

## Short Communication

# Assessment of Lustre 37.5 EC, a novel fungicide, against powdery mildew disease of urdbean (*Vigna mungo* L.)

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### ABSTRACT

A field experiment was conducted to evaluate the efficacy of lustre 37.5 SE, a combination of flusilazole 12.5% (systemic) and carbendazim 25% (systemic) against powdery mildew disease in urdbean. The experiment was carried out during Kharif 2012 and 2013 at Student Research Farm, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh. The results showed that Lustre 37.5 SE at both concentrations of 300 ml and 375 ml/ha were highly effective in comparison to Penconazole 10% EC @250 ml/ha, Flusilazole 40% EC @ 150 ml/ha and Carbendazim 50% WP @ 250 g/ha in managing of powdery mildew disease in blackgram.

**Key words:** Fungicide, Lustre, Powdery mildew, Urdbean

India is one of the leading countries in pulse production as well as consumption which accounts for 33 per cent of world area and 24 per cent of world production. The production of blackgram in the country is 2.19 million tones from an area of 4.01 million hectares, with a productivity of 547 kg/ha (Anonymous, 2017). Black gram is suffering by number of insect-pests as well as diseases which cause major yield loss besides abiotic stresses. Among the diseases, powdery mildew caused by *Erysiphe polygoni* is one of the economically important disease in blackgram which occur at later stages of crop growth. Grain yield losses have been reported up to 21% due to powdery mildew in green gram (Quebral and Cowel, 1978).

Yield losses are much high when the pathogen infects the crop before flowering, however, it results in complete loss of the crop, if disease occurs at seedling stage. Abbaiah (1993) reported that the powdery mildew in black gram was generally noticed in 45 days old crop. Similarly, Venkata Rao (1997) observed that 40 and 50 days old green gram plants were highly susceptible to powdery mildew. Since sources of complete resistance are not available in black gram, powdery mildew has to be managed by chemical fungicides to avoid yield losses. Luster 37.5 suspo emulsion is a new formulation of fungicide introduce in India first time by Dhanuka Agritech Limited. It will act both as preventive and curative agent against powdery mildew causing pathogen. It will also interfere with conidia and haustoria formation in fungus and also change the sterol content and saturation of the polar fatty acids leading to

alterations in membrane fluidity and behavior of membrane bound enzymes (Nane and Thapliyal, 1993). Several workers reported that, Lustre 37.5 SE was found to be effective in reducing powdery mildew incidence in different crops. Hence the present study was taken up to evaluate the bio efficacy of Lustre 37.5 SE in comparison with Flusilazole 40 EC and Carbendazim 50 WP and standard check, Penconazole 10 EC against powdery mildew of black gram.

The field experiment was conducted at N. D. University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during Kharif 2012 and 2013 to evaluate the bio-efficacy of lustre 37.5 SE in black gram against powdery mildew. The trial was laid in randomized block design with six treatments including untreated control, replicated thrice during both experimental years. The crop was sown in first fortnight of July during both the seasons with plot size of 5 m x 3 m and at spacing of 30 cm and 10 cm between row and plants respectively. The crop was growing under natural conditions by adopting all the agronomic practices as per recommendations. The crop was protected from sucking pest such as thrips and white flies at initial stages through sprays of selective insecticides in all the experimental plots uniformly to avoid the yield losses due to insect-pests infestations. The first spray was given at 40 days after sowing and second sprays at 55 days after sowing during both the seasons. The schedule spraying was given with Knap-sack sprayer at the rate of 400 liters of spray fluid per hectare for thorough coverage of foliage with spray fluid. The bio-efficacy of Lustre 37.5 SE was evaluated at two different doses compared with Flusilazole 40% EC and Carbendazim 50% WP and standard check, Penconazole 10% EC against powdery mildew disease of black gram.

The phytotoxic effect such as injury on leaf tips, leaf surface, necrosis, epinasty, hyponasty, wilting and vein clearing was also recorded for the test chemical at its higher dose at 3<sup>rd</sup>, 7<sup>th</sup> and 10<sup>th</sup> days after spraying. The disease severity of powdery mildew was recorded one day before the first spray and finally after second sprays using 0-5 scale (Gawande and Patil, 2003) during both the seasons percent disease index was calculated using the formula given by Wheeler (1969).

$$\text{PDI} = \frac{\text{Sum of total ratings}}{\text{No. of tubers examined} \times \text{Maximum Grade (5)}} \times 100$$

Powdery mildew Disease rating scale (0-5 scale) was used to calculate the duration index: 0 -Plants free from infection (highly resistant); 1-Plant showing traces to 10% infection on leaves, stem free from infection (Resistant); 2-Slight infection with thin coating of powdery growth on leaves covering 10.1-25% of leaf area, slight infection on stem, pods usually free (Moderately resistant); 3-Dense powdery coating covering 25.1 to 50% of leaf area. Moderate infection on stems, slight infection on pods (Moderately susceptible); 4-Dense powdery coating covering 50.1 to 75% of leaf area, stem heavily and pods moderately infected. Infected Portion turns grayish (Susceptible); 5-Severe infection with dense powdery growth, covering more than 75% area of the whole plant including pods, plants resulting in premature defoliation and drying (highly susceptible). The yield was recorded from each net plot excluding border rows and computed to yield in quintal/ha. The data were subjected to statistical analysis after using suitable transformations.

**Bioefficacy:** In general the incidence of powdery mildew was high during *Kharif* 2012 as compared to *Kharif* 2013 in all the experimental plots. The per cent disease index was ranged from 13.33 to 42.16 during *Kharif* 2012, while it was 11.49 to 39.04 during *Kharif* 2013 in different experimental plots. The results of the field experiment clearly indicated that the disease incidence was significantly low in all the treated plots as compared to the untreated control plot after two sprays. The experimental plots treated with Lustr 37.5 SE @ 375 ml/ha were found lowest PDI of 13.33 and 11.49 against powdery mildew during *Kharif* 2012 and 2013, respectively and it was significantly superior over the rest of the treatments. The next best treatment was Lustr 37.5 SE @ 300 ml/ha which was significantly superior over the remaining treatments. The test chemical Lustr 37.5 SE at its lower dose was found statistically on par with standard check, Penconazole 10 EC during both the seasons. However, all the treatments were found significantly

superior over the untreated control in reducing the incidence of powdery mildew in blackgram during both the seasons. The incidence of powdery mildew was very high in untreated control with PDI 42.16 and 39.04 in *Kharif* 2012 and 2013, respectively.

The results obtained from the present study were in accordance with many of the earlier reports. Nagaraja and Naik (1998) evaluated the relative efficacy of triazoles such as propiconazole, penconazole and difenconazole against powdery mildew of black gram and reported that penconazole was highly effective. Dhruj *et al.* (2000) reported that propiconazole, penconazole, hexaconazole, triadimefon, tridemorph, dinocap and sulphur significantly reduced powdery mildew in fenugreek and among all the fungicides, penconazole was the most effective followed by hexaconazole and propiconazole. Khunti *et al.* (2002) observed that penconazole and hexaconazole effectively minimized the disease intensity of powdery mildew and increased the yield to considerable extent in green gram. Saxena and Saxena (2002) also reported the efficacy of penconazole (0.05%) against powdery mildew (*E. polygoni*) of mungbean. Three sprays of penconazole (Topas) @ 0.1% at 15 days interval were most effective in controlling powdery mildew of okra (Naik and Nagaraja, 2003). Recently, Akhileswari *et al.* (2012) reported that systemic fungicides such as difenconazole (0.05%), penconazole (0.1%) and propiconazole (0.1%) were found significantly superior over non systemic fungicides such as mancozeb at 0.2 percent and wettable sulphur at 0.3 per cent in reducing the incidence of powdery mildew in sunflower.

**Phytotoxicity:** The test chemical, Lustr 37.5 SE did not exerted any phytotoxicity even at its higher dose i.e. 375 ml/ha on blackgram crop. None of the phytotoxic symptoms such as injury on leaf tips, leaf surface, necrosis, epinasty, hyponasty, wilting and vein clearing was observed in the crop till the end of the experiment during both years.

**Table 1. Effect of fungicides against powdery mildew disease of Black gram during rainy season *Kharif* 2012 and 2013**

S. No.	Treatment	<i>Kharif</i> 2012			<i>Kharif</i> 2013				
		PDI	% disease control	Yield (kg/ha)	% increase yield	PDI	% disease control	Yield (kg/ha)	% increase yield
T <sub>1</sub>	Carbendazim 25% + Flusilazole 12.5% SE @ 300 ml/ha	17.07 (24.52)	59.51	825.00	38.66	16.42 (23.98)	57.94	866.00	43.14
T <sub>2</sub>	Carbendazim 25% + Flusilazole 12.5% SE @ 375 ml/ha	13.33 (21.38)	68.38	891.00	49.75	11.49 (19.80)	70.57	911.00	50.58
T <sub>3</sub>	Penconazole 10% EC @ 250 ml/ha	21.17 (27.44)	49.79	798.00	34.12	19.66 (25.97)	49.64	802.00	32.56
T <sub>4</sub>	Flusilazole 40% EC @ 150ml/ha	27.06 (31.08)	35.82	691.00	16.13	25.87 (30.21)	33.73	698.00	15.37
T <sub>5</sub>	Carbendazim 50%WP @ 250ml/ha	29.57 (33.06)	29.86	655.00	10.08	28.02 (32.01)	28.23	661.00	9.26
T <sub>6</sub>	Control (Untreated)	42.16 (40.54)		595.00		39.04 (38.63)		605.00	
	S.Em. ±	1.07		8.11		0.97		9.22	
	C.D. at 5%	3.33		24.33		2.98		27.66	

\*Figures in parenthesis are Arc sign transformed

**Yield:** All the treatments significantly increased the yield over the untreated check. However, highest grain yield was recorded from the experimental plots treated with Lustre 37.5 SE @375 ml/ha(891 kg/ha and 911 kg/ha during *Kharif* 2012 and 2013, respectively) which was statistically on par with Lustre 37.5 SE@ 300 ml/ha (1027 kg/ha) during both seasons. These two treatments were found significantly over the rest of the treatments which were failed to differ significantly with each other. The present results were in conformity with Rakhonde *et al.* (2011) who reported that maximum grain yield (556 kg/ha) was obtained with 0.05% penconazole in green gram. Saxena and Saxena (2002) reported that fungicidal sprays not only control the disease but also had significant influence on the yield components in green gram.

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