

ULV APPLICATION OF SYSTEMICS FUNGICIDES FOR THE CONTROL OF POST-HARVEST AVOCADO DISEASES

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OPSOMMING

*Prochloraz teen 5.000 dpm a.b. met 1.5% Prolong het doeltreffende na-oes beheer van antraknose op avokados gelewer. Dit het ook die voorkoms van **Dothiorella** / **Colletotrichum** vrugtevreter verminder, maar geen aktiwiteit teen stingelendbederf getoon nie.*

Imazalil en die eksperimentele materiaal CGA 49104 was oneffektief teen na-oes siektes van avokados.

SUMMARY

*Prochloraz at 5.000 ppm a.i. with 1.5% Prolong applied in ULV form gave effective post-harvest control of anthracnose in avocados. It also reduced the incidence of the **Dothiorella** / **Colletotrichum** fruit rot complex, but showed no activity against stem-end rot disease.*

Imazalil and the experimental material CGA 49104 failed to control post-harvest diseases.

INTRODUCTION

Post-harvest diseases of avocados have been controlled successfully by the post-harvest application of prochloraz, a fungicide introduced recently into Australia (Muirhead, 1981) and South Africa (Rowell, 1983; Darvas, 1984). Experiments at Westfalia Estate have shown that the chemical is effective when applied with an ultra low volume (ULV) applicator in mixtures with Prolong wax (Darvas, 1984).

This paper reports on the continued testing of the ULV application of prochloraz and other systemic fungicides to avocado fruit.

MATERIALS AND METHODS

Fuente fruits which received no pre-harvest fungicidal sprays were used for the experiment. The average moisture content of the fruit was 78,7%.

The following chemicals were tested:

–Prochloraz 45% a.i. EC formulation

- Imazalil 19% a.i. EC formulation
- CGA 49104 50% a.i. WP formulation
- Prolong wax
- TAG wax
- Fungaflor

The chemicals were suspended at 2 concentrations in water containing 1.5% Prolong wax or at 5 p.p.m. in undiluted TAG wax and applied with the aid of a portable ULV applicator (model ULVA 8) at a rate of approximately 1,6 litre suspensions per 1 ton fruit. Fruits were air dried in a wind tunnel for about three minutes and then packed in cartons and stored for 24 days at 6°C. Following cold storage, fruits were ripened at ambient temperature and checked daily for firmness. The fruits were assessed for the presence and extent of post-harvest diseases externally and internally as soon as they reached the eat-ripe stage. Diseases were rated on a 0 (no symptoms) to 10 (entire fruit affected) disease severity index scale. There were 10 carton replications of count 14 size fruit in each treatment.

RESULTS

Prochloraz at a concentration of 5.000 ppm a.i. with 1.5% Prolong wax reduced the incidence of the *Dothiorella* / *Colletotrichum* fruit rot complex. However, due to large variations within treatments, the reduction was not statistically significant (Table 1). In the treatment with the experimental material CGA 49104 at 2.500 ppm a.i. with Prolong, the disease was significantly more severe than on the control fruit.

TABLE 1: Control of post-harvest avocado diseases by ULV application of some systemic fungicides.

Treatments	Mean disease severity (0-10 index)						Ripening time in days
	Dothiorella/Colletotrichum Complex		Anthracnose		Stem-end rot		
1. Control ULV Prolong 1.5%	0.53a	*	0,50 ab	b	0.18a	a	4.51 a
2. ULV Prochloraz 5.000 ppm + Prolong 1.5%	0.46 a	a	0.27 a	a	0.20 ab	a	5.27 b
3. ULV Prochloraz 2.500 ppm + Prolong 1.5%	1.18 ab	-	0.73 abc	-	0.54 cd	-	5.78 b
4. ULV CGA 49104 5.000 ppm + Prolong 1.5%	1.00 a	-	1.10 cd	-	0.52 cd	-	5.72 b
5. ULV CGA 49104 2.500 ppm + Prolong 1.5%	2.10 b	-	1.15 cd	-	0.48 cd	-	6.57 c
6. ULV Imazalil 5.000 ppm + Prolong 1.5%	1.04 a	-	0.91 bc	-	0.42 bc	-	6.77 c
7. ULV Imazalil 2.500 ppm + Prolong 1.5%	1,25 ab	-	1.23 cd	-	0.36 abc	-	6.89 c
8. ULV Prochloraz 5.000 ppm in TAG wax	1.13 ab	-	1.24 cd	-	0.71 d	-	8.19 d
9. ULV CGA 49104 5.000 ppm in TAG wax	1.26 ab	-	1.44 d	-	0.59 cd	-	8.01 d
10. ULV Fungaflor 5.000 ppm in TAG wax	1.19 ab	-	1.49 d	-	0.60 cd	-	7.97 d

Means followed by the same letter do not differ significantly at P= 0.05 level (Duncan's multiple range test).

* Comparisons were made between treatments No. 1 and 2 only.

Anthrachnose was reduced non-significantly with the 5.000 ppm a.i. Prochloraz plus Prolong treatment, compared with the control and all other treatments. On the other hand, the disease reduction was statistically significant if the comparison was made between this treatment and the control only.

In all other treatments anthracnose incidence increased and in the majority of cases this increase was statistically significant. Furthermore, none of the treatments gave any control against stem-end rot in this experiment; in most of the treatments the disease increased significantly.

Ripening time was shortest in the control fruit followed by Prolong wax treated fruits, while an even longer ripening time was observed in fruits treated with TAG wax.

DISCUSSION

The ULV treatment of avocados with Prochloraz at 5.000 ppm a.i. plus Prolong has previously been found to be effective, particularly against anthracnose (Darvas, 1984) and this was confirmed in the present experiment. The non-significant reduction in *Dothiorella* / *Colletotrichum* fruit rot complex by the treatment appears to be due to control by this chemical of the *Colletotrichum* component of the complex. Stem-end rot was not controlled by the 5.000 ppm a.i. Prochloraz treatment.

The lower concentration of Prochloraz (2.5000 ppm) is clearly less effective and none of the other fungicides tested in the experiment showed promise for the control of post-harvest avocado diseases by ULV application.

It is believed that the increased incidence of post-harvest decay with retarded ripening is a basic principle of the host / pathogen relationship in this disease which has been proved several times (Darvas, 1982; Darvas, 1984) and, that is not due to the direct action of the chemicals on the pathogens involved.

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