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June 4, 1982

Mr. Don Aluisi
Sun-Guard Chemical Company
1269 East Copper
Fresno, CA 93710

Dear Don:

I have looked over the table we developed regarding interaction of walnut aphids and whitewash trying to sort out some of your questions regarding this data. I am enclosing the table for your quick reference.

To answer your question regarding why didn't we have the same results as in our previous work, let's make some comparisons within the table. First, look at the first two lines only. In essence, this compares nut quality and value from whitewashed trees either having or not having walnut aphids. (Essentially, these are the same comparisons we made in our initial test to determine the role of walnut aphid on walnut quality and yield - i.e. aphids and no aphids on whitewashed trees - paper enclosed). Note that the data corroborates our previous work, i.e. aphids caused substantial reductions in % large size, % light colored kernels, total edible kernel, and networth per pound while increasing % light amber, amber & offgrade. Thus, this is the same result as found in our earlier work.

Now, let's compare only line 1 & 3. Here we essentially compare whitewash with no whitewash on aphid infested trees. Note that no difference in quality or price per pound occurs in this comparison. This tells me that walnut aphids can nullify effects of a whitewash treatment.

Now let's compare only lines 2 & 4. This compares influence of whitewash on non-aphid infested trees. This test would be similar to others in the state and we obtained similar results i.e. 2.74¢/lb increase in value using whitewash due to improvement in quality.

Finally, let's compare lines 3 & 4. Here we have aphids compared with no aphids on unwhitewashed trees. Note again, no difference in quality (except % large size favoring no aphids) or value exists. Thus, sunburn or heat damage appears to override aphid infestation.

Thus, in summary, the data explains clearly what we have been saying about 1) role of walnut aphid and quality; 2) role of whitewash and quality; and, 3) interaction of aphid and sunburn as it relates to whitewash treatment.

I hope this clarifies this table and answers questions you brought up at our meeting with Gary. If you have further comments or questions, please call.

Sincerely,

G. Steven Sibbett
Farm Advisor
(209) 733-6486

vj/Enclosure
cc: G. Obenauf

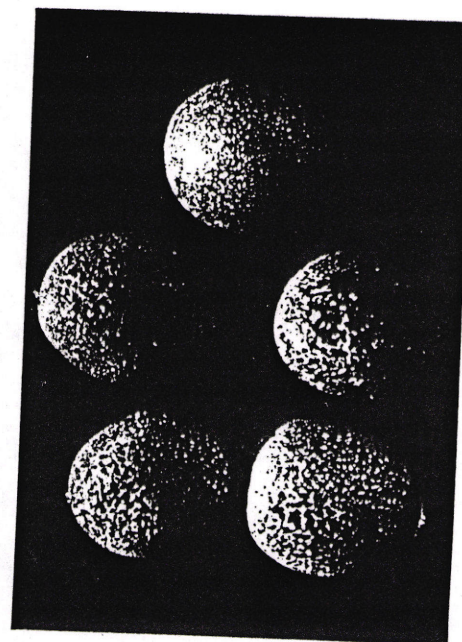
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Cooperative Extension Work in Agriculture and Home Economics, U. S. Department of Agriculture, University of California, Tulare County Cooperating.

TABLE II. Walnut quality and resulting network per inshell pounds as influenced by aphid population and 'whitewash' application.*

Line #	Treatment	% Lg. Size	% Light	% Lt. Amber	% Amber	Total Edible	% Offgrade	Network/ Pound
1	'Whitewash' + Aphids	66.6	24.1	5.1	6.4	35.6	12.9	18.63
2	'Whitewash' + No Aphids	77.7	31.2	4.6	4.9	39.9	8.2	21.53
3	No 'Whitewash' + Aphids	68.2	25.5	4.7	5.7	35.9	12.1	18.92
4	No 'Whitewash' + No Aphids	74.2	25.4	4.7	5.4	35.5	12.5	18.79

* Trees of good vigor



AT LEFT IS a general view of experimental orchard, Campbell Ranch, Visalia. Above shows Walnut Aphid honeydew injury, Payne variety.

DOLLARS AND CENTS REASONS FOR CONTROLLING **walnut aphid**

By G. Steven Sibbett, M. M. Barnes
and C. S. Davis

First year data (1969) from a trial conducted in Tulare County, designed to determine feasibility of controlling the Walnut Aphid, demonstrate an advantage of \$191 per acre favoring control. These results, of periodic aphid influence, are similar to those obtained from trials in Ventura County on the Placentia variety comparing trees having continuous Walnut Aphid populations with trees treated to exclude Walnut Aphids (Diamond Walnut News, 1962).

The trial is being conducted in cooperation with Vince Hutchison and William Campbell of Visalia on 10-year-old Payne trees planted 35 trees per acre (see Table I). It consists of twenty-two sets of paired trees, one tree of each pair being treated to exclude Walnut Aphids, the other remaining untreated. The entire plot of experimental trees receives normal cultural practice, including Codling Moth treatments and a cover spray for sunburn protection. Thus, differences in walnut yield and quality determined in this test are attributable to Walnut Aphid population alone.

Walnut Aphid infestation began May 1, 1969, reached a peak on untreated trees of 86 aphids per leaflet May 27, 1969, and declined during June to less than two aphids per leaflet by July 1, 1969, remaining at that level for the rest of the season (see Table I). It is noteworthy that the period of intense Walnut Aphid infestation coincides with the period of most rapid growth of walnut size. Hence, Walnut Aphid interfere with highest demand on leaf productivity. This sequence is typical of Walnut Aphid infestation in hot, interior valleys.

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Table 1. Aphid population, Payne walnuts, Visalia, 1969.

	5/1	5/13	5/20	5/27	6/4	6/10	6/25	7/1
Untreated	< 1	23	57	86	48	44	5	2
Treated	< 1	22	.08	1.8	1.2	8.7	.08	.4

Treated May 13 and June 18

Table 2. Effect of spring infestations of Walnut Aphid on yield—Payne variety, Visalia, 1969

	Aphids controlled	Aphids not controlled	Difference
per tree	93.7 lbs.	84.4 lbs.	9.3 lbs.
per acre	3281 lbs.	2955 lbs.	326 lbs.

Total yield, dry weight. Differences significant; 40:1.

Table 3. Effects of spring infestations of walnut aphid on quality of Payne walnut—Visalia, 1969

	Aphids controlled	Aphids not controlled	Difference
% Large Sound	73 %	47 %	26 %
% Diamond	53 %	37 %	16 %
% Emerald	19 %	19 %	0 %
% Suntan	20 %	26 %	6 %
% Offgrade	8 %	18 %	10 %
% Shriveled	4 %	9 %	5 %
% Blank	2 %	5 %	3 %
% Adhering Hulls	3 %	6 %	3 %
% Non-blowable damage	18 %	33 %	15 %

Average of samples from 22 trees of each category. Differences significant at 99:1 or greater except % Suntan—19:1.



DARKENING OF UPPER surface of walnut leaves due to honeydew accumulation from Walnut Aphid.

More About - WALNUT APHID

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Walnut Aphids were controlled in trees designated to be treated with two insecticide applications.

The entire crop from each experimental tree was harvested (two picks), hulled, and weighed prior to dehydration to determine total "wet" weight. In addition, from each tree from each pick, 1,000 gram samples were taken following hulling and weighing and were dried and fumigated.

Total dry weight of each experimental tree was determined relating difference in wet and dry weight of the samples to total weight of the tree. Samples taken from each tree were then weighed and combined, proportional to amount of crop each represented, to make up a composite 1,000 gram sample for quality use in evaluations made by Diamond Walnut Growers.

Yield and quality data were statistically analyzed and results summarized in Tables II and III.

Trees where Walnut Aphids were controlled yielded 326 lbs. per acre more than those where Walnut Aphids were not controlled and differences were statistically significant (see Table II).

Nut quality was also affected by not controlling Walnut Aphids. Significant differences in crop, between treated and untreated trees, were determined in nut soundness, kernel color, shrivel, and external damage (see Table III). These quality factors, by which value is determined, were further evaluated for each sample in terms of average price paid for walnuts of varying quality for the past five years and related to total crop per tree.

Walnuts from Walnut Aphid infested trees were valued at 20.4¢ per lbs. while those from trees where Walnut Aphids were controlled were worth 24.3¢ per lbs. Considering increased yield and differential in price, crops from trees where Walnut Aphids were controlled grossed \$797 per acre while crops from trees in which aphids were not controlled grossed \$606 per acre.

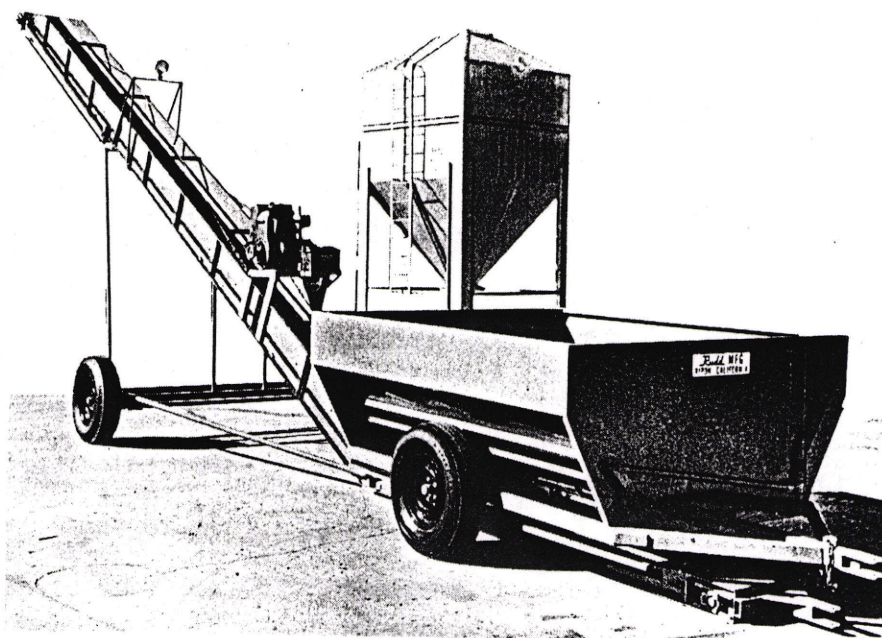
In addition to crop yield and quality, honeydew, secreted by the Walnut Aphid, is phytotoxic to green tissue of Payne walnut leaves and husks (see Tables II and III). Epidermal cells, coming in contact with honeydew, become dark brown or black resulting in possible abnormal heat absorption and sunburn.

In Payne orchards where "white-washing" was not practiced and Walnut Aphid not controlled, yield and quality reductions appeared more severe than in the experimental plot with the additional sunburn of exposed nuts that occurred. Sunburn was not a factor in the experimental plot as protection was provided.

Effective Walnut Aphid control is currently achieved by application of insecticides. Since insecticide resistance varies in different districts, information regarding effective practice should be obtained from local farm advisors offices.

Similar research is underway by Farm Advisors Ron Tyler in San Benito County and Dave Ramos of Stanislaus County but their data are not included in this report.

*G. S. Sibbett is Farm Advisor, Tulare County; M. M. Barnes is Professor, Department of Entomology, University of California, Riverside; and C. S. Davis, is Extension Entomologist, University of California, Berkeley.



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