

Management of *Macrophomina phaseolina* in groundnut through systemic fungicides



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SUMMARY

Poisoned food technique was employed to study the efficacy of different nine systemic fungicides at 250, 500 and 1000 ppm against *Macrophomina phaseolina* (groundnut isolate) under *in vitro* conditions. All the fungicides were capable of inhibiting the growth of the fungus at all the concentrations tried. Difenconazole (Score 25% EC), carboxin (Vitavax 75% WP) and saaf (SAAF 75%) were found to be the best, which caused cent per cent inhibition of growth at all the concentrations tried. Similarly hundred per cent inhibition was also observed in the treatment of fosityle-AI (Allitte 50% WP), but at 500 ppm concentration and in thiophanate methyl (Topsin 70% WP) and hexaconazole (Contaf 5% EC) at 1000 ppm concentration. 96.67, 88.96 and 85.56 per cent inhibition of growth was also recorded in carbendazim (Bavistin 50% WP), tebuconazole (Raxil 2% DS) and propiconazole (Tilt 25% EC), respectively at 1000 ppm concentration.

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The poisoned food technique was employed for different systemic fungicides under *in vitro* conditions which has been employed by various scientists and reviewed here and their conclusions. Among various systemic fungicides *viz.*, bavisin inhibited maximum growth of *M. phaseolina* (root isolate) at 250 ppm and higher concentrations which also gave maximum toxicity index, while vitavax, and thiophanate methyl also inhibited the growth but only at 1000 ppm concentration (Mathukia, 1982). Prashanthi *et al.* (2000) reported that carbendazim showed 100 per cent inhibition at all the concentrations, while propiconazole inhibited mycelial growth of *M. phaseolina* (93.7 per cent). Hence, the present study was aimed for studying the efficacy of systemic fungicides for management of dry root rot (groundnut isolate) under *in vitro* conditions.

MATERIALS AND METHODS

To study the efficacy of different fungicides under *in vitro* conditions, the poisoned food technique was employed. Nine systemic fungicides were tested at 250, 500

and 1000 ppm. Measured quantities of these fungicides were incorporated in Potato dextrose agar medium separately in flasks and then shaken well to given uniform dispersal of the fungicides. The medium containing different fungicidal concentrations were then poured into Petri plates under aseptic condition. After cooling and solidifying the medium in Petri plates it was inoculated with 4mm disc of actively growing culture of *M. phaseolina* (groundnut isolate) under aseptic conditions and then incubated at $30 \pm 1^\circ\text{C}$ temperature for 8 days. Observations on colony diameter were recorded in each of the fungicidal concentrations and the per cent inhibition of growth of *M. phaseolina* in each treatment were calculated by using equation formula of Vincent (1927).

RESULTS AND DISCUSSION

It is clear from the data presented in Table 1 that all the systemic fungicides were capable of inhibiting the growth of the fungus at all the concentrations tried, but greatly varied in their efficacy. Difenconazole (Score 25% EC), carboxin (Vitavax 75% WP) and saaf (SAAF

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Table 1 : Per cent inhibition of growth of *M. phaseolina* at different concentrations of systemic fungicides under *in vitro* conditions

Systemic fungicides	Concentration (ppm)*			Mean	Toxicity index**
	250	500	1000		
Carbendazim (Bavistin 50 % WP)	74.55	89.22	96.67	86.81	260.44
Thiophanate methyl (Topsin 70% WP)	87.00	88.00	100.00	91.67	275.00
Difencnazole (Score 25% EC)	100.00	100.00	100.00	100.0	300.00
Hexaconazole (Contaf 5% EC)	57.44	93.89	100.00	83.78	251.33
Propiconazole (Tilt 25% EC)	57.44	81.00	85.56	74.67	224.00
Tebuconazole (Raxil 2% DS)	83.22	87.78	88.96	86.65	259.96
Carboxin (Vitavax 75% WP)	100.00	100.00	100.00	100.00	300.00
Fosityle-AI (Allitte 50% WP)	85.67	100.00	100.00	95.22	285.67
SAAF (SAAF 75 WP)	100.00	100.00	100.00	100.00	300.00
Control	0.00	0.00	0.00	0.00	0.00
	Between fungicide		Within fungicide		
S.E. ±	0.33		1.34		
C.D. (P=0.05)	0.98		3.82		
C V %	0.40		0.89		

*=Average of three replications, **=Maximum toxicity index 300

75 %) were found best and caused cent per cent inhibition of growth at all the concentrations tried. Similarly hundred per cent inhibition was also observed in the treatment of fosityle-AI (Allitte 50% WP), but at 500 ppm concentration and in thiophanate methyl (Topsin 70% WP) and hexaconazole (Contaf 5% EC) at 1000 ppm concentration. 96.67, 88.96 and 85.56 per cent inhibition of growth was also recorded in carbendazim (Bavistin 50% WP), tebuconazole (Raxil 2% DS) and propiconazole (Tilt 25% EC), respectively, at 1000 ppm concentration. Various systemic fungicides *viz.*, bavistin (Prashanthi *et al.*, 2000 and Mathukia, 1982); benlate (El. Wakil *et al.*, 1985) and thiophanate methyl (Mathukia, 1982) have already been reported to be the best for control of *M. phaseolina* in ground and sunflower causing root rot.

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