



UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION:  
EL DORADO AND AMADOR COUNTIES



## FOOTHILL FARM AND ORCHARD NEWS

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Cold and wet April weather has made this a difficult spring for growing fruit in the foothills, as you all know. I have observed hail damage in many plum species and severe cold has damaged developing peach and nectarines at higher elevations-making this a light year in some areas. (Perhaps we will just have less thinning to do!) Cherries have had low temperatures during bloom time, and since bees are required for pollination, I predict the cherry crop will also be light. The wet weather has been ideal for one thing: our current Apple Scab trial should have meaningful results this year since we should have some good disease pressure to separate out treatment differences. At this writing, most growers have applied their “green tip” and “pink” apple scab sprays. Fire blight and Brown Rot treatments have also been applied. Apple and pear bloom will likely be “strung out” over time-making control more difficult and costly.

There is an urgent issue before our state legislators I hope all of you are aware of. U.C. Cooperative Extension (the “Public Service” branch of the University of California) is facing the most severe proposed budget cuts in our history. Last year U.C. Cooperative Extension took a 5% permanent budget cut and agricultural research took a 10% cut. **The Governor’s proposed California state budget for 2003-2004 includes an additional 25% cut to U.C. Cooperative Extension and an additional 10% cut to agricultural research.** Unless the state legislature acts to reduce these proposed cuts, many Cooperative Extension programs will be severely affected or eliminated. Cooperative Extension is funded jointly through State, County and Federal funds. Since most of state funding goes towards Advisor’s salaries, the network of county-based U.C. Cooperative Extension advisors will be decimated if these cuts are not reduced. We will lose our ability to respond to requests for information in the areas of agriculture, natural resources, health and nutrition, and youth development. 4-H, Master Gardeners, Master Food Preservers and other volunteer programs created by Cooperative Extension will be in jeopardy. To learn more about this timely issue, please see <http://ucanr.org/> and click on “State Budget Update”. Thanks for your support!

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**UPDATE ON CODLING MOTH: WHAT YOU NEED TO KNOW**

**What is “BIOFIX”?** A good question came up at the recent pome fruit meeting I held in

March: “Exactly how do you define biofix? Is it the first moth caught in a pheromone trap?” The answer, especially in a year like this with such a cool, erratic spring, is “NO!” Biofix is not meant to be interpreted as just the first moth caught—biofix is *consistent* codling moth trap catch (like several nights in a row) combined with sunset temperatures suitable for mating: at least 62°F. For example, the last weekend in March we had beautiful weather and I did catch a couple of codling moths in a couple of traps out near Apple Hill. However, no more moths have been caught, therefore, **we have not reached a biofix for codling moth for our area, as of the end of April.** Biofix will be very late, due to our cold temperatures. Even if a few moths do come out early, as long as cold temperatures remain, these moths are inconsequential as they probably die before mating.

**Biofix:** *Consistent* pheromone trap catch and sunset temperatures of at least 62°F. Date chosen based on these criteria to begin the “Degree Day Model”. Last year I set biofix for codling moth on April 22. This year it will be much later, but always varies depending on temperature.

**Degree Day Model:** Insects develop faster with higher temperatures (up to a point, or “threshold”) and slower with cold temperatures. The combination of temperature and time correlated to an insect’s development is called “physiological time”. Mathematical models have been developed by scientists for key pest and beneficial species that give us an idea of the physiological time, or degree days, needed for the insect to develop from one stage to another, such as egg to larva. With this information, we can calculate the number of degree days, starting at Biofix, and predict when codling moth eggs will hatch. This is key information for timing insecticide treatments, since once the codling moth larva burrows into the fruit, it is no longer susceptible to pesticides.

For example, the first pesticide spray is recommended at 250-300 degree days after biofix for a contact material such as Guthion, but earlier, about 100-250 degree days, for materials such as insect growth regulators that act best on younger larvae and very early, 75-100 degree days, for materials like oil that act on eggs.

### **Mating Disruption and Moth Emergence**

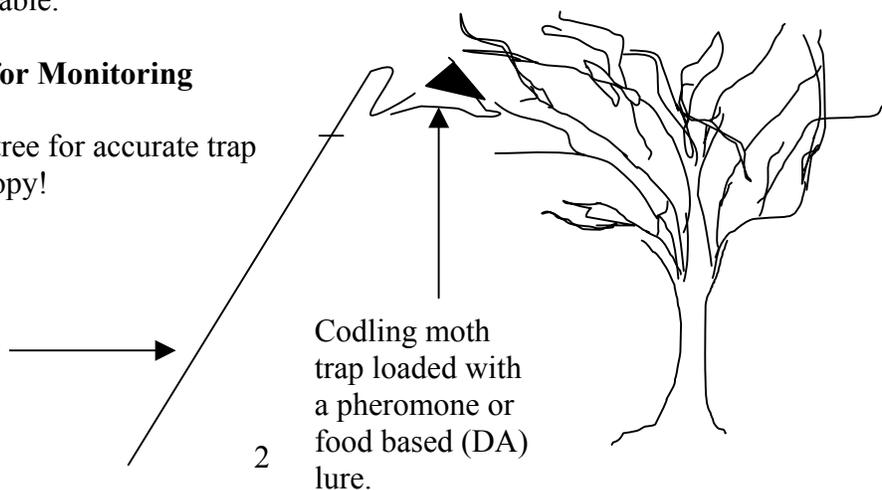
If you are using mating disruption, and you do not have your pheromone product up by biofix, then you should plan on treating the first generation with a pesticide spray. We now know that male moths emerge before females, in order to enhance their mating efficiency. Dr. Gary Judd, a researcher from Canada, reported at the Stockton meeting that they now have evidence that female moths, overwintering under tree bark, are emitting pheromone even before they emerge! This means that mating will take place almost immediately after moth emergence, so getting the pheromone up late means you will have mating and eggs deposited in your orchard.

Having the pheromone product up early is especially important for organic growers, since they have fewer effective pesticides available.

### **Hanging Pheromone Traps for Monitoring**

Always hang traps high in the tree for accurate trap catch, moths fly above the canopy!

Modified paint roller pole for codling moth trap hanging: remove the roller brush and bend the end to make a hook. The brush end unscrews to make it a convenient extension pole.





## New Pesticides for Codling Moth: Safer and with shorter REIs (re-entry intervals).

**ASSAIL (Cerexagri):** This is the product I'm really hoping will make a difference on codling moth for those of us growing apples and pears in the foothills. Assail is now fully registered in California. In tests conducted by Washington State University researchers Brunner, Doer, and Bennett, Assail provided statistically equivalent control as Guthion or Imidan in a 4 spray large plot airblast sprayer trial in 2000 and 2001. The codling moth suppression in their trials was close to 90%, under high pressure.

Assail's active ingredient is Acetamiprid, this is in the Chloronicotinyl class of chemistry. Assail's Signal Word is "Caution", which means that it is safer for humans and the environment (but is still toxic to bees directly exposed-always read the pesticide label and follow directions carefully). The REI for Assail is 12 hours, meaning you can treat and get back in to hand-thin. Assail is recommended with 1% oil to reduce flaring of mites, seen in some trials.

All this sounds too good to be true, so in order to know how this product will perform locally, I am conducting several large trials with Assail this year in our area, with the support of the manufacturer, Cerexagri. These grower trials will compare a rotation of Guthion/Assail to Guthion alone or Guthion/Imidan. We will evaluate fruit injury after each generation and also look for potential benefits such as leafhopper control. (Wouldn't it be nice to have a material that took care of those messy leafhoppers?!!) I will keep you all posted on results and a possible field day at the test site.

**INTREPID (Dow Agrosciences)** Hot off the press: The California Dept. of Pesticide Regulation just posted a notice of the intent to register the insecticide Intrepid for codling moth control on pome fruit. It now has a "conditional" registration that means it is undergoing some final tests with the expectation of full registration soon, most likely after May 27. Intrepid's active ingredient is Methoxyfenozide, it is an insect growth regulator that mimics the molting hormone of codling moth larvae, causing them to molt prematurely and die. The larvae have to ingest the chemical for it to be effective, so complete coverage is essential and it needs to be applied early, from 100-250 degree days for the first generation. It has provided good supplemental control of codling moth, on top of mating disruption, in studies conducted in Washington by Niedlinger and Duttler.

**SUCCESS (Dow Agrosciences)** The active ingredient in Success is spinosad, naturally derived compounds from an Actinomycetes fungus. Success acts on the insect's nervous system, causing paralysis and death, but is safe for humans and the environment. It is toxic to honey bees when directly applied but not when dried. Success is used against many "worm" pests in many crops. Probably the best scenario for this product against codling moth will be it's organic formulation, **ENTRUST**, which should be out next year, 2004. Entrust is sure to have a huge organic market, and I would expect it will be hard to get but worth it for those organic growers needing a supplement to mating disruption.

## APPLE SCAB trial underway: Materials offer alternatives

This year we are continuing our cooperative study with U.C. Davis Plant Pathologist Doug Gubler on fungicides to effectively control apple scab. Ken Dell, Doug's Staff Research Assistant, has worked

with me to set up a field trial looking at several alternatives compared to an untreated control and our grower standard: Dithane from green tip to petal fall followed by Captan covers, when needed.



#### Apple Scab trial 2003:

In cooperation with Doug Gubler and Ken Dell, UC Davis Plant Pathology Dept, and the fungicide manufacturing companies.

1. An untreated control
2. Procure (Uniroyal) + Dithane (Rohm Haas) for all stages
3. Flint (Bayer) at green tip and petal fall; rotated with Procure + Dithane at pink and covers.
4. “Pristine”, not yet registered, applied at all stages
5. Flint (Bayer) applied at all stages
6. Organic option #1: Champion (Nufarm-a copper hydroxide material) at green tip; followed by Kumulus (MicroFlo-a micronized sulfur) from pink on.
7. Organic option #2: Champion at green tip; followed by Serenade (Agrquest) from pink on.
8. Grower standard: Dithane green tip to petal fall; Captan (MicroFlo) covers.

The site we are using is a Red Delicious block in Apple Hill with high pressure: we have already observed scab lesions on newly formed leaves and confirmed the presence of conidia, one of the spore stages, on the leaves. This means apple scab will be present this year in untreated orchards, and we should get some good data on how well these materials work. Ken has already applied our green tip, an early pink and a third spray, since the bloom is so prolonged due to our cold weather.

Last year we had a lower incidence of scab than I would expect for this year. Ken and I evaluated fruit on May 30<sup>th</sup> of last year for a similar trial and found that the Procure + Dithane treatment performed the best. This year, with higher disease pressure, we will see if that combination holds.



#### **GROWING QUALITY FRUIT: Kevin Day, UCCE Farm Advisor from Tulare County, offers advice at local meeting.**

For those of you who attended my Stone Fruit meeting in March, the presentation given by Farm Advisor Kevin Day (Tulare County) was a real treat. Kevin gave us the following pointers:

- You can never overcome the genetics of the fruit-so understand the potential, and limitations, of your variety.
- SSC (soluble solid content) is not the only thing that matters: SSC compared to Total Acids is also important for taste. Growers in the Valley are fooling around with storage techniques that balance soluble solids and total acids to the consumer’s liking.
- Orchard factors: you can greatly enhance fruit quality by paying attention to thinning, light management and vigor control with proper pruning.

- There is data on the relationship of crop load to SSC: the lighter the crop load the higher the soluble solids (the sweeter the fruit).
- Likewise, there is also a relationship between fruit size and SSC: the larger the fruit, the higher the SSC, debunking the myth that large fruit are tasteless.
- If you have a choice between over and under fertilizing with Nitrogen, error on the side of under fertilizing. High nitrogen adversely affects fruit quality.

### **INTERNET RESOURCES: GET ONLINE FOR INFORMATION!**

**Our local UCCE website:** <http://ceeldorado.ucdavis.edu> Click on “Orchard Crops” for my website including back issues of this newsletter, update on local, current ag. issues. Also information on Natural Resources, Master Gardeners, 4-H.

**UC IPM website:** <http://www.ipm.ucdavis.edu> Click on “Pests of Agricultural Crops”-gives current Pest Management Guidelines for many crops. Also Weather Data, Pesticide Safety and Pest Notes for backyard growers.

**UC Fruit and Nut Information Center:** <http://fruitsandnuts.ucdavis.edu/> Click on “Fruits and Nuts” and search an entire database on the crop you are interested in. Also links to the “Backyard Orchard” site, Farm Advisor newsletters, chilling unit accumulations, etc.

**Available Cost and Return Studies:** <http://coststudies.ucdavis.edu> U.C. Cooperative Extension and the Department of Agriculture and Resource Economics have developed cost and return studies for many crops in California. Go here to get an idea of what it might cost to grow a crop, and typical returns.

**California Department of Pesticide Regulation:** <http://www.cdpr.ca.gov/> Click on “Product Info.” for a current product/label data base to search for pesticides registered for a particular crop in California.

**Crop Data Management Systems:** <http://www.cdms.net/manuf/default.asp> for samples of pesticide labels and MSDS. These are for reference only, always use the label on your actual product.