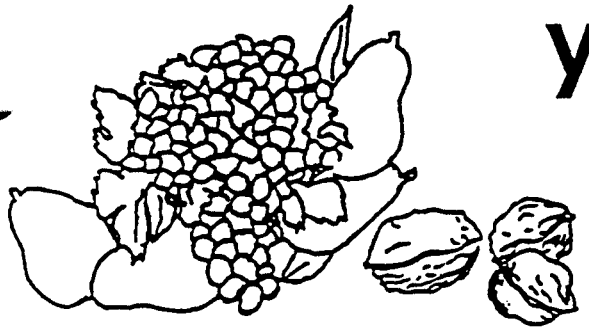

# your *Lake County* HORTICULTURAL NOTES

APRIL 1995

! ! ! MARK CALENDARS ! ! !
(contact us)

**April 6** Recent Advances in Viticulture and Enology
UC Davis

**APRIL 24** **1995 LAKE COUNTY WALNUT UPDATE**
Lower Lake High School
9430 Lake Street, Lower Lake
(agenda on blue page)

## *FRUIT SET IN BARTLETT PEARS - POLLINATION VS. PARTHENOCARPY*

Inclement weather during bloom has once again sparked the usual discussion about the nature of fruit set in Bartlett pear. In the August 1993 issue of ***Hort Notes***, there was a detailed article outlining the likely reasons fruit set was so poor that year. The main reason given was that maximum temperatures through bloom were below 60° F and thus below the threshold needed to stimulate **parthenocarpic** set.

It is well documented that Bartlett pears in California set fruit via *vegetative parthenocarpy*, that is *without pollination **or** fertilization*. U.C. Davis researchers Griggs and Iwakiri described this phenomena in 1954. After a five year study, they determined that **in California**, Bartlett pear is self-fertile, **not** because it pollenizes itself, but because fruit growth occurs **without** benefit of **any** type of pollen. They concluded that temperature during bloom was the stimulant. In further explaining the phenomena, other researchers have hypothesized that under the right temperature conditions, gibberelic acid (GA), which is produced in seeds, may also be produced in the pericarp (or fleshy tissue surrounding the seeds, i.e. the pear fruit) at high enough levels to induce and maintain set.

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Although environmentally-influenced, the tendency toward parthenocarpy is genetic. Among widely-grown pear varieties, Bosc, Clapp's Favorite and Bartlett are listed in one source as being "variably parthenocarpic", while Passe Crassane is "consistently parthenocarpic". Parthenocarpic Bartlett is limited to California and thus can be grown in solid blocks, unlike the Northwest and Eastern U.S. where it is interplanted with pollinizer varieties and pollinated with bees.

Of course, many growers have stories of improved set using bees during cold, rainy years. This is probably because bee pollination activity will continue down to 55° F, 5° F below the parthenocarpic set threshold. However, it is important to once again note that pears require **both** bee activity **and** a compatible pollenizer, e.g. Bosc or Winter Nelis in the case of Bartlett. This is because pears are self-sterile; that is one variety must have pollen from a different, compatible variety. Thus, where bees are effective, there is some source of cross-pollen, even if its just a few non-grafted rootstocks or scattered trees of another variety.

Finally, it is easy to confuse the effects of rain versus temperature on crop set. Rain in and of itself is unlikely to reduce set. However, in temperate California, rainy periods are usually accompanied by cold temperature. Rain **does** affect crop quality, especially russet.

So, what are the "rules" of parthenocarpic set? Although statements vary somewhat, the consensus is that for about a 10 day period encompassing the main bloom, there must be 60° F maximum temperatures for 3 days or more (72 hours), or, more ideally, greater than 60° F for 2 days (48-50 hours) or 70° F for 1 day. One source states that over 150 hours of over 60° F will set a bumper crop.

According to reknowned local pear grower Ross Benson, full bloom in Big Valley was March 20 (the last day of winter). Lake County growers should be encouraged that most orchards were from 40-60% (or more) bloomed the week of March 13. Parthenocarpic set conditions were ideal and, if frost and hail conditions remain "reasonable", there is a good chance there will be a decent "start-up" crop.

To be even more optimistic, Ross recalls that one year with similar weather as 1995, a warm spell following the rains and full bloom was enough to set a reasonable crop. Although there is no research (that I know of) documenting how much after-the-fact effect is gained from warmth immediately **after** bloom, if the GA theory is correct, then possibly enough GA was built up during good weather the week of March 13 to "restart" the process if weather warms after the storms that hit March 20. We shall see.

After bloom, of course, the post-bloom period of 40-50 days must be warm enough to allow for adequate cell division. At this writing (March 20), the weather outlook is still uncertain.

May ***Hort Notes*** will include a chart comparing Lake and Mendocino temperatures through and immediately after bloom.

**References on parthenocarpy and pollination:**

Briggs, W. H. and Ben T. Iwakiri. Pollination and Parthenocarpy in the Production of Bartlett Pears in California. 1954. *Hilgardia*, 22(19). Univ. of California.

Dadant and Sons. 1975. *The Hive and the Honey Bee.* Dadant and Sons, IL

Faust, Miklos. 1989. *Physiology of Temperate Zone Fruit Trees.* John Wiley and Sons, NY.

McGregor, S.E. 1976. Insect Pollination of Cultivated Crop Plants. USDA/ARS Handbook #496.

Stebbins, R.L., W.M. Mellenthin and P.B. Lombard. 1981. Pollination and Commercial Varieties of Pear in Oregon. OSU-CE Circular #986.

Westwood, M.N. 1993. *Temperate Zone Pomology; Physiology and Culture.* Timber Press, OR.

## *NEW LAKE COUNTY PEAR COST STUDY*

Finally! After **many** years, the 1994 UC Cooperative Extension *Sample Costs to Establish a Pear Orchard and Produce Pears; Green Bartlett and Sprinkler Irrigated in Lake County* (whew!) is off the presses. The study was done with the able assistance of many cooperators and is the most up-to-date cost study for pears in California. It is 22 pages long and **full** of information.

Overall, assuming 20 tons per acre with (a generous) 50% packout, 40% processed and 10% off-grade, total cash costs per ton **minus packing costs** are $168/ton or $3,360/acre. This includes operating and cash overhead costs. Costs **including packing** are $327/ton or $6,535/acre. (Interesting, these costs - minus packing - are comparable to irrigated apples in Sonoma County, based on 30T/acre.)

The most apparent bottom-line conclusion will be disheartening, but unsurprising, to many of you. While costs have continued to increase, gross returns paid for all uses of fruit - fresh, processed and off-grade - have flattened or decreased relative to costs. To avoid reducing quality, growers are thus forced to rely on increased tons per acre to cover costs and maintain margins. The study shows that **under the assumptions outlined**, at 20 tons per acre with a generous 50% packout, there is a positive net return **if** gross prices are $550 fresh, $225 processed and $70 off-grade. At the gross prices received in recent years (**not** counting 1994), 22 tons/acre were required for a positive net return.

Of course, all of you operate under varying economic and production conditions. This study is a composite of the committee of growers, bankers and other industry experts, as well as coordinating UC staff. Also, UC cost studies tend to be conservative! For these reasons, as in all UC cost studies, a YOUR COST column is included.

The study is available at our office. After reading it, we are very interested in your comments so improvements (if needed) can be made in future editions.

***UNIVERSITY EXTENSION OFFERS RHONE VARIETAL CLASS***

contact UNEX at 1-800-752-0881

A combined lecture/tasting class will introduce students to the Rhone Valley (France) winegrape varietals Marsanne, Rousanne and Syrah.

The class will be held Saturday, May 13, 9:00 a.m. to 4:30 p.m. at the University Club at UC Davis. The fee is $165, including lunch and wines. YOU MUST ENROLL BY **MAY 5.**

These classes are very popular and fill rapidly, so early enrollment is advised.

***NEW COUNTY EROSION PUBLICATION*** (contact our office)

The Land and Water Resources Subcommittee of the Clear Lake Basin Resource Management Committee and the Lake County Flood Control and Water Conservation District recently released an informational leaflet on erosion control. Although it is aimed primarily at residential/commercial landowners, it is a good basic outline on control measures for various slopes/land adjacent to water bodies and when to seek professional advise. A list of relevent public agencies is included and there is a supplemental listing of engineers, landscape architects, contractors and suppliers that deal with erosion control situations.

***NEW UC IRRIGATION LEAFLETS***

Who knows when, or even if, irrigation will be needed this season. But contact us for the latest in the UC ***Drought Tips*** series:

⇒ Evapotranspiracion de Referencia Promedio para California #92-55
⇒ Furrow Irrigation #92-23
⇒ Leaching #92-16
⇒ Sprinkler Irrigation #92-25

*FARM SAFETY NEWSLETTER* (contact us for sample copies)

The UC Farm Safety Program exists to help promote safety and health in the workplace. Their newsletter, *Farm Safety*, is printed in both English and Spanish. It is published quarterly and is available from the Dept. of Biological and Agricultural Engineering, University of California, Davis, CA 95616, (916) 752-1613 / FAX 916-752-2640.

*APRIL CHECKLIST*

* **Tree and vine growth** will be slow as long as soil is saturated. Watch for poor growth and even death of young plants due to lack of oxygen.

* **Soil-borne diseases** such as Phytophthora and oak root fungus may be problematic this year. Susceptible young roots, saturated soil and warming temperatures are the perfect combination of conditions to trigger infection if pathogens are present.

* **Bacterial canker and blast** may show up after the extended rains, especially if accompanied by low temperatures. Watch for dieback of young trees or limbs and "papery bark" under pruning cuts.

* **Nitrogen fertilizer applications** are best applied during active growth periods. Quite a bit of nitrate leaching has probably occurred this winter. Use tree/vine vigor, canopy color and (supplemental) tissue analyses to determine N need. In pears, the light crop and heavy, prolonged soil moisture may induce vigorous vegetative growth once the soil warms and drains, thus reducing need for early N applications.

* **Iron and Zinc deficiency** symptoms often coincide in either excessively dry or wet years. As soil warms and dries, root growth is stimulated by higher soil temperatures and oxygen levels. Watch trees/vines carefully this spring to determine Fe and Zn needs.

* **Weed control** will be difficult unless there was a good fall and early winter program. Strive to keep young trees and vines as weed-free as feasible, especially during this time of saturated soils which may aggravate root and crown rot conditions.

* **Walnut blight** may be a problem **again** in 1995. Growers with a blight history may want to consider at least one copper spray to cover the pistillate bloom (page 6).

Sincerely,

Rachel

Rachel Elkins
Farm Advisor

# DISEASES

## WALNUT BLIGHT (4/94)

**Pathogen:** *Xanthomonas campestris p.v. juglandis*

**SYMPTOMS:** One to several black lesions may appear on catkins. Fruits develop black, slighty sunken lesions at the stigma end when young; more lesions will develop on the sides of fruit as it matures. Shoots develop black lesions and leaves show irregular lesions on blade. All leaflets of a leaf usually show signs of infection.

**COMMENTS ON THE DISEASE:** The bacteria that causes walnut blight survives on and in dormant buds and catkins, and also in twig lesions. Rain or prolonged sprinkler irrigation is important for spreading bacteria and aiding infection. Early leafing varieties are most severely affected, and the disease tends to be more severe in northern California.

**WHEN TO TREAT:** Control of this disease depends on the application of protective sprays on newly developing nuts to prevent infections. In orchards with histories of heavy infections and high overwintering bacterial populations, protective treatments at 7- to 10-day intervals must be applied during prolonged wet springs for adequate protection. In areas or years of less intensive rainfall, a 10- to 14-day schedule maintained until the rainy season is over is important.

The first application should be made no later than first pistillate bloom, followed by additional treatments made as discussed above. Walnuts are susceptible to blight infections well beyond the pistillate bloom period whenever free moisture occurs. Additional sprays are often necessary, but they must be applied before rain for maximum benefit. The total number of sprays required depends on the judgement of the grower based on disease history and climatic conditions. The success of alternate row spraying during early bloom and leafing depends upon the ability of the machinery to deliver sufficient copper material with good coverage to trees of both target rows.

**TREATMENT:**

| Pesticide (commercial name) | Amount to Use |
|---|---|
| A. BORDEAUX# | |
| 8-5-100 | Label rates |
| COMMENTS: Adding 0.5 gal summer oil emulsion can reduce phototoxicity. If 100 gal/acre or less are used, the Bordeaux mixture should include at least 16 lbs copper sulfate. The objective is to apply 4 lb metallic copper/acre/application. Four lb of copper sulfate contain 1 lb of metallic copper. | |
| B. FIXED COPPER# | |
| COMMENTS: Wettable powders with 50 percent metallic copper (Kocide 101, Champion, etc.) - rates equivalent to 4 lb metallic copper/acre are most effective. Dry flowable formulations with less than 50 percent metallic copper (Kocide D.F., etc.) or liquid formulations (Copper-Count N, Champ, etc.) - use label rates. | |

# Acceptable for use on organically grown produce.

# 1995 LAKE COUNTY WALNUT UPDATE

Monday, April 24, 1995
Lower Lake High School, Lower Lake

## PROGRAM

| | |
|---|---|
| 8:30 A.M. | **Registration and coffee** |
| 9:00 | **Welcome and Introduction**<br>Rachel Elkins, UCCE, Lake County |
| 9:10 | **Current Local Insect Problems**<br>Rachel Elkins |
| 9:30 | **Statewide Planting Trends**<br>Sam Keiper, Director Member Services<br>Diamond Walnut Growers, Inc. |
| 10:10 | **BREAK**<br>refreshments courtesy of the California Walnut Commission and the Walnut Marketing Board |
| 10:30 | **Walnut Research Overview**<br>Dave Ramos, Extension Horticulturist, UC Davis |
| 11:00 | **Disease Problems and Management**<br>Beth Teviotdale, Extension Plant Pathologist, Kearney Agricultural Center |
| 11:40 | **Walnut Marketing Update**<br>Dennis Ballint, Walnut Marketing Board |
| 12:15 | **ADJOURN** |

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