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CERCOSPORA SPOT

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OPSOMMING

Cercospora-*vlek kan doeltreffend beheer word met Benomil bespuitings. Die kritieke periode vir bespuiting le tussen November en Januarie. Twee bespuitings per seisoen het die siekte voldoende beheer.*

INTRODUCTION

Cercospora spot (previously described in South Africa as 'black spot' or *Phomopsis* spot) is an important fruit disease of avocados in the high rainfall Tzaneen area. During the past season experiments were carried out to establish the optimum timing for the control of *Cercospora* spot with Benomyl and to detect the critical period of fruit infection.

TIMING OF BENLATE SPRAYS FOR CERCOSPORA SPOT CONTROL

The experiment was conducted at Westfalia, on 11 year old Fuerte trees which have a record of severe Cercospora infection. The experiment was carried out as a randomised block with 4 replications per treatment. The concentration of Benomyl was 0,025% a.i. with 0,02% Nu Film additive. The first evaluation of results took place at the peak of the Fuerte picking time on 12.4.1978 and was repeated on 7.6.1978.

After assessment, fruit was packed in cellophane, cold-stored for 28 days and assessed for post-harvest diseases.

DISCUSSION

In the timing experiment the severity of *Cercospora* spot infection on fruit increased during the two month period which elapsed between assessments. The disease was generally better controlled by frequent, short interval sprays. Late applications seemed to slow down the increase of disease incidence observed from one assessment to the next.

Good control was achieved by two Benomyl sprays when one was applied in the first week of November and the second around mid-January (Table 1, treatment 14). The first spray was applied prior to the rains of end-November, while the second was in the middle of the rainy period in January. Another two-spray treatment (15) applied about four weeks later was inferior at the time of the first assessment, but apparently had a

better residual effect. Above mentioned two spray treatment proved the importance of timing of the Benomyl applications for *Cercospora* spot control.

It is difficult to interprétate the precise effects of all treatments on the post-harvest diseases. In general, untreated fruit tended to have more of the pathogenic post-harvest problems. Benlate sprays notably reduced the incidence of anthracnose and stem-end rot.

Dothiorella fruit rot was not controlled by Benomyl. Data received from the fruit isolations show that fruit exposed to natural infection early in the rainy (critical) period developed more *Cercospora* spots than those exposed later in the rainy season. This may seem to indicate a latent period in the disease cycle. The most critical time was from November to January. Anthracnose was consistently more severe on fruit exposed later in the rainy season than on fruit exposed for the same time at the beginning of the rain period. *Dothiorella Colletotrichum* complex followed a pattern similar to anthracnose being more serious with late season exposure periods.

TABLE 1: Results of the Benomyl timing experiment for the control of Cercospora spot

Treatment No.	Number of applications	Date of application	Intervals (weeks)	Av. No. of *Cercospora* spots per fruit		% Exportable fruit <5 spots per fruit	
				12.4.78	7.6.78	12.4.78	7.6.78
1	–	Control	–	5,1	9,5	74	56
2	1	6 Oct. 1977	–	4,0	10,4	80	52
3	2	6 Oct. 1977, 2 Dec. 1977	8	2,3	13,9	89	36
4	3	6 Oct. 1977, 2 Dec. 1977, 2 Feb. 1978	8	1,9	7,3	88	67
5	4	6 Oct. 1977, 2 Dec. 1977, 2 Fb. 1978, 6 April 1978	8	1,0	3,5	96	88
6	3	2 Dec. 1977, 2 Feb. 1978, 6 April 1978	8	0,3	3,4	99	85
7	2	2 Feb. 1978, 7 April 1978	8	3,0	6,4	85	72
8	1	6 April, 1978	–	3,4	10,3	84	52
9	1	11 Nov. 1977	–	0,9	9,0	96	58
10	2	11 Nov. 1977, 19 Jan. 1978	9	0,9	6,8	95	69
11	3	11 Nov. 1977, 19 Jan. 1978, 27 March 1978	9	2,7	6,5	86	71
12	2	19 Jan. 1978, 27 March 1978	9	6,0	12,3	70	43
13	1	2 Feb. 1978	–	5,6	10,7	72	48
14	2	2 Nov. 1977, 19 Jan. 1978	10	0,5	6,1	98	73
15	2	28 Nov. 1977, 15 Feb. 1978	10	2,7	5,4	85	76

TABLE 2: Post-harvest problems on fruit that was assessed on 12.4.1978 in the timing spray experiment after 28 days storage at 6°C

Treatment No. (see Table 1)	Diseases on ripe fruit (rated from 0 to 10)							
	External			Internal				
	Dothiorella and Colleto-trichum complex	Anthracnose	Stem-end rot	Anthracnose	Stem-end rot	Pulp spot	Vascular browning	Lead dis-colouration
1	0,78	5,41	6,64	5,50	6,94	0,05	0,39	0,00
2	3,15	1,24	2,00	1,23	2,76	0,55	0,07	0,00
3	1,30	3,65	4,59	3,57	5,41	0,40	0,01	0,00
4	1,42	3,09	3,66	2,91	4,25	0,19	0,03	0,00
5	2,48	0,40	0,72	0,44	0,95	0,45	0,05	0,06
6	3,44	0,32	0,86	0,33	1,41	0,61	0,14	0,04
7	2,20	2,28	3,02	2,85	4,18	0,09	0,00	0,00
8	1,90	2,70	4,07	3,25	5,97	0,05	0,07	0,00
9	2,30	1,66	2,44	2,32	3,17	0,00	0,14	0,00
10	4,39	1,47	2,35	2,05	3,09	0,10	0,06	0,00
11	1,73	3,09	3,90	3,73	4,56	0,12	0,00	0,00
12	1,21	2,46	2,86	2,68	3,23	0,03	0,16	0,00
13	0,72	3,84	5,54	4,73	5,96	0,03	0,05	0,00
14	1,42	2,00	3,62	3,29	5,10	0,00	0,19	0,00
15	1,26	2,76	3,44	3,64	4,14	0,00	0,01	0,00

SUMMARY

In the control of *Cercospora* spot of avocados, correct timing of sprays was found to be of great importance. It was possible to control the disease with two Benomyl sprays at 0,025% a.i. concentration with Nu-Film additive when the first spray was applied during the early critical period (November) and the second 10 weeks later. These sprays have also reduced post-harvest diseases on stored fruit compared to untreated fruit. According to results of the three and four spray treatments, there is no economical justifiable merit in spraying more than twice in a season.

It appears that the critical time for *Cercospora* fruit infection in our orchards was during the rainy months and that early exposure of fruit to infection resulted in higher disease incidence.

FRUIT ISOLATION EXPERIMENT TO DETECT CRITICAL INFECTION PERIODS FOR CERCOSPORA SPOT

Fuerte gruit was used for this experiment. Fruits on the trees were closed in paper bags and exposed to natural infection for a determined time. Assessment of results took place on 20.6.1978 (Table 4).

The post-harvest diseases of fruit are presented in Table 5.

TABLE 4: Results of the experiment exposing fruit to natural Cercospora infection

Treatment No.	Exposed infection period	Av. no. of Cercospora spots per fruit	% Exportable fruit 5 spots per fruit
1	Never	1,12	98
2	Oct.	2,43	87
3	Oct. — Nov.	4,06	79
4	Oct. — Dec.	7,74	69
5	Oct. — Jan.	12,35	43
6	Oct. — Febr.	1,81	90
7	Oct. — Mar.	5,69	76
8	Nov. — Mar.	5,94	77
9	Dec. — Mar.	2,00	92
10	Jan. — Mar.	2,20	88
11	Febr. — Mar.	1,88	92
12	March	1,76	93

TABLE 5: Post-harvest diseases on fruit which was used in the isolation experiment

Treatment No.	Diseases on ripe fruit (rated from 0 to 10)								Total External & Internal diseases
	External			Internal					
	Dothiorella and Colletotrichum complex	Anthracnose	Stem-end rot	Anthracnose	Stem-end rot	Pulp spot	Vascular browning	Lead discolouration	
1	0,06	0,06	0,13	0,13	0,16	0,00	0,00	0,00	0,54
2	0,07	0,22	0,27	0,22	0,22	0,00	0,05	0,20	1,25
3	0,53	0,56	0,25	0,56	0,37	0,00	0,06	0,37	2,70
4	0,76	0,34	0,22	0,24	0,18	0,22	0,08	0,06	2,10
5	0,66	0,54	0,12	0,20	0,08	0,00	0,00	0,00	1,60
6	1,80	0,32	0,08	0,30	0,13	0,04	0,00	0,00	2,67
7	2,43	0,80	0,19	0,30	0,21	0,04	0,02	0,00	3,99
8	2,20	1,63	0,43	0,66	0,33	0,13	0,06	0,06	5,50
9	1,37	1,12	0,18	0,62	0,15	0,06	0,09	0,34	3,93
10	1,07	1,03	0,17	0,89	0,10	0,14	0,03	0,00	3,43
11	0,90	0,55	0,22	0,17	0,20	0,15	0,05	0,25	2,49
12	0,81	0,25	0,00	0,00	0,00	0,00	0,00	0,00	1,06