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Fertilizer Trials on the Fuerte Avocado

A PROGRESS REPORT

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The fertilizer trial plots referred to in this report are located in the La Habra-Whittier area on the P. J. Weisel properties. A preliminary report on the production of these plots covering a five year period 1930-34 can be found in the 1935 edition of the California Avocado Association Yearbook (page 118).

Beginning in the year 1935 (trees ten years old) the fertilization practice was changed on plots 3 and 4; the change being the addition of two pounds of nitrogen per tree per year in the form of ammonium sulphate. Plot 3 had previously received ten tons of manure per acre per year and from 1935 to date has received three and a half pounds of applied nitrogen per tree per year. Plot number 4 (check plot) did not receive fertilizer until 1935, and from that date to the present has received two pounds of inorganic nitrogen per tree per year.

Following the picking of the 1939-1940 crops, six sun blotched trees were removed, as their production was very low. There were two trees of this type in each of plots 3 and 4, and one in each of plots 1 and 2. In computing the average production of the various plots, the production from sun blotched trees has been eliminated.

As the trees became larger, and shaded practically all of the flat portions of the terraces, the usual winter cover crops of earlier years failed to develop. For this reason, no cultivation has been done since 1937. All fertilizer is applied broadcast on the soil, or leaf mulch around and under the trees.

The following table shows the average yield in fruits per tree as picked from the four plots for the period 1935 to 1943, also the average production per tree for the four years prior to 1935, and the average production for the eight year period 1935 to 1943.

In reviewing the data for the first four years of the trials (1931-1934) we find the average number of fruit produced per tree per year to be greatest for plot number 2, but not significantly greater than the plot 1 production. When comparing plots 3 and 4 with plot 2 we find the former produced 41% as much fruit as plot 2, while the latter produced only 26% as much. During this four year period there were two maximum crops and two light crops in perfect alternation.

TABLE I
FRUITS PER TREE

YEAR	PLOT 1— 2 lbs. N plus Manure— 1½ lbs. N	PLOT 2— 2½ lbs. N	PLOT 3— Manure 1½ lbs. N, plus 2 lbs. N starting 1935	No fertilizer to 1935. Then 2 lbs. N
1935-36	18	7	54	32
1936-37	644	765	650	351
1937-38	173	137	208	414
1938-39	643	772	713	193
1939-40	77	119	188	167
1940-41	32	36	34	35
1941-42	566	747	584	602
1942-43	163	203	291	72
Average 1931 to 1934	244	272	112	71
Average 1935 to 1943	289	348	340	233

The eight year (1935-1943) average production of plots 1 and 2 when compared with the previous four years shows a normal increase of 23%, which may be considered consistent with the increase in tree size. The same comparison for plot 3 shows a production increase of 203%, and for plot 4, 228%.

During this eight year period there were three maximum crops and five light crops, the alternation being upset in 1940, when a very light crop followed a light crop.

The following table shows the average annual production in fruits per tree over a period of five years, from healthy and diseased trees in the same fertilizer plots.

TABLE 2

	1935 to 1940
Plot III—Healthy	362
Plot III—Sun-blotch	30
Plot IV—Healthy	231
Plot IV—Sun-blotch	14

Avocado trees seriously affected with sunblotch disease are generally low producers of poor quality fruit.

Summary

The production data obtained thus far indicates that poor crops can be expected from avocado trees which do not receive nitrogen as a fertilizer after they come into production. The amount of actual nitrogen to apply for maximum production will vary somewhat depending on soil type, tree size, and irrigation practices. For the conditions under which these fertilizer trials have been conducted, it appears that two pounds of nitrogen per tree per year has been sufficient to maintain maximum production over a period of twelve years.

The application of one and a half pounds of nitrogen per tree per year in the form of bulky organic manures in addition to two pounds of inorganic nitrogen has not consistently produced more fruit than a yearly application of two pounds of inorganic nitrogen.

The data further indicate that two pounds of inorganic nitrogen per tree per year produced more than twice as much fruit over a four year period as one and one-half pounds of nitrogen from bulky organic manures.