

SOIL FUMIGATION FOR AVOCADO REPLANTS

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INTRODUCTION

The avocado industry has come of age! The avocado is no longer a luxury item and growers should not expect luxury price returns. Growers' low returns in the last two or three years indicate this trend. Good grower returns are based upon (1) high market price, (2) reduced costs, and (3) high yield. For a number of reasons the market in the last few years has not returned a high price. Many growers have adopted new irrigation, fertilization, and other cultural practices which resulted in better tree health, improved fruit production, and reduced costs. However, increased yields are necessary if growers are to remain in farming.

In each orchard there are many trees which are not "paying their way." Up until now growers have been able to continue operating with these "drones" because of the relatively high price they received for their fruit. There is a definite need—today—to replace many sunblotch, sick (other than root rot disease), and non-producing trees if top production is to be realized. Each tree must be a producer!

Tree removal and replanting has not been a common practice in the industry. Recently there has been increased interest in removal of poor trees and replanting with new vigorous ones in San Diego County. Some young avocado trees planted in old avocado soils have not grown well. This condition occurs with other crops. Citrus is a good example of poor growth and reduced yield of the replant tree when placed in old citrus soil without fumigation. Harmful soil organisms and toxic materials make it difficult for the young tree to grow. In Ventura County, (1) retardation of growth in avocado trees was noticed when they were planted in old walnut orchard soils without first fumigating the soil. To the knowledge of this writer, no soil fumigation has been done where avocados followed avocados in locations where avocado root rot was not a problem.

The economic situation within the industry seems to warrant an investigation into tree removal and replanting. In 1959 the Agricultural Extension Service undertook a preliminary study to determine whether or not soil fumigation is beneficial for replanting avocados in old avocado soils.

OBSERVATION STUDY

In March 1959 a soil fumigation study was started in the avocado orchard of Charles Geiger, El Cajón. Prior to fumigation, soil and root samples were taken from the proposed replant sites. Laboratory tests were made to determine the presence of nematodes and the cinnamon fungus. Dr. Gorge A. Zentmyer, Plant Pathologist and Dr. S. A. Sher, Nematologist, of the Citrus Experiment Station, Riverside, and Robert G.

Plait, Extension Subtropical Horticulture Specialist, Riverside assisted in the tests. Results of the tests showed no cinnamon fungus present. No trees in the orchard showed above ground symptoms of the root rot disease. Plant parasitic nematodes, of unknown pathogenicity to the avocado, were found in only one location. They appeared to be of no serious consequence.

Mr. Geiger's orchard was planted in March 1946, using Fuertes on Mexican root-stock. Planting distance was 20'x24'. As the trees grew older symptoms of the sun-blotch virus disease appeared on some trees. Some affected trees were good producers, but the grower wanted to eliminate all sick trees. After tree removal there were spots in the orchard large enough to accommodate one or more replants without too much shading from adjoining trees.

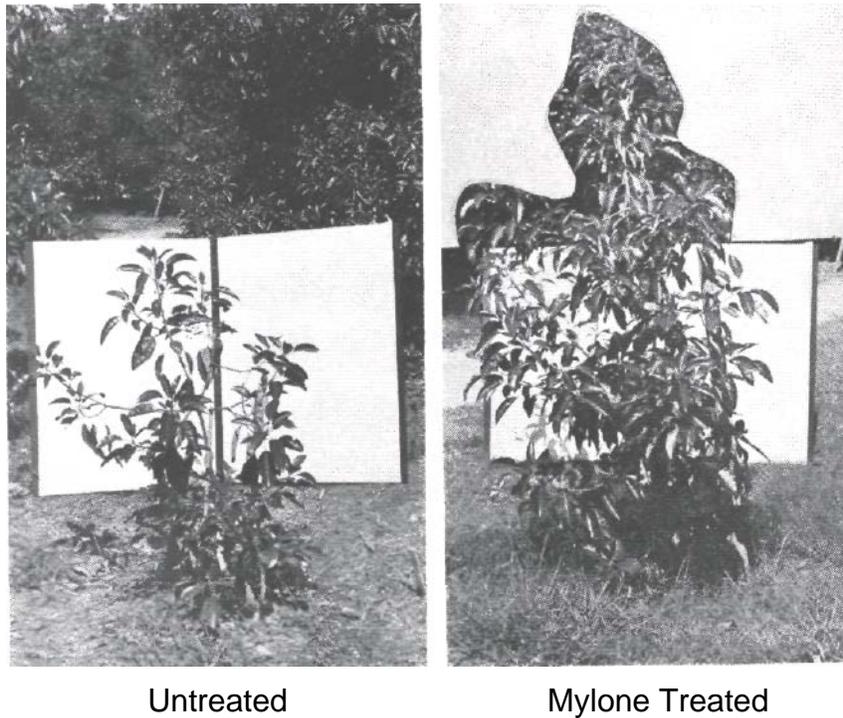
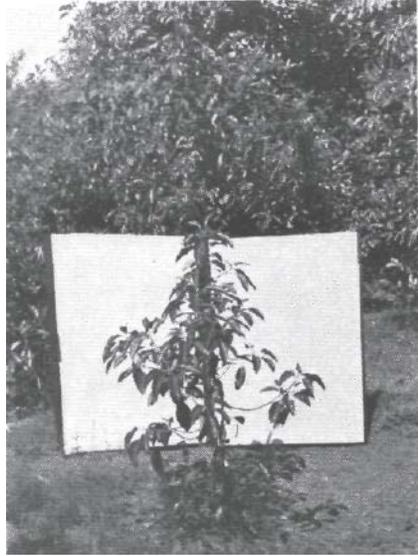
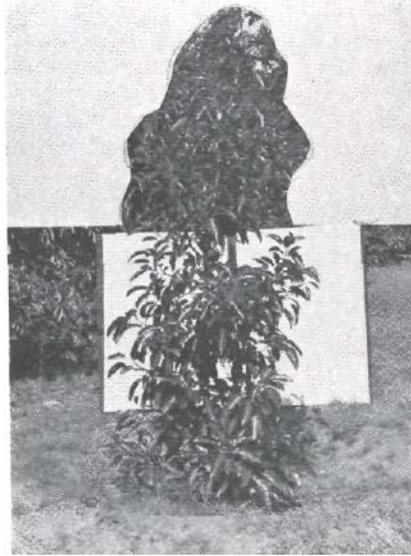


Figure 1



Untreated



Vapam Treated

Figure 2

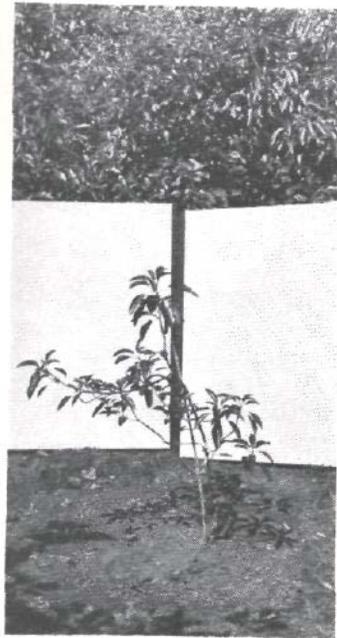


Figure 3 Untreated

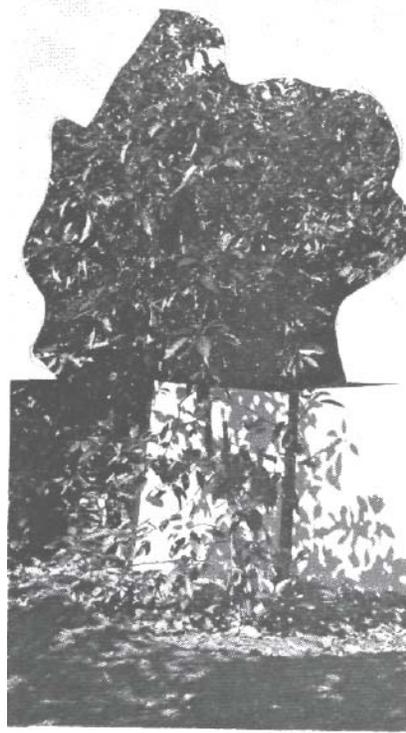


Figure 3 Vapam Treated

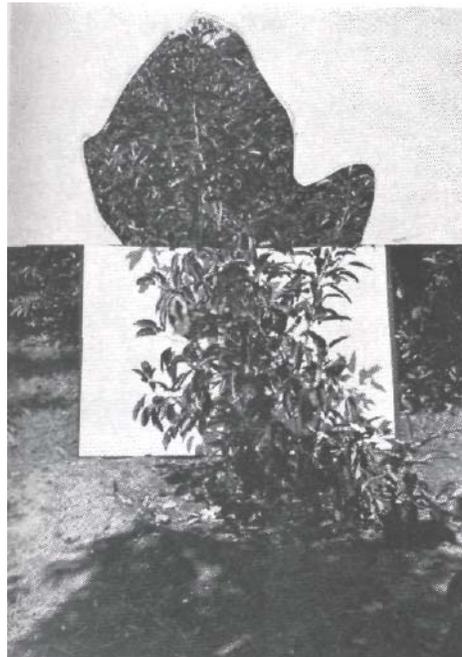


Figure 3 Mylone Treated

Two fumigation materials were used. Mylone and Vapam. Mylone was used at a rate of one pound per six foot diameter basin. This material was dusted completely over the basin surface. The basin was then filled with water. Vapam was applied at a rate of % of a quart in a nine-Foot diameter basin. The material was dissolved in a bucket of water placed in the center of the basin, and permitted to overflow until the basin was full. Non-fumigated spots were left as checks.

In April 1959, one month after the fumigation treatments, young Fuerte trees on Mexican rootstocks were planted in the treated and untreated sites.

RESULTS

In the first year no difference was noted between the treated and untreated trees. During the second year, however, differences appeared. Figure 1 shows the check tree versus its mate treated with Mylone. Figure 2 shows the Vapam treated tree and the check tree. Figure 3 shows the check tree near two treated trees; A—Mylone and B—Vapam. (The treated trees' foliage was outlined to better delineate the growth from its background.)

DISCUSSION

Results of this preliminary trial would indicate the problem warrants further study. Also, there is a need to test additional soil fumigants for their effectiveness. One of the requirements for a fumigant should be ease of application and safety for the grower, who in most cases would do the work himself.

The materials used in this test were relatively easy to apply, safe to use, and inexpensive. The cost of applying these materials was quite reasonable, from \$.75 to \$1.00 per site.

In 1961 a more elaborate trial is contemplated. Three Fallbrook avocado growers have offered to cooperate. In each case, old, sunblotch, and non-producing trees are being removed. Each orchard will replant from fifty to one hundred trees. It is planned to use Mylone, Vapam and other recognized soil fumigants on these plots.

LITERATURE CITED

1. Cook, P. H., 1960. Soil Fumigation and Avocados. California Citrograph, 45 (11): 380.