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OBSERVATIONS IN AN AVOCADO ORCHARD WHERE CHEMICAL CONTROL OF *PHYTOPHTHORA CINNAMOMI* WAS DISCONTINUED FOR TWO YEARS

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ABSTRACT

In this experiment, chemical control of Phytophthora cinnamomi was *discontinued in avocado trees which had recovered from root rot after phosethyl-AI trunk injections. Organic amendments were applied to some trees. Discontinuing chemical control of* P cinnamomi *for two years did not affect tree health or fruit production. The trial must be continued for a further period in order to provide evidence whether it is safe to discontinue chemical control of* P cinnamomi *and for how long.*

INTRODUCTION

Avocado trees suffering from root rot caused by *Phytophthora cinnamomi* can be cured using trunk injections of phosethyl-*AI* (Darvas *et al*, 1984). Where this treatment has been applied for a number of years, most avocado trees have recovered remarkably well. Continuous treatment of trees that have recovered is expensive and might give rise to phosethyl resistant strains of *P cinnamomi.* On the other hand, discontinuing phosethyl treatment holds the dangers of possible rapid decline in tree health and thereby a severe loss in production. Organic matter amendments have been reported to increase soil microbial biomass (Trochoulias *et al*, 1986) and suppress *P cinnamomi* (Rosas Romero *et al*, 1986).

The purpose of this study was to monitor fruit production and tree health in an orchard in which phosethyl trunk injections were discontinued for two years once the trees appeared to be healthy. Organic amendments were applied to some trees.

MATERIALS AND METHODS

The orchard used for this study was planted in 1977. The cultivar was Fuerte, grafted on Duke Seedling rootstock. The trees were grown on a Hutton soil (water pH 6,3) and dragline irrigation was scheduled, using tensiometers.

The following treatments were applied annually from July 1988 to July 1990:

1. Phosethyl-AI trunk injection (0,4 g/m^2 of canopy area) in February, July and November, as is the standard commercial treatment.

2. Untreated control. Phosethyl-AI trunk injections discontinued.
3. Trunk injections discontinued (as above); in addition, a legume cover crop *(Dolichos lablab,* 40 kg seed/ha) was planted around the trees.
4. Trunk injections discontinued (as above); in addition, cattle manure (100 kg/tree) was applied in November.
5. Trunk injections discontinued (as above); in addition, lucerne straw (2 bales/tree) was applied in November.
6. Trunk injections discontinued (as above); in addition, treatments 4 and 5 were combined.

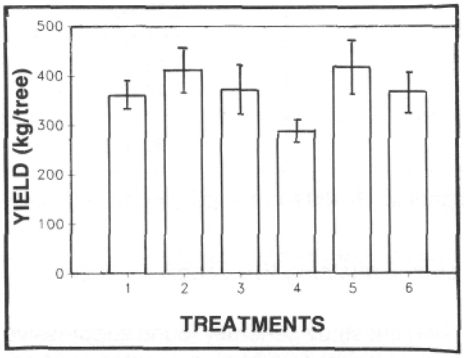

Fig 1 Cumulative yield (1989 and 1990) as influenced by treatments 1 — 6. Bars indicate SE of means.

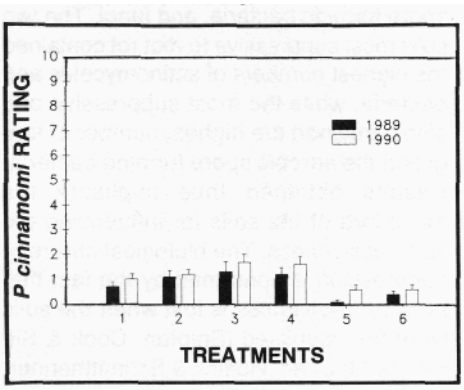

Fig 2 Changes in *P cinnamomi* ratings on a scale 0 (healthy) to 10 (dead) as influenced by treatments 1 — 6. Bars indicate SE of means.

RESULTS AND DISCUSSION

In terms of cumulative yield, only the application of manure (treatment 4) showed a decrease when compared to the commercial standard, i.e. phosethyl-AI trunk injections (treatment 1). Fruit production in all other treatments varied within the same range as the commercial standard (Figure 1). So far, there is no yield advantage resulting from any of the treatments when compared to the untreated control (treatment 2). The reduction in yield after manure application (treatment 4) could be due to the release of nitrogen, which in turn boosted tree vigour and caused excessive fruit drop.

A slight decline in tree health was observed in all treatments comparing the 1989 and 1990 *P cinnamomi* ratings (Figure 2). The least decline in tree health from 1989 to 1990 occurred in the untreated control (treatment 2). In practical terms however, all trees in this trial are still very healthy, with an average disease rating of one, without clear differences between treatments.

In conclusion, discontinuing chemical control of *P cinnamomi* for two years did not affect tree health or production. However, these results are preliminary. The trial must be continued for a further period in order to provide evidence whether it is safe to discontinue chemical control, and for how long. Until further evidence is collected,

continued preventive chemical control of *P cinnamomi* of trees which have recovered is still recommended.

There were ten single tree replicates per treatment. Tree yields and tree health were recorded annually. Tree health was rated in July, according to a disease index of 0 (healthy) to 10 (dead) as described by Darvas *et al,* (1984).

REFERENCES

DARVAS, J M, TOERIEN, J C, & MILNE, D L, 1984. Control of avocado root rot by trunk injection with phosethyl-AI. Plant Disease, 68, 691 - 693.

ROSAS ROMERO, M, TELIZ ORTIZ, D, GARCIA ESPINOSA, R & SALAZAR GARCIA, S, 1986. Influencia de estiércol, alfalfa y metalaxil en la dinámica poblacional de *Phytophthora cinnamomi Rands* causante de la tristeza del aguacate *(Persea americana* Mili). *Revista Mexicana de Fitopatología,* 4, 114 - 123.

TROCHOULIAS, T, BROADBENT, P & BAIGENT, D R, 1986. Response of avocado to calcareous and organic amendments. *Acta Hort,* 175, 179 - 181. above); in addition, cattle manure (100 kg/tree) was applied in November.