

CONTROL OF ROOT ROT OF COWPEA WITH SOIL APPLICATION OF FUNGICIDES AND GRANULAR INSECTICIDES

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Soil application with carbendazim 0.1 per cent and quintozene 0.1 per cent were highly effective in controlling root rot disease of cowpea *Vigna unguiculata* L. Walp, incited by *Macrophomina phaseolina* (Tassi) Goid. But the granular insecticides viz., aldicarb and carbosulfuran did not significantly affect the disease incidence in comparison with fungicides.

In recent years root rot disease of cowpea (*Vigna unguiculata* L. Walp.) caused by *Macrophomina phaseolina* (Tassi) Goid has become a major limiting factor in the cultivation of cowpea. Fungicides and insecticides are applied by various methods such as treating the seed, treating the soil, spraying or dusting the plant surfaces etc. to protect the plants. The potency of many of these chemicals is considerable. The biological activity of any fungicide is usually not restricted to the target organism but extends to non-target organisms as well. Similarly insecticides applied to soil may affect the soil borne plant pathogens. The present study reports the efficacy of fungicides and insecticides on the incidence of root rot.

MATERIALS AND METHODS

Efficacy of fungicides and insecticides on the incidence of root rot was assessed under laboratory conditions. Small plastic cups, 6 X 7 X 4.8 cm were filled with 100 g sterilised soil and infested with sclerotia

of *M. phaseolina* at the rate of 500mg per kg of soil. Healthy seeds of C. 152 were raised by direct sowing. Each treatment was replicated thrice. Each cup containing five seedlings was considered as a replication. Granular formulations were applied at one g per cup at the time of sowing avoiding direct contact with the seed. The fungicides viz., carbendazim 0.1 per cent, quintozene 0.1 per cent and TMTD 0.2 per cent were applied gradually as soil drenching at 100 ml per cup. The crops were placed over a water bath which was adjusted to maintain a soil temperature of 35°C and water holding capacity of 40 per cent. After 15 days the incidence of seedling rot was recorded in percentage.

In the pot culture experiment, pots were filled up with a soil mixture of uniform composition of nutrients. Healthy seeds of C152 were raised by direct sowing. Each treatment was replicated thrice. Each pot containing five plants was considered as a replication. Granular formu-

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lations were applied at one g per plant at the time of sowing avoiding direct contact with the seed. The fungicides *viz.*, carbendazim 0.1 per cent, quintozene 0.1 per cent and TMTD 0.2 per cent were applied as soil drenching at 100 ml per plant 30 days after sowing. The plants were inoculated with 8 mm mycelial discs of two numbers per plant just 24 h prior to soil drenching with the fungicides. The root rot incidence was assessed by recording the number of affected plants and the percentage of incidence worked out.

RESULTS AND DISCUSSION

Carbendazim, quintozene and TMTD were highly effective in the

control of root rot in the laboratory. Between two insecticides tested, carbofuran had a better effect on the control of root rot than aldicarb. But, its influence was not comparable to that of fungicides. The insecticide carbofuran was compatible with either carbendazim or TMTD in the control of root rot disease, but not with quintozene. The combination effect of aldicarb with three fungicides tested was significantly inferior to that of carbofuran. When the experiment was repeated under pot culture conditions, no incidence of root rot was observed in the carbendazim, quintozene and TMTD treatments indicating their superiority in the disease control

Table 1. Effect of fungicides and insecticides on the incidence of root rot

Sl. No.	Treatments	Laboratory		Pot culture	
		Incidence (%)	%reduction over control	Incidence (%)	%reduction over control
1	Carbendazim	0.00 (0.71)	100.00	0.00 (0.71)	100.00
2	Carbendazim + Aldicarb	26.67 (5.41)	69.23	26.67 (5.14)	71.42
3	Carbendazim + Carbofuran	6.67 (1.98)	92.90	33.33 (5.75)	64.29
4	Quintozene	0.00 (0.71)	100.00	0.00 (0.71)	100.00
5	Quintozene + Aldicarb	60.00 (7.70)	30.77	60.00 (7.70)	35.71
6	Quintozene + Carbofuran	20.00 (4.53)	76.92	46.67 (6.83)	49.99
7	TMTD	13.33 (2.59)	84.62	0.00 (0.71)	100.00
8	TMTD + Aldicarb	53.33 (7.23)	38.47	46.67 (6.83)	49.99
9	TMTD + Carbofuran	13.33 (3.26)	84.62	33.33 (5.75)	64.29
10	Aldicarb	73.33 (8.57)	15.39	73.33 (8.57)	21.43
11	Carbofuran	33.33 (5.75)	61.54	60.00 (7.70)	35.71
12	Control	86.67 (9.32)	—	93.33 (6.67)	—

(Figures in parentheses represent transformed values)

C. D. ($P=0.05$)

2.59

1.44

(Table 1). This corroborates the results obtained under *in vitro* evaluation of fungicides against *M. phaseolina* (Ramadoss, 1985). Soil application of carbendazim has been reported to be effective in the control of *M. phaseolina* in blackgram (Samiyappan, 1976) and bengalgram (Chandrasekaran, 1979). Quintozene when used as soil application gave good control of *M. phaseolina* in cotton (Mathur and Sing, 1973) and sesamum (Prakasam, 1976). Though the insecticides affected the mycelial growth of *M. phaseolina* they appeared to have no significant effect when compared to fungicides on the incidence of root rot of cowpea.

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