
Fungicidal management against leaf blotch incidence of turmeric (cv. RH-5)

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The disease, leaf blotch of turmeric caused by *Taphrina maculans*, especially in the early stages of crop growth reduces the yield considerably. Three different fungicides namely, mancozeb, carbendazim and Bordeaux mixture were used singly or in combination, against the disease under natural condition. All the treatments significantly decreased disease incidence as compared to control. Integration of mancozeb (0.25%) and carbendazim (0.1%) sprayed thrice was found to be the best combination, resulting in higher disease control as well as higher rhizome yield, followed by Bordeaux mixture (1%) sprayed thrice. Application of mancozeb (0.25%) and carbendazim (0.1%) singly, sprayed twice was also effective against the disease under field condition

Key words : Turmeric, leaf blotch, fungicidal management

INTRODUCTION

Turmeric (*Curcuma longa* L.), one of the most important spice crops in India, suffers from an important foliar disease caused by *Taphrina maculans* Butler (Rao, 1995). This disease was first reported from Rangpur (East Pakistan) (Butler, 1911). Though precise crop loss figure are not available, the foliar destruction it causes would reduce the yields considerably especially when the disease occurs in early stages of rop growth (Butler, 1918). The pathogen attacks only a few turmeric lines, which are immune to another foliar disease caused by *Collectotrichum capsici* Sydow (Reddy *et al.*, 1963). Different fungicides were found to be effective in the management of the leaf blotch disease of turmeric (Srivastava and Gupta, 1977). Many fungicides were tested against the disease singly but no fungicide was tested in combination for the management of the disease. In this experiment an attempt was made to find out the effect of some fungicides used singly and in

combination with different number of sprayings against leaf blotch of turmeric.

MATERIALS AND METHODS

The field experiment on the effect of fungicides on leaf blotch incidence of turmeric (cv. RH-5) was conducted at Agriculture Farm, Uttar Banga Krishi Viswavidyalaya, Cooch Behar in the year 2001 in randomised block design (RBD) with three replications under natural conditions. Seed rhizomes were planted in raised beds of 3m × 1m size. The plant to plant and row to row distances were 20 cm and 30 cm respectively. The fertilizers at the rate of N : P : K :: 60 : 60 : 60 kg/ha and FYM @ 10-15 kg per plot were applied. The fungicides viz. mancozeb, carbendazim and Bordeaux mixture were used singly or in combination. The sprays of fungicides were given starting from first appearance of the disease symptom at 15 days interval. Disease intensity, as reflected in the external symptom on the plant was

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Table 1 : Effect of fungicides on leaf blotch incidence of turmeric (cv. RH-5)

Treatment	PDI for leaf blotch			Fresh rhizome (kg/3m ² plot)	Projected yield (ton/ha)
	1st observation	2nd observation	3rd observation		
T ₁ = Control	25.406	32.557	49.280	4.267	14.22
T ₂ = Mancozeb (0.2%) (twice)	18.017	23.930	37.457	5.200	17.33
T ₃ = Carbendazim (0.1%) (twice)	19.077	25.393	37.037	5.300	17.67
T ₄ = Mancozeb (0.2%) + Carbendazim (0.1%) (twice)	11.823	18.223	29.360	6.617	22.06
T ₅ = Mancozeb (0.2%) (thrice)	14.963	22.333	37.467	6.967	23.22
T ₆ = Carbendazim (0.1%) (thrice)	17.600	24.073	31.420	5.600	18.67
T ₇ = Mancozeb (0.2%) + Carbendazim (0.1%) (thrice)	9.760	14.923	23.563	9.703	32.31
T ₈ = Bordeaux mixture (1.0%) (thrice)	10.543	16.143	25.937	7.817	26.05
SEm±	1.7055	1.3467	1.8525	0.4971	
CD (at 5% level)	5.17	4.09	5.62	1.51	

externally assessed based on 0 to 9 scale as follows :

0 = No. disease, 1 = 1-10%, 2 = 11-20%, 3 = 21-30%, 4 = 31-40%, 5 = 41-50%, 6 = 51-60%, 7 = 61-70%, 8 = 71-80%, 9 = > 81% leaf area covered. The percent disease index (PDI) was calculated by using the following formula given by Makinney (1923) and rhizome yield was recorded.

$$\text{PDI} = \frac{\text{Sum of all ratings}}{\text{Number of plants examined} \times \text{maximum score}} \times 100$$

Treatments followed in the experiment

- T₁ = Control
 T₂ = Mancozeb (0.2%) (twice)
 T₃ = Carbendazim (0.1%) (twice)
 T₄ = Mancozeb (0.2%) + Carbendazim (0.1%)
 (twice)
 T₅ = Mancozeb (0.2%) (thrice)
 T₆ = Carbendazim (0.1%) (thrice)
 T₇ = Mancozeb (0.2%) + Carbendazim (0.1%)
 (thrice)
 T₈ = Bordeaux mixture (1.0%) (thrice)

RESULTS AND DISCUSSION

The data in the Table 1 reveals that all the treatments significantly decreased disease incidence

as compared to control (no treatment). It is clear from the Table 1 that integration of Mancozeb and Carbendazim (0.2% + 0.1%) sprayed thrice was the best combination under field condition. It resulted higher disease control as well as higher rhizome yield. Application of Bordeaux mixture (1.0%) sprayed thrice and Mancozeb and carbendazim (0.2% + 0.1%) sprayed twice also found effective against the disease.

For the control of leaf blotch disease by fungicides, foliar spray of combined product of Mancozeb and Carbendazim reduced the disease and increased rhizome yield. Singh *et al.* (2000) found lowest disease severity and highest rhizome yield in Ridomil (500 ppm) followed by thiophanate methyl (0.1%), carbendazim (0.1%), blitox (0.3%) and antracol (0.3%). Similarly, effectiveness of dithane Z-78 (0.2%) followed by dithane M-45 (0.3%) in controlling the disease was reported by Srivastava and Gupta (1977), dithane Z-78 by Upadhyay and Pavgi (1974), bavistin by Subbaraja (1981), Rao and Rao (1987). In the present experiment result shows that three sprayings of Bordeaux mixture (%) was found effective and very close to the result of the best treatment, both in terms of rhizome yield and disease severity. According to Rangaswami and Mahadevan (1999), the disease can be effectively controlled by spraying three to four times at

fortnightly interval with % Bordeaux mixture. Ramakrishnan (1954) also found effectivity of Bordeaux mixture against the disease.

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