We suspect unless you had a trap in almost every tree in the orchard, you probably wouldn't catch enough males to make an impression.

We haven't used the cardboard collar method (too many trees), but they would have to be removed and destroyed well before the moths emerged from their cocoons, which is not long after bloom.

Kalangadoo Orchard

On the "other side" in South Australia

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[Michelle and Chris McColl](#)

[Re: codling moth management](#)

June 17, 2015 01:29PM

Registered: 11 years ago

Posts: 49

Colin, just noticed there are some really good and relevant posts in the "mating disruption" thread in this "Bug by Bug" section.

Kalangadoo Orchard

On the "other side" in South Australia

[Reply Quote](#)

[Tim Bates](#)

Registered: 11 years ago

Posts: 58

[Re: codling moth management](#)

June 19, 2015 10:45PM

Glad Colin brought it back up...and I see I did not respond to Terrence's post after my last one. I hope he found affordable molassus and/or SKH. It also seems the price of Cyd-X must have come down...that sounds really affordable. Terrence, is it working as expected? As for foggers or puffers I have all the "reports" working against me- 18' trees next to one year olds--hills and slopes--abandoned trees upwind (now removed for winegrapes). As the years went by I got the control I needed (seemy old post above). To help out in those worse situations I hang the puffers beyond the area of trees upwind, and I use about 1 3/4 puffers per acre instead of one per for a flat evenly planted area. As for the cardboard, if Colin has the time to do an acre really can help reduce populations in 2-3 years. Definitely trapping out will be a waste of time. My recommendation is to try 3 puffers if you can get them (I remember some other posts saying that they are not registered in many states) Mine are from Suterra in Oregon and I heard they have a blend for Coddling and Oriental Fruit Moths. They last 180 days or my whole season---cost is now 129 bucks a unit. Colin, don't know where you are? You should fill out a grower profile.

[Editor's Note: Would love for Colin (and all forum participants!) to post a [grower's profile](#) but that only happens once you become a [full-fledged member](#) of this network. Bravo for our real time backers!]

[The Apple Farm](#)

Zone 8b in California

Edited 1 time(s). Last edit at 06/20/2015 04:02AM by Michael Phillips.

[Reply Quote](#)

[Susan Fancy](#)

[Re: codling moth management](#)

July 26, 2015 11:46PM

Registered: 10 years ago

Posts: 20

Our orchard is tiny, not even half an acre and we have struggled with oriental fruit moth in peach, and starting last year, codling moth in quince. We were working with Bt and just not getting it right, not even the first generation.

This year we switched to granulosis virus (Madex version for OFM and CM, Safer now sells it directly online, we were unable to buy it until this year), without anything else in the tank. Worked like magic for us, had a very small number of hits on the fruit, the crop is 95% clean. Magic - damage has been 50-70% in previous years. We sprayed once every 7 days or so.

[Reply Quote](#)

[Peter Fisher](#)

[Re: codling moth management](#)

July 28, 2015 06:02AM

Registered: 10 years ago

Posts: 82

How long can Madex be stored and what is the concentration you used? I am trying to figure out an annual cost in our small orchard.

Turkey Creek Orchard

Solon, Iowa (zone 5A)

[Reply Quote](#)

[David Doncaster](#)

[Re: codling moth management](#)

August 10, 2015 08:08AM

Registered: 11 years ago

Posts: 50

Susan / Peter , I use a GV spray as well . Mine is called Virosoft . It comes frozen , I get it into useable amounts right away and refreeze . (1 oz)

In BC , we have an authority (SIR) that is bound and determined that they will wipe out CM . To my knowledge mankind has only erased that which it has not tried to , and there is often some heat in our discussions .

I would like to share an e-mail from last year , and my experience .

" Throughout the season SIR Field Staff collect and record data which is reviewed to determine if there is a potential for CM damage. I am unable to comment on past observations however I have been a Field Supervisor since mid season 2012 and have collected and reviewed the data on this property. There has been a history of large number of captures (SIR threshold is 5 per trap). There is one trap in the orchard which has hit threshold at least 4 times in 2012, and 2 times in 2013. As we are not yet done reading traps the current count 13 puts the trap at threshold reached 2 times so far in the 2014 growing season. In 2013 SIR banded 64 trees and found 30 larva in the bands in the fall. The bands catch only 30% of the larva so when you take the number and times it by three there was a considerable amount of overwintering in the trees to emerge this season. SIR also did a harvest sample in 2011 with a result of 1.20% and another one in 2013 showed 0.60%. Captures and damaged has decreased since then however continuing to catch the amount of moths gives reason not to back off sprays.

" You have provided information about using Virosoft. In looking at the dates you applied the first 2 sprays in June was to early. Virosoft targets larva only. Virosoft is usually applied around 400 degree days or based on moth captures. Based on your captures your first application should have been around June 26 which would have placed you closer to the 400 degree mark. At 400 degree days roughly 66% of the eggs have hatched. Virosoft is also a product that needs to be applied every seven days once started throughout the season. You have a 2 day gap between your first sprays and then roughly 3 weeks till you applied 2 mores sprays with a 2 day gap as well. The 2 day gap is not as much of a concern as the 3 week gap between first set and second set of sprays. Virosoft is a virus which needs to be built up in an orchard. Larva must ingest Virosoft unlike other product where only contact is needed.

We will flag any trees with SIR flagging in which we find CM damage. This year SIR will sample 1000 fruit. I will inform you if there is any damage once the sample is done. If no damage is found, the captures this season are still high. CM is always a season behind. IE: what you catch and damage found this season is based on what management was done in the 2013 growing season. If any sprays were missed or timing was off this could explain why the property has a CM population. Both larva and damage were found in the 2013 growing season....again based on management of the orchard in 2012...ect . "

I got two holistic sprays on to start the year (2014) . My first virosoft went on about 250 degree days with a second 5 days later . I put a second set on around 700 degree days , 7 days apart .
I had 13 moths in my trap for the season and zero damage in their 1000 fruit audit . There was one holistic spray at the end of the season .

I got two holistic sprays on to start 2015 . We are sitting at 14 weeks with out a capture . There are some stings mostly in the north east corner . I have also found two damage (I am hand thinning) . On one the frass goes along the skin for about an inch before going inside . It goes in about half way then it looks like something melted , it's just brown watery goo . The second the frass is through the skin and that is all . Taking a chance ? I have not used the GV at all this year .

Don't know if this matters but I have a huge population of yellow jackets (bees) and again a huge population of Lady Bugs of which I will quite often find in the clumps of apples when thinning , I will usually find stings there as well. but so far only the two entries , both abnormal . We are also sitting on a stage 2 drought .

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