California Avocado Society 1950 Yearbook 34: 68-69

AVOCADO ROOT ROT REPRODUCED IN THE FIELD

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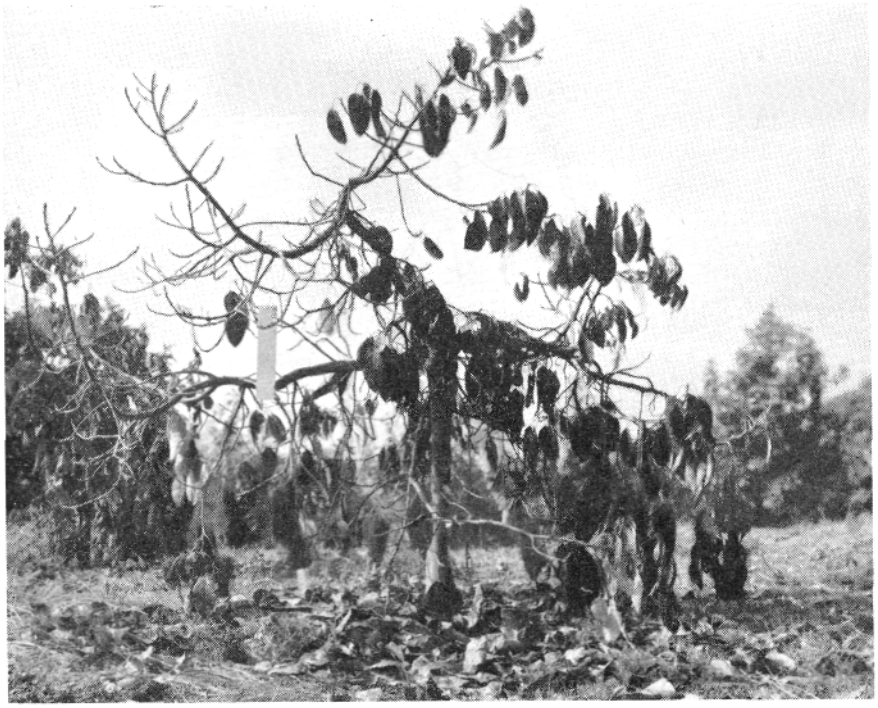
Numerous experiments have been conducted which demonstrate that the soil fungus *Phytophthora cinnamomi* can cause a rotting of the roots of avocado seedlings. By necessity, most of these experiments have been conducted under controlled conditions in the greenhouse or lathhouse. As the result of plans made by Professor Martin Huberty and other staff members a number of years ago, a field planting of 6-year-old budded avocado trees is now available for experimentation at U.C.L.A. This planting is on shallow soil which presents problems similar to those in many avocado areas in southern California, and was planned with research on irrigation and root rot in mind.

This planting presented an excellent opportunity to study the development of root rot under field conditions. An experiment was begun in January, 1949, to find out more about the progress of the disease. Twenty trees are involved in the experiment, with three different rootstocks represented. All but three of the trees are budded to Fuerte; three have Ryan scions. Root-stocks are Topa-Topa, Waldin, and Northrup.

The experiment was designed to study the effect of inoculation of the soil with the cinnamon fungus and the effect of two different levels of irrigation. The fungus was not found in root and soil samples taken in the block of twenty trees prior to the beginning of the experiment. The soil around ten trees was inoculated with the cinnamon fungus in January, 1949; the other ten trees were not inoculated. During the irrigation season five of the ten inoculated trees and five of the non-inoculated trees were watered for about one hour once a week. The other ten trees (five inoculated, five non-inoculated) were watered on the regular irrigation schedule for the grove—once every two weeks.

The first symptoms of root rot appeared in August, 1949, on one of the inoculated trees in the group that was irrigated once a week. By October, 1949, three of the five trees in this group were showing definite root rot, while the other two showed slight indications of the disease. None of the inoculated trees in the group irrigated once every two weeks showed any top symptoms at that time, although many of the roots were rotted on these trees and *P. cinnamomi* was recovered from all ten inoculated trees. None of the non-inoculated trees showed symptoms at this time, nor was the fungus recovered from roots of these trees.

Early in 1950, approximately one year after inoculation, two trees in the group that was irrigated less frequently showed early symptoms of root rot, and by August, 1950, all ten trees, regardless of irrigation frequency, were visibly diseased. The five trees in the group irrigated once a week, however, were much more severely affected at this time than those in the other irrigation series.



The soil around this Fuerte avocado tree, in the experimental plot at U.C.L.A., was inoculated with Phytophthora cinnamomi *in January, 1949. The tree was in the heavier irrigation group. Photo taken in September, 1949.*

By October, 1950, the cinnamon fungus was isolated from two trees in the row above the inoculated row; apparently the fungus had moved through the soil a distance of about 15 feet in the time between the original inoculation in January, 1949, and the sampling in October, 1950.

This plot thus provides an excellent picture of the effect of the cinnamon fungus in the field, and of the role that irrigation plays in the disease. The disease appeared sooner and destroyed the trees more rapidly in the group of inoculated trees that was kept wetter than normal. The non-inoculated trees in this heavier irrigation group are making very good growth, and show no harmful effects from the wet soil conditions alone.

Note: The establishment of this experimental plot was in part made possible by funds provided by the avocado industry for research on root rot (decline).