University of California Cooperative Extension:
El Dorado and Amador Counties

Foothill Farm and Orchard News

Issue #1 **December, 2000**

Hello from your new Farm Advisor!
Welcome to the first issue of my extension newsletter for tree fruit and specialty crop growers in El Dorado and Amador counties. I arrived as the University of California-Cooperative Extension Farm Advisor for Pomology/Horticulture/Specialty Crops in El Dorado and Amador counties on October 16 and have been quickly learning the county and the impressive array of crops grown here. I hope to deliver pertinent information in these quarterly newsletters. **Please help me to better serve you and understand the local agricultural needs by completing the enclosed grower survey and returning it to our office in the enclosed envelope.** I look forward to meeting and working with you.

Lynn Wunderlich

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What's wrong with my walnut trees? It could be walnut branch wilt,
(*Hendersonula toruloidea*).

My first farm call in El Dorado county came from a Gold Hill grower whose walnut trees had dying limbs, most evident in fall as the brown leaves remained attached to the branches while the other leaves were falling. The grower first noticed the leaves on these branches starting to yellow and wither in mid-summer, around July, and by fall the dying branches stood out on the otherwise healthy trees**.** **Walnut branch wilt** is a fungal disease of English walnut, almond, citrus, fig, European chestnut and poplar. The causal organism, *Hendersonula toruloidea*, is a fungus that grows well in hot climates and enters the bark of trees through splits, frost damage, and particularly, sunburn injury. The disease is diagnosed by the presence of black, sooty, fungal spores found just under the bark as it peels away. If left unchecked, the disease will travel down the limbs and extend into the trunk.

Fortunately, this is an easy disease to treat. The diseased limbs are pruned out and burned to prevent spread of the fungal inoculum (spores). Diseased limbs should be cut back into healthy, unstained wood, at least a foot away from discoloration. Since trees weakened by stress are most susceptible, avoid sunburn by maintaining vigorous trees through adequate irrigation and nutrition.

Chemical thinning of Fuji and Pink Lady apples in the San Joaquin Valley.

Condensed from a report submitted to the California Apple Commission
by Joe Grant UCCE-Farm Advisor, San Joaquin County and
R. Scott Johnson, UC Pomology Specialist, Kearney Ag. Center.

Note: the following is condensed from a report of research conducted in orchards in the San Joaquin Valley submitted by the authors to the California Apple Commission. Joe Grant notes that there is a certain amount of both art and science involved in the successful use of chemical thinners on apples. Results may be influenced by weather before, during and after application, tree condition, vigor and natural post-bloom drop. Therefore, the following is for informational purposes only and is not intended as a recommendation for thinning apples in El Dorado County.-L. Wunderlich

UC Cooperative Extension Farm Advisor Joe Grant (San Joaquin County) and UC Pomology Specialist R. Scott Johnson (Kearney Ag. Center) conducted research this past season in young mature orchards near Farmington, California, to evaluate the effectiveness of chemical thinning treatments on fruit set, size, and quality of Fuji and Pink Lady apples. Twenty chemical thinning treatments were applied to Fuji (Table 1) and five to Pink Lady (Table 2) in randomized complete block designs. Untreated control plots were included for each variety. Results obtained from these trials with NAA (napthaleneacetic acid) based products on Fuji were very encouraging.

Trees at the Pink Lady site were moderately vigorous, planted in 1994 on EMLA 7 rootstock with 8% Granny Smith pollenizers within tree rows. Trees at the Fuji site were TAC 114 Fuji planted in 1994 on EMLA 7 rootstock with 8% Imperial Gala pollenizers within tree rows. Spacing in the orchard is 8 X 16 feet. Soil at both sites is clay loam. Both orchards are micro-sprinkler irrigated and have a perennial grass sod planted between tree rows.

All treatments were applied in 150 gallons of spray solution per acre. Fuji spray treatments were applied with a backpack mist blower to simulate air blast sprayer application. Pink Lady treatments were applied by an air blast sprayer. Commercial application was simulated by spraying from both manifolds when traveling between pairs of test rows and spraying from the single manifold directed toward treated rows when traveling on either side of them. Applications were generally made between 5:00 and 9:30 AM, before bee flight and significant wind occurred. Weather conditions were generally cool and calm during application periods.

Thinning effectiveness was measured by evaluating the number of fruit set per 100 flower clusters and the number of fruit set per fruiting cluster. However, there was a large amount of variation in set among individual trees of the same treatment. Therefore, that data is not presented here. Thinning efficacy was also measured by hand thinning trees by a commercial crew shortly after fruit set counts were made, and the number of fruit removed from each tree was counted. These fruit per tree counts were adjusted mathematically to eliminate the effects of tree size differences on fruit loads. The authors consider the differences in the number of hand thinned fruit a better overall measure of thinning efficacy insofar as they reflect the impact of the treatment *on the whole tr*ee, as opposed to impacts on individual scaffold limbs used for fruit set counts. These results are presented in Tables 1 and 2.

In the Fuji trial, a random 20-fruit sample was collected from the count limb on each experimental tree just prior to the second commercial harvest. In the Pink Lady, 50-fruit samples were collected from count limbs (10 fruit per tree, 5 trees per plot) just before the first commercial harvest. These fruit were weighed to

determine average weight per fruit for each treatment, and fruit in each sample was evaluated for russetting severity.

Results and Discussion

Low winter chilling caused bloom to be prolonged in both varieties, making it difficult to accurately time spray applications based on bloom and fruit development. Warm dry conditions during bloom were favorable to fruit set in both varieties. This was reflected in the relatively heavy set on untreated trees of both varieties.

Fuji (Table 1). Bloom lime sulfur sprays are used widely for thinning Fuji in Japan. In contrast to moderate thinning achieved with this material in prior trials, none of the lime sulfur treatments (Treatments 1-3) provided significant thinning this year. The apparent inconsistency of this treatment, combined with its tendency to cause fruit russetting (observed in our 1999 trial), will likely result in our discontinuing its use in future trials.

Full bloom treatments of Ethrel at 600 and 900 ppm have provided good thinning of Fuji in some years, but results are not consistent from year to year. In one of several trials using high volume handgun application, Ethrel treatments reduced fruit size compared to other treatments providing a similar degree of thinning. This year, neither full bloom nor petal fall applications (at 600 or 900 ppm) gave significant thinning compared to untreated trees (Treatments 4-7). Adding Amid-Thin W at 50 ppm to the early petal fall Ethrel spray (Treatment 8) did not provide thinning either.

Combination treatments consisting of early petal fall applications of NAA-containing products (various salts of 1-naphthaleneacetic acid) followed by 12 mm fruit sprays of the same products and Sevin XLR (Treatments 9-11) significantly reduced the number of fruit removed in hand thinning compared to untreated trees. The three NAA products we tested performed comparably. Single NAA treatments of the same products at petal fall (Treatments 17-19) provided no significant thinning compared to untreated trees.

Treatment 16, an early petal fall Amid-Thin W + Sevin XLR spray, followed by a 12 mm Sevin XLR treatment is the program with which we have had the most experience in semi-commercial experiments and grower trials. As in previous years, this treatment provided good thinning. Neither adding an NAA product to the 12 mm Sevin XLR spray (Treatment 20) nor preceding the combination treatment with a bloom lime sulfur spray (Treatment 15) increased thinning.

Though an early petal fall spray of Amid-thin W + Sevin XLR alone (Treatment 12) failed to thin, combining it with a bloom lime sulfur spray (Treatment 14) did provide significant thinning compared to untreated trees. Adding Ethrel at 450 ppm to the early petal fall Amid-Thin W + Sevin XLR spray (Treatment 13) failed to increase its effectiveness. In past trials, adding Ethrel to the petal fall spray of the Treatment 16 combination has helped increase thinning activity of this treatment.

Treatments that provided significant thinning increased average fruit size roughly in proportion to the thinning achieved. None of the treatments increased russetting compared to untreated trees.

Pink Lady. (Table 2). An early petal fall spray of Sevin XLR at 0.5 lb/A (Treatment 1) did not significantly reduce the number of fruit removed by hand thinning. Adding Amid-Thin W at 25 ppm (Treatment 4) did not provide significantly better thinning. Increasing the rate of Sevin XLR to 1.0 or 1.5 lb/A (Treatments 2 and 3) did provide significantly better thinning. Adding Amid-Thin W at 25 ppm (Treatment 5) did not significantly enhance performance of the 1.0 lb/A Sevin XLR treatment.

Future research

The combination treatment of an early petal fall Amid-Thin W + Sevin XLR application followed by a small fruit Sevin spray is still considered the treatment of choice for Fuji in the San Joaquin Valley. The disadvantages of this program are that it is only moderately effective and removes entire fruit clusters (does not

reduce the number of fruit per cluster). As such, costly follow-up hand thinning is still needed to achieve optimum fruit loads. There is also the possibility of future loss of Sevin registration for thinning due to Food Quality Protection Act implementation or other regulatory actions.

Results obtained this year with NAA-based products on Fuji are very encouraging. The authors (Grant and Johnson) hope to continue working with these products with the objective of finding ways to replace and/or augment "standard" Amid-Thin W + Sevin XLR programs. The authors plan to continue trials with Pink Lady at least one more season. This work will continue to focus on Sevin XLR and Amid-Thin W treatments.

The authors wish to thank the California Apple Commission for funding these studies and Ace Apple, Inc., in particular production manager David Lowe, for cooperation in these trials.

Interested in chemical thinning in El Dorado County? I would like to conduct trials this coming season to gain experience in our climate with available, registered materials, if growers feel there is a need for this type of work. Please fill out the attached survey, or call me at (530) 621-5505 to express your interest in cooperating in chemical thinning trials in apples or stone fruits.- L. Wunderlich

Table 1: 2000 Chemical thinning treatments and results for **Fuji.**

Treatment			Hand-thinned fruit/tree[3]	Fruit weight (grams)[4]	Mean russet score[5]	% Culls[6]
Materials and Rates[1]	**Timings**	**Date**				
1. Lime sulfur (1% V/V)	80% bloom	4/2	655 bcd	193 abc	2.1	2.9
2. a. Lime sulfur (1% V/V) b. Lime sulfur (1% V/V)	80% bloom 100% bloom	4/2 4/4	644 bcde	190 abcd	2.1	3.8
3. Lime sulfur (1% V/V)	100% bloom	4/4	647 bcd	175 efg	2.1	2.0
4. Ethrel (600 ppm)	100% bloom	4/4	754 a	177 defg	2.1	3.5
5. Ethrel (900 ppm)	100% bloom	4/4	718 abc	169 g	2.2	2.6
6. Ethrel (600 ppm)	Early petal fall	4/6	675 abcd	171 fg	2.1	0.5
7. Ethrel (900 ppm)	Early petal fall	4/6	724 ab	167 g	2.2	1.5
8. Ethrel (600 ppm) + Amid-Thin W (50 ppm)	Early petal fall	4/6	727 ab	175 efg	2.1	4.9
9. a. SNAAP-8 (5 ppm) + Regulaid (1.5 pt/A) b. SNAAP-8 (5 ppm) + Sevin XLR (3 lb/A)	Early petal fall 12 mm	4/6 4/11	526 fgh	204 a	2.0	3.0
10. a. Fruit Fix 200 (5 ppm) + Regulaid (1.5 pt/A) b. Fruit Fix 200 (5 ppm) + Sevin XLR (3 lb/A)	Early petal fall 12 mm	4/6 4/11	502 h	198 abc	2.1	1.5
11. a. Fruitone N (5 ppm) + Regulaid (1.5 pt/A) b. Fruitone N (5 ppm) + Sevin XLR (3 lb/A)	Early petal fall 12 mm	4/6 4/11	546 efgh	198 abc	2.1	3.5
12. Amid-Thin W (50 ppm) + Sevin XLR (3 lb/A)	Early petal fall	4/6	610 defg	203 a	2.0	2.0
13. Amid-Thin W (50 ppm) + Ethrel (450 ppm) + Sevin XLR (3 lb/A)	Early petal fall	4/6	647 bcd	176 defg	2.1	0.5
14. a. Lime sulfur (1% V/V) b. Amid-Thin W (50 ppm) + Sevin XLR (3 lb/A)	80% bloom Early petal fall	4/2 4/6	512 gh	205 a	2.1	1.5

15. a. Lime sulfur (1% V/V) b. Amid-Thin W (50 ppm) + Sevin XLR (3 lb/A) c. Sevin XLR (3 lb/A)	80% bloom Early petal fall 12 mm	4/2 4/6 4/11	489 h	197 abc	2.0	0.5
16. a. Amid-Thin W (50 ppm) + Sevin XLR (3 lb/A) b. Sevin XLR (3 lb/A)	Early petal fall 12 mm	4/6 4/11	459 h	194 abc	2.1	3.4
17. SNAAP-8 (5 ppm) + Regulaid (1.5 pt/A)	12 mm	4/11	624 cdef	198 abc	2.0	2.6
18. Fruit Fix 200 (5 ppm) + Regulaid (1.5 pt/A)	12 mm	4/11	601 defg	188 bcde	2.1	3.5
19. Fruitone N (5 ppm) + Regulaid (1.5 pt/A)	12 mm	4/11	625 cde	195 abc	2.1	5.0
20. a. Amid-Thin W (50 ppm) + Sevin XLR (3 lb/A) b. Sevin XLR (3 lb/A) + SNAAP-8	Early petal fall 12 mm	4/6 4/11	520 gh	201 ab	2.1	2.9
21. Untreated[8]			695 abcd	185 cdef	2.0	2.8

[1]Spray applications made with backpack mist blower at 150 gallons per acre
[3]Number of fruit removed during hand thinning; Adjusted to remove differences in tree size among treatments and blocks
[4]All treatments sampled prior to second commercial harvest. Average of 20 fruit/tree
[5]Visual evaluation at harvest: 1=no russetting, 2=1-10% surface russetted, 3=11-25%, 4=26-50%, 5=More than 50%
[6]Fruit with more than 25% of surface russetted
[7]Treatments within columns followed by different letters are significantly different, Fishers Protected LSD ($P \leq 0.05$)
[8]No chemical thinning; Hand-thinned with other treatments after fruit and fruit cluster counts

Table 2. Chemical thinning treatments and results for **Pink Lady**.

Treatment			**Hand-thinned fruit/tree**[3]	**Hand-thinned fruit/cm² TCSA**[4]	**Fruit weight, grams**[5]	**Mean russet score**[6]
Materials and Rates[1]	**Timings**	**Date**				
1. Sevin XLR (0.5 lb/A)	Early petal fall	3/30	332 abc[7]	3.97 abc	164	1.8
2. Sevin XLR (1.0 lb/A)	Early petal fall	3/30	284 bc	3.39 bc	173	1.7
3. Sevin XLR (1.5 lb/A)	Early petal fall	3/30	237 c	2.83 c	175	1.7
4. Sevin XLR (0.5 lb/A) + NAD (25 ppm)	Early petal fall	3/30	361 ab	4.31 ab	168	1.7
5. Sevin XLR (1.0 lb/A) + NAD (25 ppm)	Early petal fall	3/30	287 bc	3.43 bc	174	1.8
6. Untreated[8]			407 a	4.86 a	156	1.7

[1]Applications made by commercial air blast sprayer, 150 gallons per acre
[3]Counts made of fruit on ground after hand thinning
[4]Trunk cross sectional area
[5]Sampled day of first commercial harvest; Average of 10 fruit/tree, 5 trees/plot
[6]Visual evaluation at harvest: 1=no russetting, 2=1-10% surface russetted, 3=11-25%, 4=26-50%, 5= More than 50%
[7]Numbers within columns followed by different letters are significantly different, Fishers Protected LSD ($P \leq 0.05$)
[8]No chemical thinning; hand-thinned with other treatments after fruit and fruit cluster counts on 5/26

UC Small Farm Center agri-tourism directory: Get your farm listing on the Web!

California farmers who conduct agri-tourism may now be included in the UC Small Farm Center online agri-tourism directory, which is currently under development. The web address for the Small Farm Center is www.sfc.ucdavis.edu, and it provides information on small-farm related research, news, specialty crops, food safety, ag. statistics, and materiales en espanol as well as the agri-tourism directory for consumers.

As many local growers already know, "Supplemental agri-tourism income can help keep small, family farms in business at a time when they are under increasing economic pressure", according to agricultural economist Desmond Jolly, director of the UC Small Farm Center. "It may be the boost they need to overcome a rising tide of consolidation of farms into large agricultural conglomerates." Some local growers have already taken advantage of the free web site listing.

To put your farm on the web, fill out the enclosed form and return it to the Small Farm Center address listed on the bottom.

Now is the time to treat for peach leaf curl disease (*Taphrina deformans*).

After enjoying your holiday dinner, did you remember to spray your peaches and nectarines for peach leaf curl? Late November to early December is the time to treat for peach leaf curl disease caused by the fungus *Taphrina deformans*. Fungal ascospores (sexual stage) and conidia (asexual spores) survive on the surface of twigs and between bud scales during autumn and winter. Between November and March, these spores develop thick walls and in spring, as the peach buds open, produce germ tubes, which then penetrate the young leaves. Trees should be treated just after leaf fall and **prior to bud swell** with a copper or liquid lime sulfur dormant spray to prevent infection in spring. A single application at this time should be sufficient to control the disease.

First Announcement:
5th International Peach Symposium to be held July 8-11, 2001 at Davis, California.

Topics will include:

Applied Breeding
Environmental Physiology
Fruit Development
Postharvest Technology
Cultural Practices
Pest Management

Sponsored by the UC Davis Pomology Dept. and ISHS.

For more info. contact Lynn at 621-5505.
This will be a great opportunity to learn the latest in peach research from around the world, at a close location!

Get to know your new Farm Advisor.

On October 16th I began my career as University of California-Cooperative Extension Farm Advisor for El Dorado and Amador Counties. The position I am assuming was formerly held by Mario Moratorio but has changed somewhat in that I will have responsibilities for Pomology/Horticulture/Specialty Crops in both El

Dorado and Amador counties while Amador County Director and Farm Advisor Donna Hirschfelt will remain Viticulture Advisor for both counties.

I thought I would share a little of my background for those of you who are interested. I grew up in Appleton, Wisconsin, and earned my bachelor's degree in Bacteriology from the University of Wisconsin-Madison in 1985 where I worked in the University's Plant Pathology Department assisting in apple scab research. It was then that I was introduced to biological control, at that time, a novel prospect in plant pathology since the concept of microbial biological control was relatively new. I have been interested in biological control ever since and have, I think, a good understanding of the challenges involved with on-farm implementation of alternative control strategies.

After moving to California in 1986, I worked in a number of agricultural research programs, including USDA-Agricultural Research Service in Salinas (on developing a diagnostic tool for a soil-borne sugarbeet disease) and as a lab assistant for UC Santa Cruz. While there, I helped with on-farm comparative studies in apples, artichokes and strawberries. I monitored for codling moth populations in pheromone confusion studies (this was in the early days of mating disruption technology) and operated a phone-line for codling moth degree-day information.

I returned to school to earn a master's degree in the Plant Protection and Pest Management program at UC-Davis in 1997. For my thesis research, I designed and evaluated a liquid delivery system for distributing eggs of beneficial insects (green lacewing eggs) under the direction of UC-Davis biological and agricultural engineer Ken Giles. After graduation, I worked for a short time at UC Cooperative Extension in Ventura county on avocado thrips. I then accepted a position with UC Cooperative Extension in Monterey County, serving as the Central Coast Vegetable IPM Project Coordinator. I worked with a team of Salinas Valley growers and conducted on-farm research in developing and implementing an IPM program for lettuce and celery. This involved conducting side-by-side comparisons of a "soft" (reduced-risk) pesticide program compared to the "grower standard". Many of the materials I worked with in lettuce are also registered (with different trade names) for use in tree fruit. I delivered the results of that program in a newsletter and via a web site.

I feel very fortunate to have been chosen for this position. In the short time that I have been here, I have begun to appreciate the unique growing community and the beauty of these foothill counties. (I have also tasted some quality produce!) This is the first time I will be working in the Farm Advisor title and my goal is to deliver timely information to you, the growers. I strongly believe in the farm research motto: "Keep one foot in the furrow", that is, I believe research needs to be conducted on-farm and in cooperation with it's users. I hope you will use me as a resource for information and consider working with me.

To contact me, call (530) 621-5505, or Email: lrwunderlich@ucdavis.edu.

Mark your Calendars:
Noxious Weed Workshop
Saturday, February 3, 9:30 a.m.-3:30 p.m.

With Joe DiTomaso, UC Weed Specialist and expert on Yellow Star Thistle management, plus information on Scotch Broom and other noxious weeds.

Bethell-Delfino Agricultural Center,
311 Fair Lane, Placerville.

Sponsored by the El Dorado County Noxious Weed Management Group.