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## ***In vivo* evaluation different doses of consortia on leaf blotch of turmeric caused by *Taphrina maculans***

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### **Abstract**

Turmeric (*Curcuma longa*) is a native of Indian sub-continent and Southeast Asia. Leaf blotch of turmeric caused by *Taphrina maculans* is one of the destructive diseases of this crop. The field experiment of effect of different doses of consortia (Biomix) on *T. maculans* revealed that Maximum disease incidence and intensity was recorded in control treatment with disease incidence and intensity of 10.00 per cent and 40.00 per cent after third spray respectively. Biomix (50g/10lit) showed more disease incidence (13.33%) and intensity (34.20%), followed by dose of Biomix 75g/10lit (11.33% and 32.30%) then Biomix 100g/10lit (9.33% and 32.50%), Biomix 125g/10lit (8.00% and 26.40%) and Biomix 150g/10lit (8.67% and 22.20%). Consortia (Biomix) dose at 200 was found most effective in reducing Incidence and intensity of leaf blotch.

**Keywords:** turmeric, leaf blotch, *T. maculans*

### **Introduction**

In recent years Researchers are working on use of bioagents consortia for management of plant diseases. The department of plant pathology VNMKV, Parbhani had also tried to develop the consortia of bio agent named "Biomix" for management of plant diseases, pests and improvement of plant health. Its use in turmeric has made revolutionary changes in turmeric growing area of Marathwada region. The Biomix has resolved the major disease and pest problems with improvement of yield and quality in turmeric.

### **Material and Methods**

A field experiment was conducted during *kharif* 2018, at Breeder seed production unit (BSP, Shendra), VNMKV, Parbhani, to evaluate the effects of bioagents for the management of leaf blotch disease of turmeric (Table No.1)

### **Details of Experiment:**

Design : RBD  
Treatment : 10  
Replication : 03  
Variety : Selum  
Spacing : 45 x 150 cm<sup>2</sup>  
Plot size : 15 x 35 m<sup>2</sup>

### **Treatment Dose of application**

T<sub>1</sub>: Biomix @ 50 g/10 lit  
T<sub>2</sub>: Biomix @ 75 g/10 lit  
T<sub>3</sub>: Biomix @ 100 g/10 lit  
T<sub>4</sub>: Biomix @ 125g/10 lit  
T<sub>5</sub>: Biomix @ 150g/10 lit  
T<sub>6</sub>: Biomix @ 175 g/10 lit  
T<sub>7</sub>: Biomix @ 200 g/10 lit  
T<sub>8</sub>: Biomix @ 225 g/10 lit  
T<sub>9</sub>: Biomix @ 250 g/10 lit  
T<sub>10</sub>: Control

### **No. of Sprays**

Sprays different doses of consortia (Biomix) were sprayed and subsequent observations of

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disease intensity and incidence were recorded. Starting at first appearance of disease symptoms and subsequent two sprays were undertaken at 15 days interval. Observations were recorded applying 0-9 grade disease rating scale (Mayee and Datar, 1986)

$$\% \text{ Disease Incidence} = \frac{\text{No. of plants showing disease symptoms/plot}}{\text{Total No. of plants/plot}} \times 100$$

Per cent disease intensity/index was calculated by applying the formula (Mc Kinney, 1923)

$$\% \text{ Disease Intensity (PDI)} = \frac{\text{Summation of all numerical ratings}}{\text{Total No. of leaves/plant observed} \times \text{Maximum rating}} \times 100$$

Disease severity recorded by following grade scale given by Mayee and Datar (1986) which is as follows:

Scale	Per cent area infection
0	No infection (Free)
1	01 to 10% (Very Light)
3	11 to 25% (Light)
5	26 to 50% (Medium)
7	51 to 75% (Heavy)
9	>75% (Very heavy)

### Result and Discussion

The results of effects of different doses of consortia (Biomix) sprayed against leaf blotch of turmeric under field condition is presented in Table 1.

After first spray, minimum disease incidence (4.67%) was recorded in Biomix 200g/10lit and intensity (13.00%) was

recorded in Biomix 200g/10lit and followed by Biomix (175g/10 lit) with minimum disease severity of 13.30%, Biomix (225g/10 lit) with minimum disease incidence (6.00%) and intensity (13.50%), Biomix (250g/10lit) with minimum disease incidence (8.00%) and disease intensity (13.80%).

After third spraying it was revealed from results (Table1) that different doses of bioagent consortia (Biomix), significantly reduced disease incidence and intensity as compared to control. Among different doses of biomix, minimum per cent disease incidence and intensity was recorded by T<sub>7</sub> (200g/10lit) of Biomix, incidence and intensity after first spray were 4.67 per cent and 13.00 per cent, after second spray 6.00 per cent and 16.40 per cent and after third spray 5.33 per cent and 11.50 per cent respectively, Biomix 225g/10lit with minimum disease incidence and intensity was 7.33 per cent and 12.50 per cent respectively after third spray, T<sub>9</sub> (250g/10lit) with minimum per cent disease incidence and intensity was 8.67 per cent and 12.30 per cent respectively, T<sub>6</sub> (175g/10lit) with minimum disease incidence and intensity was 7.33 per cent and 17.50 per cent respectively treatment was T<sub>7</sub> (175g/10lit) found to be at par with each other.

Maximum disease incidence and intensity was recorded in control treatment (T<sub>10</sub>) with disease incidence and intensity of 10.00 per cent and 40.00 per cent respectively, after third spray. T<sub>1</sub> (50g/10lit) showed more disease incidence 13.33 per cent and intensity 34.20 per cent, followed by T<sub>2</sub> (75g/10lit), T<sub>3</sub> (100g/10lit), T<sub>4</sub> (125g/10lit) and T<sub>5</sub> (150g/10lit).

After three sprayings T<sub>6</sub> (175g/10 lit) and T<sub>8</sub> (225g/10 lit) were found at par with T<sub>7</sub> (200g/10 lit) reducing the disease incidence. Similarly T<sub>6</sub>, T<sub>8</sub> and T<sub>9</sub> were at par with disease intensity after three sprayings.

**Table 1:** Effect of different doses of Consortia on percent disease incidence and disease intensity of leaf blotch of turmeric under field condition

Tr. No	Doses	Per cen disease incidence and disease Intensity*								Yield (kg)* / Plot	% increase over control	Yield (qt/ha)
		Before Spraying		At 1st Spraying		At 2nd Spraying		At 3rd Spraying				
		Incidence	Intensity	Incidence	Intensity	Incidence	Intensity	Incidence	Intensity			
T <sub>1</sub>	50g/10 lit	9.33 (17.79)	5.20 (13.18)	11.33 (19.67)	16.50 (23.97)	14.00 (21.97)	26.50 (30.98)	13.33 (21.42)	34.20 (35.79)	15.36 (23.07)	6.64 (14.93)	102.39
T <sub>2</sub>	75g/10 lit	8.00 (16.43)	5.30 (13.31)	11.33 (19.67)	15.20 (22.95)	13.33 (21.42)	25.40 (30.26)	11.33 (19.67)	32.30 (34.63)	16.64 (24.07)	13.82 (21.82)	110.93
T <sub>3</sub>	100g/10 lit	7.33 (15.71)	6.10 (14.30)	10.67 (19.06)	14.80 (22.63)	11.33 (19.67)	23.20 (28.79)	9.33 (17.79)	32.50 (34.76)	18.80 (25.70)	23.72 (29.15)	125.33
T <sub>4</sub>	125g/10 lit	6.00 (14.18)	5.20 (13.18)	9.33 (17.79)	14.60 (22.46)	10.00 (18.43)	21.50 (27.62)	8.00 (16.43)	26.40 (30.92)	19.80 (26.42)	27.58 (31.68)	131.99
T <sub>5</sub>	150g/10 lit	8.00 (16.43)	5.50 (13.56)	10.00 (18.43)	13.50 (21.56)	10.00 (18.43)	18.60 (25.55)	8.67 (17.12)	22.20 (28.11)	20.90 (27.20)	31.39 (34.07)	139.33
T <sub>6</sub>	175g/10 lit	8.00 (16.43)	5.40 (13.44)	6.00 (14.18)	13.30 (21.39)	8.00 (16.43)	17.20 (24.50)	7.33 (15.71)	17.50 (24.73)	22.57 (28.36)	36.46 (37.14)	150.46
T <sub>7</sub>	200g/10 lit	4.67 (12.48)	6.20 (14.42)	4.67 (12.48)	13.00 (21.13)	6.00 (14.18)	16.40 (23.89)	5.33 (13.35)	11.50 (19.82)	28.35 (32.17)	44.78 (42.00)	188.99
T <sub>8</sub>	225g/10 lit	5.33 (13.35)	6.10 (14.30)	6.00 (14.18)	13.50 (21.56)	7.33 (15.71)	16.80 (24.20)	7.33 (15.71)	12.50 (20.70)	28.00 (32.00)	40.99 (39.81)	183.13
T <sub>9</sub>	250g/10 lit	6.67 (14.96)	6.20 (14.42)	8.00 (16.43)	13.80 (21.81)	8.67 (17.12)	16.90 (24.27)	8.67 (17.12)	12.30 (20.53)	27.50 (30.95)	38.98 (38.63)	180.66
T <sub>10</sub>	Control	10.00 (18.43)	5.80 (13.94)	14.00 (21.97)	17.80 (24.95)	24.00 (29.33)	29.80 (33.09)	10.00 (18.43)	40.00 (39.23)	14.34 (22.25)	0.00 (0.00)	95.59
SE(m) +		1.97	1.43	2.02	1.51	1.18	1.51	1.08	1.64	1.82		
CD at 5%		NS	4.24	NS	4.48	3.51	4.49	3.20	4.87	5.40	-	-

\*Mean of three replications

Figures in parenthesis are angular transformed value

### Yield

Highest fresh rhizome yield was obtained in treatment dose of T<sub>7</sub> (200g/10 lit) 188.99q/ha followed by T<sub>8</sub> (225g/10 lit)

183.13q/ha and T<sub>9</sub> (250g/10 lit) 180.66 q/ha as compared with control (95.59q/ha)

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