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ASPARAGUS: COMPARISON OF FUNGICIDES FOR THE CONTROL OF PURPLE SPOT (STEMPHYLIUM VESICARIUM) ON ASPARAGUS FERN.

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Location: Wheatacre, Suffolk (co-ordinated from Cambridge Regional Office).

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Introduction

Purple spot of asparagus, caused by the fungus Stemphylium vesicarium, is now widespread in the UK and is an increasing problem worldwide. The fungus produces small purple-brown elliptical spots on the fern and spears, which often leads to downgrading. Severe infection may cause premature defoliation and twisting of spears.

Work abroad has shown that the disease can be controlled by multiple applications of fungicide to the fern. The main fungicide used in New Zealand, captafol, has now been withdrawn in the UK but, also in New Zealand, some success has been achieved using iprodione and dithiocarbamate fungicides. However, to date there has been no work on chemical control of purple spot in the UK.

Objectives

To screen a range of fungicides for efficacy against purple spot on the fern.

Method

Nine different fungicides were applied at three week intervals to asparagus fern, c.v. Regal, grown on sandy clay loam, at a site in Wheatacre in Suffolk in a randomised block trial with four replicates per treatment. An untreated control was also included. Details and rates for each chemical are given below. All chemicals were applied at a dilution rate of 400 l/ha using a knapsack sprayer with a single nozzle lance. The sprays were applied on 5 July, 27 July, 15 August and 8 September. A fifth spray could not be applied because the crop was too bushy and weed-contaminated to walk through with a sprayer without damaging the fern unacceptably. The level of disease throughout the trial was assessed at the first spray date. Thereafter, at each successive spray date (and also on 24 October), assessments of purple spot were made on 10 plants per plot.

Treatments

Chemical	Active ingredient (ai)	% ai	Rate of product (kg l/ha
Bavistin FL	carbendazim	50	1.0
Bravo 500	chlorothalonil	50	2.0
Bavistin + Bravo	as above	as above	1.0 + 2.0
Fungaflor	imazalil	20	1.5
Dithane 945	mancozeb	80	1.7
Ronilan FL	vinclozolin	50	1.0
Rovral Flo	iprodione	25	2.0
Sportak	prochloraz	40	1.25
Tilt 250	propiconazole	25	1.0

Results

Levels of disease at the time of the first spray were even throughout the trial, covering approximately 0.6% stem area, and affecting 90% of plants. Although most plants were affected with disease throughout the season, (Table 1) symptoms were consistently superficial and rarely exceeded 0.1% of the total stem area (Table 2). There were no significant differences between treatments and none of the chemicals gave disease control (Tables 1 and 2).

Table 1: Effect of fungicides on the number of plants affected

Treatments	Plants affected at each assessment date (%)			
	21 July	15 August	8 September	24 October
1 Untreated	95.0	67.5	55.0	92.5
2 Bavistin FL	72.5	72.5	55.0	95.0
3 Bravo 500	77.5	62.5	40.0	85.0
4 Bavistin + Bravo	67.5	70.0	32.5	82.5
5 Fungaflor	60.0	77.5	62.5	90.0
6 Dithane 945	77.5	65.0	55.0	95.0
7 Ronilan FL	75.0	57.5	27.5	87.5
8 Rovral Flo	67.5	55.0	40.0	75.0
9 Sportak	87.5	67.5	47.5	85.0
10 Tilt 250	77.5	67.5	52.5	95.0
	NS	NS	NS	NS
CV (%)	21.5	26.9	44.7	17.4

NS = not significant at P = 0.05

Table 2: Effect of fungicides on the severity of infection

Treatments	Mean stem area affected by Stemphylium (%)			
	21 July	15 August	8 September	24 October
1	0.100	0.072	0.055	0.105
2	0.075	0.125	0.060	0.110
3	0.080	0.065	0.040	0.095
4	0.073	0.107	0.055	0.095
5	0.063	0.110	0.067	0.095
6	0.080	0.077	0.073	0.100
7	0.083	0.080	0.028	0.098
8	0.075	0.147	0.130	0.093
9	0.113	0.130	0.123	0.202
10	0.078	0.110	0.112	0.115
	NS	NS	NS	NS
CV(%)	32.1	73.6	105.0	67.8

Conclusions

Levels of disease throughout the season were very low. Reasons for this are probably:

a) the weather conditions were not ideal for disease development. Stemphylium infection is favoured by wet conditions; work in New Zealand has shown that penetration of plant tissue by germinated spores is exclusively via the

stomata, which open more frequently when humidity is high. Work in California in 1983 and 1984 has indicated that disease is more severe following periods of wet weather or sprinkler irrigation (Wood, 1986);

b) the farmer had treated the crop in March with 45 kg/ha urea in 450 l/ha. This has been found to control ascospore discharge, thus reducing innoculum levels (Ellerton, 1984).

The main conclusions of the experiment are:

1) The trial should be repeated in a higher disease-risk situation.

2) The first fungicide application should be as soon as possible after cutting; by the time of the first spray in this trial, 90% of plants were affected, although it was only two weeks after cutting.

3) Different spray intervals should be investigated.

References

Ellerton, D. R. (1984) Production, marketing and diseases of asparagus. Report of a study tour to California, USA, 20-30 April 1984. Ministry of Agriculture, Fisheries and Food, London.

Wood, R. J. (1986) New Zealand Summary of Vegetable Research, 1985-86. Ministry of Agriculture and Fisheries, Pukekohe, New Zealand.