



your Lake County HORTICULTURAL NOTES

AUGUST 1995

MARK CALENDARS

- | | |
|----------------|--|
| Oct. 31-Nov. 2 | 1995 UC WALNUT SHORT COURSE
UC Davis (page 5) |
| Nov. 29-Dec. 2 | 1995 UC PEAR SHORT COURSE
UC Davis (page 6) |
| December 13 | IRRIGATION SYSTEM EVALUATION
WORKSHOP
8:00-12:00 Impact and microsprinklers
1:00-5:00 Drip systems
Clear Lake Grange, Finley
(more info upcoming) |

SOME FINAL THOUGHTS ON THE 1995 PEAR CROP

1995 is truly "one for the books", and one that most local growers are happy to see end. In the April and June issues of *Hort Notes*, the effect of temperature on parthenocarpic set was detailed (contact me if you missed this). But, what other factors may have combined to influence final crop quantity and quality? Although Mother Nature and the trees will keep their share of secrets from human observers, here are some thoughts:

VERY LARGE 1994 CROP - The 1994 crop was huge and largely borne on spurs. Thus, most orchards were already "set up" for alternate bearing, since most spurs bear only every other year. As part of the summer suckering research underway for the past several years, we are documenting the bearing profile of summer suckered vs. non-



summer suckered trees. In both treatments, spurs that bore fruit in 1994 are largely devoid in 1995. The exception are some spurs in the tops of the trees which receive very high light levels.

A VERY UNUSUAL FROST SEASON - This is perhaps where much of the "mystery" lies. Frost damage is evident throughout the county, but how much crop was actually LOST to frost? It is hard to say, but if set was already weak due to poor (i.e. cool) conditions, actual loss to frost may be greater than is observed.

On the face, 1995 did not follow the "rule" that for pears, damage to open blooms and young fruit occurs at **28° F for 30 minutes or more**. Here is 1995 data:

**COMPARATIVE TEMPERATURES
1995 Frost Season**

<u>TEMP.</u> °F	<u>NO. HOURS (NO. NIGHTS)</u>		
	Lakeport	Kelseyville	Scotts Valley
≤ 32	34 (12)	55.5 (19)	69 (22)
≤ 31	21 (8)	36 (13)	46 (17)
≤ 30	15 (6)	15.5 (10)	15.5 (10)
≤ 29	4 (5)	7.5 (5)	1 (3)
≤ 28	0 (0)	3 (4)	0 (0)
≤ 27	0 (0)	0.5 (2)	0 (0)

Source: *NWS Annual Report of Fruit Frost Activities in Lake and Mendocino Counties for the 1995 Frost Season.*

It can be seen that almost **no** nights or hours of 28° F minimums occurred, while frost damage is widespread. The key difference among locations seems to be the amount of time between 30° and 31°. Dr. Steve Lindow of UC Berkeley was not surprised. He commented that the very wet year likely played a big role by fostering abnormally high populations of ice nucleating bacteria. This then raised the freezing threshold above 28° F. As temperatures descend below 31° F, even as little as a .5° F increment will rapidly increase the level of nucleation. He also stated that even very short durations (i.e. a few minutes) below 30° F can trigger nucleation and cause damage. Evidence for this are the typical 1995 frost symptom of blistering rather than rings; this indicates a less severe type of damage resulting from **many short periods of marginal** frost condition rather than deep drops to or below 28° F. Other signs of high bacteria levels were the pronounced amount of bacterial blast, caused by the bacteria *Pseudomonas syringae*, and moderate amounts of russetting.

Orchard floor management may have been crucial this year. The above chart shows that the greatest difference between Big Valley and Scotts Valley was the number of nights and hours from 32° F down to 30° F. Besides directly affecting air temperature, Lindow's research has shown that various ground cover species harbor more or less ice nucleating bacteria. It would be very interesting to evaluate springtime floor vegetation in different parts of Lake County in relationship to frost damage and russet.

In summary, 1995 was actually a very MARGINAL frost year. Conditions were exacerbated by nearly 60 inches of rainfall, leading to high numbers of bacteria which in turn raised the freezing level closer to 32° F.

(It is worthwhile to speculate whether heavy early colonization of bacteria actually suppressed fireblight bacteria build-up, despite adequate temperatures for their increase. John Sisevich is currently evaluating the effects of heavy rainfall on the 1995 fireblight season).

COOL POST-SET WEATHER - Lack of adequate growing weather immediately following bloom probably hindered cell division and caused another percentage of fruit to eventually drop. Using insect degree-days as a guide, 1995 is about 200° D behind 1994; no doubt growing degree days equally lag.

SLOW ROOT AND SHOOT GROWTH - Cold, wet soil delayed and even set back root activity which, in turn slowed shoot growth and delayed carbohydrate availability to young fruit. This was after the 1994 crop, which likely left below-normal levels of carbohydrate in the above ground storage sites (e.g. spurs, branches). These local sites provide nutrition to fruit until shoots are big enough to contribute.

The above are, as always, **thoughts** based on observation, consultation and reflection. However, research such as Lindow's work with ice-nucleation bacteria, will continue to fill in more pieces of the puzzle, enabling growers to increasingly alter the orchard environment to their benefit.

AMERICAN SOCIETY OF VITICULTURE AND ENOLOGY

Some of the highlights of the 1995 annual meeting in Portland, Oregon included:

* Dr. Larry Williams of UC Davis presented data on water use of first, second and third year Chardonnay vines in Carneros, planted 5' x 7'. First year vines used 0.5 gallons per day, second year vines 0.66 gallons per day and third year vines 1.0-1.5 gallons per day. There were 200-250 total gallons per year for second year vines. Once natural soil moisture declined, irrigation supplied 70% of vine water use in the first two years and 60% in the third year.

* Francesco Ferrini of the University of Florence, Italy compared the effects of cluster thinning at set versus veraison to improve fruit quality in heavy crop years. Both treatments increased sugar, berry and cluster weights while reducing acid and increasing pH of the must. However, thinning at veraison caused improved quality with less compensatory increase in cluster/berry weight, thus was the preferable timing to control crop load.

* Dr. Robert Wample of Washington State University discussed environmental and crop load effects on cluster development. He said that cluster and flower initiation varied year to year mainly due to temperatures during bud initiation and fertilization/set, rather than irrigation or other cultural practices. The ideal temperature for initiation was 70° F. One study with Cabernet Sauvignon showed more flowers forming when the previous year's crop was removed following set. (Note from Rachel - this may be another reason not to overload vines - next year's crop may be undesirably reduced.)

* Sonoma County Farm Advisor Rhonda Smith reported on a four-year study of Enzone® applications to a phylloxera-infested vineyard in Sonoma Valley. After four years, Enzone-treated vines had larger cluster and berry weights versus untreated. Although individual treatment vine yields were larger, **total vineyard yields continued to decline**, with no response of cluster number per vine, berries per cluster or fruit characteristics.

In addition to the oral presentations, there were several posters of interest. Contact me if you are interested in seeing the *Technical Abstracts of the 46th Annual Meeting of the ASEV, June 22-24, 1995*. I also have a copy of the Clonal Symposium Proceedings.

DOWNY LEAF AND FRUIT SPOT OF WALNUT

Besides walnut blight, the excessive rains of 1995 brought on the disease **downy spot**. Both blight and downy spot were often present on the same nut, causing some confusion.

While blight is a bacteria, downy spot is caused by a fungus, *Microstroma juglandis*. Most commonly, it appears as white or pale yellow patches on the undersides of leaves. However, in 1995, fruit symptoms were more prominent. They consist of circular rings of varying size. The hull is green inside the circle, but is often raised or rough. As the fruit grows, the rings enlarge and fruit shape may be distorted. Unlike blight, however, lesions are fairly shallow and the nuts undamaged.

This is in contrast with walnut blight, which makes solid black lesions and causes deep damage and subsequent crop loss. Though downy spot nuts are seen on the ground, other factors, such as lack of fertilization or blight may be the actual cause.

Since downy spot on the fruit is relatively rare and of little economic importance, there has been no research on its control and no controls are recommended.

HOWEVER, walnut blight is a different matter. Its build up over the past four or five years, and the severe outbreak in 1995, even in Hartley and Franquette, makes it imperative that growers **BE PREPARED TO TREAT IN 1996 IF SPRING RAINS PERSIST!** Walnut blight overwinters in the tree, and if rains coincide with shoot and flower emergence, they may well emerge infected. More on this at winter meetings . . .

NEW UC MICRO-IRRIGATION MANUAL

Micro-irrigation of Trees and Vines is a 155-page spiral-bound manual written by UC Extension Irrigation Specialists. Topics include what to look for in a well designed micro-irrigation system, how to maintain the system and how to manage the micro-irrigation to irrigate efficiently and uniformly. It is one in a series of water management handbooks developed by the University of California Irrigation Program with funding provided by the California Energy Commission and the U.S. Department of Agriculture Water Quality Initiative.

The book includes numerous illustrations, tables and graphs and a comprehensive glossary of terms used in micro-irrigation. To order *Micro-irrigation of Trees and Vines* (Water Management Series publication number 94-01), contact Tania Heta, UC Cooperative Extension office, Department of Land, Air and Water Resources, 113 Veihmeyer Hall, University of California, Davis, CA 95616; or phone 916-752-1130. The cost is \$15; checks should be made payable to UC Regents.

Other currently available publications in the Water Management Series are *Agricultural Salinity and Drainage* (WMS publication #93-01), *Surge Irrigation* (WMS publication #93-02), *Low-Volume Irrigation* (WMS publication #93-03), *Irrigation Pumping Plants* (WMS publication #93-04) and *Drip Irrigation for Row Crops*, (WMS publication #93-05).

1995 UC WALNUT PRODUCTION SHORT COURSE

(contact us for more information)

The Walnut Short Course will be held Monday, October 30 through Friday, November 3 at UC Davis and Modesto. The \$500 fee includes course materials, production and IPM manuals, field trips, two dinners, all lunches and social events.

The short course is designed for growers and others interested in commercial walnut production. The program, the sixth in a series which began in 1976, features more than 40 instructors - faculty of the University of California, along with Cooperative Extension specialists and farm advisors. They provide in-depth, comprehensive information on all

phases of walnut culture, production, handling and marketing, encouraging active participation in discussion throughout. Lectures, based on current information and research, cover walnut production and additional technical information to provide growers with an understanding of the fundamental principles that form the basis for practical decisions. Field trips are included to demonstrate practical aspects of material presented in the classroom.

1995 UC PEAR PRODUCTION SHORT COURSE

(contact us for more information)

After five years, UC is planning another extensive and intensive course on pear production, to be held from Wednesday, November 29 through Saturday, December 2 at UC Davis. The \$500 course fee will include course materials, production and IPM manuals, field trips, one dinner and all lunches and social events. PCA continuing education credits will be provided.

The course will be a practical orchard management course designed for growers, pest control advisers and others involved in commercial production and postharvest handling of pears. The four day program will feature more than 30 instructors, including UC Davis and Berkeley faculty and Cooperative Extension specialists and farm advisors. The program also includes presentations from Oregon State University faculty, California pear growers and consultants. It will provide an in-depth, comprehensive look at all phases of pear production, including general pear culture, pest management and postharvest handling based on current information and research.

The format includes two and a half days of lecture and one and a half days of field trips and encourages active participation and discussion. Field trips to Sacramento and Marysville area pear orchards include various training and pruning systems, rootstock trials, area-wide pheromone mating disruption and spray rig demonstrations.

AUGUST CHECKLIST (contact me for details)

Pears

HAPPY HARVEST! As of late July, Lake County was due to be in full swing around August 10. Fruit quality and size are surprisingly good, we may even make the estimate of 62,000 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 (based on Thompson Seedless)		
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 husk split 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

BEGIN PLANNING YOUR FALL WEED CONTROL PROGRAM NOW!!! Contact me for copies of the **excellent** weed management sections in the UC Pest Management Guidelines.


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

Cooperative Extension
U.S. Dept. of Agriculture
University of California
Oakland, CA 94612-3560

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HAVE A GREAT PEAR HARVEST !!!



Rachel Elkins
Farm Advisor

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