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California Avocado Commission Grower Research Survey Results: 1999

On January 4, 1999, a research survey questionnaire was sent to all persons on the California Avocado Commission's *Green Sheet Newsletter* subscription list — 1530 people who are interested in the day to day activities of growing avocados in California. The recipients were asked to evaluate seventy-two research topics for their importance to improving production of California's avocado groves, and, or maintaining the groves' viability against pests, diseases, and high production costs. We are indebted to the 456 people who studied, evaluated and returned the questionnaire. The results of the survey are the most important source of information the Production Research Committee uses to establish its research priority list and the funded research program for the next two years.

The 456 respondents represent a very respectable 30% of those receiving the survey questionnaire. The survey also asked respondents to anonymously list the planted acreage they represented, and the location of the grove (North, South or San Joaquin Valley). There were 325 responses to the acreage and location questions. The responses represented growers who cultivate a total of 13,932 acres. This information helps substantiate the validity and utility of the survey.

All topics were to be evaluated on a one to ten scale, ten being the most important. With 456 people responding to the survey, any one topic had the possibility of a 4560 value score (456 x 10). The survey topics and results are listed below. Only the twenty highest valued topics are ranked:

<u>I. DISEASES</u>	Total Value	Rank
Root Rot		
Selecting or Creating		
Tolerant Rootstocks	2952	8
Biological Control	2843	12
Cultural Control	2500	20
Chemical Control	2433	
BlackStreak	1277	
Sun Blotch	1434	
Diseases, other (please list)	363	
<u>II. PESTS</u>		
Avocado Thrips (Scirtothrips perseae)		
Biological Control		
-Using Natural Enemies	3368	
-Continued Exploration for New Enemies	3208	3

Chemical Control	2652	17
Cultural Control	2543	18
Worms (Amorbia, Looper)		
Biological Control	1915	
Chemical Control	1269	
Persea mite		
Biological Control		
-Using Natural Enemies	3245	2
Continued Exploration for New Natural Enemies	2704	15
Chemical Control	2072	
Cultural Control	2102	
Giant White Fly	1719	
Pests, other (please list)	274	

III. INCREASING PRODUCTION

Soil Improvement

Mulching and Other Techniques	2452	
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Irrigation

Optimizing Fruit Set Through Irrigation	3173	4
Preventing Fruit Drop Through irrigation	2891	9
Irrigation Efficiency	2777	14
Frequency vs. Depth	2696	16
Moisture or Salinity Stress in Fall on Spring Fruit Set	2479	
Salt Tolerant Rootstocks	2180	
Maximum Water for Maximum Production	2846	11
Other (please list)	244	

Fertilization

Nitrogen: Seasonal Levels for Optimum Fruit Set	3128	6
Seasonal Rates and Formulations of Applications	2787	13
Nitrogen Only, or Phosphorus, or Potassium, or Combinations	2876	10
Fertilizer Application Techniques		
-Broadcast	2132	
-Irrigation	2508	19
-Foliar	1854	
-Trunk or Branch Injection	1790	
-Other (please list)	278	

Pollination

Number of Beehives per Acre		
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and Placement of hives	2323	
Boron or Growth Regulator Application to Improve Fruit Set	2275	
Bee Attractants	2105	
Pollenizer Varieties	2219	
Pollination Method Superior to Honey Bee	2399	
Other (please list)	168	
Canopy Management		
Pruning vs. Orchard Thinning by Tree		
Removal or Stumping	3134	5
Pruning Techniques	3109	7
Girdling	1954	
Other (please list)	173	
High Density Planting Varieties	1354	
New Varieties with Increased Production	2385	
Quality of New Varieties	2232	
Specific Time of Season in Which New Varieties Mature	1989	
Genetic Engineering New Genetically Engineered Varieties and Rootstocks	2264	
Genetic Transfer of Tolerances to Existing Rootstocks	2241	
Other (please list)	134	
IV. HARVESTING AND POSTHARVEST		
Harvest Techniques and Equipment	1737	
Economic and Cultural Benefits of Size Picks vs. Strip pick	2129	
Early Harvest Effect on Fruit Set and Alternate Bearing	2394	
Hand-snap picking vs. Clippers	2058	
Packinghouse Problems		
-Diseases	1402	
-Packaging	1269	
-Release Dates; Earlier Releases for preconditioned fruit	1561	
Long-term Storage: Maximum Length of Storage	1548	

Quarantine Treatments	1559
Fruit Quality at Retail	2041

COMMENTS

1. The Avocado thrips and the Persea mite are the most important topics to growers. Six of the top twenty topics involve these two pests. Be assured that the current-research program is funding a formidable team of researchers that has already provided the information to give the industry two chemicals the industry can use to control these pests — Veretrin D and Agrimek. They have developed a biological control program for the Persea mite in Southern California. Their ultimate goal is a biological control program for the Avocado Thrips and the Persea Mite in all California avocado regions.

2. Irrigation still ranks as the second major area for research in Southern California where water is high in salts, is expensive, and where the soil is predominantly shallow and granitic. Past research has found production, or lack of it is directly correlated to the amount of water applied — more water, more avocados. There is no project funded on irrigation to answer questions related to seasonal needs to avoid fruit drop or insure fruit set. Researchers have been notified of the industry's interest. (Please note there is no mention of concerns of the San Joaquin Valley, as too few comments were reported from that area.)

3. Pruning and orchard thinning were equally important to the southern and northern regions. Two projects have been funded the past year with continued funding expected for the next four to six years. In the meantime, the common suggestion for orchards with very tall trees and intertwined canopies is to start the chain saw. The trees will only get taller, and production will be less. Check with your Cooperative Extension Farm Advisors, packinghouse fieldmen and grower consultants for more in-depth recommendations.

4. Unanswered questions on fertilization and specific fertilizers were very important to northern growers with southern growers also seeing a need for answers. Seasonal levels of nitrogen for optimum fruit set was the highest priority. Fortunately, results from a four year trial have given some specific answers: an extra twenty-five pounds of nitrogen per acre in either April or November gave significant increased production, while an extra twenty-five pounds per acre in February or June decreased production. Dr. Lovatt is currently funded to determine other timings and amounts of nitrogen to increase production even more, or equally important, what not to do that could cause decreased production.

5. Root rot is still a major concern in both north and south and ranks number five in importance. Thankfully, Dr. John Menge sees a light at the end of the tunnel. There are at least two new rootstocks that look better than the current best, which is Thomas. These two are PP4 (provisional name, Zentmyer) and VC 256, an Israeli root- stock brought over as part of PRC's international liaison program in 1993. The value of mulches, gypsum, and beneficial organisms is being demonstrated by laboratory and field studies. Some specific recommendations should be available for growers in the near term.

6. Grower comments written on the survey under "Other Research Concerns" were multiple and varied. The most common request was for work on *Phytophthora citricola* crown rot. This topic wasn't listed because Dr. Menge has concluded his research on *Phytophthora citricola* and has reported his results and recommendations to the industry. The problem is that although prevention measures are effective, control treatments are only moderately effective for trees which have the disease. Survey comments have been relayed to Dr. Menge.

Once the Production Research Committee had the survey results it constructed the Research Priority List. The priority list is based on the evaluation of the survey results and other considerations raised by the members of the Production Research Committee.

RESEARCH PRIORITY LIST FOR 1999-2000

- Control and biology of avocado pests, specifically: Avocado thrips (*Scirtothrips perseae*) and Perseamite (*Oligonychus perseae*). The identification of effective biological and chemical control methods, including collection and evaluation of potential natural enemies for use in an integrated pest management program, are of primary interest.
- Canopy management, i.e., tree pruning, girdling, and other innovative techniques designed to increase efficient avocado production.
- Fertilization of avocado trees, including optimal formulations, timing, application techniques and rates, and efficacy based on soil type and considerations of grove location.
- Development of tolerant rootstocks and/or treatments and materials to combat avocado root rot (*Phytophthora cinnamomi*).
- Irrigation of avocado trees', including water management strategies designed for optimal yield, with attention being given to varying: 1) soil types, 2) water quality, and 3) environmental conditions.
- Improving pollination of the avocado. Methods to improve the use of the honey bee or alternative pollination agents. Use of plant hormones, growth regulators or chemicals to enhance pollination and fruit set.
- Development of new avocado varieties. Plant breeding, selection and evaluation of potential cultivars from growers and nursery men throughout the avocado regions of the world for productivity, fruit quality, and disease and pest tolerance.
- Understanding avocado phenology (annual growing cycles, including root, leaf, flower and fruit) under California conditions, in order to enhance fertilization and irrigation management strategies aimed at increasing productivity, and minimizing the alternate bearing tendency of the trees.
- Improving the quality of avocado fruit at retail, and the identification of points in the handling and distribution chain where a loss of quality may be occurring. This may encompass one or more aspects of harvest and post-harvest handling.