

Studies on Sunflower Root rot Disease-II. Effect of Seed Treatment

Root rot caused by *Macrophomina phaseoli* (Maubl.) Ashby (Syn. *Sclerotium bataticola* Taub., *Rhizoctonia bataticola* Taub. (Butl.) is one of the most important diseases of sunflower in Tamil Nadu. Several workers reported that *M. phaseoli* infected seeds did play a major role in perpetuation of the disease (Garren and Higgins, 1947,

Shanmugam and Govindaswamy, 1973). The present study reports the evaluation of seed dressing fungicides against *M. phaseoli* *in vitro* as well as the effect on the germination of sunflower seeds.

Sun dried healthy seeds of 'K 1' (EC 68414) were treated with elght fungicides (Table 1) at three concen-

TABLE 1. Effect of seed treatment on the germination of sunflower seeds

Fungicides	Germination (%)			
	Concentrations (%)			Mean
	0.2	0.3	0.4	
Agrosan G N	97.8 (81.4)	98.9 (83.9)	91.9 (73.5)	96.2 (79.6)
Ceresan	93.6 (75.3)	93.6 (75.3)	(95.0) (77.1)	94.1 (75.9)
T. M. T. D	99.5 (85.7)	97.8 (81.4)	91.8 (73.4)	96.4 (80.2)
Captan	95.7 (78.1)	83.6 (66.1)	91.0 (72.5)	90.1 (72.2)
Brassicol	92.2 (73.8)	90.5 (72.0)	90.5 (72.0)	91.1 (72.6)
Tillex	91.8 (73.4)	95.7 (78.1)	90.5 (72.0)	92.7 (74.5)
Benlate	93.3 (75.0)	95.7 (78.1)	93.6 (75.3)	94.2 (76.1)
Vitavax	90.0 (71.6)	88.4 (70.1)	94.8 (76.8)	91.1 (72.8)
Control	—	—	—	90.5 (72.0)
Mean	94.2 (76.8)	93.1 (75.9)	92.4 (74.1)	—

Figures in parenthesis are transformed values

Comparison of significant effects CDCP=0.05)

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|---|-----|-----|-----|-----------------|
| (i) Between treatment | ... | ... | ... | 5.02 |
| (ii) Between concentrations | ... | ... | ... | Not significant |
| (iii) Between concentrations and treatments | ... | ... | ... | Not significant |

trations viz., 0.2, 0.3 and 0.4 per cent by mixing them thoroughly for 15 minutes. One lot of seed was left untreated to serve as control. One hundred seeds from each treatment in three replications were tested for germination to assess the adverse effect if any due to higher concentration of fungicides

(Table 1). The evaluation of seed dressing fungicides against *M. phaseoli* was done by inhibition zone assay (Rama-krishnan *et al.*, 1965). The diameter of the inhibition zone that developed around the seed was measured (Table 2).

TABLE 2. Effect of seed treatment on the inhibition of *M. phaseoli*

Fungicides	Inhibition (mm)			
	Concentration(%)			Mean
	0.2	0.3	0.4	
Agrosan GN	0 (0.71)	20.00 (4.53)	34.00 (5.87)	18.00 (3.70)
Ceresan	0 (0.71)	0 (0.71)	22.33 (4.78)	7.44 (2.07)
T.M.T.D.	36.33 (6.06)	44.67 (6.71)	45.33 (6.76)	42.11 (6.51)
Captan	0 (0.71)	4.67 (2.27)	5.67 (2.48)	3.45 (1.82)
Brassicol	0 (0.71)	0 (0.71)	0 (0.71)	0 (0.71)
Tillex	12.33 (3.58)	60.67 (7.82)	63.00 (7.97)	45.33 (6.46)
Benlate	59.33 (7.74)	61.33 (7.86)	66.00 (8.15)	62.22 (7.92)
Vitavax	32.00 (5.70)	36.30 (6.07)	37.33 (6.14)	35.20 (5.97)
Control	—	—	—	0 (0.71)
Mean	17.60 (3.24)	28.46 (4.59)	34.21 (5.36)	—

Figures in parenthesis are transformed values
Comparison of significant effect CD (P=0.01)
(i) Between treatments .. 0.22
(ii) Between concentrations .. 0.14
(iii) Between concentrations and treatments .. 0.37

The germination in the seeds treated with T.M.T.D., and agrosan was significantly superior to others. However no significant effect could be seen on the germination of seeds due to different concentrations. Thus, the results revealed that the seed dressing with fungicides at higher concentrations of 0.3 and 0.4 per cent was not deleterious to the germination of sunflower seeds. All the fungicides except brascol were effective over control in inhibiting the root rot pathogen and among the fungicides benlate, T.M.T.D. and tillex were superior. Benlate was highly effective at a concentration of 0.3 and 0.4 per cent, while T. M. T. D. was effective only at a higher concentration of 0.3 and 0.4 per cent. In general the fungicides at higher concentrations were more effective in inhibiting the growth of *M. phaseoli*. In the light of the data it is clear that seed treatment with T.M.T.D. at 0.3 or 0.4 per cent could be employed safely to afford protection to sunflower crop against seed-borne nature of root rot pathogen besides increasing the germination of sunflower seeds.

The efficacy of T.M.T.D. in maintaining higher germination of chilli seeds (Pillayarsamy *et al.*, 1973), groundnut seeds (Shanmugam and Govindaswamy, 1973), and sorghum seeds Venkata Rao *et al.*, 1970) has been

reported. Seed treatment for the control of *M. phaseoli* on jute has also been suggested (Ahmed, 1968). Shanmugam and Govindaswamy (1973) from laboratory evaluation found benlate, T.M.T.D., and Sandoz 6335 as effective against *M. phaseoli* of groundnut.

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