California Avocado Society 1960 Yearbook 44: 15-17

REPORT OF THE AVOCADO RESEARCH COMMITTEE, I960

Hugh T. Walker

A meeting of the committee was held at the Citrus Experiment Station, March *29,* 1960.

Representatives of the staff were asked to report on the work of their departments. For the benefit of those who were not present, the reports are filed in the office of the California Avocado Society, 4833 Everett St., Los Angeles.

The following four reports include only those which were contributed for inclusion in the Yearbook to be added to the report of the research committee.

SUMMARY OF CURRENT INFORMATION ON CAUSES AND CONTROL MEASURES FOR IRON AND ZINC DEFICIENCIES IN THE AVOCADO

E. F. Wallihan and T. W. Embleton
University of California Citrus Experiment Station Riverside, California

Iron Deficiency

Causes. Insufficient iron in tree, brought about by lime in the soil, poor soil aeration, poor drainage, excessive moisture. Severity varies with rootstock and scion varieties.

Diagnosis.

Visible symptoms—leaf chlorosis consisting of fine network of green veins against a light green or yellow background. Severe cases followed by dieback of twigs, then limbs.

Leaf analysis—less than 45 parts per million of iron in dry matter of leaves. (N. B. fresh leaves must be washed carefully with soap to remove dust and spray residues.)

Control Measures.

1. Avoid excessive soil moisture.

2. Try application to soil of ¼ to ½ Ib. Sequestrene 138 Fe per tree.

Zinc Deficiency

Causes. Low availability of soil zinc.

Excessive use of phosphate fertilizers.

Diagnosis.

Visible symptoms—(Fuerte variety)—light green or yellow blotches between veins in leaves, relatively uniform in severity over entire leaf. This is in contrast to excess

chloride chlorosis in which the mottling is most severe at the tip and near the edges of the leaf. Leaves narrower or smaller than normal. Fruit, round, rather than pear shape. Leaf analysis—less than 15 ppm. zinc in dry matter of leaf.

Control Measures.

In neutral or acid soils.

a. Apply zinc sulfate to soil at 1 to 10 Ibs. per tree, depending on size.
b. Apply zinc chelate to soil at rates up to 3 Ibs. per tree, depending on size and severity of deficiency.

In alkaline soils.

a. Apply standard zinc spray to foliage.
b. Zinc chelates applied to soil sometimes give successful control.

AGRICULTURAL EXTENSION PROGRAM FOR AVOCADOS

Robert G. Platt

Extension Subtropical Horticulturist

1. Avocado Varieties

Plots in most counties testing new varieties and hybrids and checking experimental varieties for adaptation and performance in various areas. Work closely with A.V.I.C.

Continuing to stress top working poor varieties to desirable ones.

2. Avocado Root Rot

Cooperating with research on county plots for methods of control and resistant rootstocks.

Extension Horticultural Technologist works closely between research and farm advisors.

Soil surveys being studied in relation to location of infected orchards.

Irrigation-root rot plot to study effect of controlled irrigation in preventing spread of disease.

Education and publicity for growers to teach precautions to avoid root rot and best means of containment.

3. Avocado Fertilization

Teaching efficient uses of nitrogen for more fruit and lower costs. Helping growers form leaf analysis groups to guide fertilization. Well water surveys to determine N content of irrigation waters (100 Ibs. N per acre foot water found in one well).

4. Avocado Irrigation and Salinity

Trials to get best irrigation in amount and timing to hold tip-burn to minimum.

Education on use of tensiometers.

5. Costs and Economics

Cost data sheets.

Education on minimum cost of production with yield and quality maintenance.

6. Fruit Quality Studies

Trials to determine how fruit bruising may be reduced or eliminated. Work for the coming year will be in methods of field handling.

AIR POLLUTANTS AFFECTING AVOCADO SEEDLINGS

O. C. Taylor

Symptoms of damage from oxidizing air pollutants on avocado seedlings include: a.) Small brown to black necrotic spots on the upper surface of young leaves; b.) premature senescence, chlorosis and drop of leaves; c.) reduced growth rate; d.) and reduced rate of water use. The polluted ambient air is known to contain several potentially phytotoxic materials, three of which have been used experimentally to fumigate avocado seedlings. Of these materials, only ozone, at concentrations reported in the atmosphere, has caused the characteristic upper surface brown spotting on the foliage and the premature senescence and drop of leaves. Experimental fumigations with ozone and with the reaction products of ozone-olefin (synthetic smog) suppressed growth and reduced the rate of water use by avocado seedlings. Only superficial tests have been run with the third component of the polluted atmosphere, known generally only as Compound X, and in these tests there was no evidence of injury to avocado.

Visible symptoms of injury from the oxidizing air pollutants are well known on many plants but unfortunately the full extent of injury expressed as growth, production and quality of the economic product can only be estimated. Without further evidence, we can only assume that the necrotic lesions on the foliage and the premature drop of leaves are probably evidence of adverse effects to be reflected in reduced production of avocado fruits.

STUDIES ON THE SUN-BLOTCH DISEASE OF AVOCADO

A Summary of Report Presented to Avocado Research Advisory Committee

J. M. Wallace
Plant Pathologist
Citrus Experiment Station, *March 29, 1960*

Only one virus disease of avocado is presently known. This disease, called "sun-blotch" because its symptoms were originally attributed to sunburning, is not known to be transmissible other than by tissue grafts and through seeds. Most seedlings grown from avocado trees infected and showing symptoms of the sun-blotch virus disease are healthy and virus-free but an occasional seedling becomes infected through seed transmission of the virus and develops characteristic symptoms. Some infected but symptomless trees have been discovered which produce seedlings, all or nearly all of which are symptomless carriers of the virus. No seedlings of the latter type have developed sun-blotch symptoms and are unaffected when reinoculated, but when used as rootstocks they bring about infection of the scion top. The capacity to transmit virus through seeds to all or nearly all seedlings is passed on from one seedling generation to another. Avocado seedlings experimentally inoculated with sun-blotch virus develop characteristic symptoms of the disease but later some of them produce symptomless shoots which eventually make up the major part of the tree. Seeds from fruits produced on a recovered limb produced seedlings which were symptomless carriers of the virus. This suggests the origin of trees which regularly produce diseased seedlings, some of which are known to have been used as rootstock parents by nurserymen and which have been responsible for a high percentage of disease in the nursery. These findings make it clear that the rootstock (seed) parent tree as well as the budwood parent source must be indexed for sun-blotch to insure freedom from the disease in nursery propagations.