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Chemical and Cultural Control of Avocado Root Rot (Chemigation)

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Avocado root rot is the most serious disease problem of the avocado industry. Chemicals are now available as topical applications and injections to help control the disease. The most cost effective method appears to be injections, but these leave wounds which are slow to heal in California. With treatment being required for the life of the tree, serious damage results from the multiple injections, probably shortening tree life.

This project explores injection of chemicals into the irrigation system for delivery through drippers or mini-sprinklers. The rationale is to stimulate the tree to recovery using trunk injections, then to maintain health using chemigation.

Duration of the project is estimated to be five years. Fiscal year 1989-90 was the first year of investigation.

Summary

During the 1989-90 year, we selected three chemigation sites. Two trials have been initiated, and the third should be in effect in September-October.

Trial One is located at the South Coast Field Station, in Orange County, and consists of 480 Hass on Duke 7 trees. Treatments include chemicals, mulches, and soil amendments in all combinations for a total of 24 treatments with 20 replications each, as follows:

#	Treatment
1.	Inoculated control.
2.	Aliette, normal rate and timing (standard control).
3.	Ridomil, normal rate and timing (standard control).
4.	Alfalfa mulch.
5.	Black plastic mulch.
6.	Alfalfa plus black plastic mulch.
7.	Composted steer manure soil amendment.
8.	Lime soil amendment.

9. Alfalfa mulch and manure amendment.
10. Alfalfa mulch and lime amendment.
11. Plastic mulch and manure amendment.
12. Plastic mulch and lime amendment.
13. Alfalfa mulch, plastic mulch, and manure amendment.
14. Alfalfa mulch, plastic mulch, and lime amendment.
15. Manure and lime amendments.
16. Alfalfa mulch, manure, and lime amendments.
17. Plastic mulch, manure, and lime amendments.
18. Alfalfa mulch, plastic mulch, manure, and lime amendments.
19. Aliette 1 time a year.
20. Ridomil 1 time a year.
21. Aliette 1 time a year plus alfalfa and plastic mulches.
22. Ridomil 1 time a year plus alfalfa and plastic mulches.
23. Aliette 1 time a year plus alfalfa and plastic mulches and manure and lime amendments.
24. Ridomil 1 time a year plus alfalfa and plastic mulches and manure and lime amendments.

The alfalfa mulch was chopped on site and part of it was incorporated into the planting soil. The remainder was spread on the soil surface around the tree. The plastic mulch was placed on the soil surface with the tree protruding through the center.

The manure and lime were mostly incorporated into the soil around the tree with a small amount being scattered over the soil surface.

The trees are all watered by mini-sprinklers, with separate systems installed so that the two chemical treatments and two timings can be applied as desired.

To date, we have lost a number of trees in this planting. Most of the dead trees were associated with the alfalfa. In retrospect, with alfalfa it may be best to not add it to the soil, or to chop it much finer and moisten it before incorporation.

Data from the trees will include survival, trunk diameters, tree heights, and visual appearance. Chemical treatments have begun.

Trial Two is located in Field 20 at UC/Riverside and consists of 234 Hass on Duke 7 rootstocks. Treatments include chemical treatment, foliar fertilizer, and foliar cytokinin treatments. There are 13 treatments with 18 replications per treatment, as follows:

Treatment

1. Inoculated control.

2. Foliar fertilizer alone.
3. Foliar cytokinin alone.
4. Foliar fertilizer plus foliar cytokinin.
5. Aliette chemigation at label rates and timing.
6. Aliette chemigation plus foliar fertilizer.
7. Aliette chemigation plus foliar fertilizer and cytokinin.
8. Aliette foliar at label rates and timing.
9. Aliette foliar plus foliar fertilizer.
10. Aliette foliar plus foliar fertilizer and foliar cytokinin.
11. Ridomil chemigation at label rates and timing.
12. Ridomil chemigation plus foliar fertilizer.
13. Ridomil chemigation plus foliar fertilizer and cytokinin.

The foliar fertilizer is Nutri-leaf, which contains both macro and micro nutrients and will be applied bi-monthly along with the cytokinins.

This trial (on August 20) was in the final stages of preparation, with treatments to begin late August or early September. All trees will receive a basic level of soil applied fertilizer.

Data to be collected will include mortality, trunk diameters, tree heights, and visual appearance.

Trial Three is scheduled to be installed in September-October at the Embarcadero Ranch in Santa Barbara County. The trees are Hass on Thomas rootstocks. The design of this experiment has not been finalized, but will essentially mirror the trial at UC Riverside.

Cooperating personnel in this project include J. A. Menge, S. Campbell, G. Bender, G. Witney, and B. Faber.