



# Pomology Notes

October/November, 2003

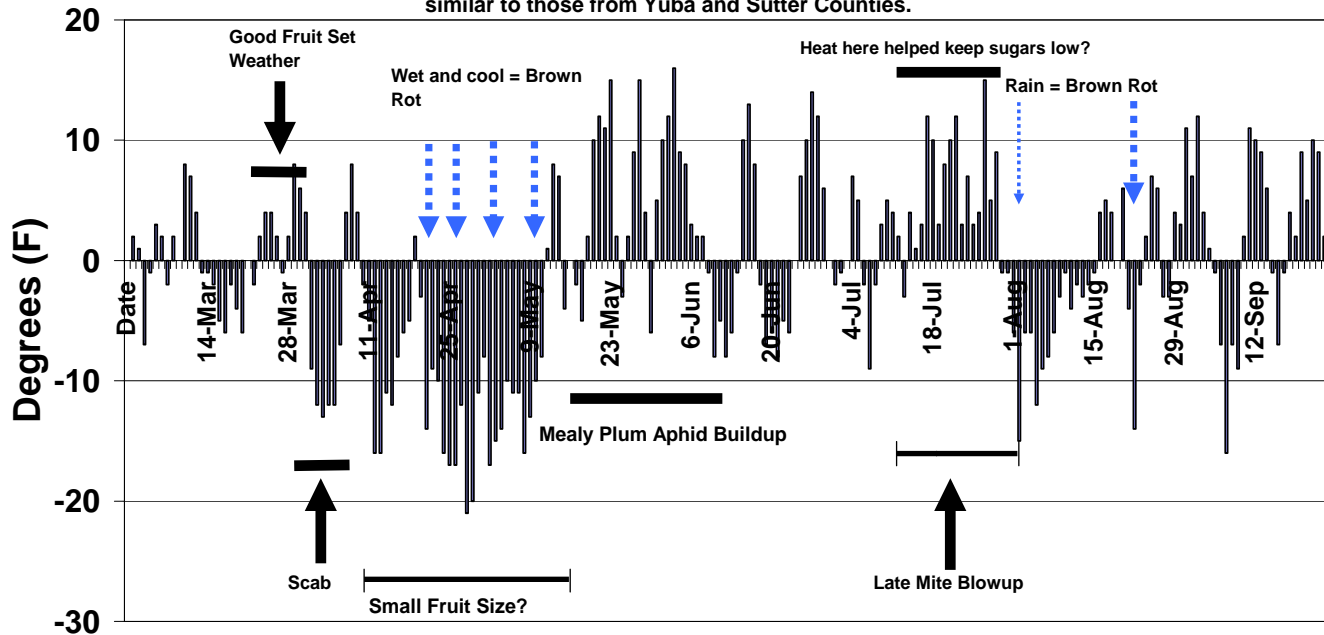


## POSTMORTUM FOR THE YEAR IN PRUNES

*A 20/20 LOOK BACK AT THE 2003 CROP*

In general, the 2003 prune crop was relatively large (the last estimate I saw was for an 180,000 ton crop) and not very clean. A large crop, small fruit size, hail, brown rot, scab, aphids, and mites – all were challenges encountered by some growers in 2003. In this section of the newsletter, I will review the biology of these problems and the control measures available to try to address them. I'll also offer some theories to at least partially explain how the weather this season affected the 2003 crop.

Differences between 2003 max temps and average max temps (1982-2002) in Durham, CA (CIMIS station) and the possible prune orchard problems that the weather may have influenced. Data are very similar to those from Yuba and Sutter Counties.



MONTH	GENERAL WEATHER DESCRIPTION
March	Average temps, some rain
April	Wet and cold
May	Wet and cold early, then dry and hot the rest of the month
June	Dry. Hot early, "normal" rest of month
July	Dry. Hot the last 2/3 of month
August	Wet and cool first half of month. Dry and "normal" temps the rest of month

**LARGE CROP:** Despite some rain, especially at green bud, bloom weather was good. Drying north winds followed rains, and blossom brown rot was minimal in the region. Conditions were good for flower pollinization and fertilization.

**LACY SCAB:** Around petal fall, the weather turned cold and wet – perfect conditions for lacy scab development. Scab is not a disease. It is scar tissue formed after imperfect fruit skin development associated with wet and cool weather around petal fall. Even though scab is not a disease, two fungicides registered for prunes, captan and chlorothalonil (marketed as Bravo or Echo), can reduce the level of scab on fruit when applied at petal fall. UC research in the 1998 crop year showed that scab alone did not result in substandard grade for a fruit lot. Call me (Franz at 822-7515) for a “how to” handout for evaluating potential off grade in your fruit due to scab.

### **SSMALL FFRUIT SSIZE:**

**Background:** Prune fruit grows in two steps.

Step One: Cell Division. Occurs from bloom to reference date (late April -- early May).

Step Two: Cell Expansion. Occurs from the end of cell division to fruit maturity. Most rapid period of cell expansion is from late June through July.

The bigger the fruit at the end of cell division, the bigger is its potential for growth and final size – much like the size of a balloon after it is filled with air depends on it's size before its inflated. All the water and potassium and sunlight there is won't make a big fruit at harvest out of one that is relatively small when fruit expansion starts.

*So, here's what may have happened...*

The unusually cool and wet April and early May of 2003 meant that prune trees were probably under very little stress during a time when stress (heat or water stress or ?) produces natural fruit drop. So, flowers that were pollinated and fertilized stayed on the trees as fruit and made a big crop. A large crop means that many fruit compete for the energy produced by leaves, resulting in smaller fruit and lower sugars at harvest. Put another way, the tree has many mouths to feed (fruit) with only a certain amount of food makers (leaves), there is less food for each fruit, and small fruit are the result. The large crop size most probably played a major role in the large crop and low sugars generally in the 2003 crop.

Another factor that might have played a role in small dried fruit size this year was the cool temperatures in April and early May -- when the fruit size potential is set. Leaf energy production (photosynthesis) is limited by cool temperatures. It is possible that not only was there a large crop reduce the available energy to fuel individual fruit growth, but that energy “pot” per tree that was available for fruit growth might have been reduced by the cool temperatures early in the season.

Also, too much heat can affect fruit growth and sugar levels later in the season. Energy for fruit growth (net photosynthesis) is reduced when temperatures are very hot. The consistently hot weather of late July may have reduced energy production by leaves and so reduced the sugar levels in fruit at harvest.

Finally, conditions the previous fall, when fruit buds were growing and getting ready for bloom in March 2003 may have affected fruit size potential in the 2003 crop. The fall of 2002 was very dry, and some growers elected to not irrigate after harvest for economic reasons. UC research shows that cropload the next year is not affected by lack of water postharvest, but bud size can be reduced when no irrigation is applied after harvest. The fall of 2002 was very dry, so, it is possible that severe postharvest water stress during the time may have affected fruit size (but probably not yield) in 2003. This is an interesting theory, but I have no proof that this is what happened.

While not related to weather conditions, nitrogen and potassium deficiency also can reduce the final prune fruit size. However, good potassium and nitrogen nutrition can't overcome the effects of heavy cropload and poor weather conditions. Keeping adequate nitrogen and potassium in prune trees avoids smaller fruit than would otherwise be possible to grow under the cropland, weather, and management conditions in a block.

**F****RUIT BROWN ROT:** 2003 was a “fruit brown rot year”. Why? Three things are needed for disease infection – the “right” weather conditions, a susceptible target (the crop), and disease spores. All those factors converged in some orchards in 2003 in Yuba and Sutter Counties.

Research by Dr. Themis Michailides and his lab group at UC Kearney Ag Research Station have shown that prune fruit is most susceptible to brown rot infection before pit hardening. This occurs between late April and early May, depending on the year. Infections that occur at this early timing lay dormant until wet weather later in the season triggers further growth. These are called ‘latent’ infections. Dr. Michailides and lab also have learned that the second-most sensitive timing for fruit brown rot infection is just before harvest. Wet weather occurred at both of those timings this year. The longer the fruit is wet and the higher the disease spore levels in an orchard, the higher the risk of infection.

How could growers have controlled brown rot this year? There are several steps that can be taken to reduce the risk of brown rot infection.

Pruning and orchard sanitation are the first steps in a brown rot control program. The worst cases of fruit brown rot I saw this year were in unpruned orchards. The longer the fruit remains wet after a rain, the higher the risk of brown rot infection. A good pruning job opens the tree canopy, increases air movement around fruit, and shortens drying time after a rain. Pruners should also remove any fruit “mummies” from trees, which reduces spore load in the tree canopy the following season.

Effective fungicides for brown rot control are available, but brown rot chemical control is a gamble. For good disease control, all fungicides effective for brown rot (labeled for prunes) must be applied before, not after, infection. These materials prevent infection from starting, but can't stop an infection once it is started. This means that brown rot fungicides are sprayed on the CHANCE that an infection period will occur, not with any

solid knowledge of the need to spray. Fungicides protect flowers or fruit for 7-10 days, so repeat applications are needed if wet weather continues when flowers or fruit are sensitive to infection. Multiple brown rot fungicides could have been applied in 2003 to protect flowers and fruit based on weather conditions.

**APHIDS:** Growers who skipped a dormant spray this year most probably had leaf curl aphid damage early and/or mealy plum aphids build up in May. The early warm weather at harvest pushed the leaf curl aphids out early, while the cool weather that followed suppressed the mealy plum aphids until the May heat boosted their populations. Many in-season aphid sprays were applied in mid-to-late May this year, later than usual due to the cool weather in April and early May.

As of today, a carefully applied dormant spray (calibrated sprayer, good coverage, etc.) using a reduced rate of pesticide is the most cost effective way to control aphids without the need for in-season sprays.

Reduced dormant insecticide rates that control APHIDS may not provide good control of scale and/or peach twig borer. However, scale and peach twig borer may not be a problem in many area orchards. Monitoring dormant spurs will show if there is a need to spray for scale. Training for this scouting practice will be offered at the field meetings in November. More information on those meetings is provided later in this newsletter.

Oil in bloom sprays (3 gallons of oil per 100 gallons of water per acre at green bud and full bloom) looks promising as an alternative to a dormant insecticide. This treatment was tried by some growers last year, and will be evaluated again in the coming spring by UC farm advisors. [**Note:** Captain and chlorothalonil should not be tank-mixed with oil.]

**Mites:** Mite populations can increase very quickly in hot weather, and it was consistently hot in late July. One grower I talked with had trees defoliate due to mites just before harvest. He told me that his trees looked good until August 1, but then the leaves came off. He held off on an early August miticide because of worries about preharvest intervals, miticide cost, and actual impact of defoliation at that time.

*What can be done to control mites?*

A good dormant spray is **not** the answer. A dormant spray does not control web-spinning mites. These pests overwinter as female adults in cracks on the trunk and/or in the groundcover at the base of trees. (European red mites overwinter as eggs on spurs, and can be controlled by a dormant oil application. However, red mites are not usually the mites that defoliate trees.)

UC recommends that growers, their employees, or PCA monitor trees for mites starting on June 1, and applied an oil spray (4 gallons in 100 gallons of water per acre) or a modest rate of miticide when mites started to build. The timing depends on pest and beneficial mite counts. Details of this strategy are available in the UC IPFP Binder available for \$30 at the UCCE offices in Yuba City.

Which is better, oil or miticide? Both have their advantages and disadvantages. Oil is relatively inexpensive, easy to use, helps control scale and aphids, and leaves no residue that could be a marketing problem. The downside to oil is that it is a management tool, not a potential clean-up material, and shouldn't be sprayed in hot weather (over 90 degrees). Oil only suppresses mites for about two weeks. A miticide, properly applied under the right conditions, should shut the door on mite problems for the year – for a price. [**Note:** Potassium nitrate also helps suppress mites, but it only works on adults and may actually help “flare” mites if applied only once.

Growers who follow a multiple spray potassium nitrate program may not see this jump in mite numbers, as they are continually controlling the adults as long as they are putting on the potassium nitrate.]

With 20/20 hindsight, this season a grower with mite defoliation beginning late in the season before harvest, and with cool weather in the forecast (as in the first half of August, 2003), might have used 4 gallons of narrow range oil per acre (at 100 gallons of water per acre) to hold off the mites long enough to get the crop off without preharvest defoliation.

### **FIELD MEETINGS FOCUS ON SAVING MONEY IN DORMANT SPRAYS**

A series of UCCE field meetings in the second week of November will focus on money saving practices in orchard pest management. There will be a discussion and demonstration on how to calibrate an orchard air-blast sprayer. In addition, experienced growers and I will show growers and their employees how to identify dormant season orchard pests, and demonstrate how to count these pests in a block. This information will be of value to all tree fruit growers. Finally, there will be a discussion regarding options for dormant spray programs in prune orchards. This information may also be of interest to other orchard crop growers. Growers are encouraged to attend and to bring their employee(s) to this meeting. Please bring a hand lens for pest ID, and spur samples from your orchard. Extra hand lenses will be available for use during the class. Please call me (822-7515) for further information on equipment and how to cut spurs to view during the class. 2 hours of "other" CE credit have been approved for each meeting.

### **UCCE WINTER FIELD MEETINGS YUBA/SUTTER COUNTIES - NOVEMBER 10-14, 2003**

DAY OF WEEK	DATE	TIME	HOST	AREA	LOCATION
Monday	Nov. 10	9-11 AM	David Crane	Live Oak	11565 N. Township Road
Wednesday	Nov. 12	9-11 AM	Khan Ahmed Khan	District 10	414 Silva Ave.
Wednesday	Nov. 12	1-3 PM	Danna & Danna, Inc.	Southern Yuba County	Murphy Road, west of Feather River Blvd.
Thursday	Nov. 13	1-3 PM	Bains Brothers Farming	North Yuba City	1970 N. Township Road
Friday	Nov. 14	9-11 AM	Neill Mitchell	Tudor	365 Wilson Road

### **TRAINING TO HELP AVOID PESTICIDE DRIFT AND LEACHING**

Many growers have received training on how to avoid orchard spray drift and/or leaching, but how many of their employees or family members who apply pesticides have received similar training? On Wednesday, November 19 there will be a 4-hour training program to teach orchard sprayer applicators and/or their supervisors how to control pesticide drift and leaching. The program will be taught through demonstration and discussion by local agriculture community members and farm advisors with supervision and support by UC IPM Statewide Pesticide training staff. There will be two sessions of four hours each, with one session taught in English, and the other taught in Punjabi. The program will cost \$25 per person, with a single \$35 cost for two people from the same farming operation. This pair of individuals could be a supervisor and employee, a father and a son, two brothers, etc. Four hours of CE credit – one for rules and regulations plus three of "other" has been approved for each session. A sign up sheet is included in this newsletter.

## **SMALL FARM/DIRECT MARKETING CONFERENCE SCHOLARSHIPS AVAILABLE**

In early February 2004, the North American Farmers' Direct Marketing Association and the California Small Farm Conference will hold a joint annual conference in Sacramento. Workshops, a trade show, featured speakers, and bus tours will all be part of this interesting program. See more information on the internet at: <http://www.nafdma.com/Conference/Sacramento/>

Registration scholarships are available, and applications can be obtained by contacting me (Franz) at the UCCE office in Yuba City at 822-7515.

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FRANZ NIEDERHOLZER, U.C. FARM ADVISOR

