



FIELD EVALUATION OF DIFFERENT FUNGICIDES AGAINST PHOMA LEAF SPOT DISEASE OF INDIAN BEAN

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ABSTRACT

A field experiment was laid out with the chemicals, which were found effective under laboratory screening to test relative field efficacy of different fungicides in controlling the Phoma leaf spot disease of Indian bean during summer season. Six fungicides at various concentrations were screened against *Phoma tropica*. The minimum per cent disease intensity (PDI) and maximum per cent disease control (PDC) was recorded in the field plots, which were sprayed with carbendazim (Bavistin 50 % WP@ 0.05%) and flusilazole (Nustar 40% EC @ 0.05%).

KEYWORDS

Indian bean, *Phoma tropica*, Fungicides, Management.

INTRODUCTION

Indian bean (*Lablab purpureus* L.) is an important pulse crop of Gujarat. Occurrence of Phoma leaf spot disease was found serious in south Gujarat in summer 2006. Out of various management strategies, Considering the importance of the disease and variation in the recommendations of different fungicides available in the market for the control of leaf spot disease, a field experiment was laid out with the chemicals, which were found effective under laboratory screening to test relative field efficacy of different fungicides in controlling the Phoma leaf spot disease of Indian bean during summer season.

MATERIALS AND METHODS

The experiment was laid out in Randomized Block Design with six fungicides keeping three replications. The fungicides tested were carbendazim (Bavistin 50% WP, 0.05%, 0.5 g l⁻¹), flusilazole (Nustar 40% EC, 0.05%, 1 ml l⁻¹), carbendazim 12 % +

mancozeb 63 % (Sixer 75% WP, 0.2%, 2 g l⁻¹), propiconazole (Tilt 25% EC, 0.025%, 1 ml l⁻¹), mancozeb (Dithane M 45, 0.2%, 2 g l⁻¹) and thiophanate-methyl (Topsin-M 70% WP, 0.1%, 1 g l⁻¹). The efficacy of each fungicide was compared with control plot, which was sprayed with water only. The gross plot size was 5.0 m x 4.5 m and net

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plot size was 3.4 m x 4.3 with 80 cm x 10 cm spacing. Two sprayings of the fungicides were carried out on Indian bean cv. Gujarat Wal- 1, first at the time of initiation of disease, and second at fifteen days after first spraying. Five plants from each of the plot were selected for recording observations.

From each plant, three leaves from top, middle and bottom portions were chosen for recording observation. The disease rating was done by using 0-6 scale and average disease severity index based on percent leaf area affected was calculated by following

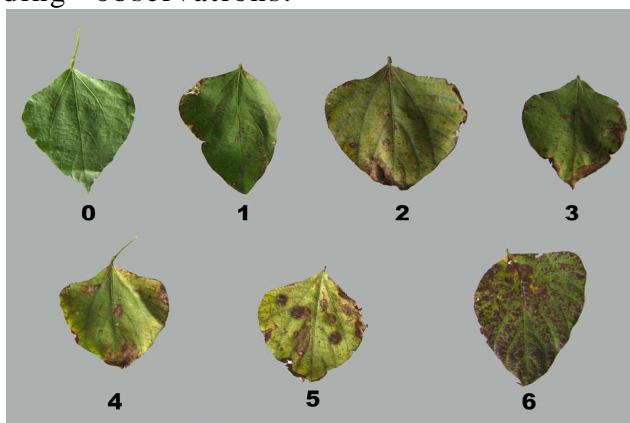


Fig 1. Standardised 0-6 rating scale of leaf spot.

Scale	Per cent leaf area infection
0	= No visible symptoms
1	= 1 to 5 per cent leaf area infected
2	= 6 to 10 per cent leaf area infected
3	= 11 to 25 per cent leaf area infected
4	= 26 to 50 per cent leaf area infected
5	= 51 to 75 per cent leaf area infected
6	= 76 to 100 per cent leaf area infected

Per cent disease intensity (PDI) was calculated by adopting the following equation as¹

$$PDI = \frac{\text{Sum of rating scales of the leaves in the treatment}}{\text{Total no. of leaves examined} \times \text{Max. rating scale}} \times 100$$

**FIELD EVALUATION OF DIFFERENT FUNGICIDES AGAINST PHOMA LEAF SPOT DISEASE OF INDIAN BEAN****RESULTS AND DISCUSSION**

For controlling Phoma leaf spot disease of Indian bean under field conditions, the chemicals which were found effective under laboratory screening were further evaluated under field conditions. The performances of each of these fungicides were compared with control, where no fungicide was sprayed. The per cent disease intensity (PDI) and per cent disease control (PDC) were worked out and is presented in Table-1

Table1.**Field evaluation of different fungicides against Phoma leaf spot disease of Indian bean**

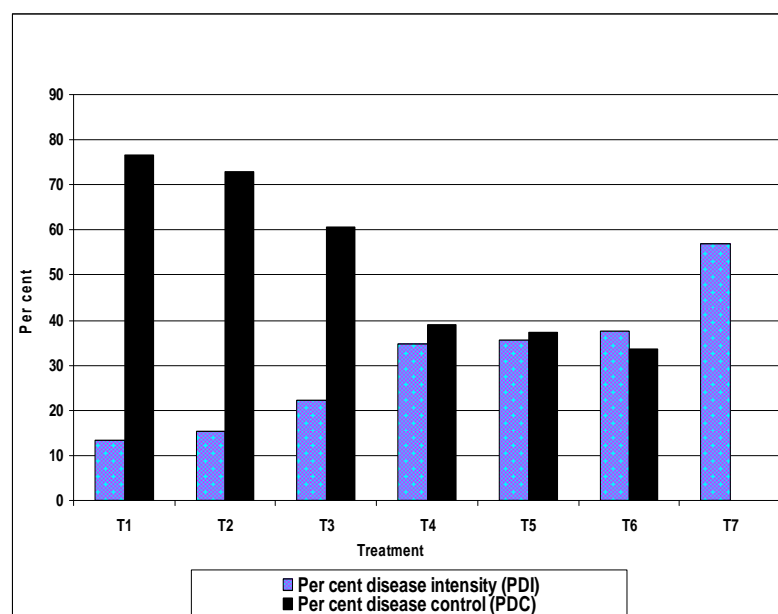
Sr. No.	Technical and trade name of fungicide	Conc.	Per cent disease intensity (PDI)	Per cent disease control (PDC)
1	Carbendazim (Bavistin 50% WP, 0.05%)	0.5 g/l.	21.39*(13.33)**	76.54
2	Flusilazole (Nustar 40% EC, 0.05%)	1 ml/l	22.97 (15.33)	73.02
3	Carbendazim 12 % + Mancozeb 63 % (Sixer 75% WP, 0.2%)	2 g/l.	28.16 (22.33)	60.70
4	Propiconazole (Tilt 25% EC 0.025%)	1 ml/l.	36.03 (34.67)	38.99
5	Mancozeb (Dithane M 45 75% WP @ 0.2%)	2 g/l.	36.64 (35.67)	37.23
6	Thiophanate methyl (Topsin-M 70% WP @ 0.1 %)	1 g/l.	37.84 (37.66)	33.71
7	Control	-	48.92 (56.83)	
	S.Em. ±		0.98	
	C.D. at 5%		3.01	
	C.V. %		5.12	

* Figures indicate arcsine-transformed values

**Figures in parentheses indicate arcsine retransformed value



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Graph 1.

Field evaluation of different fungicides against Phoma leaf spot disease of Indian bean

The data presented revealed that all the fungicidal treatments significantly reduced the disease intensity as compared to control. Among them, two sprayings at fifteen days interval of carbendazim (Bavistin 50% WP, 0.05%) @ 0.5 g/l were found significantly superior over the rest as minimum disease intensity (13.33%) was observed, which was at par with flusilazole (Nustar 40% EC, 0.05%) @ 1.0 ml/l (15.33%). The next best treatment in order of merit was carbendazim + mancozeb (Sixer 75% WP, 0.2%) @ 2.0 g/l (22.33%) followed by propiconazole (Tilt 25% EC, 0.025%) @ 1ml/l (34.66%), mancozeb (Dithane M 45 75% WP, 0.2 %) @ 2 g/l (35.66%) and thiophanate methyl (Topsin- M 70% 0.1%)@ 1.0 g/l (37.66%).

The maximum disease control (76.54%) was achieved in the plots where carbendazim (Bavistin 50% WP, 0.05%) @ 0.5 g/l was sprayed followed by

flusilazole (Nustar 40% EC, 0.05%) @ 1.0 ml/l (73.02%), carbendazim + mancozeb (Sixer 75% WP, 0.2%) @ 2 g/l (60.70%), propiconazole (Tilt 25% EC, 0.025%) @ 1ml/l (38.99%), mancozeb (Dithane M 45 75% WP, 0.2 %) @ 2 g/l (37.23%) and thiophanate methyl (Topsin- M 70% 0.1%)@ 1.0 g/l (33.71%).

Similar results were reported by² as Bavistin and Dithane M45 @ 0.2% applied as soil drench was found effective in controlling leaf spot disease of *Gmelina arborea* caused by *Phoma tropica*. The different fungicides tested in vivo after treatment of the benomyl and carbendazim @ 50 g a.i./100 kg seeds as well as difenconazole @ 5g a.i./100 kg seeds of soybean were found to be highly effective in controlling *Phoma sojae* and *Phoma phaseoli* infection in field condition³.

^{4,5,6}reported Bavistin @ 200 to 250 µg/ g to be



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highly effective in complete inhibition of *M. phaseolina*.⁷ reported the maximum disease control of *M. phaseolina* (84.16%) was recorded in the plot where carbendazim + mancozeb were sprayed followed by carbendazim (78.45%), mancozeb (61.89%), thiophanate methyl (48.81%), chlorothalonil (34.12%), propiconazole (29.80%) and propineb (19.05%).⁸ reported that leaf spot of cowpea (*M. phaseolina*) can be effectively controlled by 2 sprayings of flusilazole and carboxin + thiram and the huge crop loss can be prevented if sprayed, right from the initiation of disease.

Results suggests that leaf spot of Indian bean (*P. tropica*) can be effectively controlled by 2 sprayings of carbendazim and flusilazole and the huge crop loss can be prevented if sprayed, right from the initiation of the disease. Our results are also in line with the previous workers who reported carbendazim @ 0.5 g/l and flusilazole @ 1 ml/l as most effective in per cent disease control (PDC) of Indian bean leaf spot with two applications right from initiation of disease.

CONCLUSION

Minimum per cent disease intensity and maximum per cent disease control was achieved with the treatment of carbendazim (Bavistin) (0.05 %) and flusilazole (Nustar) (0.05%).

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