your *Lake County* HORTICULTURAL NOTES

AUGUST 1993

HAPPY HARVEST!

SOME THOUGHTS ON THE 1993 PEAR CROP

To say the least, (as of mid-July) 1993 will go on the books as a "light" year. Lake County tonnage is estimated at 15% to over 50% below 1992, depending on orchard. Fruit distribution within the canopy varies widely among orchards, within blocks and even among individual trees. Clusters appear "randomly" scattered throughout the canopy. Interestingly, bottom crop is heavier than in the tree tops in many cases, despite some apparent frost damage.

Growers have made many observations about the 1993 crop. Here are some factors which may help explain those observations. Besides growers and PCA's, UC research and extension personnel contributed valuable information and ideas.

Bloom And Fruit Set - TEMPERATURE immediately before, during and after bloom was probably the key factor. Bartlett (and theoretically Bosc) trees in California set parthenocarpically, that is, without pollination (thus are normally seedless). Although a "scientific enigma", parthenocarpy is closely associated with mild temperatures at bloom. It is commonly held that 60°F is the minimum needed to ensure set. More specifically, without pollination (which requires bees and pollenizers), one source states that a minimum of 3 consecutive days at 60°F maximum temperature or 2 days at 61-62°F or 1 day at 70°F is needed to set a full crop. Below is a summary of the three week period encompassing full bloom:

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Temperatures During Bloom
Kelseyville, Lake County 1993
* Full bloom 4/1/93

DATE	MAXIMUM TEMP.	Lakeport RAIN	WEATHER
March			
23	54	.32	cloudy
24	56	.59	p cloudy
25	56	-	p cloudy
26	57	-	cloudy
27	47	.14	rain
28	62	.12	fair
29	64	-	cloudy
30	67	-	p cloudy
31	57	trace	rain
April			
*1	52	.22	m cloudy
2	61	-	m cloudy
3	56	-	cloudy
4	54	.01	cloudy
5	58	-	p cloudy
6	59	trace	m cloudy
7	72	-	clear
8	54	.11	cloudy
9	56	-	m cloudy
10	56	.02	p cloudy
11	62	-	clear
12	68	-	p cloudy
13	66	-	fair
14	62	-	m cloudy

From the above, it appears that the reported minimum temperature requirements for full set were unmet. Clusters, trees, blocks or areas that bloomed before April 1 likely have better crops while those that bloomed between March 31 and April 6 likely fared the worst. April 7 and April 11-14 had fair to good set conditions, which may explain decent crops in some later orchards.

By comparison, Sacramento has a large crop. Full bloom was around March 19, with adequate temperatures before, during and after. The Mendocino crop is reportedly variable, reflecting a range of bloom dates from Hopland to Potter Valley.

While temperature probably played the major role, tree vigor, site conditions and cultural practices may have also enhanced or diminished set. Tree vigor is probably the main secondary factor. Growers have noted particularly light crops on very weak, very strong and young trees. In early season, shoot growth is favored over fruit development. Young shoots utilize stored carbohydrates before photosynthesis takes over. In a wet, cool, cloudy year, photosynthesis is delayed due to low light and

temperature and saturated soils which inhibit root growth. Shoots thus depend on stored reserves longer, potentially competing even more strongly with bloom and young fruit.

Marginal bloom conditions were exacerbated by any tree characteristic or condition favoring shoots over buds. This perhaps explains why young trees (e.g. interplants) and trees on vigorous rootstock (e.g. *Betulaefolia*) have less crop than older or less vigorous trees. Besides their stronger shoot growth, young age and good vigor tend to delay bloom. Also, these trees bear more fruit on terminals which often bloom later.

Likewise, marginal bloom and set conditions probably accentuated the handicap of buds already weakened by poor nutrition/water status, overcropping or shade. UC Davis Pomologist Dr. George Martin ventured that very weak trees with poor buds and shoots may indeed outperform a moderately vigorous tree with weak buds since on very weak trees, at least shoots would be weak competitors.

Site conditions mainly affect bloom date. Judging from the erratic crop pattern among and within orchards, it is difficult to be sure how important site conditions were this year. Earlier blooming blocks often set the best crops and largest fruit (if frost is avoided). Any condition promoting early bloom (before April 1) may have helped, e.g. proximity to lake, light soil, firm, bare orchard floor. As noted above however, some very late orchards also have better crops.

Cultural practices mainly applies to date of dormant oil application. Early dormant oil (pre-January) tends to hasten bloom while late applications delay it. Growers often time applications to achieve either early bloom and harvest or late bloom to avoid frost.

Fruit Size - Despite the light crop, fruit size (as of mid-July) is about normal. As with other fruits, ultimate size equals the number of cells X enlargement per cell. The final number of cells is determined during cell divison which occurs the first 40-50 days after bloom. UC Davis Pomologist Dr. Ted DeJong suggested that it is also possible that warmer orchard floors may have actually resulted in temperatures that were higher in the lower part of the tree than the upper parts, thereby allowing more set in the bottoms.

In a very cool spring, cell division is slow, thus limiting final size. Inherently small fruit must then complete with rapidly growing shoots. "Catch-up" is difficult, despite subsequent ideal weather and cultural management. With the warm weather and irrigations, however, fruit size is increasing nicely and will probably be fine by harvest.

Fruit Distribution - This is the most confounding aspect of the 1993 crop. Light set in the tops and among terminals may be due to a combination of later bloom and stronger shoot competition. As stated before, young trees tend to set more on terminals which is reflected in final crop distribution. However, why some clusters set fully while others completely shattered is a mystery - any reasonable explanation will be entertained!

In summary, it is likely that the size of the 1993 crop largely reflects unfavorable weather during bloom, with the main variability due to bloom date. Other important secondary factors include, among others, tree vigor, site conditions and date of dormant oil application.

For more detailed information on factors affecting pear fruit pollination, set and development, consult or contact me for a copy of **Fruit Set and Development**, chapter by UC Extension Specialist Jim Beutel (Emeritus) in Proceedings of the 1990 Pear Short Course.

PROPER INTERPRETATION OF GRAPE TISSUE ANALYSES

Each year, growers request help interpreting tissue analyses. In many cases, reported levels are accompanied by fertilizer recommendations. Following is a "checklist" to go through before any recommendations are accepted - and money spent.

1) **When were the samples taken?** Sampling time is perhaps the most important factor when interpreting reported values. BE SURE SAMPLES WERE TAKEN AT BLOOM IF RECOMMENDATIONS ARE BASED ON UC LEVELS, specifically, those given in Grapevine Nutrition and Fertilization in the San Joaquin Valley, Publication #4087, by Christensen et al (contact us for a copy). These are based on bloomtime samples to ensure uniformity among sites and varieties. Some reports, however, list August or September sample dates, which can lead to inappropriate interpretation and recommendations. For example, petiole potassium (K) levels decrease through the season as berries grow, so basing potassium applications on post-veraison levels maybe a wasted expense.

2) **What part of the plant was sampled?** UC levels are mainly based on petioles, with a few additional ones from blades. Petiole and blade results should be listed separately. Again, if recommendations are made based on UC levels, petioles are generally most relevent.

3) **Where were the samples taken?** UC recommends samples be taken from no more than 10 acre blocks of uniform vigor. Weak and strong (e.g. gravel vs. clay, phylloxerated, etc.) areas should be sampled separately and clearly delineated on the report. Results based on one combined sample for a variable block can lead to over- or under-fertilization because deficient, excess or adequate levels will be masked.

4) **What was the sample size?** Ideally, results should be based on at least 75-100 petioles (one per bearing vine) from each (approximately) 10 acre block. Too few petioles can give inaccurate results.

5) **What is the source(s) of the thresholds?** Christensen et al. still provides the main guidelines for California recommendations. Based on experience matching tissue levels with vine symptoms, these have been modified to a limited extent by local laboratories for different growing areas and varieties. If recommendations are based on unfamiliar threshold levels, find out the source and compare them with UC levels. This may especially be a concern if using out-of-state labs with mainly Midwest or Eastern staff and experience.

6) Finally, **do vine symptoms corroborate reported deficient or excessive levels?** As the saying goes, "if it ain't broke, don't fix it." If vines bear adequate amounts of good quality grapes and are neither overly vigorous or weak, then chances are fertilizer needs are minimal. Growers should always consider other important aspects of their total program, i.e. irrigation, canopy management and pest management, before spending money on fertilizer.

At the 1993 nutrition seminar last winter, the results of a four-year petiole survey of local Sauvignon blanc and Cabernet Sauvignon was discussed. Lake County nutrient levels are generally adequate, with the main variation between varieties and some among growing areas. These results will be detailed in a future Hort Notes and a preliminary report is available. Of course, I am always happy to assist any grower with vineyard sampling as well as interpreting report results.

VERTEBRATE PEST MANAGEMENT

July Hort Notes contained a lengthy excerpt on vole (field mouse) biology and control by UC Extension Vertebrate Ecology Specialist Rex Marsh. The excerpt was from a monograph distributed at the 1992 UC Pest Management Seminar in Ukiah. Contact me for a copy of the paper, which also contains sections on general vertebrate control, ground squirrels, pocket gophers and rabbits. Don't let these pests get away from you!

ORGANIZED RESEARCH AT UC DAVIS

County Extension offices may be scattered through the state, but it is important to remember we are part of the University of California and work closely with on-campus research and extension staff. Those of us who work in agriculture have our major contacts at the Davis, Berkeley and Riverside campuses which contain the Agricultural Experiment Station (AES).

At UC Davis, many in the agricultural industry are familiar with AES departments such as Viticulture and Enology and Pomology. However, the AES is only one (albeit very large) organized research unit at UC Davis. Extension personnel work with many faculty members from these other less well-known (in ag circles) units. Examples are Agricultural Issues Center, Center for Consumer Research, National Institute for Global Environmental Change and Program in International Nutrition.

Contact me for a copy of Organized Research - UC Davis, which contains excellent synopsis of these various campus-based programs.

1993 APPLE PRODUCTION SHORT COURSE

University Extension, UC Davis, in conjunction with the Pomology Department and UC Cooperative Extension, offers **Apple Production: A Pomology Short Course**, Tuesday-Thursday, November 16-18, at the Red Lion Inn in Modesto. Designed for apple growers and others interested in commercial apple production, this program provides a comprehensive study of all phases of apple culture, production, handling and marketing, along with the opportunity for active participation in discussions.

Featuring more than 30 UC faculty members, Cooperative Extension specialists and farm advisors, the course's format includes two and one-half days of lectures and a one half-day field trip designed to demonstrate practical aspects of material presented in the classroom.

The $325 fee includes course materials, three lunches, one dinner and a reception. To request more information, or to enroll, call toll free in California (800) 752-0881.

RETURN THOSE HORT NOTE SUBSCRIPTION FORMS!

All subscribers should have received a pink 1993 subscription renewal form. Thanks to all who have returned it. Those who have not will soon receive a reminder note with attached pink form in the mail. PLEASE RETURN IT PROMPTLY or you will be removed from the mailing list before the September mailing.

Annual subscription renewal to Extension newsletters is required by USDA, which subsidizes our mailing costs. For those of you who NEITHER reside nor own property in Lake County, please enclose a check for $5.00 payable to UC Regents.

We wish to keep all who desire informed about commercial Lake County horticulture. Help us out by returning your subscription form ASAP.

AUGUST CHECKLIST (contact me for details)

Pears

HAPPY HARVEST!! As of mid-July, Lake County should be in full swing around August 15. Though not the prettiest, fruit is now sizing; maybe we will make 61,000 tons (anybody betting?).

Begin thinking about post-harvest nitrogen applications (with irrigation) to optimize uptake and movement into storage organs while trees are still actively growing (May 1993 Hort Notes).

Grapes

Terminal growth should slow as clusters begin to turn color and sugar. Watch excessive vigor on fertile sites and hold back water if needed. However, severely stressed vines due to phylloxera, poor soil conditions (gravel, hard pan, etc.) or some other reason should not be deprived of water simply to enhance "quality". A dead vine produces absolutely no quality.

If bloom petiole potassium (K) levels were low or you are seeing suspicious symptoms, collect another sample at veraison.

K LEVELS

	Percent	
Level	Bloom	Mid-summer
Adequate	over 1.5	0.8
Questionable	1.0 - 1.5	0.5 - 0.8
Deficient	below 1.0	below 0.5

Walnuts

Continue to monitor for walnut husk fly until husksplit since flies can emerge through September. Available materials are short term so growers with pears will probably need to retreat walnuts during pear harvest; don't get caught with late-season damage.

For those with irrigated orchards, the final irrigation before harvest is an ideal time to apply nitrogen if tissue levels warrant it.

All Trees and Vines

Plan for fall pre-emergence weed control. Contact me for copies of the excellent weed management sections in the UC Pest Management Guidelines. More on this topic in September Hort Notes.

Late summer is an excellent time to remove dead and dying limbs/cordons or entire trees/vines and to prepare ground for replanting. For individual replants, I recommend you consider pre-plant fumigation with methyl bromide to kill pathogens, nematodes and old or competing roots.

Sincerely,

Rachel

Rachel Elkins
Farm Advisor

Safety Tip - Always Travel in Pears