

EFFICACY OF PROCHLORAZ TREATMENTS FOR POST HARVEST DISEASE CONTROL IN AVOCADOS

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OPSOMMING

Na-oesbederf (antraknose en stingel-end-vrot) is doeltreffend beheer deur Prochloraz doop-behandelings (0,06 kg ab./100ℓ water) en ook deur ultra lae volume bespuitings van Prochloraz (0,5kg ab./100ℓ water). Die byvoeging van Prolong net nie, die effektiwiteit van Prochloraz verbeter nie, maar hierdie mengsel as doop-behandeling het in een geval die rypwording van avokado vrugte dramaties verleng.

SUMMARY

Post harvest diseases (anthracnose and stem-end rot) were effectively controlled by Prochloraz dip-treatments (0,06 kg a.i./100ℓ water) as well as ultra low volume applications of Prochloraz (0,5 kg a.i./100ℓ water). The control of post harvest diseases was not improved by the addition of Prolong to Prochloraz mixtures. Prochloraz plus Prolong however increased ripening time dramatically in one dipping trial.

INTRODUCTION

In South Africa anthracnose, stem-end-rot and the *Dothiorella/Colletotrichum* complex are major limiting factors in the production and marketing of healthy avocados for the various export markets.

The fungi causing these post-harvest diseases are latent in avocados and are rather difficult to control with fungicides. Prochloraz, a member of the imidazole group of fungicides, has shown promise in post-harvest treatments for the control of diseases caused by *Colletotrichum* species in mangoes, paw-paws and avocados. A number of experiments were carried out to establish methods of application and to determine the optimum rate of Prochloraz for the control of post-harvest diseases. Results of some of these experiments will be discussed in this report.

MATERIALS AND METHODS

Mature unripe avocados from Tzaneen and Nelspruit were harvested and exposed to the various treatments:

- i. Sixty four randomly selected avocados were dipped into various concentrations of Prochloraz 45% EC for 4 minutes. The fruits were allowed to dry and then packed into

boxes and placed into cold storage (5°C) for a period of 28 days. After this period boxes were removed from cold storage and kept at room temperature to ripen. The fruits were then examined at various intervals for ripeness and for the presence and incidence of post-harvest diseases.

- ii. Avocados were treated with various concentrations of Prochloraz 45% EC alone and in combination with 1,5% Prolong, a sugar based wax. The treatments were applied by means of a hand held ULV applicator whilst fruits were moving on the conveyor belt or under simulated conditions thereof. (± 1,6ℓ spray mixture per ton of fruit was applied.)

After application the fruits were packed into boxes and stored at 5,5°C for 28 days. Hereafter the boxes were taken out of cold storage and kept at ambient temperature. The fruits were then evaluated for the presence and incidence of post-harvest diseases.

RESULTS AND DISCUSSIONS

1. Prochloraz dip-treatments:-

All the Prochloraz treatments gave excellent control of anthracnose (Table I, II and III). Although the incidences of stem-end-rot infections were not as high as the anthracnose infections, some promising results were also recorded (Table II and III). An interesting phenomenon was observed where the Prochloraz 0,05 g a.i./100ℓ water plus Prolong 1,5% treatment significantly reduced the number of ripe fruit for 36 days after treatment.

2. Prochloraz ULV treatments:-

Prochloraz applied at 0,5 a.i./100ℓ water by means of a hand held ULV applicator gave excellent control of both *Colletotrichum gleosporioides*, *Dothiorella aromatica*. This treatment was also superior to similar concentrations of Prochloraz plus Prolong which was rather surprising. Prolong on its own had very little effect on the incidence of post harvest diseases.

TABLE I:

The effect of Prochloraz dip-treatments on the incidence of anthracnose at 36 days after treatment. (Nelspruit)

Treatment (Rate per 100ℓ water)	Mean % ripe fruit	Mean % anthracnose infected fruit	Mean % clean (healthy) fruit
Untreated control	100	67,2	32,8
Prochloraz 45 EC 0,04 kg a.i.	100	25	75,0
Prochloraz 45 EC 0,05 kg a.i.	100	21,9	78,1
Prochloraz 45 EC 0,06 kg a.i.	100	6,3	93,8
Prochloraz 45 EC 0,1 kg a.i.	100	7,8	92,8
Prochloraz 45 EC 0,06 kg a.i. + Prolong 1,5%	6,3	4,7	95,3

TABLE 2:

The effect of various Prochloraz treatments on the incidence of post harvest disease infections 42 days after treatment. (Tzaneen)

Treatment Rate/100ℓ water)	Mean % anthracnose infected fruit	Mean % Fruit infected with stem-end rot	Mean % Surface area infected with post harvest diseases
Untreated control	84,4	41,5	55,7
Prochloraz 45 EC 0,5 kg a.i. (ULV treatment)	26,4	6,9	1,1
Prochloraz 45 EC 0,04 kg a.i. (Dip)	44,7	3,3	4,1
Prochloraz 45 EC 0,05 kg a.i. (dip)	65,6	1,6	3,4
Prochloraz 45 EC 0,1 kg a.i. (Dip)	20,9	16,3	1,7

TABLE 3:

The effect of Prochloraz dip-treatments on the incidence of post-harvest diseases in Fuerte avocados collected in Tzaneen. (T+ 42 days)

Treatment (Rate per 100l water)	Mean % anthracnose infected fruit	Mean % stem end rot infected fruit	Mean %- healthy fruit
Untreated control	38,5	19,3	49,5
Prochloraz 0,04 kg a.i.	11,3	8,3	80,5
Prochloraz 0,05 kg a.i.	6,8	7,6	89,5
Prochloraz 0,06 kg a.i.	4,3	4,3	91,5
Prochloraz 0,1 kg a.i.	9,6	2,5	87,5

TABLE 4:

The effect of ULV treatments of Prochloraz and Prochloraz plus Prolong on the incidence of Post Harvest diseases in avocado fruit 42 days after treatment.

Treatment (Rate/100l water)	Mean % anthracnose infected fruit	Mean % stem end rot infected fruit	Mean % surface area infected
Untreated control	84,4	41,5	55,7
Prochloraz 0,05 kg a.i.	26,4	6,9	1,1
Prolong 1,5%	84,4	31,6	26,5
Prochloraz 0,5 kg a.i. + Prolong 1,5%	61,9	15,6	9,0
Prochloraz 0,6 kg a.i. + Prolong 1,5%	47,7	12,0	2,8