COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

your Lake County HORTICULTURAL NOTES

883 LAKEPORT BOULEVARD
LAKEPORT, CALIFORNIA 95453
TELEPHONE: 263-2281

APRIL 1988

WALNUT BLIGHT CONTROL FOR EARLY SEASON VARIETIES

Walnut blight is not a problem in Franquette and Hartley orchards, our mainstay. For those with early varieties, here is the latest "scoop" on blight from Bill Olson, UC Farm Advisor in Butte County, where blight is a major, chronic problem.

"What's new in walnut blight control? That's the question I have been getting lately. Sorry to say, not much is new. Since my research showed that frequent sprays with copper rates at 4 lbs. metallic copper/A to be a much better blight protection program than the old program of 3 sprays during bloom and early nut development period with 16 lbs. metallic copper/A, few improvements have been made in walnut blight control strategy.

We have added a few new products to use but, so far, none seem better than what was already available. We have tried a few wild ideas such as trying to kill the bacteria in the winter and found this didn't work any better than what we already had.

We have found out that a segment of the walnut blight bacteria is resistant to copper. This may explain why we cannot achieve 100% control. I will be looking at this resistance thing more closely over the next few years as well as a few other wild ideas which might lead to something new down the road.

Until something new comes along, I think we have gone about as far as we can with the materials available to us.

With the most susceptible varieties, those showing some life now, protective sprays will need to be applied soon. My research shows that the most benefit per dollar spent begins as the little flower bud can be found by unfolding a few leaves and continues until the rain and dew season is over (late May-early June). Of course, with dry conditions, less protection is needed during this period since it is moisture (particularly rain) that spreads the bacteria around.

Another time to protect against this disease is before the pistillate flower starts to appear, the so called "catkin spray". Although the bacteria can attack any green tissue, can kill catkins, can contaminate pollen and ultimately, reach the new nutlet, this spray has never been cost effective in my trials. If I were trying to trim cost and risk a little blight, this is one spray I would eliminate in all but very wet springs.

Copper rates that provide 4 lbs. metallic copper have proven to be the maximum required in my trials. More has provided no more benefit. Less has provided less benefit. However, in "clean" orchards, some growers apparently have been successful with less metallic copper per acre.

With new unprotected growth constantly appearing and wet weather always threatening, my research showed that frequent sprays were better than infrequent sprays. Sprays applied every week during the "blight season" were the best program in my test. Many growers have adopted this and found it successful. Some growers spray every other row every 4 days and have also found this successful. The point is to spray often. Of course, if dry conditions prevail, longer intervals between sprays may be acceptable. But be careful and remember that copper sprays need to be applied before rain, not after rain for the most benefit.

This article lists the high points on walnut blight control. If you have questions, don't hesitate to call me."

WALNUT PHYTOPHTHORA CROWN/ROOT ROT SURVEY

This spring, I will be sampling surface irrigation water sources for Phytophthora spores. Since spring and fall (when it's cool) are the best times to culture the organism, I will also be sampling suspect trees. If you suspect Phytophthora infection in your orchard, please call me at 263-2281 and I will come sample. I hope to establish the extent and distribution of the disease in Lake County, and find out which species are present. I am also happy to discuss management strategies with concerned growers.

RESEARCH/EDUCATION PRIORITIES - WHAT YOU SAID

Many growers have filled out the research and education priority survey distributed through my newsletters and various meetings. The survey listed 14 topics of potential interest and asked you to rate only the top 5 priorities (#1 = highest to #5 = lowest) in each crop category that applied to your farming business -- grapes, pears, walnuts, kiwi, or "other". The survey was, and will continue to be, one of the key ways you let me know what production problems should be addressed by the University of California and the Lake County office in particular. The 14 topics were:

1. Rootstocks/varieties
2. Nutrition/fertilization
3. Spacing/trellising
4. Pruning/thinning
5. Irrigtion
6. Pest Management
   - Insects
   - Diseases/nematodes
   - Weeds
   - Vertebrates
7. Pesticide application/ safety
8. Equipment/harvest operations
9. Post-harvest problems
10. Alternative practices/ sustainable agriculture (or organic methods)
11. Farm Management/economics
12. Labor/personnel management
13. Marketing
14. Computer applications in farming

Since my first research season is beginning, I thought this would be an appropriate time to summarize the results so far. The survey will be a continuing factor in my program and I hope that those of you who have not responded will be inspired to do so -- especially if you disagree with these results:

For each crop, there are 2 tables:

1) Topics that received the most "votes" in each category #1 - 5, and,
2) the five topics that were mentioned as #1 - 5 (out of 14) the most times.

For example, weed control received the most votes as the #5 priority for grapes, but did not receive enough votes as 1, 2, 3, 4 or 5 to make the second list. On the other hand, nutrition did not make the top 5 of any one rating but many growers thought it important enough to list it as either 1, 2, 3, 4 or 5 so that it made the top 5 overall. This is important because it tells me that a problem may not be everyone's top priority, but growers were concerned enough to mention it at some level from 1 - 5. The crops broke down as follows:

GRAPES

No. of surveys received: 22

RATING	TOPIC	NO. OF TIMES IN RATING
1	rootstocks/varieties	14
2	pruning/thinning	4
	irrigation	4
	insect pest management	4
3	spacing/trellising	5
4	disease management	4
5	weed management	5

TOPIC	NO. TIMES LISTED AS 1 - 5
rootstocks/varieties	19
pruning/thinning	14
nutrition	13
spacing/trellising	12
irrigation	11

PEARS

No. of surveys received: 18

RATING	TOPIC	NO. OF TIMES IN RATING
1	insect pest management	10
2	nutrition/fertilization	5
3	rootstocks/varieties	4
4	weed management	
	postharvest problems	3
5	computer applications in farming	3

TOPIC	NO. TIMES LISTED AS 1 - 5
insect pest management	16
nutrition/fertilization	16
weed management	12
irrigation	10
diseases	10
pest management (general)	9
post harvest problems	9
marketing	9
rootstocks/varieties	7
pruning/thinning	7
farm mgt./economics	7
computer applications in farming	7

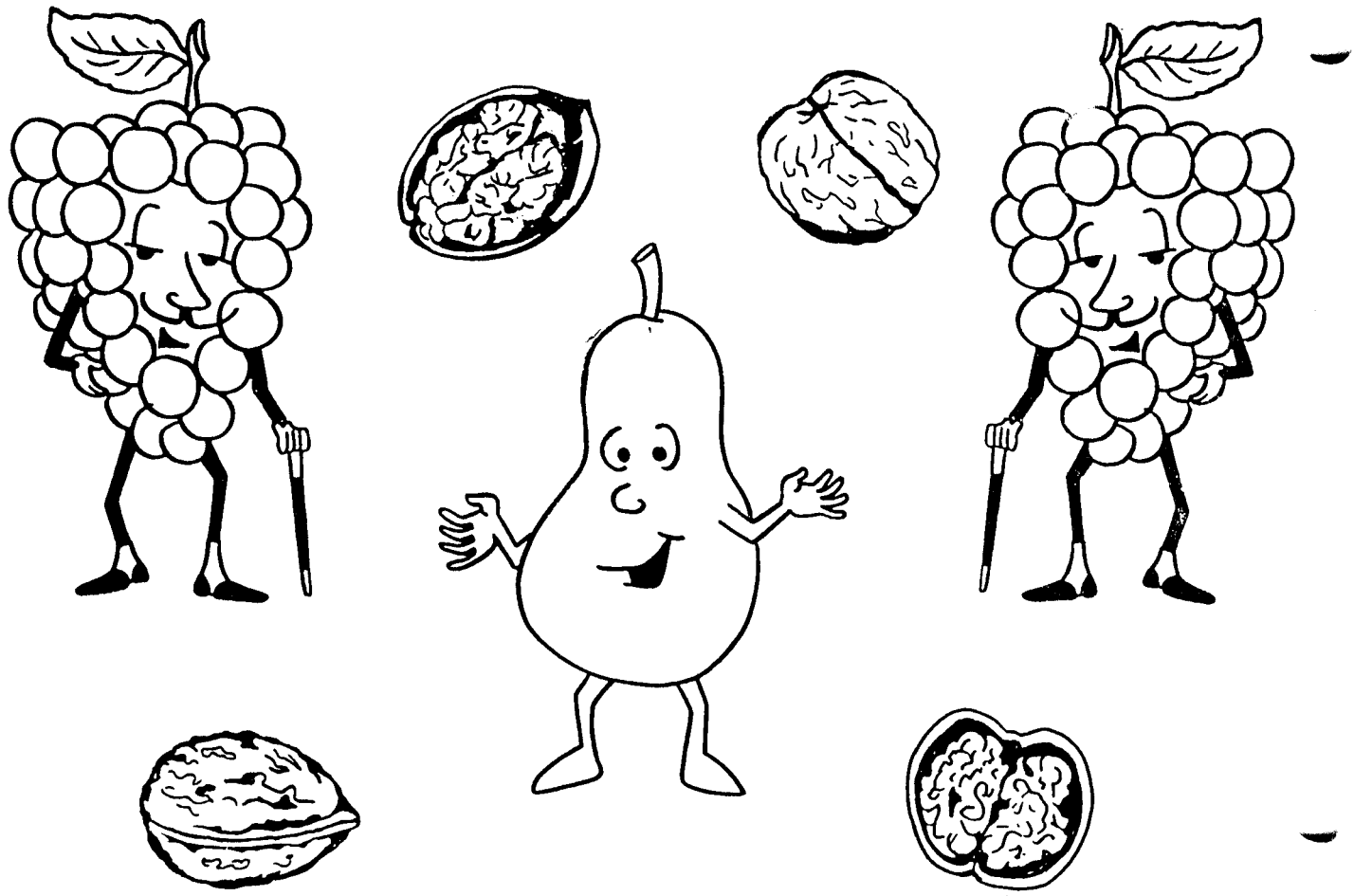
WALNUTS

No. of surveys received: 21

RATING	TOPIC	NO. OF TIMES IN RATING	TOPIC	NO. TIMES LISTED AS 1 - 5
1	nutrition/fertilization	4	nutrition/fertilization	18
2	nutrition/fertilization	6	irrigation	12
3	irrigation	6	pruning/thinning	11
4	disease management	5	diseases	11
5	alternative practices/ sustainable agriculture (organic methods)	3	insect pest management	10
			farm management/economics	9

So, how are these initial results reflected in Extension programs? First, the survey corresponds to what you've expressed during farm calls, at meetings and in personal conversation. Not surprisingly, Lake County needs are similar to those expressed in other counties and, consequently, are being reflected in research/education programs statewide.

Briefly, on the following page, are this year's activities that correspond to the #1 priority expressed in each crop category.



1988 LAKE COUNTY UC COOPERATIVE EXTENSION PROGRAM

CROP #1	TOPIC	RESEARCH	EDUCATION
GRAPES	Rootstock/ varieties	Rootstock trials: phylloxera - Middletown Kelseyville non-phylloxera - Lakeport (part of statewide effort)	Personal assistance
PEARS	Insect pest management	Insect growth regulators Dimilin/oil program Codling moth mating disruption	Grower meeting: pear psylla research in Pacific NW resistance to miticides codling moth mating disruption Personal assistance
WALNUTS	Nutrition/ fertilization*	July leaf analysis survey - countywide Tree response to P and Zn applications in Red Hills (dry land)	Grower meeting: fertilization options personal assistance

*Lake County problems are unique in the walnut industry and, in many cases, research and education activities may differ from other walnut-producing counties.

Reviewing survey results, I feel that issues important to growers are being addressed by Cooperative Extension, and that some exciting new production tools will be available in the near future. I am also very pleased with this type of informal survey as a way to gather your opinions. If you have not done so, call me or stop by for a RESEARCH/EDUCATION PRIORITIES SURVEY form. GET YOUR TWO CENTS IN!

EARLY SEASON STRESSES CAN REDUCE NEXT YEAR'S GRAPE CROP

Budbreak is in progress or just around the corner in most vineyards. Most attention is focused on frost protection, insect and disease control, and maybe irrigation. It is also a good time to consider the overall "time line" of vine growth and crop development. From budbreak to mid-June, you are actually growing two crops, the harvest of 1988 and the harvest of 1989. The hand Mother Nature or the grower deals during this period will strongly influence next year's crop as well as the current one.

Stresses affecting vine growth early in the season will also affect developing dormant buds that become the 1989 crop. Severe heat stress, wind and freezing are examples of weather-related factors to be aware of. Early season water stress has been shown to reduce crops in subsequent seasons (see past newsletter articles on the work of Mark Matthews). Over or under fertilization, crop load, and general vine vigor all play roles in determining current and dormant cluster development.

Rhonda Smith, Farm Advisor in Sonoma County, diagrammed very nicely the relationship between current and next season crop development in relation to seasonal vine growth. Pin this up on a bulletin board or on the refrigerator so you can follow what's going on in the vine as well as in the vineyard. (See Insert 1)

For more details on vine physiology and crop development, the leaflet 'Grapevine Physiology - How Does a Grape Vine Make Sugar?' (No. 21231) is available at our office for $1.75.

PEAR/PSYLLA RESISTANCE TO PYDRIN

On February 9, winter form pear psylla adults were collected from three Lake County orchards: 1 in Big Valley and 2 in Scotts Valley. Pete Gonzalves, a graduate student at Oregon State University, took the psylla up to the lab of Dr. Brian Croft at OSU where they were tested for resistance to Pydrin.

The insects were subjected to two "diagnostic doses" of 0.5 and 1.0 lb. active ingredient per acre in a slide-dip bioassay (psylla on slides were dipped in the insecticide at the above doses). The lethal dose required to kill 50% of the population (LD50) was determined, and from this a resistance ratio (R-ratio) was calculated as compared to a susceptible population from the OSU Farm in Willamette Valley with an R-ratio of 1.0.

The following table shows how Lake County compares with other pear-growing areas:

Table 1. LD_{50} values (lb AI/A) of fenvalerate (pydrin) for post diapause adult pear psylla from Oregon (Willamette Valley) and California (Placerville and Lake County) using slide-dip bioassay.

population		LD_{50}[a]	R-ratio
Willamette Valley Oregon			
Corvallis:	Entomology Farm	0.0069	1.0
	Botany Farm	0.053	7.7
	Horticulture Farm	0.089	13.0
Lane County:			
	Harrisburg	0.14	20.0
	Pleasant Hill	0.0097	1.4
	Salem	0.058	8.4
		0.047	6.8
California			
	Placerville	<0.0125	<1.8
		0.0125	1.8
		<0.0125	<1.8
Lake County:			
	Scott's Valley	0.066	9.6
	Kelseyville	0.058	8.4

How is this data interpreted? For Lake County, it took 9.6 (in the case of Scotts Valley) or 8.4 (for Kelseyville) times the dose of Pydrin to achieve the LD50 as did to achieve it for the Corvallis population. In the case of Harrisburg, Lane County, Oregon, it took 20 times the base to achieve LD50. These numbers say that a moderate level of Pydrin resistance exists in Lake County. However, in the Hood River and Medford areas, where an R-ratio of 20 was found, winter psylla is still controlled with oil and Pydrin without synergists (e.g. piperonyl butoxide - PBO). Compare this with the Wenatchee area, with an R-ratio of 100 (100 times the dose needed vs. Corvallis). Growers there are having a lot of trouble controlling psylla without synergists.

Why are the areas all so different, particularly us vs. the Placerville area (with an essentially suseptible population)? According to the researchers (Hugo Van de Baan, Pete Gonzalves and Brian Croft), pesticide history of the area is the main reason. Placerville has used very little Pydrin, in most cases never exceeding 0 - 1 sprays per year, and only in the dormant period. In Lake County, many of you recall the use of Pydrin up to 3 times per year in some orchards. This previous intensive use, though drastically scaled back now, is reflected in the detected resistance level. The second major separating factor among areas is the intensity of cropping. Placerville, Lake County, Hood River and Medford are all intensively cropped into pears. Differences in resistance levels reflect different areawide historical Pydrin use patterns. However, in the Willamette area, the commercial pear orchards are spread out over the valley, so the R-ratio is more strictly related to individual orchard use patterns. In other words, in Lake County, even if a grower has always used Pydrin sparingly, if resistance develops due to higher use levels by neighbors, resistant populations will spill into the low-use orchard. This implies that any monitoring and control programs must be done on an area-wide basis in a situation like ours. WHAT ONE GROWER DOES AFFECTS EVERYONE IN THE SAME AREA.

So, what now? Is it panic time? NO! Dr. Pete Westigard recommends two key elements in halting any rise in the resistance level.

1) MONITORING - both during the season, in the fall and during the winter. KNOW what the populations are doing in your orchard.

2) Restrict Pydrin use to dormant season ONLY. Lake County has already done a good job in this area, and the less Pydrin is depended upon, the better the future looks.

Next season, we will conduct a more intensive sample of Lake County orchards. Until then, consider this food for thought and be thankful this is not Wenatchee!

UPCOMING EVENTS/CLASSES

April 6 - Walnut grafting demonstration, Yolo County
8 - Legal Aspects of Winery Management - UNEX course, UC Davis
23 - UC Hopland Field Station, Open House, 9:30 - 3:45.

Contact me if you are interested in any of the above.

Sincerely,

Rachel

Rachel Elkins, Farm Advisor

Figure 1. Bud Development. At bud break in 1988 dormant buds are initiated for next year's crop. During the early shoot growth period in 1988, the dormant buds continue to develop. A short time later, during bloom, clusters of the 1989 crop are initiated in the dormant buds.

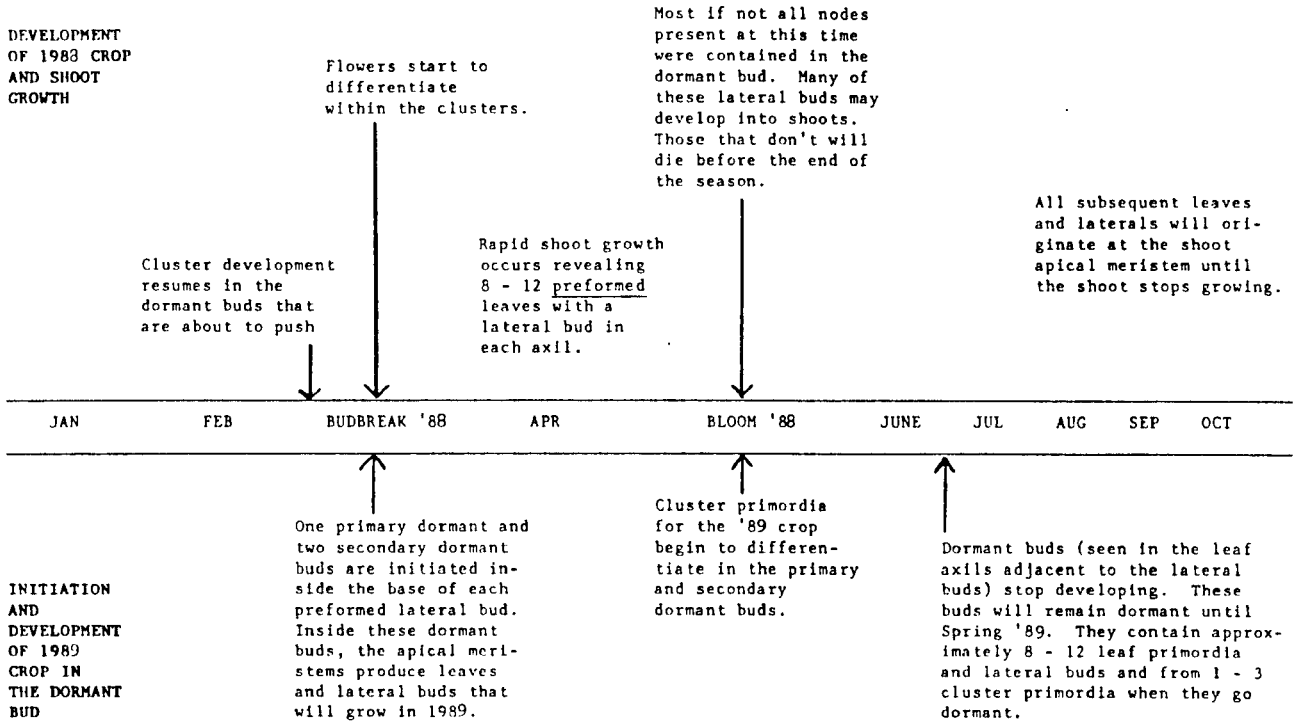
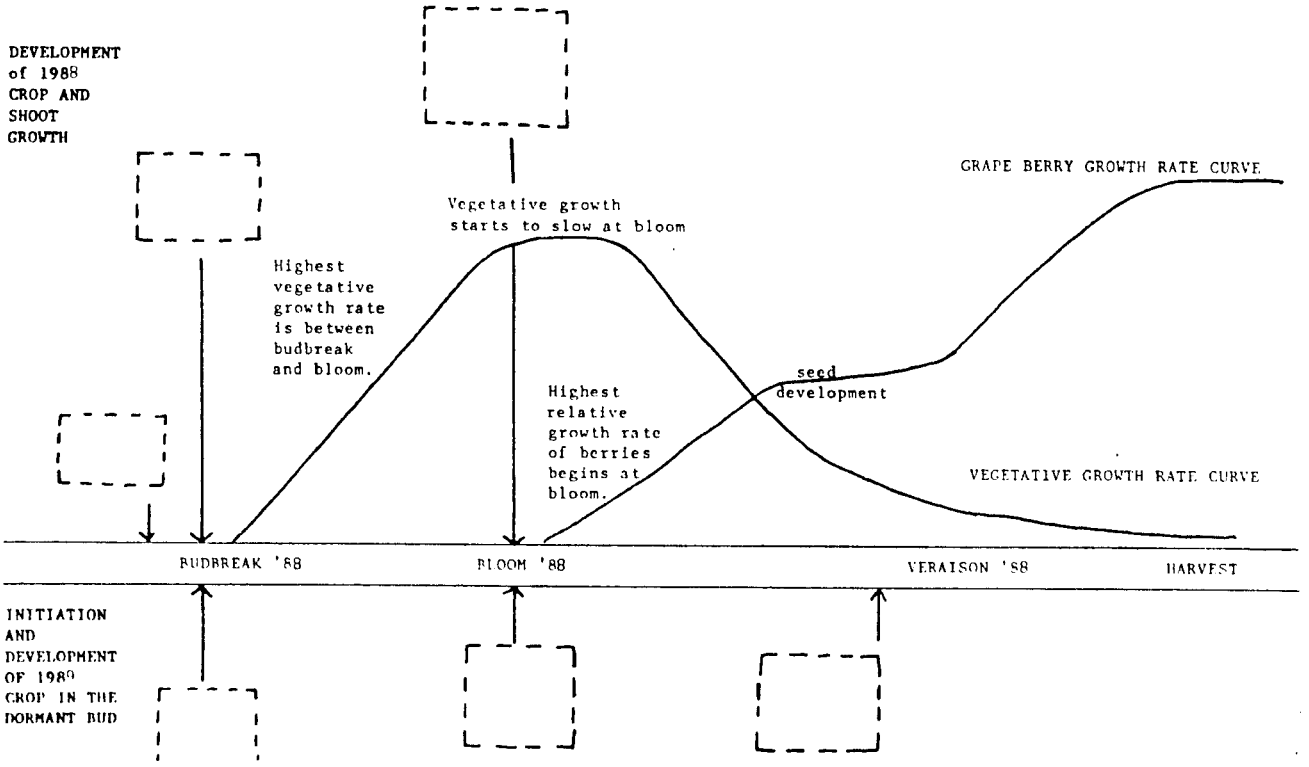


FIGURE 2. Diagram of relationship of vegetative and berry growth to bud development. The boxes outlined with dashes refer to Figure 1.



INSERT 1