

## Management of Leaf Blight of Tuberose

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### ABSTRACT

The three years pooled results revealed that the treatment with azoxystrobin 0.1% showed the least disease intensity (2.70 PDI) with maximum disease reduction (86.72 %) but it was at par with difenoconazole 0.1% (3.46 PDI and 82.98 % PDR) and iprodine + carbendazim 0.1% (4.00 PDI and 80.32 PDR) and were found significantly superior over rest of the treatments. The maximum yield of flower stalks and salable bulbs were obtained in azoxystrobin 0.1% (8.40 lakh flower stalks/ha. and 23.6 lakh bulb/ha.), iprodine + carbendazim 0.1% (8.37 lakh flower stalks/ha. and 24.47 lakh bulbs/ha.) and difenoconazole 0.1% (8.28 lakh flower stalk/ha. and 23.55 lakh bulbs/ha.). The different treatments gave monetary returns ranging from Rs. 18.44 lakh/ha. to 20.60 lakh/ha. as against Rs. 15.83 lakh/ha. in control. The highest monetary returns of Rs. 20.60 lakh/ha. with maximum benefit cost ratio 3.47 was obtained in sprays with iprodine + carbendazim 0.1%.

**Key words:** Percent disease intensity (PDI), Percent disease reduction (PDR)

### INTRODUCTION

Tuberose (*Polianthes tuberosa* L.) is one of the most important bulbous ornamental of tropical and subtropical areas. It is commercially cultivated for cut and loose flower trade and also for the extraction of highly valued natural flower oil. In India, tuberose is grown on an area of about 20,000 ha. and in Maharashtra the area is about 1648 ha. (Gurav *et. al*<sup>5</sup>). The tuberose crop is taken well with less protection measures, however due to change in climatic conditions the leaf blight disease caused by *Alternaria polyanthi* accounting 15-20% losses in yield and quality of tuberose and becomes the major threat in Maharashtra state.

### MATERIAL AND METHODS

A field trial was conducted at All India Co-ordinated Research Project on Floriculture NARP, Ganeshkhind, Pune during 2012-13 to 2014-15 for three years to find out the most suitable management measures against leaf blight of tuberose. The cultivar Suvasini was planted in randomized block design with three replications at 30x30cm spacing in flat bed. The six sprays of six different fungicides namely mancozeb 0.2%, chlorothalonil 0.2%, tricyclazole 0.1%, iprodine+ carbendazim 0.1%, difenoconazole 0.1%, azoxystrobin 0.1% and control were given at 10 days interval starting the first spray at first disease appearance.

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The observations of disease intensity was recorded by using 0 – 7 grade score card as per Hande<sup>6</sup> and Gaikwad<sup>4</sup>. The percent disease

intensity was calculated by using following formula.

$$\text{Percent disease intensity} = \frac{\text{Total number of numerical rating}}{\text{Total No. of units examined} \times \text{maximum rating}} \times 100$$

## RESULTS AND DISCUSSION

### A. Leaf blight of tuberose:

The three years pooled results presented in Table 1 revealed that the treatment with azoxystrobin 0.1% showed the least disease intensity (2.70 PDI) with maximum disease reduction (86.72 %) but it was at par with difenoconazole 0.1% (3.46 PDI and 82.98 % PDR) and iprodine + carbendazim 0.1% (4.00 PDI and 80.32 PDR) and were found significantly superior over rest of the treatments.

Similar results in respect of Iprodine + carbendazim 0.1% was recorded by Dubey et al.<sup>3</sup> Anonymous<sup>2</sup> and Rao<sup>7</sup> against *Alternaria* blight of sunflower.

### B. Yield of flower stalk and salable bulbs:

The maximum yield of flower stalks and salable bulbs (Table 2) were obtained in

azoxystrobin 0.1% (8.40 lakh flower stalks/ha. and 23.6 lakh bulb/ha.), iprodine + carbendazim 0.1% (8.37 lakh flower stalks/ha. and 24.47 lakh bulbs/ha.) and difenoconazole 0.1% (8.28 lakh flower stalks/ha. and 23.55 bulbs/ha.)

### C. Economics of treatments (ha.<sup>1</sup>):

The data presented in Table 2 revealed that different treatments gave monetary returns ranging from Rs. 18.44 lakh/ha. to 20.60 lakh/ha. as against Rs. 15.83 lakh/ha. in control. The highest monetary returns of Rs. 20.60 lakh/ha. with maximum benefit cost ratio 3.47 was obtained in sprays with iprodine + carbendazim 0.1%. The other effective fungicides i.e. azoxystrobin 0.1% and difenoconazole 0.1% fails to give good benefit cost ratio due to higher cost of fungicides.

**Table 1: Effect of different fungicides on leaf blight of tuberose cv. Suvasini (Pooled results 2012-13 to 2014-15)**

S. No.	Treatments	Percent Disease Intensity					Flower stalks / Plot				Flower stalks / Plant			
		2012-13	2013-14	2014-15	Pooled Mean	PDR	2012-13	2013-14	2014-15	Pooled Mean	2012-13	2013-14	2014-15	Pooled Mean
1	Mancozeb 0.2 %	13.13 (21.24)	4.78 (12.61)	11.92 (20.19)	9.94 (18.01)	51.11	315.33	223.00	318.33	285.55	10.51	7.43	10.61	9.51
	Chlorothalonil 0.2 %	9.75 (18.19)	1.41 (5.58)	10.83 (19.19)	7.33 (14.73)	63.94	319.33	237.00	320.33	292.22	10.64	7.84	10.68	9.72
3	Tricyclazole 0.1%	9.52 (17.96)	2.25 (8.49)	8.53 (16.98)	6.76 (14.52)	66.75	342.00	244.66	339.00	308.55	11.40	8.15	11.30	10.28
4	Iprodine + Carbendazim 0.1 %	4.97 (12.87)	1.00 (3.32)	6.05 (14.23)	4.00 (10.94)	80.32	347.00	247.66	346.67	313.77	11.56	8.26	11.35	10.39
5	Difencanazole 0.1 %	4.73 (12.56)	2.16 (8.44)	3.50 (10.76)	3.46 (10.59)	82.98	342.33	245.66	342.00	309.99	11.41	8.18	11.40	10.33
6	Azoxystrobin 0.1%	3.78 (11.19)	1.16 (5.05)	3.17 (10.22)	2.70 (9.21)	86.72	348.00	250.33	344.00	314.11	11.60	8.34	11.47	10.47
7	Control	24.92 (29.88)	16.00 (23.55)	20.08 (26.61)	20.33 (26.70)	-	285.00	180.66	295.00	253.55	9.50	6.02	9.83	8.45
	SE ±	0.72	1.94	0.36	1.00	-	1.56	2.49	0.99	2.93	0.05	0.06	0.03	0.095
	C.D. at 5%	2.23	6.05	1.12	3.00	-	4.87	7.78	3.09	9.12	0.16	0.20	0.10	0.297

PDR= Percent Disease Reduction

**Table 1a.: Effect of different fungicides on leaf blight of tuberose cv. Suvasini (Pooled results 2012-13 to 2014-15)**

S. No.	Treatments	Wt. of flower stalk (g)				Length of flower stalk (cm)				Bulb/Plant			
		2012-13	2013-14	2014-15	Pooled Mean	2012-13	2013-14	2014-15	Pooled Mean	2012-13	2013-14	2014-15	Pooled Mean
1	Mancozeb 0.2 %	74.67	78.33	78.00	77.000	64.00	67.00	64.58	65.193	25.67	28.0	27.67	27.113
2	Chlorothalonil 0.2 %	76.00	81.00	77.50	78.167	66.00	69.33	64.17	66.500	26.67	27.0	27.39	27.020
3	Tricyclazole 0.1%	78.33	81.66	78.83	79.607	69.33	71.00	68.67	69.667	28.33	27.5	28.53	28.120
4	Iprodine + Carbendazim 0.1 %	80.33	84.00	81.92	82.083	71.67	73.66	70.16	71.830	30.00	31.0	30.92	30.640
5	Difencanozole 0.1 %	80.00	83.66	80.21	81.290	71.33	74.00	69.30	71.543	29.33	30.0	29.00	29.443
6	Azoxystrobin 0.1%	79.67	82.00	80.56	80.743	69.67	70.00	69.82	69.830	29.00	29.0	29.67	29.223
7	Control	69.33	71.66	71.75	70.913	61.33	63.00	61.05	61.793	23.33	22.5	22.00	22.610
	<b>SE ±</b>	<b>0.50</b>	<b>1.04</b>	<b>0.33</b>	<b>0.480</b>	<b>0.58</b>	<b>0.63</b>	<b>0.88</b>	<b>0.526</b>	<b>0.76</b>	<b>0.85</b>	<b>0.51</b>	<b>0.396</b>
	<b>C.D. at 5%</b>	<b>1.55</b>	<b>3.26</b>	<b>1.09</b>	<b>1.494</b>	<b>1.81</b>	<b>1.97</b>	<b>2.75</b>	<b>1.640</b>	<b>2.36</b>	<b>2.50</b>	<b>1.57</b>	<b>1.234</b>

Note : Figures in parenthesis are arc sin values.

PDR = Percent Disease Reduction , PDI = Percent Disease Intensity

**Table 2: Comparative assessment over three years of different treatments on monetary returns of tuberose (2012-13 to 14-15)**

S. No.	Treatments	Yield/ha.		Total monetary returns (Rs. Lakh/ha.)	Cost of production (Rs. Lakh/ha.)	Net profit (Rs. Lakh/ha.)	B:C ratio
		Fl. Stalk lakh /ha.	Bulb lakh/ha.				
1	Mancozeb 0.2 %	7.60	21.69	18.44	5.82	12.62	3.17
2	Chlorothalonil 0.2 %	7.78	21.69	18.62	5.85	12.77	3.18
3	Tricyclazole 0.1%	8.25	22.44	19.47	5.90	13.57	3.30
4	Iprodine + Carbendazim 0.1 %	8.37	24.47	20.60	5.94	14.66	3.47
5	Difencanozole 0.1 %	8.28	23.55	20.05	5.89	14.16	3.41
6	Azoxystrobin 0.1%	8.40	23.64	20.22	6.04	14.18	3.34
7	Control	6.74	18.18	15.83	5.80	10.03	2.73

### CONCLUSION

Six sprays of iprodine + carbendazim 0.1% at 10 days interval starting the first spray at disease appearance was found effective for better management of leaf blight and increasing yield and monetary returns in tuberose.

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