



SUTTER/YUBA COUNTIES COOPERATIVE EXTENSION ~ UNIVERSITY OF CALIFORNIA

142A GARDEN HIGHWAY, YUBA CITY CA 95991

Tel: (530) 822-7515 ~ Fax: (530) 673-5368

Pomology Notes

February/March 2003

CHILLING UNITS TO DATE

Where are we this year in regards to chilling accumulation? These are the hours below 45°F since November 1 for this winter and for the past seven years for comparison. Similar numbers have been recorded up and down the Sacramento Valley – plus or minus 100 hours. Chilling unit accumulations can be viewed on the internet at: <http://fruitsandnuts.ucdavis.edu/weather/index.html> (click on chilling units)

CHILLING HOURS ACCUMULATED AT NICHOLAS.

Year	Chilling to Feb. 4	Chilling thru March 31	Chilling between 2/4 and 3/31
2002-2003	700	?	?
2001-2002	658	1060	+402
2000-2001	1182	1527	+345
1999-2000	846	1004	+158
1998-1999	1116	1478	+362
1997-1998	672	912	+240
1996-1997	728	1051	+323
1995-1996	710	931	+221

GROWER SURVEY MAILED

In late January, a survey was mailed to all California prune growers. Please take the time to fill out this survey! Why? Because it helps the University of California and the California Dried Plum Board understand how prunes are really grown in this state, and if taxpayer (grower) and CDPB (grower) money is being spent in ways that best serve growers. Do you think you're getting your money's worth from U.C.? Here is the chance to tell someone about it.

UNITED STATES DEPARTMENT OF AGRICULTURE, UNIVERSITY OF CALIFORNIA, AND COUNTIES OF SUTTER & YUBA COOPERATING

The University of California prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or status as a covered veteran (covered veterans are special disabled veterans, recently separated veterans, Vietnam-era veterans or any other veterans who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized). University Policy is intended to be consistent with the provisions of applicable State and Federal laws. Inquiries regarding the University's equal employment opportunities policies may be directed to the Affirmative Action Director/Staff Personnel Services Director, University of California, Agriculture and Natural Resources, 300 Lakeside Drive, 6th Floor, Oakland, CA 94612-3550 (510) 987-0096.

PEST CONTROL INFORMATION ON THE WEB

The folks at UCIPM have recently updated the information on prune, olive, and plum pest management. Check out: <http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html> and then click on the crop. Pesticide impacts on beneficial insects and **bees** are available on the prune page under "General Information".

BEE HIVE HEALTH AND FUNGICIDES

The information below came to me from Dr. Eric Mussen, U.C. Extension Apiculturist at U.C. Davis. His web address is: <http://entomology.ucdavis.edu/faculty/mussen.cfm>

Do fungicides kill bees? Yes and no. Fungicides registered for use on almonds and prunes do not appear to be toxic to adult honeybees. However, two fungicides registered on almonds and prunes can harm hives, because they can poison immature bees (brood) in the hive when those bees are fed pollen contaminated with captan or Rovral.

Bees that are directly sprayed with these two fungicides (captan or Rovral) will, most likely, not be killed but heavily contaminated. When they return to the hive, they will bring contaminated pollen back to feed the brood.

A healthy, strong beehive is essential to successful almond production. Early season brood loss weakens the hive and reduces beekeeper income from that hive throughout the season.

Please consider this information when spraying fungicides on your trees.

DORMANT/DELAYED DORMANT OPTIONS FOR PRUNE

Recent U.C. research has demonstrated that there are several options available to prune growers looking to control peach twig borer, scale, mite eggs, and/or aphid eggs in a pre-bloom spray (either dormant or delayed dormant). These options include:

- ✓ Full dormant spray (oil + pesticide)
- ✓ Reduced rate(s) of oil and/or pesticide in dormant or delayed dormant spray
- ✓ Oil + Bt in with fungicide at green bud to popcorn spray
- ✓ Oil in with fungicide at green bud to popcorn spray
- ✓

These different options work for different pest situations. For example, oil alone will control light to moderate San Jose scale populations, but an OP insecticide (diazinon, Lorsban, or Supracide) is needed to control a heavy scale population. Oil alone has no effect on peach twig borer, but oil helps with pesticide penetration and retention when the two are tank mixed to control that insect. There are cost differences to each program that may be of interest to growers.

Please call me at 822-7515 if you would like to talk about any of these programs and the orchard monitoring practices that are key to a cost effective spray program.

NOTE: The captan label says “Do not apply captan in combination with, immediately before or closely following oil sprays”. “The time factor governing the safe interval between captan and oil sprays varies due to general climatic conditions, therefore consult local agricultural spray programs and authorities to determine the proper timing.” At a recent meeting of UCCE farm advisors with prune expertise, the general consensus was that no one had seen damage to prune trees from an oil spray at green tip followed by captan at full bloom. Damage was observed when captan and oil were tank-mixed.

PRUNE ORCHARD MANAGEMENT EDUCATIONAL SERIES

Please mark your calendars for the first annual Yuba/Sutter Prune Management Series. Six times between now and September, two one-hour classes will be held to discuss timely orchard management issues. The paired inside/outside meetings will cover the same material in different ways. The indoor meetings will include classroom presentation and discussion of orchard management fundamentals, and the outdoor meetings will be a “hands on” program with a focus on orchard monitoring, pest ID, etc.

- ➔ Indoor meetings will be from 7-8 P.M. at the UCCE Yuba/Sutter office at 142A Garden Hwy. Coffee will be provided.
- ➔ Outdoor meetings will be held from 8-9 A.M. (except for May 7th 8 -10 AM) in a local prune orchard, location to be announced. Bring Your Own Coffee. Please bring a hand lens.

Program Topics	Indoor Meeting	Outdoor Meeting
Bloom spray options Russett scab control Aphid scouting PTB/OBLR scouting	March 3	March 4
Pests (aphids, worms, etc.) Fruit set Irrigation yet?	April 8	April 9
Potassium/nutrition Cropload check Insect and mites Irrigation	May 6	May 7 <i>Time change for this meeting 8 to 10 A.M.</i>
Insects and mites Irrigation Rust	June 10	June 11
Pests Harvest Prep Leaf analysis Irrigation	July 15	July 16
Post-harvest practices	September 16	September 17

TANK MIXING WITH COPPER DEGRADES SOME PESTICIDES

In an earlier newsletter, I mentioned that dormant copper sprays may help to improve the condition of trees suffering from bacterial canker. Based on new research from U.C., this “piggy back” approach may affect dormant pest control.

Tank mixing insecticides Diazinon or Lorsban with copper result in a rapid breakdown of the insecticide. In lab research directed by Dr. Frank Zalom, U.C. Davis IPM specialist, the amount of diazinon 4EC or Lorsban 4EC remaining after mixing with water and copper hydroxide (Kocide, Champ, etc.) at field rates decreased rapidly and was completely gone after two days, compared to the amount that remained after mixing just pesticide and water (no copper).

Dr. Zalom and his team are continuing to work on this topic to see if peach twig borer control is reduced when copper and diazinon are tank-mixed in a dormant application.

Previous research has shown that this breakdown reaction is due to the copper, not tank water pH. (The breakdown reaction will be faster at higher pHs.)

GENERAL DISEASE CONTROL REVIEW

Protecting blossoms from disease is a key to successful orchard management. A cost effective disease control program protects the tree from infection when there is significant risk of damage to the crop or tree. Knowing what conditions produce infection risk is therefore important to a good disease control program.

Three ingredients are needed to produce a disease outbreak (see table below), much like three ingredients are needed to make a fire. Different combinations of these ingredients produce different sized fires or disease infections.

INGREDIENTS	TO MAKE FIRE	TO MAKE DISEASE OUTBREAK
Source	Spark	Disease organism
Fuel	Fuel (wood, gasoline, etc.)	Receptive tissue on host plant
Environment	Oxygen	Proper conditions (moisture, etc.)

Controlling disease in an orchard is basically about 1) reducing, as much as possible, the disease organism in the orchard and 2) protecting the crop. The third ingredient, environment, is mostly beyond our control.

Eliminating pest organisms from the orchard is a foundation of any disease management program. This usually means removing and destroying the overwintering sites of the disease, such as fireblight and/or brown rot cankers in the tree, old fruit “mummies”, etc. However, complete orchard “clean up” or sanitation is almost impossible.

Once bloom arrives, the disease management focus shifts to treating the host (flowers, etc.) when weather conditions favor infection. Key information needed includes:

- ➔ What varieties are most susceptible to a particular disease
- ➔ What flower parts are most susceptible to disease
- ➔ What weather conditions favor infection
- ➔ How a certain fungicide works and for how long

For brown rot control in almonds and prunes, flower protection is essential, as there are no materials with “kick back” that can eradicate an infection once it starts. It is best to treat early -- at pink bud for almonds and green bud for prunes. A second application may be needed depending on the weather and/or if there are other diseases that need to be controlled. For example, Dr. Themis Michaelides has developed the following risk potential for brown rot (*Monilinia fructicola*) on prune. The chart below shows how different disease pressure, host status, and weather conditions contribute to disease risk.

Relative risks of blossom brown rot in prunes caused by *Monilinia fructicola*. From research by Dr. Themis J. Michailides, UC Davis and associates, funded by California Prune Board.

-----Hours of Wetness-----

Bloom Stage	Innoculum Potential	Temperature (°F)	4	8	12	16	20	24
Popcorn	Low	50						
To Full	Low	59						
Bloom	Low	68						
	Low	77						
Popcorn	High	50						
To Full	High	59						
Bloom	High	68						
	High	77						
Late full	Low	50						
Bloom	Low	59						
To petal	Low	68						
fall	Low	77						
Late full	High	50						
Bloom	High	59						
To petal	High	68						
fall	High	77						

Legend

Disease Risk	Color Code
No Risk	
Low Risk	
Moderate Risk	
High Risk	

Finally, good spray coverage is essential to good disease control. Unprotected flowers on a sprayed tree are as vulnerable to infection as flowers on an unsprayed tree. Poor coverage can also contribute to fungicide resistance development in the pest organism.

EVERY-OTHER-RROW FUNGICIDE SPRAYING

Every-other-row spraying can be a way to stretch a limited disease control budget. However, it may have a down side as well.

At a recent UCCE peach meeting in Yuba City, Dr. Jim Adaskaveg, UC Riverside Plant Pathology professor, suggested that every-other-row fungicide spraying might eventually result in, or at least contribute to, fungicide resistance in orchards. Fungicide resistance is defined by

Dr. Adaskaveg as “*a genetically inherited character that allows a fungus to withstand a chemical that previously inhibited its growth*”.

Dr. Adaskaveg’s work has shown every-other-row spraying can decrease the fungicide concentration (and disease control) in the blossoms on the far side of the tree (away from the sprayer) compared to the side of the tree nearest the sprayer. So, this spray practice can contribute one part of the three-part equation for resistance development presented by Dr. Adaskaveg:

High pest pressure + **low fungicide concentration** + repeated applications of the fungicide = *Optimal resistance development conditions*

Pest resistance to a particular chemical can result in a devastating control failure at a crucial time. Dr. Adaskaveg recommends the R-U-L-E-S program to reduce or avoid fungicide resistance development:

Rotate or tank-mix before resistance develops

Use labeled rates and only when needed

Limit total number of applications to 4 per season of a material from any single fungicide class.

Educate yourself about fungicide activity, mode of action, and class

Start a fungicide resistance management program with the most effective materials in its class or a multi-site mode of action fungicide.

The use of every-other-row spraying should be weighed against the risk to the orchard given weather conditions, flower development stage, and orchard disease history. If it were me, and a big, warm storm was forecast, my prunes were in full bloom, and it had

been a 5-10 days since the greenbud spray, I'd think very hard about spraying fungicide on every row. I'd also use a fungicide material from a different fungicide class than the greenbud spray. The disease control publication mentioned below contains important information relative to R-U-L-E-S program.

UC DISEASE CONTROL GUIDELINES AVAILABLE

Every year, UC researchers evaluate tree and nut crop fungicides both for efficacy and timing. The 2003 update is available on-line at <http://www.uckac.edu/plantpath/>. This is a very valuable publication that is available free off the internet. This publication also describes the chemistry classes of the different labeled fungicides. I recommend this excellent publication to all deciduous nut and/or fruit growers.

OWL BOXES AVAILABLE TO GROWERS

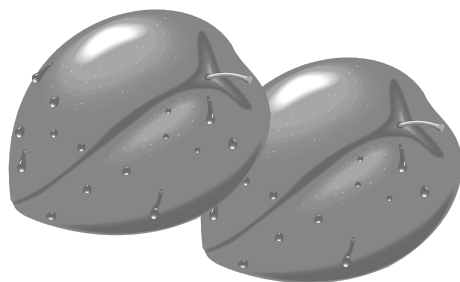
Owls can help control rodent pests in orchards, especially gophers. However, owls may not live near an orchard with a rodent problem. Owl boxes are owl "homes" that can be set in trees or on poles in or near orchards. If owls make a home in the box, they should help with rodent control in the area.

Students from Yuba County Office of Education's Construction Academy are interested in finding local growers to work with them on an owl box manufacturing and placement project.

Interested growers can contact project supervisor Chris Mahurin (at 741-6025) or talk with the students after their presentation at the Prune Day on February 26th

ORCHARD UPDATE MESSAGES START ON FEBRUARY 14TH

Beginning Friday, February 14th, a recorded phone message regarding prune orchard conditions, meeting info, etc. will be available by calling 822-7515 x26. Please let me know if the information is of any value by leaving questions or comments on that same line after the recorded message.



Sutter/Yuba Dried Plum Day

Wednesday February 26, 2003

Veterans Memorial Community Building
1425 Veterans Memorial Circle, Yuba City

Sponsored by U.C. Cooperative Extension

- 8:00 – 8:30 a.m. Registration, Coffee and Cookies
- 8:30 – 8:40 Swamps and Alligators in Prune Growing
Franz Niederholzer, UCCE Sutter/Yuba Counties
- 8:40 – 9:10 Insect and Mite Pest Management Review.
Carolyn Pickel, UCIPM Area Advisor, Sacramento Valley
- 9:10 – 9:40 Tree Pull and Trade Issues Update.
Greg Thompson, PBA
- 9:40 – 10:15 Brown Rot Control and Biology
Dr. Themis Michailides, UC Kearney
- 10:15 - 10:25 Owl Box Research
Students from Y.C.O.E.'s Construction Academy
- 10:25 – 10:45  *Coffee Break*
- 10:45 – 11:15 Making Money at Harvest
Wilbur Reil, UCCE Yolo County
- 11:15 – 11:30 Getting the Most Out of Your Fertilizer Dollar
Franz Niederholzer, UCCE
- 11:30 – 12:00 New Prune Varieties
Caroline DeBuse, U.C. Dried Plum Development Program