

FIVE YEARS OF CONTINUED CHEMICAL CONTROL OF PHYTOPHTHORA ROOT ROT OF AVOCADOS

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OPSOMMING

Metalaxyl Korrels teen 2,5 g a.b.lm² het goeie beheer gegee teen wortelvrot en dit het ook die swam effektief ge'inhipeer gedurende die eerste twee jare van toediening. Die inhibisie effek het daarna toenemend verswak en ten voile verdwyn na vyf jaar se aanhoudende gebruik. 'n Gelydelike verswakking in die siektetoestand van die borne het gevolg.

Ethazole teen 10 g a.b.lm² het geblyk om 'n effektiewe swamdoder te wees vir die beheer van wortelvrot sonder 'n verlaging in ef-fektiwiteit na vyf jaar.

Fosetiel-Al blaarspuit teen 0,3% a.b. oplossing het aanvanklik 'n stadige reaksie getoon wat die mate van agteruitgang in die boomkondisie verminder het gedurende die eerste drie jaar. Borne behandel met die swamdoder, het eers gedurende die vierde en vyfde jaar van aanhoudende toediening, positief gereageer.

SUMMARY

Metalaxyl granular at 2,5 g a.i.lm² gave good control of root rot and inhibited the fungus well in the first two years. Its inhibitive effect progressively weakened thereafter and completely disappeared after five years of continued use. This was followed by a gradual deterioration in the condition of the trees.

Ethazole at 10 g a.i.lm² appeared to be an effective chemical for the control of root rot with no loss in efficacy after five years.

Fosetyl-Al foliar spray using 0,3% a.i. solution, showed a slow initial reaction which reduced the rate of retrogression in tree condition in the first three years. Trees treated with the chemical reacted positively only in the fourth and fifth year of its continued use.

INTRODUCTION

Investigations into the chemical control of Phytophthora root rot of fully grown avocado trees at Westfalia Estate were initiated in 1977. Since then a number of reports have been published on the interim results (Darvas, 1978; Darvas, Toerien and Kotzé, 1979; Darvas, 1982).

This is a final report of the results after five years of continued use of metalaxyl,

Ethazole and fosetyl-AI.

MATERIALS AND METHODS

The site of the experiment was block 4A of Evenrond Section of Westfalia Estate where Fuerte trees on Guatemalan rootstocks were eight years of age at the commencement of the experiment in 1977. Treatments were applied to trees in sub-blocks within the orchard each running parallel with the slope, for the full length of the block.

The treatments used were:

1. Metalaxyl 5 g: granular at 0,5 g a.i./m² applied in the drip zone four times in the first year at 10 week intervals and twice a year (Nov. and Jan.) in the following three years at 12 week intervals. This treatment was discontinued after four years.
2. Metalaxyl 5 g: 2,5 g a.i./m² applied as the previous treatment, but was continued also in the fifth year.
3. Ethazole EC: soil drench at 5 g a.i./m¹ in the first three years and at 10 g a.i./m² in the fourth and fifth year, applied monthly from September until March.
4. Fosetyl-A I 80 WP: foliar spray at 0,3% a.i. applied six-weekly in the first year and monthly thereafter from September until March.
5. Untreated control.

Assessment of results was done by rating the trees according to a 0 to 10 disease index (0 = healthy and 10 = dead) in the winter months of every year (Table 1). Soil samples were drawn from around the feeder roots under the trees in each treatment and analyzed with the lupine seedling bait technique (Darvas, 1979) to determine the inoculum potential of *Phytophthora cinnamomi* in the soil (Table 2).

RESULTS

TABLE 1: Control of *Phytophthora* root rot of avocados for a five year period.

Treatments	Mean disease rating (0-10) N = 138						Percent trees with no root rot symptoms					
	1977	1978	1979	1980	1981	1982	1977	1978	1979	1980	1981	1982
1. Metalaxyl 0,5 g a.i./m ²	2,5	2,3	4,0	4,3	4,1	—	31	28	7	0	7	—
2. Metalaxyl 2,5 g a.i./m ²	1,8	0,8	0,9	2,0	2,1	3,5	59	59	56	15	20	4
3. Ethazole 5-10 g a.i./m ²	0,9	1,7	4,6	4,6	4,1	3,6	67	33	0	0	10	10
4. Fosetyl-A I 0,3% a.i.	0,5	0,8	2,8	3,2	2,7	2,4	74	57	11	0	12	16
5. Control	0,9	1,6	4,8	4,8	5,3	4,9	65	35	10	6	5	5

TABLE 2: The effect of the various chemical treatments on the inoculum potential of *Phytophthora cinnamomi* in the root zone.

Treatments	Percent Lupines killed by <i>P. cinnamomi</i>									
	1978		1979		1980		1981		1982	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
1. Metalaxyl 0,5 g a.i./m ²	13	6	2	11	12	16	NA	NA	—	--
2. Metalaxyl 2,5 g a.i./m ²	0	0	0	9	30	5	38	34	35	53
3. Ethazole 5-10 g a.i./m ²	37	53	25	14	15	15	NA	NA	5	NA
4. Fosetyl-A1 0,3% a.i.	15	39	19	16	45	27	NA	NA	45	NA
5. Control	20	44	24	18	60	30	45	30	25	26

NA = data not available

DISCUSSION

There is a close correlation between the inhibition of *P. cinnamomi* in the soil by metalaxyl and root rot control. An effective inhibition of the fungus by the 2,5 g a.i./m² dose rate of metalaxyl was observed throughout the first year of its use and this was associated with a remarkable improvement in the condition of the trees. The inhibition was good in the second year also, but it progressively became poorer thereafter. No inhibition of the pathogen was achieved by metalaxyl application in the fourth and fifth year and a simultaneous deterioration in tree condition was recorded. The low rate of metalaxyl gave unsatisfactory results and this treatment was terminated after four years.

Ethazole at 5 g a.i./m² showed no effect against root rot and the retrogression of the trees continued for the first three years. When the dosage was increased to 10 g a.i./m² it improved the condition of the trees in the fourth and fifth years.

Fosetyl-al showed a slow initial controlling effect against the disease, but the tree condition improved with time with continued spraying. The chemical had no apparent effect on the inoculum potential of the fungus in the root zone.

REFERENCES

- DARVAS, JM, 1978. Chemical control of *Phytophthora* root rot on fully grown avocado trees. *SAAGA Research Report 2*: 7 - 9
- DARVAS, JM. TOERIEN JC, & JM KOTZÉ. 1979. Chemical control of *Phytophthora* root rot of fully grown avocado trees. *SAAGA Research Report 3*: 23 - 24
- DARVAS, JM, 1982. Chemical control of *Phytophthora* root rot on fully grown avocado trees. *SAAGA Yearbook*. 1982: 96 - 97.