COOPERATIVE EXTENSION

University of California - Sacramento County

Tree and Vine Newsletter

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January 1998

1998 PEAR PRODUCTION RESEARCH MEETING – SACRAMENTO RIVER AREA

Friday, February 13, 1998 – 7:45 AM to 12:30 PM

Jean Harvie Senior & Community Center, Walnut Grove
4.5 hours PCA credit applied for

7:15 Registration. *Coffee and pastries courtesy of the California Pear Advisory Board.*

7:45 Sacramento County Update
Chuck Ingels – UC Cooperative Extension, Sacramento County

Entomology

8:00 Randall Island Project, Resistance Management, and Gene Flow of Codling Moth
Steve Welter – Insect Biology, UC Berkeley

8:30 Codling Moth Management through Postharvest Control
Bob Van Steenwyk – Insect Biology, UC Berkeley

8:50 Disruption of Pheromone Communication for Control of Codling Moth and Leafrollers
Harry Shorey – Kearney Agricultural Center, Parlier

9:10 Importing Parasitoids for Areawide Management of the Codling Moth in Pears
Nick Mills – Insect Biology, UC Berkeley

Plant Pathology

9:30 Studies in the Biology and Control of Oak Root Fungus
Dave Rizzo – Dept. of Plant Pathology, UC Davis

9:50 Control of Fire Blight and Fruit Russet Using Cultural and Biological Controls
Steve Lindow – Dept. of Plant & Microbial Biology, UC Berkeley

10:10 --Break

10:30 Evaluation of Alternative Bactericides for Fire Blight Control
Bruce Kirkpatrick – Dept. of Plant Pathology, UC Davis

10:50 Control of Rat-Tail Bloom and the Implications for Fire Blight Control
Steve Southwick – Dept. of Pomology, UC Davis

11:10 Potential of Urea Foliar Sprays and Liming for Reducing Pear Scab
Lucia Varela – UC Cooperative Extension, North Coast

Horticulture

11:30 Low Water Potential in Pears: Relations to the Root System
Oenes Huisman – Insect Biology, UC Berkeley

11:50 Plant Water Status Measurements to Identify Impairment of Root Function
Ken Shackel – Pomology Dept., UC Davis

12:10 Late-Season Pheromone Hanging to Reduce Overwintering Codling Moth Populations
Rachel Elkins – UC Cooperative Extension, Lake County

12:30 Adjourn

Vineyard Bunch Rot Trials

In 1997, Bunch rot was severe in many vineyards of tight clustered varieties (i.e. Zinfandel, Chenin blanc, Chardonnay, Barbera, Carignane, etc.). In the San Joaquin Valley, sour rot is usually more serious than Botrytis, while the opposite is true in North Coast vineyards. Favorable spring and summer weather led to high initial berry set and good berry development. More berries of increased size caused increased splitting, which increased rot; mid-season rains also added to the problem.

I conducted a trial with Rod Vargo formerly of Bayer Corp.) in 1997 to determine whether the powdery mildew fungicide, Elite, sprayed at the maximum label rate, also has the potential to suppress bunch rot. Elite is a DMI fungicide that will be registered for use in 1998. We planned to evaluate powdery mildew also, but virtually none appeared through the season. In addition, Roger Duncan, UC Farm Advisor in Stanislaus County, conducted a trial in 1997 examining 27 materials and methods for controlling bunch rot.

Our experiment was conducted at the Herzog Co. vineyards near Courtland using Chenin Blanc vines. Sprays were applied with a backpack sprayer (129 gpa) between April 4 and July 25. The treatments were replicated four times and are listed below:

1. Elite 45DF (4 oz.) 8 times (max. rate)
2. Elite 45DF (4 oz.) 8 times + Dithane M45 (2.5 lbs.) 3 times
3. Elite 45DF (4 oz.) 8 times + Rovral 50 WP (2 lbs.) 4 times
4. Rally 40W (4 oz.) 8 times
5. Abound 80WG (4 oz.) 8 times
6. Gibberellic Acid – (ProGibb, 7.5 ppm), sprayed April 7; Thiolux 80DF sprayed 12 times
7. Leaf removal – late May; Thiolux 80DF sprayed 12 times
8. Untreated

Rally and Abound are used for powdery mildew control, while Dithane and Rovral are used for control of Botrytis rot. The maximum seasonal rate was used for these fungicides, although two extra applications of Rally were used. Gibberellic acid is used a few weeks before bloom to elongate and loosen the clusters, reducing berry splitting and rot; it has a Section 18 registration for the Clarksburg District. In late May, gibberellic acid increased the rachis (cluster stem) length an average of 15 to 20 cm compared to the untreated clusters, and it increased the pedicel (berry stem) length from 5 to 8 mm. Leaf removal is used to increase exposure of the clusters to air movement, which reduces moisture buildup and thus reduces rot.

Results

Sacramento Trial. The results are shown in Table 1. Disease incidence and severity were evaluated on September 9, two weeks after commercial harvest. Bunch rot *incidence* is the percent of sampled clusters with bunch rot. Rot *severity* is the percent of rotten berries in an affected cluster. Their product, *incidence x severity*, best approximates the total amount of rot in a treatment, according to R. Duncan.

As one might expect, total rot in the Rally and Abound treatments did not differ from untreated vines. Rot in the gibberellic acid, leaf pulling, and Elite treatments was significantly less than untreated vines, and did not differ from each other. However, sour rot was somewhat lower in the gibberellic acid treatment.

Stanislaus Trial. Roger Duncan tested 27 products and strategies for their effects on bunch rot. Most fungicides, including Elite (6 oz.), were applied at bloom and again at preclosure. Elite did not improve sour rot control, but did reduce Botrytis rot significantly compared to the untreated vines. Several treatments reduced Botrytis incidence more than Elite, but not significantly.

The most effective single practice in reducing total bunch rot in the Stanislaus trial was leaf removal (68% reduction compared to untreated vines). When leaf removal was combined with an application of gibberellic acid and two applications of COCS dust,

control was slightly better. Gibberellic acid alone reduced total rot by 56%. Botran was also effective in reducing rot. Some of the other more effective treatments included Cryolite + Bt (for reducing damage to berries by omnivorous leaf roller), Benlate + Captan, Blight Ban (*Pseudomonas fluorescens*), NZYM at 100 ppm, and COCS 15-25 copper-sulfur dust.

These results show that Elite can suppress Botrytis rot somewhat (but not sour rot) with two applications and can further suppress both Botrytis and sour rot at the maximum label rate. However, use of Elite at the maximum rate is expensive and would likely lead to the buildup of resistance by the disease organisms. These results also illustrate the importance of canopy and cluster management in a bunch rot management program. Increasing air movement in the cluster zone is vital to reducing bunch rot.

Let me know if you would like to receive the complete report of the Stanislaus trial.

Table 1. Efficacy of treatments used in the Sacramento trial.

Treatment	**Total Rot(%)**[1,2]	**Sour Rot(%)**[1]	**Botrytis(%)**[1]
Rally	28.5 a[3]	23.6 a	4.9 a
Abound	26.0 a	24.6 a	1.4 bc
Untreated	**24.4 a**	**21.9 a**	**2.5 b**
Leaf pulling	7.9 b	7.6 b	0.3 c
Elite	7.6 b	7.3 b	0.3 c
Elite + Dithane	7.1 b	7.0 b	0.1 c
Elite + Rovral	6.2 b	6.0 b	0.1 c
Gibberellic acid	4.1 b	3.5 b	0.6 c

[1] Percent rot was determined by multiplying rot incidence (% of sampled clusters with rot) by rot severity (estimated % of berries rotted in an affected cluster).
[2] Total rot is the cumulative total of sour and Botrytis rots; very little other rots were found.
[3] Data followed by the same letters in each column are not statistically different according to the Duncan's Multiple Range Test.

Fire Blight Research

Research on fire blight in Lake and Sacramento Counties last year, led by Steve Lindow (UC Berkeley) has provided useful information for pear growers.

A506 Trials. Studies on the concentration and frequency of application of the bio-control agent *Pseudomonas fluorescens* strain A506 (Blightban) were conducted in Lake County. The research showed that spraying at the label rate, 3 times at 50%, or 3 times at 10% of the label rate produced similar populations of the bacteria on the flowers. The highest populations were observed on trees where strain A506 was applied at 50% but at twice the number (6 times) of recommended applications. Application of strain A506 with the silicon-based surfactant Breakthru resulted in slightly higher populations than where it was applied in water alone. The population size of strain A506 on trees was substantially lower when it was tank mixed with Terramycin. Population sizes were also lower when Terramycin was sprayed onto A506-treated trees within about 3 days after inoculation than when Terramycin was not sprayed within 3 days.

Resistance Testing. A large-scale survey of resistance to streptomycin, copper, and Terramycin was conducted on strains of fire blight bacteria (*Erwinia amylovora*) collected from 39 orchards throughout California. We collected blighted shoots from 19 locations in Sacramento County.

No strains were resistant to either Terramycin or copper. In many orchards, all strains were sensitive to streptomycin (Table 1). In some orchards a small percentage of streptomycin-resistant strains were observed, while in a few orchards, all of the strains were streptomycin resistant.

Most streptomycin-resistant strains of *E. amylovora* were resistant to over 1000 ppm streptomycin, and resistance in these strains is presumably conferred by chromosomal mutations. In a few orchards, strains were recovered that were resistant to only about 120 ppm streptomycin, and resistance is probably due to plasmid-borne streptomycin resistance genes.

The incidence of streptomycin resistance in *E. amylovora* populations has thus not increased substantially in the 20 years since the last surveys were conducted, and is much lower than many growers believe. It therefore appears that many growers are applying Terramycin needlessly, since many orchards have no apparent streptomycin-resistant *E. amylovora* strains. It may be advisable for growers to determine the streptomycin resistance levels in their orchards to better determine whether frequent (or any) Terramycin sprays are needed. It also appears that in the many orchards in which there is little or no streptomycin resistance among the *E. amylovora* population, growers would be taking little risk in applying only streptomycin within the few days after applications of strain A506 if they wanted to avoid Terramycin sprays to maximize the colonization of pear flowers with strain A506. Further work will be done in 1998 to verify that

Terramycin applications can be omitted from orchards with low *E. amylovora* streptomycin resistance to enhance biological control with strain A506.

Table 1. Incidence of streptomycin resis-tance among strains of *E. amylovora* isolated from fire blight cankers in Sacramento County in 1997.

Orchard	**# Samples**	**# Resistant**
1	12	0
2	9	0
3	10	0
4	8	1
5	6	0
6	9	1
7	6	1
8	9	0
9	4	1
10	8	1
11	7	0
12	4	4
13	2	0
14	1	0
15	8	6
16	10	6
17	6	0
18	4	0
19	8	1

Codling Moth Meeting

If you are involved with pear, apple, or walnut production, you'll want to attend the upcoming meeting, "Advances in Codling Moth Management in Pear, Apple & Walnut Orchards" on February 5th (see attached brochure). The statewide meeting is a culmination of many years of research on reduced chemical control of codling moth in Califor-nia and in the Pacific Northwest, particularly related to mating disruption with phero-mones. Registration deadline: Jan. 30.

Other Meetings

Jan. **California Cherry Research Review** – Stockton Inn, Hwy. 99 at Waterloo Rd., Stockton. 8:30 to 12:20. Free. Contact Joe Grant
(209) 468-2085.

Feb. **North SJ Valley Grape Seminar** – 5 Turlock Irrig. Dist. Meeting Room, 333 E. Canal Dr., Turlock, 8:30- 12:00. Topics: Mediterranean wine grape varieties, omnivorous leaf roller, irrigation, and leafhoppers. Free. Contact Roger Duncan, (209) 525-6654 or Maxwell Norton, (209) 385-7403.

Feb. **Pear Research Review meeting** – 9-11 Hood River, OR. Contact Muriel Ing, (541) 386-1008.

Feb. **Strawberry Pest Management Meeting** – Sacramento. 8:30 AM to 12:30 PM. Translation to Mien provided. Free.
Contact Chuck Ingels (916) 875-6913.

Mar. **Apple Research Meeting** – Stockton 10 Inn, Stockton. Topics: Maturity studies, postharvest disorders, apple growing in Japan, core rot, chemical thinning update. Contact Joe Grant (209) 468-2085.

Resources

Suppliers of Beneficial Organisms in North America. 1997. Free. Contact Calif. EPA, Dept. of Pesticide Regulation, Environ. Monitoring & Pest Mgmt. Branch, 1020 N St., Room 161, Sacramento, CA 95814-5624; (916) 324-4100.

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