



tree and vine notes

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WHY WERE FRUIT SMALL IN 1997?

R. Scott Johnson

UC Cooperative Extension

Many fruit growers reported problems with fruit size this past year. Since it was such a widespread phenomenon, it raises the question of whether certain climatic conditions during the growing season

lead to reduced fruit growth. Using industry wide data for O'Henry peaches collected by the California Tree Fruit Agreement, we looked at a couple of weather variables over the last 14 years. Of particular interest were hours of winter chilling and springtime temperatures.

Hours of temperatures below 45°F during the winter of 96-97 were only 827 at the Kearney Ag Center in Parlier. This is considerably lower than normal and has led some to speculate that lack of winter chilling may have contributed to smaller fruit. However, over the last 14 years the data shows no correlation between O'Henry fruit size and winter chilling. In fact, there is a tendency for fruit to be larger after low chilling hours. Springtime temperatures, on the other hand, show some significant correlations.

It has been well established that temperatures after bloom affect the time of fruit maturity. Several researchers 40 to 50 years ago developed relationships between temperatures for 30 to 50 days after bloom and harvest dates. Our O'Henry data confirmed this relationship, showing that for every degree warmer than normal there is about 2 days advancement in maturity. The spring of 1997 was very warm with maximum temperatures averaging 77°F for 60 days after bloom. As a result, we had one of the earliest harvests on record. There were only 143 days from bloom to harvest which contrasts with 169 days in 1991 when spring temperatures averaged 66°F. That means the fruit were hanging on the tree for 26 days less in 1997 than they were in 1991.

It seems logical to assume that with less time on the tree, fruit would not be able to grow as large. Again, our O'Henry data from the last 14 years tends to support this conclusion. For example, in 1991 fruit size was excellent but in 1997 it was poor. Some years do not fit the relationship as well but 40 percent of the variation in fruit size can be accounted for by this one variable. The other 60 percent of the variation in fruit size is probably due to a combination of many factors. We did not correlate other weather parameters but it is possible that such things as hot temperatures during harvest, rapid changes in temperature and number of rainy days could affect fruit growth. Other biological factors such as initial fruit load, drought, ozone pollution and mite outbreaks could also influence final fruit size in the whole region.

We can not do much about the weather but it might at least give us some clues about how to manage our fruit tree. If we get another warm spring like 1997 (global warming scientists predict we will have many) then harvest will be early and there is a good chance fruit will be smaller. In such years it will be especially important to thin early and thin a little harder than normal to make up for the loss of fruit size.

TIME TO PUT UP SCALE TRAPS

Hendricks

March 1 is a good time to put out some pheromone traps for San Jose scale (SJS) males. Many almond growers in this area have not used dormant sprays for years, and have not suffered scale outbreaks. In this area we have good parasitism of San Jose scale, and it is often not a problem if its natural parasites are preserved.

But how do you know if not spraying is safe? Use scale traps! Monitor!

First, pheromone traps will tell you if scale is in your orchard. The SJS males begin to fly and search for mates in early March, and the bulk of the flight is in March. The males are very tiny yellow insects with a single black stripe across the back. Next, the catches will give you an idea of the population size; whether it is very light or heavy. Two or three traps in a 20 to 40 acre orchard will give you an indication of the scale situation in the orchard.

Most importantly- the **scale parasites** are also attracted to this pheromone trap. If you find tiny wasps that look all black, this is *Prospaltella*, the most common SJS parasite in this area. Often, 5 to 10 times more *Prospaltella* than SJS males are trapped. This means that the scale is moderately to highly parasitized, and that the populations are balanced. This is a good indication that dormant scale treatments are not necessary. If you see another tiny wasp that is all yellow, this is *Aphytis* which is another parasite, usually not found in high numbers. Many flies and other large insects will get stuck in the traps, but just ignore these. →

By good monitoring you will be able to know whether it is safe to eliminate dormant sprays. You will also be able to see the effects that other treatments have on your parasites, and you can learn to select treatments that are least disruptive. If you have any problem with identification of the insects on your traps, see me or Everett Younce in our office.

CONTROLLING GROUND SQUIRRELS WITH BURROW FUMIGANTS

Desley Whisson, Extension Vertebrate Pest Specialist
University of California

With the onset of spring, ground squirrels emerge from their winter hibernation. Soon after, they begin to breed, and before you know it you have a squirrel problem on your hands.

The most cost-effective management strategy for ground squirrels is to control them before they have a chance to reproduce. Every female killed early in the season means about 8 fewer young to remove later if the control is delayed until young are active above ground.

In early spring, fumigating burrows is one of the most effective means of control. Fumigants work best at this time of year because soil moisture is relatively high, helping to retain a high concentration of the lethal gases in the burrow system. Do not fumigate while squirrels are still hibernating because the squirrel plugs its burrow with soil, preventing fumes from reaching the nest chamber. The plug cannot be seen by examining the burrow entrance.

You have 3 choices when it comes to fumigants:

(i) *Gas cartridges:*

Gas cartridges are cylinders of combustible ingredients with a fuse. When ignited, they emit smoke and toxic gases. The cartridge is placed in the burrow entrance, the fuse lit, and the cartridge pushed well back into the burrow with a shovel handle. The opening is then sealed off with sod or soil and tamped lightly.

(ii) *Aluminum phosphide:*

Aluminum phosphide tablets or pellets react with atmospheric and soil moisture to produce phosphine gas which is lethal to all mammals. The label recommended number of tablets are placed in the burrow entrance. Crumpled newspaper is placed in the opening to prevent soil from covering the tablets and the entrance filled with sod or soil which is tamped firmly. Aluminum phosphide is a restricted use material and should be handled accordingly.

(iii) *Acrolein* (Magnacide "H"):

Acrolein is an aquatic herbicide which has vapors that, in high concentration are quite toxic to mammals. This volatile liquid is applied to the burrow system through a hose with a specially constructed wand calibrated to deliver a precise dose. The burrow entrances are then sealed with sod or soil. Acrolein is a restricted use material that can only be used by licensed Pest Control Operators.

With all fumigants it is necessary to examine the treated area about 3 days following the application to determine if any survivors have dug out. All opened holes should be retreated and sealed.

One way to conserve fumigants is to first fill in all of the burrow entrances with sod or soil. After about 3 days, squirrels will reopen their burrow systems. Fumigants need only be applied to active burrows.

As with any pesticide, it is important to read and follow label instructions with particular regard for safety factors and nontarget species. Gas cartridges have the potential to produce flames so should not be used where a significant fire hazard exists such as near buildings, dry grass, or other flammable materials. To avoid the accumulation of fumes in enclosed areas, never fumigate beneath buildings or in burrows that may open under occupied buildings.

Be aware of the signs of nontarget species such as kit foxes or burrowing owls inhabiting abandoned ground squirrel burrows. Do not treat a burrow if you suspect a nontarget animal is present. County agricultural commissioners can provide additional information on how to recognize active ground squirrel burrows.

Further information on ground squirrel control may be obtained from County Extension offices, County Agricultural Commissioners, or Desley Whisson [Ph: (530) 754-8644].

DEAD-ARM DISEASES

Roger Duncan

Dead-arm diseases are probably the single largest cause of vineyard decline in our area. "Dead-arm" is a general term for two diseases that kill arms and cordons of grapes. The most recognized dead-arm disease is Eutypa die-back. Another disease called "Bot canker" essentially does the same thing as Eutypa and is managed the same way. One would be very hard pressed to walk through any older vineyard in California and not find vines affected with one or both of these "dead arm" diseases.

Eutypa is more common in the cooler growing areas while bot canker dominates in the hotter growing areas (south of Madera County). In Stanislaus County, we are unlucky enough to have both diseases. The symptoms of both diseases appear first in one or two spurs on a vine and slowly spread to adjacent spurs killing the arm, then the cordon, and eventually the whole vine. It is common to find one side of a vine dead while the other looks perfectly healthy.

The leaf and shoot symptoms of Eutypa dieback are most easily seen in the spring. Shoots growing from affected arms are severely stunted often with very small, tattered, misshapen, chlorotic leaves. Many times the flowers will fall off of these affected shoots. These symptoms are difficult to see later in the season after they become buried under the foliage of nearby healthy canes. In the early stages, "wedge-shaped", darkened cankers coming to a point at the center of diseased cordons are visible when cut in cross-section. The cankers will continue to grow around the cordon, eventually killing it completely. Close inspection will usually reveal that the canker originated from an old pruning wound. There are no foliar symptoms with bot canker but the wedge-shaped cankers are indistinguishable from Eutypa dieback.

The cause of Eutypa dieback is a fungus called *Eutypa lata*. Bot canker is caused by a fungus called *Botryodiplodia theobromae*. Both fungi are wound parasites. Virtually the only way they can gain access into a grape vine is through pruning wounds. Eutypa is a very slow growing fungus and it may take several years after infection before symptoms are noticed. In fact, dead arm diseases are not usually noticed in vineyards than 10 years even though infection has occurred long before then.

The diseases are introduced into a vineyard when spores are blown in during the winter. Eutypa spores can come from vineyards, apricots, or cherry trees from as far away as the San Francisco Bay area. Spores of both fungi are discharged from old cankered wood during a rain.

Wind-driven rain can then disperse the spores onto relatively fresh pruning wounds where they will infect the vine.

Management of dead-arm diseases. The first thing to do is to remove infected wood of grape, apricot, cherry, or other hosts in the vicinity. This will reduce the amount of inoculum present in your area. However, this will have only a limited effect because the spores can travel for many miles in the winter air currents.

Prune after a rain storm and as late in the season as possible. After a storm, the Eutypa spore load in the air is at its lowest. Therefore one of the best times to prune is shortly after a rain. However, it is best to wait until a spring rain because the largest percentage of Eutypa spores are released during the first rains of the season. Also, pruning wounds heal much more quickly in spring than they do in winter. **Research has shown that pruning wounds on vines pruned early in winter can be susceptible to Eutypa infection for 4-5 weeks. Pruning wounds on vines pruned in February may only be susceptible for 10-14 days.** Large cuts are more prone to infection because chances are greater that a spore may land on the larger surface area. In addition, large cuts take much longer to heal. Hand painting or spraying with a fungicide such as benomyl can protect fresh pruning wounds from infection.

Growers should walk their vineyards in late spring to monitor for Eutypa and bot canker symptoms. If an infection area is discovered, the canker should be removed. Cuts need to be made all the way back to healthy wood. Because the fungi grow so slowly, there is no need to cut far advance of the canker. If no dark cankered area is visible in the cut, then the disease has been eliminated from the vine.

Even the most vigilant program will not likely eliminate the disease from a vineyard. Annual inspections should be made to maintain older vineyards. When a cordon is removed, a sucker from the trunk can be tied to the wire to establish a new cordon.

THE SYRAH VARIETY

If you are thinking of planting a new vineyard you may want to consider the variety "Syrah". It has been widely planted in Australia and is catching on in California. This variety is adapted to our warm San Joaquin Valley growing conditions.

When supply of wine grapes begins to catch up with demand, San Joaquin Valley growers will likely feel the squeeze first as wineries select North Coast and Central Coast grapes over ours. However, high quality wine can be made from Syrah even when grown in very warm climates. In variety trials at the UC Kearney Ag Center in Parlier, this variety has produced well and has been a relatively easy grape to grow with loose clusters, tough skin, and uniform color. Syrah is pretty vigorous though and should be planted on a de-vigorating rootstock.

ANTHRACNOSE A THREAT TO ALMONDS IN 1998

Hendricks

You may be tired of **hearing** about anthracnose, but you **sure don't want to see it** in your almonds this year. Anthracnose was widespread in '95 and '96, but it almost disappeared in '97 with our dry spring weather. With El Nino rains hitting us hard as I write this, the threat looks more likely again this spring.

Anthracnose infects blossoms, nuts, leaves, and stems. It usually kills small nuts about 2 to 3 weeks after petal fall and then infects and kills spurs and small branches. The infected and dead nuts have characteristic orangish-brown fungus spores in the lesions on the surface of the nuts. It is sometimes possible to see the orange spores in the kernel itself.

Infections in young nuts rarely exude gum, but half-grown and larger nuts gum profusely, and clusters of nuts can be glued together. Infected leaves show a marginal and blotchy necrosis. Wood 1" in diameter and sometimes even larger can be killed by anthracnose. The fungus over winters in the shrunken nuts and in the dead wood. After harvest, very gummy, shrunken nuts are easy to find tightly sticking to branches of the very susceptible varieties such as Merced.

Dr. Jim Adaskaveg at UC Riverside has tested a number of fungicides for use to control anthracnose. Our older, standard fungicide programs are not able to control this disease very well, but fortunately we have some new fungicides coming along which do a better job.

On January 5, 1998, the US Environmental Protection Agency issued a Section 18, specific exemption, that permits almond growers to use Break EC (propiconazole) to control anthracnose. The Section 18 allows for 94,000 acres of almonds within specified counties to be sprayed with this fungicide. You must get a recommendation from your pest control adviser before you can get a permit to use propiconazole.

FINAL CHILL HOURS

The final chill hours $\leq 45F$ for the period 11-1-97 to 2-15-98 near Livingston is 850.

We had some very warm periods this winter which may have cancelled out some of the chilling effects. We may or may not see some symptoms of low chilling this year. Below are the totals for the prior four years:

Year Ending Hours

1997 922

1996 600

1995 1044

1994 1397

Special thanks to Stan Fidel who has been collecting temperature data for us for several years now. We appreciate his commitment.

IPM UPDATE BREAKFASTS

(Norton & Hendricks)

Below is a schedule of the 1998 IPM Update breakfasts which are held the first and third Wednesdays, 7:00 AM at the Pine Cone Bar and Grill in Merced. ***There is no charge and continuing education credit will be offered.*** Our first meeting will focus on spring diseases in tree crops. Dr. Beth Teviotdale will be present to help answer questions.

4, 18 March

1, 15 April

6, 20 May

3, 17 June

1, 15 July

All interested persons welcome – especially growers!

Handicapped accessible.

STORMY WEB SITES

Disaster assistance and flood damage information:

<http://www.ucce-north.ucdavis.edu/docs/disaster/disaster.htm>

<http://www.engr.ucdavis.edu/~bae/FarmSafety/FARMSAF.HTML>

<http://www.ca.gov/s/disaster>

Stream flow and reservoir levels:

<http://cdec.water.ca.gov/>

<http://www.spk-wc.usace.army.mil/>

Flash flood warnings for California

<http://iwin.nws.noaa.gov/iwin/ca/flashflood.html>

Hourly weather observations

<http://iwin.nws.noaa.gov/iwin/ca/flashflood.html>

More web info: Merced County web page – click on local road conditions & flood info <http://www.co.merced.ca.us/> Naval Research Lab satellite images of water vapor and storm formation over the Pacific: <http://www.nrlmry.navy.mil/sat-bin/www.cgi> National Weather Service for San Joaquin Valley <http://nimbo.wrh.noaa.gov/Hanford/> Storm radar image loop for the SJV <http://www.intellicast.com/weather/fat/radarloop/> Yearly rainfall totals for Turlock <http://tid.org/rainfall.htm>

TRI-COUNTY EXTENSION APPLE MEETING

Friday 13 March 1998

Merced County Agriculture Center
Corner of Grogan & Wardrobe
(Just north of the Merced Airport)

8:30 AM Coffee & Registration

9:00 to 11:30 Program:

Using the plant growth regulator Apogee to control vigorous growth.

Kathy Kelley & Maxwell Norton, UC Cooperative Extension

Using Success as a biological control for codling moth.

Maxwell Norton, UC Cooperative Extension

Biological control of Fire blight

Steve Lindow, U C Berkeley

Apple thinning research in Fuji and Gala

Brent Holtz, UC Cooperative Extension

Continuing education credit
Handicapped accessible
No admission fee

SAN JOAQUIN VALLEY STRAWBERRY EXTENSION MEETINGS

Tuesday 24 February 1998
9AM to Noon - Fresno Cooperative Extension Office
1720 South Maple, Fresno
1:30 to 4:30 - Merced Cooperative Extension Office
Corner of Wardrobe and Grogan, Merced

New Variety Testing

Maxwell Norton & Richard Molinar, Farm Advisors

Methyl Bromide alternatives and Solarization

Maxwell Norton & Richard Molinar

Fertilizing More Efficiently

Benny Fouche, Farm Advisor

Nitrogen Quick Test

Richard Molinar, Farm Advisor

Beneficial Insects & Mites

Richard Coviello, Farm Advisor

No admission charge
Translation will be available
1.5 hours PCA Credit
Handicap accessible

UPCOMING MEETINGS AND IMPORTANT INFORMATION
FREE PESTICIDE TRAINING AVAILABLE

The Central Valley Opportunity Center offers free EPA certified pesticide training in English and Spanish through an Americorps Grant. For more information contact Maria Martinez at 383-2859.

SOUTHERN SAN JOAQUIN VALLEY PRUNE DAY

February 26, 1998
Agricultural Building Auditorium
Visalia, California
7:00 - Noon
**For more information call (209) 385-7403 OR
(209) 733-6363**

**MODESTO SOIL FERTILITY & PEST MANAGEMENT
CONFERENCE**

March 6th & 7th, 1998
Modesto Junion College
Science Building 213, Modesto
PCA/DPR units applied for
Preregistration fees **\$55 per day or \$90 for both days**
Register by phone to: (408) 763-2111

TRI-COUNTY NUT MEETING

Wednesday, March 18, 1998
Turlock Fairgrounds
Sponsored by NUT GROWER magazine with the educational program for Almonds and Walnuts by the University of California Cooperative Extension Service

CENTRAL VALLEY APPLE SYMPOSIUM

Sponsored by
Cooperative Extension & Mid-Valley Apple Association
March 10
Stockton Inn, Hwy 99 & Waterloo Road, Stockton
8:00 Registration 8:30-1:00 Program
[Agenda and Information](#)
Lunch is \$7.00 for MVAA members and \$12.00 for non members.
Send reservations by Feb 27 to: MVAA, 6001 Maze Blvd, Modesto 95358

AG TECH '98

UC DAVIS

Thursday June 25, 1998, 7:30 am - 3 pm

AG TECH '98 will feature Equipment Demonstrations, Laboratory Tours, Field Presentations, Grower Panels and an Ag Fair.

Information is available at our office or on the internet at

<http://agronomy.ucdavis.edu/safs/agtech.htm>.

Farm Advisors

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