

## CERCOSPORA SPOT OF AVOCADOS

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### **OPSOMMING**

*Die mees kritiese tydperk vir Cercospora-vlek infeksie op Fuerte is gedurende die vroeë reënseisoen. Daar is 'n latente fase in die siekte se lewenssiklus van tenminste drie maande. Spoorontwikkeling van die patogeen gaan gepaard met reën en gunstige warm toestande.*

*Twee nuwe swamdoders en twee kleefmiddels is getoets maar die resultate was nie so gunstig soos met die gesamentlike gebruik van Benlate en Nu Film 17 nie.*

### **SUMMARY**

It has been proved again that the most critical period for Cercospora spot infection on Fuerte is the early rainy season and that there is a latent phase in the disease cycle of at least 3 months. Spore production of the pathogen is coupled with rainfall and favourable warm temperatures. Two new fungicides and two stickers were tested and were found to be inferior to the Benlate + Nu Film 17 combination.

### **INTRODUCTION**

Cercospora spot or blotch of avocados was first described by Cooke (1878). Later it was found to be widely scattered along the East Coast of the U.S.A. on seedling avocado plantings in Florida (Stevens, 1920) and it is referred to as the most important disease of avocados there (Zentmyer, 1953). In a list of the main industry problems Cercospora spot is mentioned from French West Indies, Martinique and Cameroon (Gustafson, 1976). In Mexico it is the second most common avocado disease (Turu, 1969).

In South Africa it was first described by Brodrick, Pretorius & Freaan (1974) from Tzaneen area. Growers in that area named it 'Phomopsis spot' or black spot. According to Mr WE Maddison, Section Manager of Westfalia Estate, who has many years of practical experience with avocados, the disease was first observed as a problem with growing economical importance in the mid-sixties. From here, it has spread through the Northern Transvaal and Nelspruit area (Brodrick *et al.*, 1974). Today, Cercospora spot is undoubtedly the most important pre-harvest avocado fruit pathogen in the high rainfall

growing areas of South Africa.

The causal organism is *Pseudocercospora purpurea* (Cke) Deighton (Syn. *Cercospora purpúrea* Cke). It is fairly easy to isolate but difficult to have it sporulate under laboratory conditions. Brodrick et al. (1974) were also unsuccessful in trying to induce sporulation and make a proper identification of the fungus.

In 1978/79, further experiments were carried out to study the epidemiology and control of the disease.

## MATERIALS AND METHODS

Intensive experiments were laid out to study the critical infection period, spore trapping and chemical control of *Cercospora* spot on Fuerte at block 34, Westfalia Section, in the Eastern Transvaal.

To detect critical infection periods fruit were closed in paper bags on the tree and exposed to natural infection for a given time. A Hirsch type spore trap was put into operation from October 1977, but since the positive identification of the conidia was not possible in the first year we analyzed only the 1978/79 catch. In the chemical control, we used as standard the two-spray treatments which proved to be effective in earlier experiments (Nov & Jan). The identity of the pathogen was confirmed by the Commonwealth Mycological Institute in England.

### RESULTS

TABLE 1: Results of exposing Fuerte fruit to natural *Cercospora* spot infection

Treatment No.	Time of exposure to natural infection	Average number of <i>Cercospora</i> spots per fruit	% exportable fruit (< 5 spots/fruit)
1	—	1,6	96
2	November	5,7	75
3	December	4,6	81
4	January	2,9	91
5	February	3,8	86
6	March	0,8	98
7	February—March	1,7	95
8	January—March	5,0	82
9	December—March	3,7	87
10	November—March	7,4	69

**TABLE 2: Number of *P. purpurea* conidia caught in spore trap and weather data in the 1978–79 summer season**

Date	Number of <i>P. purpurea</i> conidia	Rainfall mm	Mean temperature °C	Mean relative humidity %
1978: Oct. 1st week	5	7,5	20,8	72,0
2nd	9	8,5	20,6	69,5
3rd	3	31,3	19,9	70,5
4th	6	5,8	20,1	61,3
Total conidia and rainfall and mean of temp. & R.H.	23	53,1	20,3	68,3
Nov. 1st week	6	86,9	20,4	70,5
2nd	24	52,4	22,5	64,8
3rd	16	17,3	20,9	68,6
4th	20	15,8	23,1	64,8
Total conidia and rainfall and mean of temp. & R.H.	66	172,4	21,7	67,1
Dec. 1st week	31	23,0	22,9	67,0
2nd	15	40,8	21,9	63,3
3rd	8	0	23,6	60,5
4th	20	43,3	24,4	57,8
Total conidia & rainfall and mean of temp. & R.H.	74	107,1	23,2	62,1
1979: Jan. 1st week	29	22,0	21,3	64,0
2nd	26	19,3	24,0	61,2
3rd	20	59,7	23,9	63,5
4th	34	61,3	22,7	66,0
Total conidia and rainfall & mean of temp. & R.H.	109	162,3	22,9	63,6
Febr. 1st week	27	14,4	23,5	62,8
2nd	3	0,2	25,9	59,6
3rd	56	28,4	25,1	65,7
4th	16	73,2	23,5	67,4
Total conidia and rainfall and mean temp. & R.H.	102	116,2	24,5	63,8
Mar. 1st week	45	137,8	21,7	72,0
2nd	7	4,0	22,1	61,4
3rd	14	0,2	25,0	59,0
4th	39	19,6	23,1	62,3
Total conidia and rainfall and mean of temp. & R.H.	105	161,6	22,9	63,6

Rain from Oct. 1978 until end March 1979: 773 mm. Evaluation date: 1979.06.05

**TABLE 3: Number of *P. purpurea* conidia and weather data analysed on daily basis from 1979.01.27 until 1979.02.06**

Date	Number of <i>P. purpurea</i> conidia	Rainfall mm	Mean temperature °C	Mean humidity %
1979 Jan. 27	1	0	24,3	59
28	1	0	24,0	64
29	3	0	26,0	62
30	7	12,5	21,8	77
31	18	47,5	20,0	82
Febr. 1	10	14,1	21,0	69
2	4	0,2	21,3	68
3	8	0,1	22,8	60
4	1	0	23,5	61
5	2	0	24,0	61
6	0	0	25,5	59

TABLE 4: Results of the spray experiment on Cercospora spot control

Treatment No.	Treatments	Average number of Cercospora spots/fruit	% Exportable fruit (< 5 spots/fruit)
1	Benlate 0,025% a.i. + Nu Film 17 0,02%	1,3	95
2	Benlate 0,025% a.i. + Biofilm 0,05%	1,9	92
3	Benlate 0,025% a.i. + Solvaïd 0,1%	2,1	91
4	Benlate 0,025% + Tecto 0,05% a.i. + Nu Film 17	1,2	95
5	CGA 64250 0,025% a.i. + New Film 17	7,0	70
6	CGA 64251 0,025% a.i. + Nu Film 17	8,1	63
7	CGA 64250 0,005% a.i. + Nu Film 17	2,5	91
8	CGA 64251 0,005% a.i. + Nu Film 17	3,0	90
9	Control	4,3	82

## DISCUSSION

The rainfall in 1978 - 79 summer was about half of that in 1977 - 78 and this resulted in a lower Cercospora spot incidence.

The number of *P. purpurea* conidia caught in the spore trap first attained significant numbers with the onset of the rainy, warm period, which started in November. The suppressing effect of low temperatures on spore production or release is illustrated with the 3rd week's catch in October, when only a few conidia were seen in spite of the substantial rain experienced during that period. In the daily analysis, spore production was clearly associated with rain. It is interesting to note that most conidia were trapped early in the morning, from about 01h00 to 06h00.

Fruit exposed to natural infection early in the critical (wet and warm) period developed significantly more Cercospora spots than fruit exposed later. The latent period appears to be longer than 3 months.

Information obtained from the spray experiment shows that Nu Film 17 is a more effective sticker than Bio film and Solvaïd. Tecto added to Benlate with the January spray was primarily aimed at the control of post-harvest *Dothiorella* fruit rot and did not improve on Cercospora spot control. The new CGA products had little effect on the disease at low dosage rates and they seemed to aggravate it (which in fact may be phytotoxicity on fruit) at high rates.

## REFERENCES

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