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CHEMICAL CONTROL OF CAPSULE ROT OF CARDAMOM

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ABSTRACT

Capsule rot of cardamom prevalent in the High Ranges of Kerala is a serious disease responsible for heavy losses in yield. Chemical control trials carried out in plantations using different fungicides showed that Bordeaux mixture 1% or copper oxychlorides 0·2% with a wetting agent when sprayed twice in June and August was effective in controlling the malady.

INTRODUCTION

CARDAMOM [*Elettaria cardamomum* (L.) Maton] is one of the most important spice crops grown in Kerala, Karnataka, and Tamil Nadu states of India. In recent years, there has been a considerable setback in production due to the damages caused by different diseases and pests. Recently, capsule and panicle rot of cardamom (known in Malayalam as "Azhukal") was reported to occur in the High Ranges of Kerala (Idikki district) (Menon *et al.*, 1972). Thankamma and Pillai (1973) reported *Phytophthora nicotianae* var. *nicotianae* as the causal agent of the disease. We isolated *Pythium* sp. from the affected capsules and could establish its pathogenicity also. Since no information is available on the control of the disease under field conditions, a trial was laid out in the High Ranges of Kerala and the results are presented here.

MATERIALS AND METHODS

A field trial was laid out in an estate in Santhampara, a heavily infected area, in 1972 and 1973 on a randomised block design. During 1972, the trial consisted of four replications with five clumps per treatment, while in 1973, there were three replications with ten clumps per treatment. The fungicides used were: (1) Bordeaux mixture, (2) Zineb 75%, (3) Zinc + Maneb, (4) Ziram 80%, (5) Thiram 75%, (6) Captan 75%, (7) Heptaene antibiotic (N-methyl-*p*-amino acetophenone and mycosamine), (8) and (9) two different formulations of copper oxychlorides, (10) 2, methoxy carbamoyl benzimidazole, and (11) DMOC. The first seven fungicides were used for the trial in 1972 while all except Zineb were used in 1973. Two litres of fungicide spray fluid, along with a wetting and spreading agent (Dodecyl benzene sulfonate) at 0·1% concentration, were used in spraying the panicles and the bases of each clump. Two sprayings were given one in June as a premonsoon spray and the other in August. The total number of healthy and infected panicles was recorded and the percentage of incidence calculated. The data were statistically analysed.

The demonstration *cum* trial plots were divided into three equal blocks of 250 plants per treatment. One block received spray with Bordeaux mixture 1% at the rate of one litre per clump, while the second received at the rate of two litres per clump and the third remained untreated. There were five replications, three in Santhampara and two in Udumbanchola areas. The incidence of capsule rot was recorded in 50 clumps selected at random.

RESULTS AND DISCUSSION

The disease incidence in the 1972 trial was least in the Bordeaux mixture-treated plots followed by heptaene and Ziram-treated plots (Table I). The efficacy of Bordeaux mixture in controlling the disease was borne out by the results obtained from 1973 trial also. It was also seen from the 1973 trials that copper oxychlorides at 0·2% were as equally effective as Bordeaux mixture. Though Captan and benzimidazole were on a par with copper fungicides in reducing the incidence of capsule rot, copper fungicides were better in that least incidence of the disease was observed in plots treated with them.

TABLE 1

Incidence of capsule rot in fungicide-treated plots

Sl. No.	Treatment	Conc. of the fungicide %	Disease incidence %	Trans-formed values (°)	Conc. of the fungicide %	Disease incidence %	Trans-formed values (°)
1.	Bordeaux mixture ..	1	1·73	6·38	1	2·03	7·83
2.	Zineb 75% ..	0·2	8·26	16·09	..	..	..
3.	Zinc + Maneb ..	0·2	5·20	12·61	0·3	7·59	15·77
4.	Ziram 80% ..	0·2	3·17	7·92	0·3	11·17	19·33
5.	Thiram 75% ..	0·2	6·14	14·19	0·3	7·75	15·63
6.	Captan 75% ..	0·2	3·97	11·05	0·3	5·72	13·80
7.	Heptaene antibiotic ..	50 ppm	2·29	7·77	250 ppm	10·68	19·07
8.	Copper oxychloride I ..	..	..	..	0·2	2·16	6·83
9.	Copper oxychloride II ..	..	..	..	0·2	3·79	10·67
10.	2. Methoxy carbamoyl benzimidazole ..	..	..	..	0·1	5·82	13·50
11.	DMOC ..	..	..	..	0·05	7·21	15·33
12.	Control ..	..	10·97	18·51	..	28·15	32·00
	General Mean ..			11·81			15·43
	S.E. per plot ..			5·15			3·59
	F. ratio for treatment difference			2·82*			10·80**
	C.D. (5%) level ..			7·581			6·112

* Significant at P = 0·05

** Significant at P = 0·01

Based on the data obtained from 1972 trials, five large scale demonstration *cum* trial plots were laid out in private estates to demonstrate the efficacy of Bordeaux mixture in the control of the disease. The mean percentage of incidence in blocks which received Bordeaux mixture at one litre per clump was 1·84 while that in the second block (receiving Bordeaux mixture at two litres per clump) was 1·90. The disease incidence was 16·82 in untreated control blocks.

The data thus show that Bordeaux mixture 1% is effective in controlling the disease when sprayed at the rate of one litre per clump. Two sprayings, one in June as a pre-monsoon spray and the other in August, are recommended for the control of the disease.

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REFERENCES

MENON, M. R., SAJOO, B. V., RAMAKRISHNAN, C. K. AND REMA DEVI, L. 1972. A new *Phytophthora* disease of cardamom [*Elettaria cardamomum* (L.) Maton]. *Curr. Sci.* 41: 231.

THANKAMMA, L. AND PILLAI, P. N. R. 1973. Fruit rot and leaf rot disease of cardamom in India. *F.A.O. Pl. Prot. Bull.* 21: 83–84.