

## Evaluation of Propineb against fungal leaf spots of cotton

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**ABSTRACT:** Efficacy of propineb 70 WP was tested at three doses of 700, 1050 and 1400 g/ha in comparison with copper oxychloride 50 WP @ 625 g/ha and mancozeb 50 WP @ 750 g/ha at Regional Agricultural Research Station, Guntur, during *kharif* 2006 - 2007 against fungal leaf spot diseases of cotton. Propineb (1400 g/ha) along with copper oxychloride (625 g/ha) and mancozeb (750 g/ha) was significantly effective against *Alternaria* leaf spot while *on par* with copper oxychloride (625 g/ha) and mancozeb (750 g/ha) in controlling *Helminthosporium* leaf spot. Propineb at higher doses (1050 g/ha and 1400 g/ha) and mancozeb (750 g/ha) significantly increased the yield with benefit cost ratio in between 3.79 to 4.02.

**Key words:** Cotton, efficacy, fungal leaf spots, Propineb

Cotton crop is affected by a number of foliar diseases throughout the season. Foliar diseases account upto 20 to 30 per cent losses in cotton. Fungal leaf spots are caused by species of *Alternaria*, *Helminthosporium*, *Cercospora* and *Myrothecium* species in cotton. Among the leaf spot diseases, *Alternaria* leaf spot is most common appearing wherever cotton is grown. Besides *Alternaria macrospora* Zymm., *Helminthosporium gossypii* Tucker caused leaf spot in India. These diseases under congenial conditions cause severe defoliation and yield losses to the tune of 30 to 33 per cent in unprotected fields (Bhattiprolu and Prasada Rao, 2009; Bhattiprolu, 2010). Spraying copper fungicides (0.25%) mixed with streptomycin (0.01%) control foliar diseases. In order to explore the possibility of the use of new chemicals against fungal foliar diseases in cotton, propineb was tested against fungal leaf spot diseases in cotton.

A field trial was laid out at Regional Agricultural Research Station, Guntur during *kharif* 2006 – 2007. Cotton variety NA 1325 was sown on 5.8.2006 in plots of 36 sq. m. adopting a spacing of 120 x 60 cm. Six treatments *viz.*, propineb 70 WP at three doses of 700 (T<sub>1</sub>), 1050 (T<sub>2</sub>) and 1400 g/ha (T<sub>3</sub>) in comparison with copper oxychloride 50 WP @ 625 g/ha (T<sub>4</sub>) and mancozeb 50 WP 750 g/ha (T<sub>5</sub>) and untreated control (T<sub>6</sub>) were imposed with four replications in randomized block design. Three sprays were given at 10 days interval with first spray starting immediately after the appearance of the leaf spot diseases. Data on fungal leaf spot diseases

caused by *Alternaria* and *Helminthosporium* were recorded using 0 to 4 scale. Per cent disease intensity (PDI) was calculated. Per cent disease control in each treatment was calculated. Yield data was recorded and treatment wise benefit cost ratio was calculated.

Results indicated that all the treatments reduced intensity of *Alternaria* and *Helminthosporium* leaf spot diseases. Intensity of *Alternaria* leaf spot ranged between 21.92-39.48 per cent. Lowest PDI of 21.92 per cent was recorded with copper oxychloride (625 g/ha) followed by 22 per cent in mancozeb (750 g/ha) treatment. Untreated plots recorded maximum PDI of 39.48 per cent (Table 1). Propineb at highest dose of 1400 g/ha was *on par* with copper oxychloride and mancozeb in controlling *Alternaria* leaf spot. Copper oxychloride recorded maximum disease control of 44.48 per cent followed by mancozeb (44.28%) and Propineb at 1400 g/ha (40.17 %).

Intensity of *Helminthosporium* leaf spot varied from 20.75 per cent (T<sub>3</sub>) to 35.17 per cent (T<sub>6</sub>). Propineb (1400 g/ha) recorded lowest PDI of 20.75 while mancozeb and copper oxychloride gave 22.22 and 22.55 per cent PDI, respectively. Maximum disease control of 41 per cent was obtained with Propineb (1400 g/ha) followed by 36.82 per cent in mancozeb treatment and 35.88 per cent with copper oxychloride.

Propineb at a higher concentration of 0.4 per cent checked the development of *Cercospora* and *Alternaria* leaf spots at Ludhiana centre (Singh *et al.*, 2010). Propiconazole at 0.1 per cent

**Table 1.** Efficacy of propineb against cotton leaf spot diseases

Treatment	Disease intensity (%) <sup>*</sup>		Disease control (%)		Mean yield (kg/ha)	Increase in yield over control (%)	Cost of spraying (Rs)	Gross expenditure	Additional yield (kg/ha)	Gross returns (Rs)	Net Profit (Rs)	B : C ratio	Avoidable yield loss (%)
	ALS	HLS	ALS	HLS									
<b>T<sub>1</sub></b>	29.42 (32.82)b	28.08 (31.99)b	25.48	20.16	1855b	3.63	1374	16639	65	55650	39011	3.34	26.95
<b>T<sub>2</sub></b>	26.25 (30.85)b	29.55 (30.61)b	33.51	15.98	2192a	22.46	1836	17101	402	65760	48659	3.85	7.44
<b>T<sub>3</sub></b>	23.62 (29.05)a	20.75 (27.10)a	40.17	41.00	2355a	31.56	2298	17563	565	70650	53087	4.02	0.0
<b>T<sub>4</sub></b>	21.92 (27.84)a	22.55 (28.34)a	44.48	35.88	1997b	11.56	1200	16465	207	59910	43445	3.64	17.93
<b>T<sub>5</sub></b>	22.00 (27.95)a	22.22 (28.12)a	44.28	36.82	2089a	16.70	1260	16525	299	62670	46145	3.79	12.73
<b>T<sub>6</sub></b>	39.48 (38.92)c	35.17 (35.36)c			1790c			15265		53700	38435	3.52	31.56
P=0.05	4.62	2.96			205.72								
CV (%)	8.1	5.4			6.7								

\* Figures in parentheses are transformed values. Figures marked with same letters are not significantly different  
ALS- Alternaria leaf spot; HLS- Helimthosporium leaf spot

was reported effective in controlling *Alternaria* and *Helminthosporium* leaf spot diseases in cotton by preventing losses to the tune of 30 to 33 per cent (Bhattiprolu and Prasada Rao, 2009; Bhattiprolu, 2010).

Yield data revealed that control plots recorded lowest yield of 1790 kg/ha and maximum yield of 2355 kg/ha was recorded with T<sub>3</sub> followed by T<sub>2</sub>. T<sub>5</sub> was *on par* with T<sub>3</sub> and T<sub>2</sub>. Net profit in different treatments was between Rs 38435 to Rs 53087. Highest benefit cost ratio of 4.02 was obtained with Propineb (1400 g/ha) followed by propineb (1050 kg/ha) (3.85) and mancozeb (3.79). Mancozeb (0.25%) was superior in managing *Alternaria* leaf spot and increasing cotton yields (Ramagour, 2007). Propineb 70 WP @ 0.2, 0.3 and 0.4 per cent effectively checked *Alternaria* leaf spot at Faridkot (Singh *et al.*, 2010). It was also reported that copper oxychloride @ 0.25 per cent was effective in controlling fungal leaf spots and giving highest yield. Propineb was found effective against *Myrothecium* leaf spot (Mourya *et al.*, 2009). During present investigation also propineb at 1400g/ha *i.e.*, 0.28 per cent was effective against *Alternaria* and *Helminthosporium* leaf spots and gave highest yields. Hence it is concluded that propineb is effective against cotton leaf spot diseases by preventing yield losses to the tune of 31.56 per

cent and useful in managing cotton diseases.

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