

**Fourth Avocado Institute of Intercounty Farm Bureau Avocado Department**

Reported by Dr. Bachelor on Friday, October 13, 1933

**IRRIGATION**

*(Consumptive use of water by avocados)* In April, 1932, consumptive use of water studies were started in two groves of mature Fuerte avocados, located in the East Whittier Heights area of Los Angeles County. The soil is classified as an Altamont Clay adobe. Soil moisture investigations have extended throughout the irrigation seasons of 1932 and 1933.

These studies show that mature avocados in this locality remove from the soil 18 to 20 acre-inches of water per acre. The greatest use of water occurred in July of both years when about 3.5 and 4.8 acre-inches per acre were extracted for the two years respectively. Seasonal use of water in acre-inches per acre by months in one grove in 1932 was found to be as follows:

|           |     |
|-----------|-----|
| April     | 1.8 |
| May       | 2.3 |
| June      | 3.3 |
| July      | 3.5 |
| August    | 2.8 |
| September | 2.0 |
| October   | 2.0 |

In another grove in 1933 the seasonal use to the end of September has been 18.5 acre-inches per acre, divided as follows:

|           |     |
|-----------|-----|
| May       | 2.3 |
| June      | 4.5 |
| July      | 4.8 |
| August    | 3.7 |
| September | 3.0 |

## FRUIT SETTING

"A Study of Flower Development and Behavior and of the Factors Affecting Fruit Setting in the Avocado" was originally started in 1929.

Some cytological work on avocado flowers has been accomplished. While not sufficiently comprehensive to be fully conclusive, this work established the fact that the embryo is ready for fecundation at the first opening stage of the avocado flower.

During the blooming season of 1932-33 studies were made of the blooming and setting behavior of some 30 young seedling trees on the U.C.L.A. campus at Los Angeles. The importance of favorable weather to satisfactory setting was strongly emphasized in this study and strong evidence obtained of a pronounced tendency to alternate bearing.

The conclusions from these studies have been reported at the annual meetings of the California Avocado Association and in the annual reports of the Agricultural Experiment Station.

The work this summer has consisted mainly in obtaining additional information concerning the alternate bearing tendency in the Fuerte variety with a view to locating suitable trees for field experiments. The widespread and pronounced occurrence of the alternate habit of bearing in this variety is revealed by the evidence accumulated. Individual tree yield records show that by far the greater part of the bearing Fuerte avocado trees in this state fluctuate from high to low yield and that the production of two large crops in succession is extremely rare.

Within the coming month or six weeks it is planned to lay out some simple field experiments on pairs of trees, one member of which is in the "on crop" stage and the other in the "off crop" condition. These experiments all include fertilization, girdling, and injection.

Avocado seeds are now being germinated to provide seedlings for the breeding project it is proposed to undertake in another year or two.

## AVOCADO INSECTS

Active work on avocado insects has been under way now for a year and a half. Detailed studies have been made, and completed, on the life history and habits of the amorbia, looper, avocado brown mite, and latania scale; the four most important pests of the avocado. Control measures have also been determined for these pests. Thus far, the control appears to be fairly satisfactory.

Observations have been made on several other insects that are minor pests of the avocado, and sufficient work will have been done by the end of the present season to furnish material for a preliminary publication on avocado insects.

## BENEFICIAL INSECT INVESTIGATIONS

In connection with the possible use of the parasite, **Comperiella** on the dictyospermum scale, we have determined that this parasite works on that host. We have made

colonizations on dictyospermum scale at Whittier. Next spring we expect to colonize on dictyospermum scale on avocados, if satisfactory infestations can be located.

## **PLANT PHYSIOLOGICAL INVESTIGATIONS**

The principal work now underway is a study to determine the distribution of the mineral constituents of the fruit. This investigation is directly related to the problem of imperfections in the fruit, such as surface spots, internal browning, and irregular maturity. A published report has been made on the accumulation of mineral constituents in the leaves, with special reference to tip-burn.

Some preliminary studies have been made on mottle leaf of avocado. The conditions found have been similar to that of mottle leaf of the orange.

## **AVOCADO DISEASES**

Papers have been given from time to time at avocado growers' meetings, and some of these have been published for immediate guidance of the industry.

A bulletin is being prepared which gives a general discussion of all avocado diseases in California that have been studied extensively enough to warrant publication.

Work is being continued with especial attention to softening fruit by Dothiorella rot, and canker diseases including ring-neck. Thompson spot, and a spot which has sometimes been called salt spot, as well as smudgy spot are to be studied as the opportunities arise. Plans have been made for a critical study of avocado anthracnose. Plants for this study are being kept in the greenhouse, including lime, mango, sugar apple, and sour sop which are known to be susceptible to certain forms of anthracnose. Observations are being made on the blemishes and diseases which have been inadequately studied up to the present time.

The possible relation of parasites to the failure in productiveness of many trees, during the present season, is being watched.

**Sun-blotch.**—Several papers have been published concerning sun-blotch, and it is believed that the nature of the disease is established. The work has indicated the nature of transmission of the disease, and has helped to classify it as being caused by a virus. Although certain observations have been made regarding the movement of the infectious principle within the plant, these studies have not been sufficiently complete to determine whether or not all the buds within a diseased plant may transmit the disease. Closely related to this phase of the investigation is the question of the apparent recovery of parts of diseased plants. These problems are to be the subject of continued study.

**Avocado Little-leaf.**—This abnormality of avocado trees is being investigated,, particularly in San Diego County. At that place comprehensive experiment has been set up to test the effectiveness of certain soil treatments in the control of the trouble.

**Avocado fertilization.**—Assistance has been rendered the county agents and others in planning relatively simple fertilizer experiments. Such a method of approach to the

problem, if carefully planned, should indicate basic principles to be continued, in view of the lack of satisfactory large acreage for such experiments.

We appreciate the cooperation of the County Farm Advisors, and of the various organizations working for the improvement of the avocado industry.

**Dr. Coit:** To state a concrete case, suppose Prof. Quayle secured some new results which warranted a paper, you approved it, and you asked where he expected to give it. If he had two invitations, one from the Association and one from the Farm Bureau what would you suggest.

**Dr. Batchelor:** I think material presenting direct information to the industry should be given where it will do the most good. It is sometimes damaging to release such material unless it is before a large number of people.

**Dr. Coit:** You would prefer the organization which offered the largest audience?

**Dr. Batchelor:** Yes.

**Mr. Dutton:** That was what Director Christie spoke about this morning, over the phone. He thinks we should not bother the Experiment Station people to run around the country and give important papers at very small meetings.

**Dr. Coit:** Several members of the Board of the Association have been uncertain in their minds as to the future of the annual Association dinners. Are the dinners worth while from the standpoint of Calavo Growers, and also from the standpoint of the Farm Bureaus and the industry as a whole?

**Mr. Hodgkin:** I, for one, think the annual dinners should be continued. I assume you will appoint a Committee. Mr. Blanchard made some very definite suggestions that I think well worth following up—having the Association call together the leaders of the Farm Bureau groups and the Farm Advisors and others, at stated intervals. You should get the growers from the various districts together at meetings twice a year under the combined auspices of the Association and the Farm Bureaus. Have the members come together at the annual dinner and meeting, and get it sponsored by all organizations. If you don't have the individuals interested in both the Farm Bureau and the Association, you will not have funds to carry on your duties. You must have funds to print the Year Book. I think if you don't cut out some of the duplication you now have, you will lose a lot of support to the Farm Bureau. The growers don't know where to spend their money. Some leaders think one way, some another. If they belong to the Farm Bureau, they are not able to belong to the Association unless you can show some definite reason for so doing. We should remember there are two types of work—research which should be done by one organization. That should not be duplicated. The educational work and the general distribution of information, can be duplicated as much as you wish. It is like advertising. This would apply to trying to get a Tariff, for example, or getting Legislation, or promoting a cooperative spirit.

**Mr. Palmer:** I have been thinking of some ways in which the County Agricultural Commissioner might be of assistance and several points occurred to me. Our office is making an attempt to catalog the avocado growers in that district, the number and variety of trees, age of trees, etc. That should be of value. Another suggestion is for the Agricultural Commissioners to report to the Experiment Station any work that is being

done on pest control or disease investigation. It may aid the University, and give an opportunity to inspect such work. Each Commissioner in the Counties where avocados are grown should report such activities to the Experiment Station. The Station would then draw its conclusions and give some definite information from the data.

**Dr. Coit:** The matter of funds is a difficult one for the Association. The Calavo Growers forgave us a part of our bill last year. The principle items are rent, stenographic service, telephone, stationery, postage, printing, etc. Certain amounts of money have been donated to the Association, specifically for research work. At the present time there is a very small amount in the research fund. It requires perhaps between \$2,000 and \$2,500 per year to operate as we are now operating. We have about 400 members, at \$5.00 each. When a method of cooperation is worked out between the Association and the Farm Bureau, the question of finances should be taken up and carefully studied.

**Mr. Blanchard:** When I was a Director of the Association, I outlined a system which we operate in Ventura County. The Farm Bureau could not operate on \$5.00 memberships. We have a \$25.00 sustaining membership. Anyone desiring to take one or more sustaining memberships, might do so. The large agricultural enterprises, the large ranches, take out several. We have some fifty to sixty annually, giving us \$1500.00. This enables our organization to function. Perhaps this might work out in the Association.

**Dr. Coit:** What do you wish to do regarding this Committee? The Committee would simply crystallize the average opinions given here today. The general consensus of opinion appears to be that the Association should continue in some form,, and should be rebuilt in such a way as to furnish congenial and effective leadership for the Farm Bureaus. This Committee should work out the details. The By-Laws would probably have to be changed, and also the matter of finances.

It was moved and seconded that the Chairman be authorized to appoint such a committee. Upon unanimous vote of approval, the motion was carried.

**Dr. Coit:** The members of this committee will be: Judge F. D. Halm, chairman, C. V. Newman, J. N. Thille, H. E. Wahlberg, Dean Palmer,, M. G. Rounds, A. W. Christie.

The committee will meet at 6 P.M., November 21st, at Hotel Hoover, at Whittier.

This meeting stands adjourned.