

**RESEARCH ARTICLE**

# Chemical management of *Alternaria* leaf blight of Bt cotton

■ G.H. ANIL, S.A. ASHTAPUTRE AND M.S.L. RAO

## **SUMMARY**

Field experiment was conducted during *Kharif* 2006-07 and 2007-08 at Agricultural Research Station, Dharwad Farm for evaluation of different fungicides against *Alternaria* leaf blight of cotton. Fungicides *viz.*, Hexaconazole (0.1%), Tebuconazole (0.1%), Propiconazole (0.1%), Difencconazole (0.1%), Penconazole (0.1%), Propineb (0.2%), Chlorothalonil (0.2%), Carbendazim (0.1%), Mancozeb (0.2%) were sprayed after initiation of disease infection, three sprays were taken with 20 days interval and per cent disease index (PDI) was calculated after final spray. Propineb (0.2%) was effective in controlling disease with per cent disease control of 76.09 followed by Difencconazole @ 0.1% with 66.96 control.

**Key Words :** *Alternaria* blight, Cotton, Management, Foliar spray

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Cotton is the most important cash crop of India. It is the backbone of our sprawling textile industry contributing 7.00 per cent to our GDP, fetching an export earning besides providing employment in the production, promotion, processing and trade of cotton. Cotton accounts for 45 per cent of the world fibre and supplies 10 per cent world edible oil (Rathore, 2005). The first place is occupied by cotton among cash crops as it guides the destiny of large section of the farming

community as well as that of the flourishing textile industry. Called by the different names as king of fibres, white gold, natural fibre etc., it plays an important role in the Indian economy both in terms of providing employment directly or indirectly to about 60 million people and in terms of production of wealth and earning foreign exchange for the country.

Four species of *Gossypium* have been cultivated for fibre. Of these species, the tetraploid *Gossypium. hirsutum* and *Gossypium. barbadense* currently dominate commercial cotton production, with *Gossypium. hirsutum* accounting for over 90 per cent of the production. *Gossypium. hirsutum* and *Gossypium. barbadense* differ significantly in agronomic and fibre attributes and their commercial end uses. The area under cotton during 2011-12 in India was 110.00 lakh ha with

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production and productivity of 325 lakh bales and 503 kg lint per ha, respectively. In the year 2011, in Karnataka, cotton was grown over an area of 4.66 lakh ha with 10.15 lakh bales production and 370 kg productivity (Anonymous, 2012).

The low productivity of cotton is attributed to many factors, one of which is the losses due to diseases although insect pests continue to be a major constraint. A large number of fungal, bacterial, viral and nematode diseases have been reported on cotton crop right from early stage to maturity. Controlling the foliar diseases in the absence of suitable resistant cultivars is difficult so use of fungicides has become inevitable. In view of these fungicides need to be evaluated for their efficacy against the foliar diseases in field conditions.

## MATERIAL AND METHODS

The field experiment was conducted in Agricultural Research Station during *Kharif* 2012 under rainfed conditions. A Randomized Block Design (RBD) with ten treatments replicated three times with a plot size of 3.6 x 6 m was adopted. The Bunny Bt variety was sown during first week of July with a spacing of 90 x 30 cm. The nine fungicides were sprayed thrice at an interval of 20 days starting from the initial appearance of the disease. Untreated plot was maintained as control. All other cultural and pest management practices were imposed as recommended in package of practices. The first spray of each treatment was initiated as soon as the first symptom of leaf spot was seen in the field (65 DAS) and repeated three times at an interval of 20 days.

The fungicides with recommended concentration were used in this experiment *viz.*, Hexaconazole (0.1%),

Tebuconazole (0.1%), Propiconazole (0.1%), Difenconazole (0.1%), Penconazole (0.1%), Propineb (0.2%), Chlorothalonil (0.2%), Carbendazim (0.1%), Mancozeb (0.2%). Disease grading was done using 0-4 scale (Sheo Raj, 1988). Per cent disease incidence was calculated using Wheeler's formula (1969) and finally per cent disease control was calculated. Yield was recorded in each treatment.

## RESULTS AND DISCUSSION

The results obtained during 2012 revealed that all the treatments were significantly superior over untreated control from the data it is clear that, Propineb @ 0.1% (11.20) showed very less per cent disease index followed by Difenconazole @ 0.1% (15.48), Penconazole @ 0.1% (15.81), Mancozeb @ 0.2% (18.33), Tebuconazole @ 0.1% (20.00), Propiconazole @ 0.1% (20.73), Chlorothalonil @ 0.2% (22.69), Carbendazim @ 0.1% (23.90) and very higher per cent disease index was shown by Hexaconazole @ 0.1% (25.10) (Table 1).

Out of different treatments carried out, the highest per cent disease control was shown by Propineb @ 0.1% (76.09) followed by Difenconazole @ 0.1% (66.96), Penconazole @ 0.1% (66.24), Mancozeb @ 0.2% (60.76), Tebuconazole @ 0.1% (57.31), Propiconazole @ 0.1% (55.75), Chlorothalonil @ 0.2% (51.59), Carbendazim @ 0.1% (49.00) and least per cent disease control was shown by Hexaconazole @ 0.1% (46.43) (Fig. 1).

The kapas yield of cotton was significantly superior in all treatment as compared to untreated control. Maximum yield was recorded in propineb (1048.45 kg/ha) followed by Penconazole (1035.64 kg/ha),

**Table 1 : Efficacy of fungicides against *Alternaria* leaf blight of Bt cotton**

Sr. No.	Treatment details	Per cent disease index (PDI) at 105 days	Per cent disease index (PDC)	Yield (Kg/ha)	B:C
T <sub>1</sub>	Hexaconazole (0.1%)	25.10 (30.04)*	46.43	920.06	0.39
T <sub>2</sub>	Tebuconazole (0.1%)	20.00 (26.54)	57.31	964.96	0.37
T <sub>3</sub>	Propiconazole (0.1%)	20.73 (27.07)	55.75	985.03	0.39
T <sub>4</sub>	Difenconazole (0.1%)	15.48 (23.15)	66.96	989.05	0.26
T <sub>5</sub>	Penconazole (0.1%)	15.81 (23.41)	66.24	1035.64	0.42
T <sub>6</sub>	Propineb (0.2%)	11.20 (19.50)	76.09	1048.45	0.52
T <sub>7</sub>	Chlorothalonil (0.2%)	22.69 (28.39)	51.59	1026.85	0.41
T <sub>8</sub>	Carbendazim (0.1%)	23.90 (29.21)	49.00	926.08	0.38
T <sub>9</sub>	Mancozeb (0.2%)	18.39 (25.37)	60.76	936.72	0.39
T <sub>10</sub>	Control	46.87 (43.18)		736.11	0.14
	S.E.±	0.82		85.50	
	C.D. (P=0.05)	2.45		265.92	

\* Figure in parentheses indicates angular transformed values

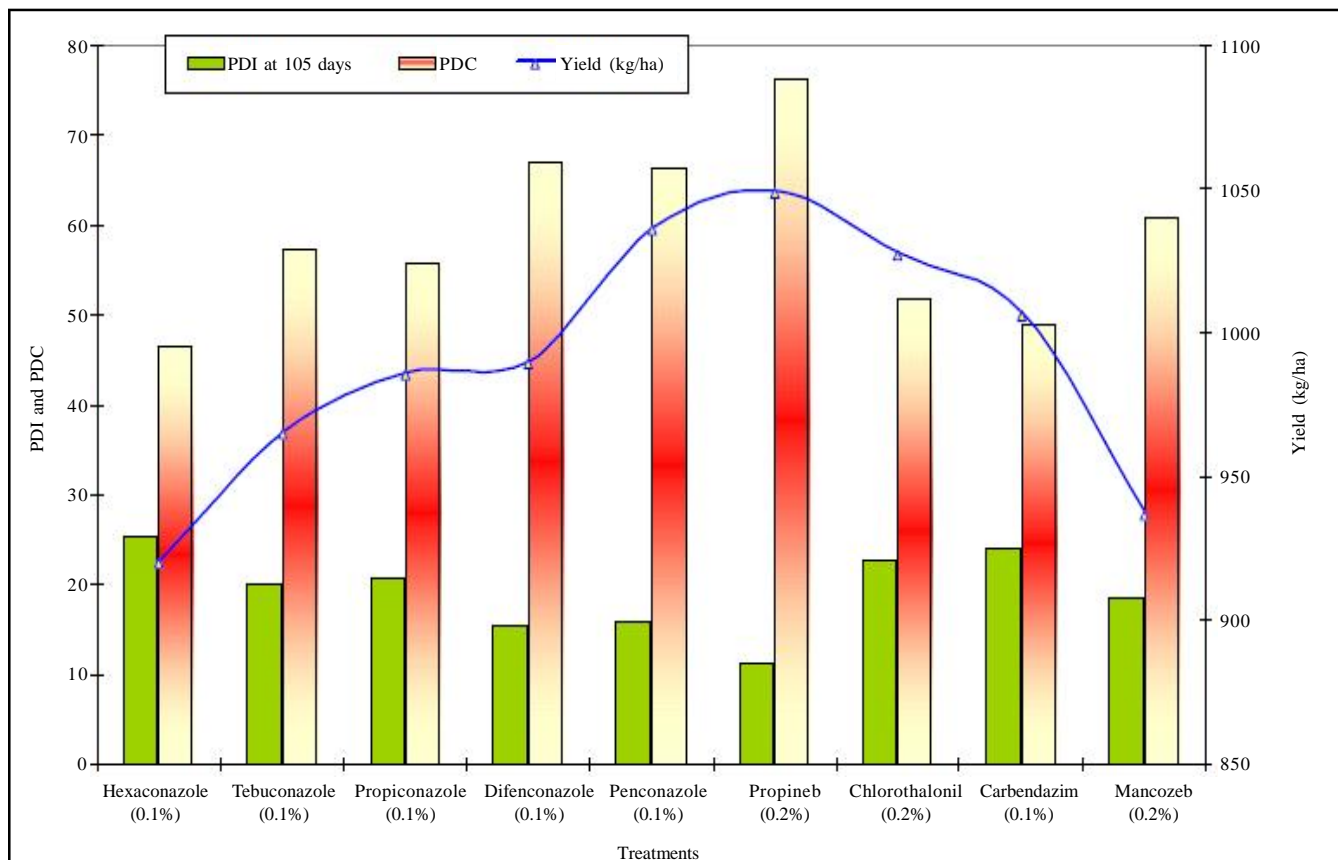


Fig. 1 : Efficacy of fungicides against leaf blight of Bt cotton

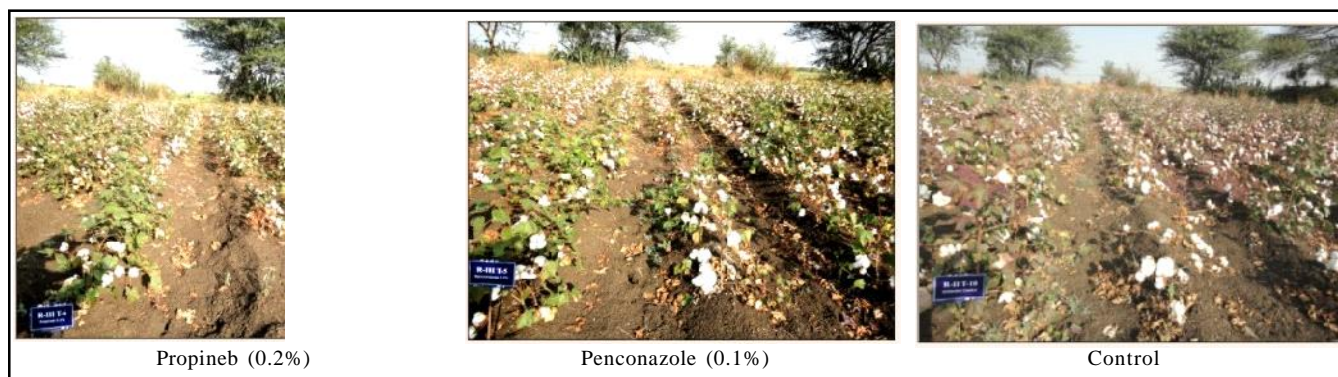


Plate 1 : Management of *Alternaria* leaf blight of cotton with different chemical during *Kharif* 2012

Chlorothalonil (1026.85 kg/ha), Difencozle (909.41), Propiconozal (985.03), Tebuconazole (964.96), Mancozeb (936.72), Carbendazim (926.08 kg/ha) and very least quantity of yield was recorded in Hexaconazole (920.06).

The benefit cost ratio study revealed that, Propineb @ 0.2% (0.52) is considered to be effective chemical for the management of *Alternaria* leaf blight of cotton Penconazole @ 0.1% (0.42) is found to be second best

chemical, even though Chlorothalonil @ 0.2 % (0.41) showed high per cent disease index (22.69) because of its low chemical cost and high yield it is considered as next best to Propineb and Chlorothalonil. Hosagoudar (2007) reported that Propineb 0.2% was effective against *Alternaria* blight of cotton followed by Propineb 0.1% (24.92 PDI) while Propiconazole 0.1% (25.99 PDI) was least effective. Similarly Chattannavar *et al.* (2004) observed that the new chemical Folicur (Tebuconazole)

at 0.05 and 0.07 per cent was very effective against *Alternaria* blight and grey mildew followed by Copper oxychloride.

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