

## FUNGICIDE EVALUATION FOR CONTROL OF DIDYMELLA STEM CANKER OF TOMATOES

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### SUMMARY

Fungicides were evaluated for control of didymella stem canker on an outdoor tomato crop. Of the five fungicides tested, dichlofluanid, procymidone, propineb, thiophanate-methyl and triforine, and dichlofluanid gave the best control and crop yields. Procymidone and propineb were also effective but gave lower crop yields. Thiophanate-methyl and triforine gave no control. The pathogen, *Didymella lycopersici*, may be developing resistance to procymidone.

**Keywords:** *Didymella lycopersici*, stem canker, tomato, dichlofluanid, procymidone.

### INTRODUCTION

Stem canker of tomatoes caused by the fungus *Didymella lycopersici* Kleb., became a problem again during the 1989-90 season. In the Horowhenua region it caused some economic losses to tomato growers (Cheah *et al* 1991).

Symptoms of this disease first appear as small brown to black lesions on the stem at the pruning wounds. As the disease progresses, the lesions increase in size and finally girdle the stem. The infected plants eventually wilt and die. The fungus may also cause infection on the fruit.

Didymella stem canker was a major problem in Horowhenua during the 1981/82 season (Soteris and Cheah 1982). In the following seasons, fungicides were tested in two glasshouses and one outdoor trial. Procymidone was the most effective, giving almost total control of the disease (Cheah and Soteris 1982, 1983, 1984). Since then procymidone, along with good plant hygiene, has been recommended for the control of didymella stem canker. Towards the end of 1989, however, there were reports that the disease was becoming a problem on tomatoes again despite the crops being sprayed with procymidone as recommended (R.A.J. White, pers. comm.). Resistance to the fungicide was suspected and tests on *D. lycopersici* isolated from disease samples supported this (L.H. Cheah, unpublished data).

This paper reports a further field evaluation of fungicides for the control of didymella stem canker on outdoor tomatoes.

### MATERIALS AND METHODS

Fungicides were compared on outdoor tomatoes cv. 'Extase' at D. Stuart's property, Otaki. Seedlings were planted on 6 October 1990 in single rows at spacing of 0.25 m between plants and 1 m between rows. Each plot consisted of 12 plants; 10 were used for disease and yield recording. Guard plants were planted between the rows and the plots. The experimental design was a randomised block with five replications. Crop management followed routine commercial practices.

Four weeks after planting, and immediately after pruning, plants were inoculated with spore and mycelium suspensions from 14 day old cultures of *D. lycopersici* by application to pruning wounds. Two inoculations were applied 14 days apart to ensure infection.

The fungicides and rates tested are listed in Table 1. The spray programme, consisting of four applications at 14 day intervals, was commenced on 9 November. Sprays of each fungicide were applied to run off with a knapsack sprayer.

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Disease was assessed on 20 December by counting the wilted plants. Fruit were harvested and weighed on 11 January 1991.

### RESULTS AND DISCUSSION

Dichlofluanid gave almost total control of the disease although it was not significantly different from procymidone and propineb (Table 1). Dichlofluanid gave the highest yield ( $P < 0.05$ ). Thiophanate-methyl and triforine were not effective.

In our previous tests, procymidone was shown to be the most effective fungicide tested, giving almost total control of the disease (Cheah and Soteris 1982, 1983, 1984). It was not as effective in this test, however, indicating that the fungus causing the disease may have developed resistance to procymidone. A field survey in 1989/90 showed that some growers applied up to eight procymidone sprays in one season to control the disease. Under such conditions, it is not surprising that populations of *D. lycopersici* may be developing resistance to procymidone. Detailed studies on resistance to the fungicide are in progress.

Dichlofluanid is fully registered for use on tomatoes against *Botrytis*. On the basis of this trial, this registration may be extended for use against didymella stem canker. The use of procymidone should be restricted to three applications and should be either mixed or alternated with non-cross-resistant partner fungicides for the disease control. The use of the fungicides should be accompanied by good plant hygiene practices (Soteris and Cheah 1984).

**TABLE 1: Effect of fungicides on occurrence of didymella stem canker and yield of outdoor tomatoes.**

Treatment	Rates (g ai/100 litres)	Wilted plants %	Mean marketable yield (kg/plot)+
dichlofluanid (Euraparen DF)	100.0	2.0a*	14.2a*
procymidone (Sumisclex 25F)	50.0	16.0a	10.1b
propineb (Antracol)	175.0	10.0a	9.8b
thiophanate-methyl (TopsinM-4A)	40.0	80.0b	1.0c
triforine (Saprol)	28.5	86.0b	3.2c
untreated	—	78.0b	0.9c
LSD (P = 5%)		23.0	2.3

+ = 10 plants per plot

\* Results followed by the same letter in a column are not significantly different.

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