INTERNATIONAL JOURNAL OF PLANT PROTECTION | VOLUME 7 | ISSUE 1 | APRIL, 2014 | 122-124
e ISSN-0976-6855 | *www.researchjournal.co.in* | Open Access

IJPP

RESEARCH ARTICLE

Management of powdery mildew of mustard with chemicals and biogents

■ C.B. LOMATE[1]*, G.D. MATE[2] AND R.R. KALASKAR[1]

[1]College of Agriculture, NAGPUR (M.S.) INDIA
[2]Shramshakti College of Agriculture, Maldad, AHMEDNAGAR (M.S.) INDIA

ARITCLE INFO

Received : 30.10.2013
Revised : 26.02.2014
Accepted : 11.03.2014

Key **W**ords :
Powdery mildew, Mustard, Fungicide, Bioagents, *Erysiphe cruciferarum*

***Corresponding author:**
Email: chhayalomate@gmail.com

ABSTRACT

A study was undertaken to evaluate the effect of fungicides and bioagents on per cent disease infection, per cent disease control and per cent disease intensity of powdery mildew (*Erysiphe cruciferarum* Opiz.) of mustard (*Brassica juncea*) after first and second spraying. Two spray of Dinocap minimized the powdery mildew (76.29 %) significantly as compared to all other treatments followed by Triademorph (74.18 %), Wettable sulphur (73.80%) and Triademefon (72.72 %). Regarding bioagents, maximum disease was reduced with *Ampelomyces quisqualis* (65.53 %) which proved better than *Trichoderma harzianum* (61.65 %). Highest grain yield (1023.62 kg/ha) and 1000 seed weight (5.5 g) of mustard was recorded by Dinocap treatment and among bioagents, *Ampelomyces quisqualis* gave higher grain yield (810.13 kg/ha) and 1000 seed weight (3.9 g) as compared to *Trichoderma harzianum*.

How to view point the article : Lomate, C.B., Mate, G.D. and Kalaskar, R.R. (2014). Management of powdery mildew of mustard with chemicals and biogents. *Internat. J. Plant Protec.*, **7**(1) : 122-124.

INTRODUCTION

Mustard (*Brassica juncea* L.) is one of the most important oilseed crops grown under a wide range of agroclimatic conditions. For its low productivity various diseases have been identified as the important yield destabilizing yield factors. Among diseases, powdery mildew is one of the major diseases causing 45 per cent and 90 per cent deduction in mustard grain yield (Hare, 1994). So little efforts have been made so far to find out the sources of management against powdery mildew of mustard. Therefore, present study were conducted to screen different varieties against powdery mildew of mustard.

MATERIAL AND METHODS

The experiment was conducted during *Rabi* season of 2010-2011, at the experimental field of Plant Pathology Section, Dr. Panjabrao Deshmukh Krishi Vidyapeeth Akola, College of Agriculture, Nagpur. The seed of mustard variety Pusa Bold was used. Seven fungicides *viz.*, Chlorothalonil 75 WD, Maneb 75 WD, Wettable sulphur 75 WD, Triademefon 25 WP, Penconazale 10 EC, Dinocap 48 EC and Tridemorph 80 EC as well as bioagents *Ampelomyces quisqualis* and *Trichoderma harzianum* were used to evaluate their effect on infection and intensity of powdery mildew. The first spary of fungicides was given immediately after the disease appearance (54 DAS) and subsequent second spraying at an interval of 15 days. Untreated plot was maintained as control.

The observations were recorded on powdery mildew infection from five plants from each plot, tagged randomly on which the observation was taken 15 days after each spray of fungicides and bioagents. The observations regarding disease severly were recorded by 0-9 grade scale (Mayee and Datar, 1986). Per cent disease intensity was calculated by the following formula used by Wheeler (1969).

$$\text{Per cent disease intensity} = \frac{\text{Sum of all numerical ratings}}{\text{Total no. of leaves examined} \times \text{Maximum rating}} \times 100$$

Observations on yield and yield contributing factors were recorded at the time of harvesting.

RESULTS AND DISCUSSION

The powdery mildew appeared at 54 DAS. Initially the symptoms appeared as white floury patches on both the sides of leaves. These floury patches increased in size and coalesced to cover entire foliage, stem and pods. Powdery mildew incidence started early in the month of January and reached peak at harvest.

Effect of fungicides :

The data presented in Table 1 reveal that the treatment differences due to different fungicides were statistically insignificant in respect of powdery mildew infection and intensity. The fungicide Dinocap showed significantly least infection (23.50%) and intensity (5.55%) of powdery mildew and thereby recorded maximum disease control of 76.29 per cent. It was followed by Tridemorph in which the per cent infection intensity and disease control were 25.7, 5.40 and 74.78 per cent, respectively. The next treatments in order of superiority were wettable sulphur, Tridemefon and Pencanozole which recorded 73.80, 72.72 and 71.63. per cent powdery mildew control, respectively. The results in respect of efficacy of dinocap and tridemorph are in agreement with Dod and Deshmukh (2003), Shete *et al.* (2008) who also reported that these fungicides were effective in controlling powdery mildew of various crops. Further, Rathore and Rathore (1995) noticed best results of triadimefon and sulphur for control of powdery mildew of fenugreek, however in present studies, these fungicides were moderately effective.

Effect of bioagents :

Bioagents were significantly controlled powdery mildew disease. Among the bioagents, *Ampelomyces quisqualis*

Table 1 : Efficacy of fungicides and bioagents on per cent disease infection of powdery mildew of mustard

No.	Treatments	PDI before spraying	PDI after first spraying	PDI after second spraying	PDC after first spraying	PDC after second spraying
T_1	Chlorathalonil 75%WP @ 0.15 %	65.30	41.05	29.68	50.96	70.06
T_2	Maneb 75%WP @ 0.2%	65.60	41.62	30.48	50.28	69.25
T_3	Wettable sulphur 75% WP @ 0.25%	65.30	39.22	25.97	53.15	73.80
T_4	Triademefon 25% WP @ 0.02%	65.97	39.76	27.04	52.20	72.72
T_5	Penconazole 10% EC @ 0.10%	65.97	40.13	28.12	52.24	71.63
T_6	Dinocap 48%EC @ 0.10%	66.09	38.50	23.50	54.10	76.29
T_7	Tridemorph 80% EC @ 0.05%	64.44	38.93	25.7	53.49	74.78
T_8	*Ampelomyces quisqualis* 10^8 CFU/ml	65.21	42.71	34.17	48.98	65.53
T_9	*Trichoderma harzianum*, 10^8 CFU/ml	65.40	43.06	38.02	48.56	61.65
T_{10}	Control	66.00	83.72	99.15	00	00
	F test	NS	Sig.	Sig.		
	SE (m) ±	0.39	0.78	0.82		
	C.D. (P= 0.05)	1.11	2.33	2.43		

Table 2 : Efficacy of fungicides and bioagents on per cent disease intensity of powdery mildew of mustard

No.	Treatments	PDI before spraying	PDI after first spraying	PDI after second spraying
T_1	Chlorathalonil75%WP @ 0.15 %	18.519 (4.35)	14.07 (3.81)	6.90 (2.72)
T_2	Maneb 75%WP @ 0.2%	19.0 (4.47)	14.31 (3.84)	7.15 (2.76)
T_3	Wettable sulphur 75%WP @ 0.25%	17.77 (4.27)	12.71 (3.63)	5.67 (2.48)
T_4	Triademefon 25%WP @ 0.02%	17.15 (4.20)	13.08 (3.68)	6.04 (2.55)
T_5	Penconazole 10%EC @ 0.10%	18.14 (4.31)	13.33 (3.71)	6.53 (2.65)
T_6	Dinocap 48%EC @ 0.10%	19.00 (4.41)	12.09 (3.54)	5.55 (2.45)
T_7	Tridemorph 80%EC @ 0.05%	19.13 (4.42)	12.46 (3.60)	5.40 (2.43)
T_8	*Ampelomyces quisqualis* 10^8 CFU/ml	18.63 (4.37)	14.68 (3.89)	7.64 (2.85)
T_9	*Trichoderma harzianum*, 10^8CFU/ml	19.65 (4.48)	15.18 (3.95)	8.63 (3.02)
T_{10}	Control	17.64 (4.25)	32.22 (5.71)	44.68 (6.72)
	F test	NS	Sig.	Sig.
	SE (m) ±	0.08	0.04	0.05
	C.D. (P=0.05)	0.23	0.13	0.16

Figures in parenthesis are square root transformed value

Table 3: Efficacy of fungicides and bioagents on yield (kg/ha) of mustard

No.	Treatments	Yield (kg/ha)	1000 seed weight (g)
T_1	Chlorathalonil 75%WP @ 0.15 %	864.93	4.1
T_2	Maneb 75%WP @ 0.2 %	845.77	4
T_3	Wettable sulphur 75 % WP @ 0.25 %	968.06	5.1
T_4	Triademefon 25% WP @ 0.02 %	946.03	4.9
T_5	Penconazole 10% EC @ 0.10 %	907.08	4.4
T_6	Dinocap 48% EC @ 0.10 %	1023.62	5.5
T_7	Tridemorph 80% EC @ 0.05 %	979.23	5.3
T_8	*Ampelomyces quisqualis* 10^8 CFU/ml	810.13	3.9
T_9	*Trichoderma harzianum*, 10^8 CFU/ml	737.22	3.5
T_{10}	Control	708.73	3.2
	F test	Sig	Sig.
	SE (m)±	10.82	0.24
	C.D. (P=0.05)	32.15	0.72

showed significantly least infection (34.17%), intensity (7.64%) of powdery mildew and maximum disease control 65.53 per cent (Vaidya and Thakur, 2005). The next treatment in order of superiority was *Trichoderma harzianum* which recorded 61.65 per cent powdery mildew control, respectively (Pasini *et al.,* 1997).

Yield parameter :

Observations presented in Table 2 and 3 indicate that the treatment differences due to fungicides and bioagents were statistically significant as regarding all yield contributing parameters. The highest thousand grain weight (5.5 g) and yield (1023.62 kg. ha.) were obtained in Dinocap. However, it was followed by Tridemorph in respect of all these parameters in which thousand grain weight and yield were 5.3 g and 979.23 kg/ha, respectively. The next treatments in order of superiority were wettable sulphur, Traidemefon and Penonazole. The present findings as regards to increase in yield of mustard due to powdery mildew control by dinocap are in conformity with Dange *et al*. (2002). Similarly Rana *et al*. (1991) also reported that the reduction in powdery mildew infection was reflected in increase of yield of mustard, which reflected in increase of yield of mustard, which is in consonance with present results. Among the bioagents, *Ampelomyces quisqualis* recorded significantly higher grain weight (3.9 g) and yield (810.13 kg/ha). It was followed by *Trichoderma harzianum* which produced maximum thousand grain weight (3.5 g) and yield (737.22 kg/ha).

REFERENCES

Dange, S.R., Patel, S., Mishra, R.L. and Saxsena, C.M. (2002). Assesment of losses in yield due to powdery mildew disease in mustard under north Gujarat conditions. *J. Mycol. Pl. Pathol.,* **32** (2): 249-250.

Dod, S.R. and Deshumkh, V.V. (2003). Management of powdery mildew of greengram by chemicals. *Crop Res.*, **25**(1) : 132-135.

Hare, R.M. (1994). Influence of detes of sowing on powdery mildew of rapeseed mustard. M.Sc .(Ag.) Thesis Marathwada Agricultural University, Parbhani, pp. 1-47.

Khodke, S.W. and Kakde, S.V. (2004). Effect of chemicals and botanicals on powdery mildew of mustard. *P.K.V. Res. J.,* **28**(1) : 61-63.

Mayee, C.D. and Datar, V.V. (1986). Phytopathometry. Tech. Bulletin-1. Publis Marathwada, Agricultural University, Parbhani, Maharashtra, pp. 107.

Pasini, C., Aqula, F.D., Curir, P. and Gullino, M.L. (1997). Effectiveness of antifungal compounds against rose powdery mildew (*Sphaerotheca fuliginea*) in semi commercial scale glasshouse trials. *European J. Plant Path.*, **104**(4) : 413-423.

Rana, D.P.S., Bharadwaj, P.K., Rao, M.V.B. and Chatterjee, D. (1991). Field evaluation of Fenarimol and Triademefon for control of powdery mildew of pea. *Indian J. Pl. Protec.*, **19**(1) : 31-35.

Rathore, B.S. and Rathore, R.S. (1995). Studies on varietal resistance and chemical control of powdery mildew of fenugreek. *Indian J. Mycol. Pl. Pathol.,* **25**(3) : 260-262.

Saharan, G.S. and Kaushik, J.C. (1981). Occurance and epidemiology of powdery mildew of Brassica. *Indian Phytopath.,* **34**(1) : 54-57.

Shete, M.H., Dake, G.N., Gaikwad, A.K. and Pawar, N.B. (2008). Chemical management of powdery mildew of mustard. *J. Pl. Dis. Sci.,* **3** (1) : 46-48.

Vaidya, S. and Thakur, V.S. (2005). *Ampelomyces quisqualis* Ces.- a mycoparasite of apple powdery mildew in western Himalayas. *Indian Phytopath.*, **58**(2) : 250-251.

Wheeler, B.E.J. (1969). *An Introduction to Plant Diseases*, John Wiley and Sons Limited, London, UNITED KINGDOM.