



UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION:  
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## FOOTHILL FARM AND ORCHARD NEWS

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Cold March weather has contributed to a light crop of plums and made the second season of experimental trials in chemical thinning of stone fruits tricky to time. According to a HOBO temperature weather station I have up in the Gold Hill area we had lows of 30°F on March 15 and 28°F on March 18 with several nights of similar cold weather the week previous (remember that snow fall in mid-March?). Looking at the peach and nectarine crop set recently it looks as though most is going to be alright, although some varieties appear to have a lighter set than last year. Hopefully the later bloom in the cherries had enough warm weather to get good pollination up here. Meanwhile, the pear bloom along with many apples varieties occurred during the week of 70° weather we had at the beginning of the month, ensuring a good crop. There will be plenty of pome fruit to thin in a few weeks.

The recent erratic weather of warm temperatures followed by the current cold front has also meant a drawn out period of emergence for codling moth. Last year's Biofix date for codling moth was April 25 and so far it looks like it may be a little earlier this year, assuming it warms up again. Biofix is the date we begin accumulating degree-days to time chemical cover sprays and also the date by which pheromones for mating disruption should be up. Please see the article in this issue for more information.

Thanks to everyone who attended any one of the three meetings I sponsored in the last month: the walnut meeting, olive growing meeting and irrigation meetings provided a wealth of information, thanks to the invited speakers. I am planning on hosting a Cherry X-disease field meeting in June at Dave Fausel's orchard with Plant Pathologists Jerry Uyemoto and Bruce Kirkpatrick. Look for the meeting notice in the mail. If you have information you want me to deliver, please let me know! I am always open to suggestions and ways to serve you better!

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**INSIDE THIS ISSUE:**

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- EARWIG CONTROL FOR PEACHES AND NECTARINES: ACT NOW OR PAY LATER!
- CHEMICAL THINNING GUIDELINES FOR APPLES



### WHAT'S NEW FOR CODLING MOTH CONTROL

As I write this article on April 17 we are experiencing a cold front that has slowed the beginning of the first flight -emergence of the over wintering generation- of codling moth. Trap

catches so far have indicated the beginning of male emergence in the past week; however, this cold weather will push back the female emergence. This is confirmed by the lack of female moths to date in the “DA” traps I have up. Recall that the “DA” lure is made from pear plant volatiles and will attract female as well as male moths, while standard pheromone lure is made from a female sex attractant that will only attract male moths. I am continuing to work with USDA scientist Doug Light to assess the season-long attractiveness of the DA lure in several apple varieties. Hopefully we will have another tool to use to time codling moth treatments.

### **PHEROMONE MATING DISRUPTION PRODUCTS**

The idea with pheromone is to confuse moths so they can't find each other to mate. Several theories exist as to how this actually works-“habituation”, “false trail following”, etc. Growers who intend to use mating disruption for codling moth control should get their chosen product up now, if they haven't already done so, in anticipation of the first flight with warmer weather. Remember, the product needs to be up at Biofix, the time when moths are flying and beginning to mate. If the pheromone is put up late, moths will have time to find each other and mate, lay eggs, resulting in larvae for succeeding generations. Pheromone mating disruption works best in low pressure orchards or those that have been vigorously controlling codling moth over previous seasons. For orchards with higher codling moth pressure, a well-timed cover spray in addition to the pheromone will probably be necessary. Consider spraying the first flight, (at about 250 degree days, corresponding with egg hatch), since this may be the most important flight to control because it drives the remaining season's population.

**Note: The following list is informational only, it may be incomplete and it is not an endorsement of the products by myself or the University of California Cooperative Extension. I do not have locally gathered data to support the efficacy of any of these materials and I make no claims to their efficacy.**

ISOMATE-C PLUS. (PACIFIC BIOCONTROL CORPORATION): This is the standard “rope” or plastic clip pheromone that many growers in our area have been using. Delivers approx. 205 mg. of pheromone per dispenser. Recommended rate is 400 dispensers/acre. This product lasts about 120-150 days, depending on temperature.

ISOMATE-C TT (PACIFIC BIOCONTROL CORPORATION): This is a new alternative to the standard C plus rope. TT stands for “twin tube”-the shape of the dispenser is like a closed hoop that is popped open and slung over a branch. Each C TT dispenser contains 382 mg. of pheromone, allowing for a lower application rate per acre: recommended is 200 dispensers/acre. Therefore, this product should be easier and cheaper to apply. Pacific Biocontrol estimates a half hour time to put up an acre of C TT. They have directions to make a PVC pipe applicator on their web site. This product lasts approximately 150-170 days, depending on temperature.

3M SPRAYABLE PHEROMONE (CERTIS COMPANY): THIS is the first registered sprayable pheromone available; you can expect to see others (a flowable pheromone product from SuTerra, formerly Consep, is in the registration process) in the future. Unfortunately, this formulation, developed by 3M company, is the nonstick and non-rain fast one, it is the “nonstabilized phase IV” product. What this means is that it will likely degrade with UV and rain (or overhead sprinklers) and is only being recommended for orchards with good canopy protection such as in walnuts. 3M does have another formulation with microcapsule stabilizing components that they are pursuing registration on.

PARAMOUNT AEROSOL CM (OR “PUFFERS”-SUTERRA COMPANY): SUTERRA is the company that now includes the old Consep and Paramount businesses. As such, they are marketing the “puffers” which consist of an aerosol dispenser, a can of pheromone, a cabinet containing the electronic and dispensing equipment and a hand-held programmer. The idea is to put out a larger dose of pheromone with fewer point sources, depending on the wind to carry it across the orchard where some researchers speculate it is absorbed and re-emitted by leaf tissue. The system typically gives a 30 mg. “puff” of pheromone every 15 minutes for the programmed amount of time-12 hours a day beginning in the late afternoon when codling moth are flying and throughout the evening. 2-3 puffers per acre are recommended, greatly cutting down on the labor of hanging pheromone.

**\*\*Note:** All mating disruption products will not prevent already mated females from flying in to a block from an adjacent, untreated, orchard and laying eggs. This is why neighbor cooperation (or “area-wide IPM”) is so important in getting good control, especially for our small foothill farms. If you are considering pheromone mating disruption, look at your block and determine if you have untreated trees adjacent. If so, you will need to either get cooperation from your neighbor (the more mating disruption among adjacent orchards, the better it will work) or add a conventional cover spray to your block, or you could consider spraying the edges or borders of your orchard.

### **“ATTRACT AND KILL” PRODUCTS**

LAST CALL (IPM TECHNOLOGIES) THIS is the first product I know of to use pheromone to lure adult moths to a toxic dose of pesticide, thus reducing the male portion of the codling moth population. Last Call is codling moth pheromone mixed with the pesticide permethrin in a glue-like matrix. It is applied to the woody part of the upper canopy of the tree with a pump dispenser, calibrated to deliver discrete droplets. The number of droplets varies between 800 –2,400 per acre, depending on the number of trees/acre and the size of the trees and if they are located in the orchard perimeter. It is supposed to be rain fast and reapplication is recommended every 5 weeks. The product is registered for homeowner or “backyard orchard” use and may also be helpful for treating sensitive areas such as near homes and schools. Since pheromone is the attractant, it will only “take out” male moths.

### **PESTICIDES FOR CODLING MOTH CONTROL**

If you elect not to use pheromones you have several choices for pesticide sprays. The important thing with these “cover” sprays is the timing: the idea is to kill the larvae after they hatch from the eggs and before they burrow into the fruit. This timing is determined by the degree-day model, which correlates temperature to codling moth development. The model is well developed and tested and accuracy can be quite good if used appropriately. You can call my office during the season if you are wondering where we are in the accumulation of degree-days, or you can access the information yourself via the UC IPM website at <http://www.ipm.ucdavis.edu>.

GUTHION (BAYER CORP.), or azinphos-methyl, will be allowed on apples for the next 4 years, according to an informal report given at the Mid-Valley Apple Association meeting I attended last month in Stockton. It is expected, however, that there will be a targeted reduction to something like 8 lbs. (over the season) on apples and 5 lbs. on pears during this 4 year period.

IMIDAN (GOWN CORP.) Proposed changes for Imidan include the likelihood of an increased REI (re-entry interval) from 24 hours to 3 days. The PHI (pre-harvest interval) is not expected to change. A new label with these changes should be out June 30 of this year.

### **REDUCED RISK PESTICIDES FOR CODLING MOTH**

Several newer classes of pesticides are being developed which are safer for humans to use, safer for the environment, and “selective” or “soft” on beneficial insects. This is especially important since natural enemies can play a big role in controlling secondary pests such as mites and aphids. Often reduced risk pesticides require more time to work, or to see effect, since they are not usually contact materials. Most of these reduced risk pesticides have the drawback of less persistence or the need for ingestion by the insect, making the timing of their application critical to success.

### **INSECT GROWTH REGULATORS (IGRs)**

CONFIRM (TEBUFENOZIDE, DOW AGROSCIENCES) THIS insecticide mimics the insect hormone responsible for molting and metamorphosis. It basically causes a larva to molt too early, before it is physiologically ready, thus killing the larva. Larvae have to ingest it to be effective; it will not kill eggs or adults. Timing is recommended earlier than for other conventional sprays, right after egg hatch at about 150 degree days, followed by a second application 10-15 days later at about 450 to 550 degree days. Use of a spreader-sticker is recommended.

ESTEEM (PYRIPROXYFEN, VALENT CORP.) This insecticide acts by suppressing egg development and inhibiting metamorphosis, it has no effect on adults. It is also recommended to time early, at about 100 degree days, with reapplication recommended 2-3 weeks later. The addition of oil may increase effectiveness.

### **NICOTINOID OR CHLORONICOTINYL INSECTICIDES**

This group of insecticides causes toxicity to the nervous system of insects with a mode of action similar to nicotine. The group includes imidacloprid (Provado, Bayer) which is used successfully for aphid control and other sucking insects in many crops.

ASSAIL (ACETAMINIPRID, AVENTIS CORP.) This product is not yet registered in California, but is expecting registration this season. It is a “second generation” chloronicotinyl with contact activity and may have systemic activity in leaf tissue. In trials conducted last year against codling moth in pears by UC researcher Bob Van Steenwyk, Assail looked very promising with control most similar to the grower standard of Guthion or Imidan. Assail may flare mites, however, and adding horticultural oil may prevent mite flare-ups.



### **EARWIG CONTROL IN STONE FRUIT**

Several peach and nectarine growers had problems with earwig damage on their fruit last year. Earwigs will feed on the surface of fruit, chewing shallow, irregular holes. They can also enter ripening fruit at the stem end and feed inside around the pit, where they remain until fruit is harvested. Earwigs belong to the insect order Dermaptera, (“Derma” = skin, “ptera” = wings) which refers to the skin-like texture of their front wings. Although some earwigs do possess wings, other species have lost their wings altogether and in general earwigs are not considered good flyers. This means they must crawl up the tree to feed on the fruit. Earwigs lay their eggs in the soil and the eggs hatch into nymphs that molt 4-8 times before becoming adults. Earwigs are nocturnal; they only come out at night.

Management for earwigs requires removing daytime harboring sites (such as debris near the base of the trees) and preventing the earwigs from climbing up the trunk by removing weeds and pruning out limbs that come in contact with the soil. Early spring treatment-before the earwigs have climbed up

into the tree canopy- is essential to control. Monitor for earwigs by placing boards or rolled up newspapers in the orchard in early spring. Once you find earwigs, carbaryl (Sevin) can be applied to the trunk from the base of the scaffold to the soil line or a carbaryl bait can be placed in the crotch of the tree.

Earwigs are omnivorous; they will feed on just about anything. Some consider them beneficial in orchards as they feed on other insects and their eggs, such as codling moth.

### **APPLE THINNING GUIDELINES**

The guidelines are written by U.C. Cooperative Extension Farm Advisors Joe Grant (San Joaquin County) and Paul Vossen (Sonoma/Marin Counties) with U.C. Extension Specialist Scott Johnson. They are meant as guidelines based on these advisors best experience, however, please pay close attention to the notes on factors that can influence tree response to thinning chemicals: weather, tree condition and tree vigor are all site specific.

These guidelines are available on the UC IPM website at: <http://www.ipm.ucdavis.edu>.