

Effect of leaf blight [*Macrophomina phaseolina* (Tassi.) Goid.] on growth parameters and yield of greengram and its chemical control

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SUMMARY

An experiment was conducted to know the effect of leaf blight on crop phenology of greengram and its chemical control at Pulse Research Station, NAU, Navsari during *Kharif* and summer seasons of the year 2003-2004. There was 9.38 % loss in plant height, 26.32 % loss in number of leaves, 30.00 % loss in number of pods and 40.00 % loss in pod weight per plant due to leaf blight (*Macrophomina phaseolina*). For the control of the disease, seven fungicides were tested among them Carbendazim + mancozeb (Sixer) was found significantly superior over the rest as it resulted minimum (8.13%) disease intensity. This suggests that leaf blight of mung bean (*Macrophomina phaseolina*) can be controlled very effectively by spraying of carbendazim + mancozeb (Sixer) and the huge crop loss can be saved if sprayed at the time of disease initiation.

Key words : *M. phaseolina*,
Greengram,
Growth, Yield,
Fungicides

Greengram (*Phaseolus aureus* Roxb.) is one of the important pulse crops, primarily grown for food in India. Greengram was observed severely affected by leaf blight caused by *Macrophomina phaseolina* (Tassi.) Goid. in *Kharif* as well as during summer season. It was first reported from Jabalpur (M.P.) India (Philip, 1968). Leaf blight caused by *M. phaseolina* of greengram has become a threat to successful and profitable cultivation in South Gujarat. Considering this facts, the present investigation was carried out to know the effect of leaf blight (*M. phaseolina*) on growth parameters and yield of greengram and its chemical control.

MATERIALS AND METHODS

To know the effect of leaf blight (*M. phaseolina*) on growth parameters and yield, ten each of healthy and infected plants of susceptible variety, GM-2K-5 were selected and observations on plant height, number of leaves/plant, number of pods/plant and pod weight/plant were recorded starting from the initiation of the disease to the harvesting of the crop and per cent losses were calculated.

A field experiment was carried out with the chemicals *viz.*, chlorothalonil (Kavach, 2g/lit), mancozeb (Dithane M-45, 2g/lit), carbendazim + mancozeb (Sixer, 2g/lit), propineb (Antracol, 1g/lit), carbendazim

(Bavistin, 1g/lit), propiconazole (Tilt, 1ml/lit) and thiophanate-methyl (Topsin M, 1g/lit) to test relative field efficacy of different fungicides in controlling the leaf blight disease (*M. phaseolina*) of green gram in cv. GM-2K-5 during summer season of the year 2004. The efficacy of which was compared with control plot was sprayed with water only. The experiment was laid out in Randomized Block Design with three replications and seven treatments during summer season. The gross plot size was 3.60 \times 4.0 m with 45 cm spacing. One spray of the fungicides at the time of initiation of disease was carried out. Fifteen days after spraying, five plants from each of the plots were selected for recording the observations. From each of the plants, three leaves from top, middle and bottom parts were observed. Disease rating was done by using 0-6 scales and per cent disease intensity (PDI) was calculated by using the formula devised by Kumar *et al.* (1969).

Scale	Per cent area infection	Numerical value
0	leaves disease free	0.0
1	leaves area covered up to 5%	1.0
2	leaves area covered 6-10%	1.5
3	leaves area covered 11-25%	2.0

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Table 1 : Effect of leaf blight (*M. phaseolina*) on growth parameters and yield of greengram

Sr. No.	Attributes	Healthy	Infected	Per cent loss
1.	Plant height (cm)	32	29	9.38
2.	No. of leaves/plant	38	28	26.32
3.	No. of pods/plant	30	21	30.00
4.	Pod weight /plant (g)	50	30	40.00

fungicidal treatments significantly reduced the disease intensity as compared to control. Among them, carbendazim + mancozeb was found significantly superior over the rest as it resulted minimum (8.13%) disease intensity. The next best treatment in order of merit was carbendazim (11.06%) followed by mancozeb (19.56%), thiophanate methyl (26.26%), chlorothalonil (33.84%), propiconazole (36.05%) and propineb (41.56%). These

Table 2 : Field evaluation of different fungicides for the control of *Macrophomina* leaf blight of greengram

Sr. No.	Fungicide	Concentration on formulation base	Per cent disease intensity	Per cent disease control
1.	Carbendazim + Mancozeb (Sixer)	2g/lit.	16.57* (8.13)**	84.16
2.	Carbendazim (Bavistin)	1g/lit.	19.43 (11.06)	78.45
3.	Mancozeb (Dithan M-45)	2g/lit.	26.25 (19.56)	61.89
4.	Thiophanate methyl (Topsin-M)	1g/lit.	30.83 (26.26)	48.81
5.	Chlorothalonil (Kavach)	2g/lit.	35.57 (33.84)	34.12
6.	Propiconazole (Tilt)	1ml/lit.	36.90 (36.05)	29.80
7.	Propineb (Antracol)	1g/lit.	40.14 (41.56)	19.05
8.	Control		45.77 (51.34)	-
	S.E. ±		0.34	
	C.D. (P=0.05)		1.05	
	C.V. %		1.90	

4	leaves area covered 26-50%	2.5
5	leaves area covered 51-75%	3.0
6	leaves area covered 76-100%	4.0

$$PDI = \frac{\sum \text{of ratings of infected leaves observed}}{\text{No. of leaves observed} \times \text{maximum diseases score}} \times 100$$

RESULTS AND DISCUSSION

The result presented in Table 1 indicate that there was 9.38 per cent loss in plant height, 26.32 per cent loss in number of leaves per plant, 30.00 per cent loss in number of pods per plant and 40.00 per cent loss in pod weight per plant. Tiwari and Kotasthane (1986) reported *M. phaseolina* causing premature defoliation of foliage leading to heavy losses in grain yield of mungbean. Kaushik *et al.* (1987) reported 10.8 per cent yield loss due to leaf and pod infection by *M. phaseolina* in mungbean. The leaf blight (*M. phaseolina*) affected considerably the growth parameters and yield of greengram.

The result presented in Table 2 reveals that all the

results confirm the finding of Singh *et al.* (1986) who reported 2 sprayings of carbendazim at 45 days interval for checking maximum leaf blight (*M. phaseolina*) of mung bean followed by mancozeb.

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