

UNIVERSITY OF CALIFORNIA ~ SUTTER/YUBA COUNTIES
COOPERATIVE EXTENSION

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ORCHARD NOTES

MARCH 1998

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The chilling hours accumulated below 45 degrees at Davis are 1586 as of March 1, 1998. Last year (1996-97) the season ended at 1309; the previous 1995-96 season was 703.

WALNUT BLIGHT

Blight bacteria survive the winter primarily in dormant buds. Bacteria is spread to unprotected tissue by rain, heavy dew or irrigation. To control blight, apply sprays to the bloom, nutlets and foliage **before** it rains to prevent the bacterium from being spread by moisture.

You have all heard by now that Manex received a Section 18 as a tank mix with fixed copper for blight control on March 10. This is great news since the rainfall patterns from El Nino may continue through spring. The addition of Manex to fixed copper sprays reduces blight infection by about 50 percent compared to copper spray alone. From 1997 trials, the 6 lb. rate of Kocide 101 with 58 oz. of Manex, gave the same control as the 8 lb. rate of Kocide 101 plus the same rate of Manex. The Section 18 will expire on June 15, 1998.

Other encouraging research is reducing the population of walnut blight bacteria by applying the surfactant Breakthru with a mix of copper and Manex at bud break. This gave disease control similar to weekly applications of Kocide + Manex without surfactants in 1997 research trials. As in 1996, copper-resistant bacterial strains were found in about half of all orchards sampled in 1997 surveys of northern and central California walnut orchards. Most strains were copper-sensitive and the proportion of copper-

PEST TRACKER

The pest tracker is posted in the entry area of our office as in the past. Degree-days will be updated weekly on Mondays. Oriental fruit moth, peach twig borer, codling moth, San Jose scale and navel orangeworm will be tracked from the beginning of the flight in Yuba City and codling moth in Yuba County.

ORCHARD SERVICE INDEX UPDATE

We receive many questions from growers asking for contacts to get various jobs done in their orchards. Our local (Sutter and Yuba Counties) orchard service index needs updating. If you have a business that offers a service to growers, please fill out the attached form and either send or drop it by our office.

FINAL CHILLING HOURS

resistant strains in a given orchard did not increase during the growing season even with multiple copper sprays. These findings suggest that copper-resistant strains of blight bacteria are less able to survive than copper-sensitive strains.

The main points to keep in mind with your blight control program are:

- Start your spray program just before the first female flower appears and be prepared to apply sprays through May.
- All new plant tissue must be sprayed **before** it rains. Plan to treat weekly, but watch the weather forecasts. Spray at least every seven days during wet weather and every ten days during drier weather.
- Full coverage is needed for the most effective blight control.

CODLING MOTH

Monitoring codling moth with pheromone traps is critical to its management. These traps indicate codling moth activity and population size of the male moth flight. From research we know that female moths emerge about the same time as male moths. Pheromone traps should be hung in early March to detect the first moth. The different pheromone lures vary in how often they need to be changed so be aware of the pheromone type and change it according to instructions throughout the season. Once 30 moths have been caught, change trap bottoms and continue to do this throughout the season. Growers may benefit from placing traps higher in the tree if they are not getting enough moths to delineate peaks.

Insect development is driven by temperature and the units in which this heat accumulation is reported are degree-days (DD). We start accumulating DD at a specific point in time known as the biofix, which is set at the first sustained moth catch. Biofix is often around the end of March in our area but varies year to year. We have not yet set a biofix for codling moth in walnuts as of March 20 but some moths were caught in pears and apples during the week of March 16. The other factor to consider when setting a biofix is sunset temperature. Codling moth needs sunset temperatures of 62 degrees to mate successfully. Usually a 75 degree maximum temperature is needed for a sunset

temperature of 62 degrees. With first trap catches, determine the sunset temperatures before setting a biofix. Local weather can be found and degree days calculated through UCIPM on the world wide web (<http://www.ipm.ucdavis.edu>). Other environmental factors affecting codling moth are wind speed and rain. They won't fly with winds more than 1½ miles per hour. Rainfall of just 1/10 inch in the evening period is enough to wet the leaf surface to prevent egg laying.

Applying the first flight spray Moth emergence to beginning of egg hatch takes about 200 DD. If using an organophosphate like Guthion, Imidan or Lorsban or a pyrethroid like Ambush or Asana, then target when most of the larvae have hatched. This corresponds to a spray timing of 300 DD from biofix or at **d** -½ inch nut size, whichever is later, on early leafing varieties like Ashley and Serr. In Ashley, ½ inch nut size and 300 DD generally coincide but not always. The insect growth regulators (IGRs) Confirm or Dimilin have different spray timings than conventional pesticides. Confirm is sprayed at 200 DD which is the beginning of egg hatch. Generally, these IGRs are better suited for the second flight spray because the foliage is expanding too rapidly during the first codling moth flight to get the necessary coverage that is needed for them to be effective.

In some years there is a second peak of the first flight. We call this second peak 1B and the first peak 1A. Codling moth damaged nuts from the 1A flight will drop to the ground but infested nuts from the 1B flight will not all drop but will be blows at harvest. These damaged nuts can make a good home for navel orangeworm to build up in over the season. If a 1B peak is seen, then plan to spray again especially if a short residual material was used for the 1A peak. The spray timing for this second peak often occurs around 600-700 DD. With varieties like Chandler or Hartley, this 1B peak is also of concern. Here, if there is enough foliage expansion, you may want to consider an IGR like Confirm if the codling moth population is low and the trees are smaller (below 30').

Last year some of our local surface water sources were monitored by the Regional Water Quality Control Board for insecticides. They were targeting organophosphates, especially Lorsban, applied for

codling moth control. Lorsban was found in the Wadsworth Canal in late April, and Diazinon in Gilsizer Slough in late May. It is very important that best management practices be used when applying all insecticides and irrigation water is managed to avoid runoff.

NAVEL ORANGEWORM (NOW)

Reduce overwintering NOW populations as soon as possible by shredding or chopping all remaining mummy nuts in walnut orchards. Disking mummy nuts into the soil will reduce NOW but not eliminate it. Also remove and destroy all waste from hullers, bins, hulling and drying equipment and buildings.

NITROGEN MANAGEMENT

Developing a sound nitrogen program involves several steps. First, make an estimate of the orchard's nitrogen removal rate and nitrogen needs. Then estimate nitrogen supplied by other sources such as irrigation water, cover crops and soil organic material. From this, an approximate fertilization rate is developed. Then fine-tune the rates annually using leaf tissue analysis (July), yield records and general vigor of the trees. The efficiency of nitrogen applications is influenced by fertilizer materials, timing and placement, irrigation application efficiency and fertigation techniques. Nitrogen assessment, increasing use efficiency, choosing fertilizer materials and determining specific nitrogen fertilizer rates are clearly explained in the video/handbook on nitrogen management in stone fruit. (See video section).

Nitrogen Application Timing:

Walnuts

For greater efficiency, apply a part of your nitrogen (N) fertilizer in the spring. Apply the remainder at the end of summer or early September while the roots are still active. The springtime N application will be used by the tree during the growing season, and the N applied late summer goes into storage and is used during the following bloom. On sandy soils, consider splitting nitrogen into three or more applications.

Peaches

During the spring growth flush period, usually early April, apply between 30-70% of the total annual amount of nitrogen depending on the variety. Apply

higher rates to late-season varieties. Apply the second application in late summer, usually August to September. Early season varieties should have higher rates at this timing. Evaluate tree vigor during the growing season by looking at the upper shoot growth, three feet is usually sufficient. The common 5-7 feet of shoot growth is excessive and causes hangers to dieback from shading.

Apples

Split nitrogen applications between spring and postharvest. Nitrogen levels should be low but not deficient as harvest nears to improve fruit quality and color (red varieties).

Kiwifruit

Each mature vine needs about one pound of actual nitrogen annually. Apply about two-thirds of the N fertilizer in March at budbreak as a broadcast application. This gets the vine growing vigorously and provides the N needed for fruit set. Apply the remaining one-third of N needed in May for vine maintenance. If using fertigation, apply N April through July.

ORIENTAL FRUIT MOTH AND PEACH TWIG BORER

The first oriental fruit moths (OFM) were caught at our Yuba City peach orchard on March 9, which we set as the biofix. This is the orchard that we calculate degree-days from for reporting on the pest tracker. We have continued to get biofixes over the last two weeks in area orchards. Some blocks where mating disruption (pheromone confusion) has been used for several years, have no biofix yet because of low populations. Generally no insecticide is applied to the first generation because of erratic emergence and egg-laying caused by variable weather. For growers using OFM mating disruption however, the pheromone dispensers needed to be applied to trees at biofix. The three OFM pheromone dispenser products available - Hercon's Disrupt OFM, Consep's Checkmate OFM and Biocontrol's Isomate-M, last for about 90 days. Consep has a dual OFM/PTB dispenser that should be hung at OFM biofix rather than waiting for PTB biofix.

If planning to control OFM with sprays, monitor shoot strikes during the first flight to decide if a spray will be needed during the second flight to reduce OFM population levels. When about 920-1010 degree-days

(DD) have accumulated, the second flight should begin. Once started (in May), begin accumulating DD from zero and apply spray treatments 500-600 DD from the beginning of the second flight for the best control.

For peach twig borer (PTB), pheromone indicator traps should be placed in orchards by **April 1st** to detect first moth emergence. For mating disruption, there are two PTB pheromone dispenser products available, Consep's Checkmate PTB and Hercon's Disrupt PTB that last 90 days. PTB pheromone dispensers should be placed in orchards around April 1st or when the first moth is caught. If planning to spray, it should be applied between 400 DD to 500 DD after biofix.

FUNGICIDE EFFICACY & TREATMENT TIMING TABLES

Fungicide efficacy and treatment timing tables for apple and pear and peach and nectarine are attached for your reference. If you ever have questions (and who doesn't!) as to how effective a particular fungicide is for a disease and when to apply it, just refer to these guides. They were produced by U.C. plant pathologists Beth Teviotdale, Jim Adaskaveg, Themis Michailides, and Doug Gubler.

CLING PEACH RUST & POWDERY MILDEW

Over the last two years, I've had questions as to whether putting sulfur in with your bloomtime brown rot sprays will help control peach rust. The answer is no for the following reason. The rust fungus overwinters in perennial twig cankers that allow a one to two year mechanism of survival. From early April to early May, urediniospores are produced from these cankers that starts the disease cycle. From research, late April and May applications are the most effective in reducing leaf rust. Sulfurs, Break, and Elite are all effective; none will eradicate peach rust and none have long residuals, 10-14 days at the most.

For peach varieties prone to powdery mildew, sulfur applied at late bloom and again at 3-6 weeks post bloom will provide some control. Some of the

common brown rot fungicides will also control powdery mildew (see fungicide efficacy table).

CONTROLLING GROUND SQUIRRELS WITH BURROW FUMIGANTS

Leaflets are available at the Sutter/Yuba Farm Advisor's Office.

VIDEOS

All videos available on a two-day checkout. Some videos can be purchased.

The Fruits of Their Labor: Nitrogen Management in Stone Fruit and Almond Production.

Nitrogen assessment, orchard specific rate determination and timing, soil and tissue monitoring, fertilizer selection, and irrigation practices are discussed. Sample calculations and accompanying video handbook make information understandable and practical. Information also applies to walnuts. Video and handbook can be ordered for \$10.00.

- Grafting Walnut Trees
- Ground Squirrel Management, A Better Understanding of Your Options
- Walnut Husk Fly - Biology, Monitoring & Control Strategies
- Pesticide Handlers and the Worker Protection Standard

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PEACH AND NECTARINE -- FUNGICIDE EFFICACY

Fungicide	Resistance Risk	Brown Rot ^a	Powdery Mildew ^a	Scab	Rust	Leaf Curl	Shot Hole
Benlate ^b	high	++++	+++	+++	+	----	----
Break EC	high	++++	+++	----	+++	----	+/-
Elite	high	++++	+++	++	+++	----	+/-
Rovral ^c +oil ^d	high	++++	+	+	+++	----	++ ^h
Topsin ^b	high	++++	+++	+++	+	----	----
Rally	high	+++	+++	----	----	----	----
Ronilan	low	+++	----	----	----	----	----
Rovral ^d	low	+++	----	----	----	----	----
Bravo ^{e,f}	low	++	----	+++	+++	+++	+++
Captan ^f	low	++	----	+++	----	----	+++ ^h
Funginex ^g	high	++	++	----	+	+	----
Copper	low	+/-	----	----	----	+++	+++
Sulfur	low	+/-	+++	+++	+++	----	----
Ziram	low	+/-	----	+++	----	+++	+++

Rating: +++++ = excellent and consistent, +++ = good and reliable, ++ = moderate and variable, + = limited and/or erratic, +/- = minimal and often ineffective, ---- = ineffective, and ? = unknown

^aDo not use the same fungicide or fungicides with similar chemistry and high resistance risk more than twice in one year.

^bStrains of *Monilinia fructicola* resistant to Benlate and Topsin are present in some peach and nectarine orchards.

^cRovral is not available for pre-harvest use.

^dOil is a 'light' summer oil, 1-2% volume/volume.

^eDo not use after shuck split.

^fDo not use in combination with or shortly before or after oil treatment.

^gLabel canceled; other companies may produce.

^hNot effective if used as dormant treatment.

PEACH AND NECTARINE -- TREATMENT TIMING

Note: Not all indicated timings may be necessary for disease control.

Disease	Dormant	Bloom		3-6 weeks post bloom	Preharvest ^a	
		20-40%	80-100%		3 weeks	1 week
Brown Rot	----	++	+++	+ ^b	++	+++
Powdery Mildew	----	++	++	++	----	----
Leaf Curl ^c	+++	----	----	----	----	----
Rust	+ ^d	----	----	+++	++	----
Scab	----	----	++	+++	----	----
Shot Hole ^e	+++	----	----	++	----	----

Rating: +++++ = most effective, ++ = moderately effective, + = least effective, and ---- = ineffective.

^aTiming not exact; weather conditions determine need for treatment.

^bApplication at about 4 weeks post bloom may reduce pre-harvest brown rot.

^cTreatment should be made before bud break and preferably before bud swell.

^dDormant treatment with liquid lime sulfur.

^eFall application before winter rains begin is the most important; additional spring sprays are seldom required but may be needed to protect the fruit if heavy persistent spring rains occur.

APPLE AND PEAR -- FUNGICIDE EFFICACY

Fungicide	Resistance risk ^a	Scab		Powdery Mildew (apple only)
		Protectant	Eradicant	
Bayleton	high	+++	+++	++++
Benlate	high	+++	+++	+++
Funginex ^b	high	+++	+++	++
Procure	high	+++	++++	++++
Rally ^c	high	+++	++++	++++
Rubigan ^c	high	++++	++++	++++
Topsin M	high	+++	+++	+++
Vanguard	medium	+++	+++	+++
Captan ^d	low	++	---	---
Maneb ^d	low	++	---	---
Thiram ^d	low	++	---	---
Ziram ^d	low	++	---	---
Copper	low	---	---	---
Sulfur	low	++	---	+++

Rating: ++++ = excellent and consistent, +++ = good and reliable, ++ = moderate and variable, + = limited and/or erratic, +/- = minimal and often ineffective, and --- - ineffective

^aDo not use the same fungicide or fungicides with similar chemistry and high resistance risk more than twice during a season.

^bLabel canceled; other companies may produce.

^cOn pears, use only **before** white bud and **after** full bloom.

^dThese are important components of resistance management programs.

APPLE AND PEAR -- TREATMENT TIMING

Note: Not all indicated timings may be necessary for disease control.

Disease	Green Tip	Pink Bud	Spring
Scab ^a	+++	+++	+++
Powdery Mildew ^b	---	++++	+++

Rating: ++++ = most effective, ++ = moderately effective, + = least effective, and --- = ineffective

^aProtection of early tissue is important. Additional applications should be made according to infection periods as determined by the Mills table (apple) or Spotts (pear).

^bEarly application is most effective; added treatments are made if mildew continues.

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SUTTER/YUBA COUNTIES ORCHARD SERVICE INDEX

We receive many questions from growers asking who they can contact to get various jobs done in their orchards. To help growers, I am updating the Sutter/Yuba Counties Orchard Service Index.

Examples of the types of orchard service listing we are looking for include: custom harvesters, custom hullers, pruners, grafters, spraying services, orchard consultants, backhoe services, black walnut rootstock buyers, wood chippers, land levelers, fumigation, etc.

This service index WILL NOT be used as a PRODUCT listing. Therefore, all listings will be confined to businesses that offer a SERVICE to the grower rather than a product for sale.

If you would like to be listed in this index, please fill out the following information:

NAME OF BUSINESS:

OWNER:

Type of service offered, including any limitations such as minimum acreage, area, etc.
(No products please):

ADDRESS:

(City) _____ (State) _____ (Zip) _____

PHONE:

Approximate cost to grower per hour or unit:

(The dollar figures will be confidential and are strictly for use in updating our cost studies. Cost figures will not be given to growers or listed in the brochure.)

Please return completed form to:

**ORCHARD INDEX
SUTTER/YUBA COOPERATIVE EXTENSION
142A GARDEN HWY
YUBA CITY CA 95991**