

Studies on powdery mildew of chilli

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SUMMARY

Powdery mildew of chilli incited by *Leveillula taurica* was found to be one of the devastating disease of chilli. Present studies include defoliation and yield losses estimation due to powdery mildew. During present studies six fungicides, two bioagent and one plant extract were evaluated under field condition. Minimum leaf defoliation (4.3 %) after third spray recorded in plot sprayed with balyeton followed by bavistin (5.01%) topsin –M (5.22 %), Tilt (5.74%) and thiovet (6%). Among bioagents, *Trichoderma viride* was superior. Highest yield of dry chillies was obtained in plot sprayed with balyeton (12.1 q/ha). Followed by bavistin (11.33 q/ha.) and topsin – M (11.23 q/ha.) .

Key Words : Chilli, *Leveillula taurica*, Powdery mildew

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Chilli (*Capsicum annum*) is an important spice cum vegetable crop . India is the major producer consumer and exporter of chilli in world. India's share in total exporter of chilli in world is 4 per cent (Gupta and Naik, 2005).

Disease are major limiting factor in crop production. Chilli crop suffers from several fungal bacterial and viral diseases among all diseases *Leveillula taurica* which causes powdery mildew is unique foliar pathogen having ability to infect large numbers of plants (Hirate 1968). The disease has been reported to occur on chilli crop from several countries, like Hungary, USA, Italy, Israel, Romania, Bulgari, India and elsewhere (Shah and Singh, 1988). Powdery mildew is prevalent in all major chilli growing states of India. It has been reported to occur in serious prporation in Vidrabha region (Gohokar and Peshney 1981) and western Maharashtra (Pawar *et al.*, 1985) and now it is increasing importance in Marathawada region.

Powdery mildew caused by *Leveillula taurica* is one of the devastating disease of chilli that causes significant yield

losses *i.e.* 24 per cent (Sharmila *et al.*, 2004).

Considering economic importance of powdery mildew of chilli following studies were carried out.

- Defoliation of chilli leaves due to powdery mildew.
- Yield of dry chillies as influenced by application of different fungicides, bioagents and botanicals.

MATERIALS AND METHODS

A field experiment was carried out at Department of Horticulture ,Marathwada Agriculture University Parbhani .during *Kharif* and *Rabi* season 2007-2008. The experiment was conducted in a randomised block design with three replications and ten treatments .The variety pusa Jwala was used to carry out experiment. The plot size was 3×2.7m and transplanting of seedling was done with spacing 60×45cm. The recommended intercultural practices were under taken as and when required.

The experiment was conducted with ten treatments out of these three were systemic fungicides *i.e.* bavistin, bayleton and tilt. There were non-systemic fungicides *i.e.* thiovit, kavach and topsin-M and also two bioagents *i.e.* *Trichoderma viride*, *Pseudomonas fluorescens*, and one plant extract *i.e.* neem oil. The spraying schedule was under taken at the time interval of 15 days from 135 days after transplanting. Observations on leaf defoliation were recorded on five plants selected randomly from each plot. Leaf defoliation was

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recorded on five plants selected randomly from each plot. Leaf defoliation was recorded daily after each spray, total leaves on the observational plants were also counted before each spray. Picking wise yield of fresh red chillies was recorded separately from each net plot.

RESULTS AND DISCUSSION

The results of the present study as well as relevant discussions have been presented under following sub heads:

Defoliation studies :

Data presented in Table 1 showed that all treatment were significantly superior in inhibiting leaf defoliation after first, second and third spray. Among all treatment bayleton recorded significantly lowest leaf defoliation (4.33 %) after third spray followed by bavistin (5.1 %), topsin-M (5.22), tilt (5.74) and thiovet (6.0 %). Among bioagents *Trichoderma viride* (9.39 %) was superior over *Pseudomonas fluorescens* (10.85 %)

against leaf defoliation due to powdery mildew, after third spray. Neem oil also recorded to be effective (8.19 %) to control leaf defoliation due to powdery mildew after third spray.

Data presented in Table 2 indicated that among all treatment, fungicidal treatment bayleton gave highest inhibition of defoliation (88.20 %) after third spray. While bioagent *pseudomonas fluorescens* (70.43 %) showed lowest inhibition of defoliation after third spray.

Present investigation indicated that leaf defoliation was significantly reduced by all the treatments of fungicides, bioagents and botanicals. Above finding are more or less similar to the findings of Patil (1990) and Hingole (1999).

Yield of dry chillies :

Data presented in Table 3. Indicated that highest (12.1 q/ha) yield of dry chillies was obtained in the plots sprayed with bayleton (Triademefon) followed by bavistin (11.33 q/ha) and topsin-M (11.23q/ha). These treatments were statistically similar in their effect but significantly increased the yield over

Table 1: Defoliation of chilli leaves due to powdery mildew disease

Tr. No.	Treatments	Mean per cent defoliation		
		First spray	Second spray	Third spray
T ₁	Thiovit (Wettable sulphur 80 % WW) 0.3 %	15.4 (23.07)	12.07 (20.32)	6.0 (14.17)
T ₂	Topsin-M (70 WP) (Thiophanate methyl) 0.1 %	14.73 (22.56)	11.50 (19.79)	5.22 (13.20)
T ₃	Kavach (Chlorothalonil 75 % WP) 0.2 %	19.06 (25.88)	12.73 (20.90)	6.62 (14.90)
T ₄	Bavistin (Carbendazim 50% WP) 0.1 %	12.23 (20.46)	10.54 (18.93)	5.01 (12.93)
T ₅	<i>Pseudomonas fluorescens</i> @ 10 g/lit of water	23.93 (29.28)	15.48 (23.16)	10.85 (19.22)
T ₆	Tilt (Propiconazole 25 % EC) 0.1 %	16.90 (24.26)	12.14 (20.38)	5.74 (13.85)
T ₇	Bayleton (Triadimefon 25 % WP) 0.05 %	11.33 (19.65)	7.90 (16.32)	4.33 (12.00)
T ₈	Neem oil (Azadirachtin 0.03 % EC) 1 %	20.67 (27.04)	13.70 (21.71)	8.19 (16.61)
T ₉	<i>Trichoderma viride</i> @ 5 g/lit of water	22.46 (28.28)	13.53 (21.57)	9.39 (17.84)
T ₁₀	Control (water spray)	24.50 (29.66)	31.03 (34.05)	36.70 (37.28)
	S.E. ±	0.37	0.46	0.33
	C.D. (P=0.05)	1.10	1.38	1.00

Table 2 : Per cent inhibition of leaf defoliation after each spray

Tr. No.	Treatments	Per cent inhibition of leaf defoliation after		
		First spray	Second spray	Third spray
T ₁	Thiovit (Wettable sulphur 80 % WW) 0.3 %	37.14	61.10	83.65
T ₂	Topsin-M (70 WP) (Thiophanate methyl) 0.1 %	39.87	62.93	85.77
T ₃	Kavach (Chlorothalonil 75 % WP) 0.2 %	22.08	58.97	81.96
T ₄	Bavistin (Carbendazim 50% WP) 0.1 %	50.08	66.03	86.34
T ₅	<i>Pseudomonas fluorescens</i> @ 10 g/lit of water	2.32	50.11	70.43
T ₆	Tilt (Propiconazole 25 % EC) 0.1 %	31.02	60.86	84.26
T ₇	Bayleton (Triadimefon 25 % WP) 0.05 %	57.75	74.54	88.20
T ₈	Neem oil (Azadirachtin 0.03 % EC) 1 %	15.63	55.84	77.68
T ₉	<i>Trichoderma viride</i> @ 5 g/lit of water	15.63	55.88	77.68
T ₁₀	Control (water spray)	8.32	56.38	74.41

Table 3 : Yield of dry chillies as influenced by application of different fungicides

Tr. No.	Treatment	Yield (q/ha)	Per cent increase over control
T ₁	Thiovit (Wettable sulphur 80 % WW) 0.3 %	10.73	65.07
T ₂	Topsin-M (70 WP) (Thiophanate methyl) 0.1 %	11.23	71.23
T ₃	Kavach (Chlorothalonil 75 % WP) 0.2 %	10.43	60.46
T ₄	Bavistin (Carbendazim 50% WP) 0.1 %	11.33	79.38
T ₅	<i>Pseudomonas florescens</i> @ 10 g/lit of water	8.36	33.84
T ₆	Tilt (Propiconazole 25 % EC) 0.1 %	9.50	47.69
T ₇	Bayleton (Triadimefon 25 % WP) 0.05 %	12.21	94.00
T ₈	Neem oil (Azadirachtin 0.03 % EC) 1 %	7.16	20.00
T ₉	<i>Trichoderma viride</i> @ 5 g/lit of water	7.15	10.00
T ₁₀	Control (water spray)	6.50	
	S.E. ±	0.20	
	C.D. (P=0.05)	0.59	

rest of the fungicidal treatments. The next best treatment which recorded significantly higher over control were thiovet (10.70q/ha) and kavach (10.43q/ha). The yield of dry chillies in remaining treatments was numerically more but statistically at par to that of control

Several workers in past have tried to estimate yields losses due to powdery mildew. Above results are in agreement with Patil (1990). Sharmila *et al.* (2004) reported that *Leveillula taurica* in chilli reduce the yield of dry chillies by 24.41 per cent.

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