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# EFFICACY OF FUNGICIDE APPLICATIONS FOR THE CONTROL OF PHYTOPHTHORA CINNAMOMI ROOT ROT ON AVOCADO SEEDLINGS IN THE GLASSHOUSE

**CP SNYMAN and JM KOTZÉ**
*DEPARTMENT OF MICROBIOLOGY AND PLANT PATHOLOGY, UNIVERSITY OF PRETORIA*

***OPSOMMING***

*Metalaksiel en fosetiel-Al sponsband en stamverf aanwendingsmetodes is getoets vir die beheer van Phytopthora-wortelvrot van avokado-saailinge in die glashuis.*

***SUMMARY***

*Metalaxyl and fosetyl-Al sponge band and stem paint application methods were tested for the control of Phytophthora root rot of avocado seedlings in the green house.*

## INTRODUCTION

Reports of preventative treatments for the control of Phytophthora root rot of citrus have been published by Timmer (1977 and 1979) and Davis (1982). Both stated that metalaxyl applied as stem paint, showed preventative as well as curative effects on sour orange root stock. In recent years Snyman (1982) and Snyman and Kotzé (1983) have studied various application techniques of systemic fungicides for the control of avocado root rot on Edranol seedlings in the greenhouse.

This is a final report confirming the control of Phytophthora root rot by stem applications of systemic fungicides.

## MATERIALS AND METHODS

Seedlings were planted in a 1:2:1 mixture of course river sand, Irish peat and perlite. *P cinnamomi* inoculum was added to the planting bags as described in Snyman *et al* (In press). *P cinnamomi* inoculum consisted of isolates obtained from the root zones of avocado trees that had not been treated with fungicides before. To eliminate some biological variation three Edranol seedlings were planted per plastic bag. A bag with 3 plants was treated as one experimental unit. Treatments were applied after the seedlings started to flush, indicating a root-shoot balance.

To determine the efficacy of new application methods for the control of *P cinnamomi* root rot on Edranol seedlings the treatments tested were:

## TREATMENT

Metalaxyl (5 % granule) drench 2,5 g ai/m

Metalaxyl (WP) sponge band 0, 5 g ai/seedling

Metalaxyl (WP) stem paint 100 g ai/ℓ

Metalaxyl (WP) stem paint 50 g ai/ℓ

Metalaxyl (WP) stem paint 7 g ai/ℓ

Fosetyl-A€ sponge band 0,5 g ai/ℓ

Fosetyl-Af stem paint 100 g ai/ℓ

Fosetyl-A€ stem paint 50 g ai/ℓ

An uninoculated and an inoculated control were used in the experiments.

The drench and stem paint treatments were applied every six weeks. The sponge band treatments were renewed after twelve weeks.

The dry mass of the lateral roots of the Edranol seedlings was used as criterium for root rot control in analysis to evaluate the various treatments.

**TABLE 1. The effect of fungicidal treatments on the dry mass of lateral roots of Edranol seedlings inoculated with *P cinnamomi*.**

| Fungicide treatment | Dry mass of lateral roots |
|---|---|
| Uninoculated control | 16,96 a |
| Untreated control | 6,48 c |
| Metalaxyl drench | 11,73 b |
| Metalaxyl sponge band | 12,98 b |
| Metalaxyl stem paint | 10,05 bc |
| Fosetyl-Aℓ sponge band | 10,36 bc |
| Fosetyl-Aℓ stem paint | 9,37 bc |
| CV | 34,11 % |

1: Means followed by the same letter do not differ signifficantly (Duncan, P=0,05).

## RESULTS

The mean dry mass values of lateral roots of the treated seedlings are presented in Table 1.

From Table 1 It is evident that the uninoculated controls yielded a significantly higher dry mass of lateral roots than any other treatment. Seedlings treated with metalaxyl drenches and metalaxyl sponge band had a significantly higher dry mass of lateral roots compared to untreated control seedlings. Seedlings treated with metalaxyl stem paint, fosetyl-Al sponge band and fosetyl stem paint did not have a significantly higher dry mass of lateral roots than the untreated control seedlings.

## DISCUSSION

This experiment confirmed the effective control of root rot by stem applications of

systemic fungicides. Compared with the effective metalaxyl soil drench treatment the stem applications of metalaxyl and fosetyl-Al proved effective Metalaxyl sponge band resulted in the highest numerical dry mass of lateral roots of Edranol seedlings compared to other treatments.

Results of experiments of the previous two years showed that stem applications of systemic fungicides controlled Phytophthora root rot as effective as the recommended treatments (Snyman, 1982; Snyman and Kotzé, 1983) Metalaxyl 5% granular, metalaxyl 25% WP, fosetyl-Al WP, Etridiazole 41 % EC, Dowco 71 % EC (D4408), d4562 80 % EC, D4598 80 % EC, milfuram 25 % WP and Galben were tested in these experiments.

Dowco showed reasonable control as a spil drench and slight control as a stem paint but severe phytotoxic symptoms were observed. Milfuram was effective but the high rate of application made the treatment expensive. Galben was totally ineffective. Fosetyl-Al showed no control as a drench or foliar spray on seedlings. Sponge band applications of metalaxyl and fosetyl-Al showed phytotoxic symptoms when calcium chloride was added to the sponge bands.

The most promising treatments were metalaxyl applied as a soil drench, sponge band or stem paint, fosetyl-Al as a sponge band or stem paint and Etridiazole as a soil drench. The soil drench and the sponge band applications should be repeated two times and the stem paint applications four to six times a season.

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