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RESEARCH ARTICLE

FUNGICIDAL MANAGEMENT OF ALTERNARIA LEAF BLIGHT OF MUSTARD IN FOOTHILLS OF NORTH WESTERN HIMALAYAS

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ABSTRACT

Alternaria blight of mustard caused by *Alternaria brassicae* (Berk.) Sacc. and *Alternaria brassicicola* is one of the wide spread and destructive diseases of mustard in intermediate zone of Jammu region. All the five fungicides reduced the Alternaria blight of mustard in comparison to untreated control. The results showed that three sprayings at 15 days interval from 40 days after sowing showed minimum percent of leaf infection (14.35% in case of iprodione, followed by 18.35% in case of metalaxyl and 30.35% in case of mancozeb. Seed yield (q/ha) in iprodione sprayed plots was 9.35 q/ha followed by metalaxyl (8.65 q/ha and mancozeb 7.4 q/ha with maximum cost benefit ratio was 1:5.3, 1:4.2 and 1:3.8, respectively.

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INTRODUCTION

The oilseed crops, especially *Brassica* spp. play a pivotal role in the agricultural economy of India. Rapeseed-mustard, among these, are important *Rabi* crops in intermediate zone of Jammu region (Ahamad, 2005). Alternaria blight incited by *Alternaria brassicae* (Berk.) Sacc. and *Alternaria brassicicola* is one of the wide spread and destructive diseases of mustard in India. The disease causes 10-70% yield loss (Kumar, 1997). A number of fungicides like fytolan, antracol and ridomil have been recommended to control this disease (Godika and Pathak, 2002, Ahamad and Narain (1998)). However, continuous and indiscriminate use of same fungicides often leads to development of fungicide resistance in pathogen (Gangawane, 1997). The present objective of this investigation was to find out the suitable new fungicide which would be able to reduce this important disease of mustard with maximum profit under natural field conditions in Rajouri district.

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MATERIALS AND METHODS

Field experiment was conducted for two consecutive years (2006-07 and 2007-08) during *Rabi* season at RARS, Rajouri under natural field conditions. The test variety Varuna was sown on November 10 with a spacing of 30 cm x 10 cm in randomized block design with 3 replications including check (un sprayed). The plot size was 5 m x 3 m size and replicated thrice for each treatment. Recommended agronomic practices were followed to raise the crop. Five fungicides, viz. Carbendazin @ 0.1%, Metalaxyl @ 0.25%, iprodione @ 0.25%, Tricure @ 0.2% and mancozeb @ 0.2% were sprayed thrice at 15 days interval starting from initial appearance of disease (40 days after sowing) on foliage. One check unsprayed control was also maintained through water spray. The observations on per cent disease intensity, disease severity were taken from 40 DAS to 100 DAS, at an interval of 10 days. The number of spots/silique and the data on yield parameters were taken at harvest. The per cent infection was assessed as no of leaves infected / 10 plants and disease severity was assessed as the average disease index of leaves. Per cent Alternaria blight severity was recorded on leaves and pods at 10 days interval following the scale of Sharma and Kolte (1994) as, 0 - 5 disease rating scale, where, 0 = no visible

Table 1. Effect of fungicides on Per cent of leaf infection and AUDPC due to ALB of mustard (2006-07& 2007-08)

S.No.	Fungicides	Dose (%) a.i.	Per cent disease intensity				Mean		Yield q/ha		Mean	C:B ratio
			2008-09		2009-10		Leaf	Pod	2008-09	2009-10		
			Leaf	Pod	Leaf	Pod						
1	Carbendazin	0.1%	53.7	55.4	48.5	57.5	51.1	56.45	7.1	6.2	6.5	1:32
2	Mancozeb	0.2%	24.0	30.2	25.2	30.5	24.6	30.35	7.5	7.3	7.4	1:38
3	Metalaxyl	0.25%	17.2	21.4	19.5	22.5	18.35	21.95	8.8	8.5	8.65	1:4.2
4	Iprodione	0.25%	13.5	15.7	15.2	20.4	14.35	18.05	9.5	9.2	9.35	1:5.3
5	Tricure	0.2%	54.2	57.8	52.5	62.5	56.0	60.15	6.8	6.2	6.5	1:2.2
6	check	-	58.8	65.5	62.2	68.5	60.5	67.0	6.0	5.5	5.75	-
	SEm+-						0.53	0.64	3.8			
	C.D. (P 0.05)						1.23	1.65	14.48			

symptoms, 1= 1 - 10%, 2= 11 - 25%, 3=26 - 50%, 4=51-75% and 5=>75% area of leaf infected. Evaluation was done on randomly selected plant in each replicated block for measuring the disease progress. Efficacy of the fungicides against the disease was assessed by comparing their percent leaf infection, disease severity, percent of siliqua infection, number of spots per siliqua over all replicated plots. The cost benefit ratio was also calculated on different treatments for economic viability of these sprayings.

RESULTS AND DISCUSSION

Plants showed a variety of symptoms individually and in mixed infections. The severity was found maximum on check variety Varuna. Fungi isolated from diseased samples were pathogenic and produced typical *Alternaria* blight on vegetative and reproductive plants parts. *Alternaria brassicae* (Berk.) Sacc. and *Alternaria brassicicola* (Schwein) Wiltshire were isolated as reported by other workers (Saharan *et al.*, 1997, Ahamad and Srivastava, 2002 and Ahamad, Srivastava, 2003 and Ahamad, 2005). All the fungicidal treatments (Table 1) gave significantly superiority over check and seed yield. All five fungicides reduced all the characters of disease data like per cent of leaf infection, percent of siliqua infection also number of spots per siliqua. This result was observed in both the two years differential disease reaction and conclusion was drawn with the two years pooled mean data. From the table it was found that maximum per cent disease intensity was reported in case of check i.e. 60.5% and minimum was reported in case of Iprodion i.e. 14.35% in leaf and 18.05 % in pod or siliqua followed by metalaxyl i.e. 18.34% and 21.95% in leaf and pod.

The maximum seed yield was reported in case of Iprodion i.e. 9.35 q/ha followed by mancozeb i.e. 8.65 q/ha and minimum yield was reported in case of check i.e. 5.75 q/ha. The highest cost benefit ratio was (1:5.3) achieved when plots were sprayed with iprodione 0.25% a.i. followed by followed by metalaxyl i.e. 1:4.2 and mancozeb 1:38 respectively. Number of siliqua was maximum in iprodione sprayed plots in comparison to metalaxyl and mancozeb. All the fungicides in different doses increased the yield of mustard significantly in comparison to untreated control. It was observed in both the years and as well as in pooled mean. Maximum seed yield was obtained in iprodione treated plots in comparison to other four chemicals. The above experiments therefore suggested that among the five chemicals (iprodione, metalaxyl, mancozeb, Tricure and carbendazim) iprodione, was most effective in reducing the *Alternaria* leaf blight of mustard followed by metalaxyl and least effective was Tricure.

It is therefore concluded that iprodione @ 0.25% a.i. was most effective in reducing the disease of *Alternaria* blight of mustard and increased seed yield of mustard. Since the appearance of the disease *Alternaria* blight of mustard, chemical control had been attempted by many workers Ahamad *et al.* 2009, Singh and Singh, 2005. The results which were observed in this experiment was also confirmed by the reports of Pandey *et al.*, (2000) and Mukherjee *et al.*, (2003) that iprodione 0.2% a.i. gave maximum control of *Alternaria* leaf blight of mustard and increase seed yield. These results also confirmed the results of Singh and Singh, 2005) that the best control of *Alternaria* blight of mustard was done by iprodione followed by mancozeb. In this experiment iprodione @ 0.25% a.i. followed by metalaxyl @ 0.25% a.i. had been proved to be effective and one can safely conclude that these two fungicides proved to be the best to prevent disease development and increase yield of mustard with high cost benefit ratio.

REFERENCES

- Ahamad, S. 2005. Status and Evaluation of Rapeseed-Mustard germplasm against white Rust (*Albugo candida*) disease in the intermediate zone of Jammu region. *J. Res. SKUAST-J*:4:111-117.
- Ahamad, S. and M. Srivastava 2003. Fungi associated with Rapeseed-mustard (*Brassica juncea*) seed, pathogenicity and chemical control. *Ann. agric. Res.* 24:748-751.
- Ahamad, S. and Narain, U. 1998. Management of *Alternaria* leaf spot caused by *Alternaria cucumerina*. *Ann. Pl. Protec. Sci.* 2 : 35-36
- Ahamad, S. and Srivastava, M. 2002. Fungi associated with Ethiopian mustard seed, pathogenicity and chemical control. *Ann. agric. Res.* 23: 748-751.
- Ahamad, S., Sharma, P. and Kumar, B. 2009. Integrated disease management on Rapeseed mustard, In: Plant disease management for sustainable Agriculture, Edited by Shahid Ahamad, Published by Daya Publishing House New Delhi.
- Gangawane, L.V. 1997. Management of fungicide resistance in Plant Pathogen. *Indian Phytopathology* 50 :305-313.
- Godika, S. and Pathak, A.K. 2002. Efficacy of some fungicides against white rust and *Alternaria* blight disease of mustard. *Plant Disease Research* 17 :138-140.
- Jones, R.K. 2000. Assessment of FHB of wheat and barley in respect to fungicide treatment. *Plant Disease* 84: 1021-1030.
- Kumar, A. 1997. Assessment and Economics of avoidable yield losses due to *Alternaria brassicae* in Brassicus. *Plant Disease Research* 12 :152-156.

- Mukherjee, I., Gopal, M. and Chatterjee, S. C. 2003. Persistence and Effectiveness of Iprodione against Alternaria blight in Mustard. *Bulletin of Environmental Contamination and Toxicology* 70 :586-591.
- Pandey, R.K., Tripathi, M.L., Reeti Singh and Singh, R. 2000. Efficacy of fungicides in the management of white rust and Alternaria blight of mustard. *Crop Research Hisar* 21 :137 - 139.
- Panja, B.N., Chaudhury, A., Chakraborty, A. and Laha, S.K. 2000. Management of Alternaria leaf blight and white rust disease of mustard in tarai agro-ecological zone of West Bengal. *Journal of Mycopathological Research* 38 :85-88.
- Saharan, G.S., Verma, P.R. and Nashaat, N.I. 1997. Monograph on Downey mildew of Crucifers.
- Singh, R.B. and Singh, R.N. 2005. Fungicidal management of foliar diseases of mustard in mid eastern India. *Ind. Phytopath.* 58 (1) 51-56.
- Wheeler, B. E. 1969. An Introduction to Plant Diseases. John Wiley and Sons Ltd., London, UK.
