

# Evaluation on different fungicides against *Alternaria blight* of cabbage caused by *Alternaria brassicae*

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## ABSTRACT

Cabbage (*Brassica oleracea* L. var. *capitata*) is second important vegetable crop of Cole group. A rich source of vitamin A, B and C it also contains minerals. The cabbage cultivars are under a great threat for profitable cultivation due to the attack of several abiotic and biotic factors viz., Fungi, Bacteria, Virus, Nematode etc. The experiment on integrated disease management of Cabbage leaf blight disease under field conditions revealed that out of 12 treatments using fungicides and bio-agent formulations was conducted during 2012-13 and 2013-14. The mean of analysis of two years data indicate that the minimum disease intensity 4.56 per cent was recorded in three foliar sprays of Acrobat @ (0.1%) + Mancozeb@ (0.2%) which also gave maximum yield 408.02 q/ha. Second best treatment was three foliar sprays of Ridomil MZ-72@ (0.2%) which gave 4.60 per cent disease intensity and 373.65 q/ha heads yield.

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## INTRODUCTION

Cabbage (*Brassica oleracea* L. var. *capitata*) is a leaf green or purple biennial plant; grow as an annual vegetable crop of Cole group for its dense-leaved heads. In India, it is a popular vegetable and widely grown during the winter season. Cabbage is the rich source of vitamin A, B and C, it contains many minerals also. It is the major source of vegetable in the world and constitutes an important part of diet. Daily per capita consumption of vegetables in the country is only 145 g, which is much less than the requirement of about 285g for a balance diet (ICMAR, 1998). Cabbage is grown 372000 hectare area in India with 8534000 Metric tons and 22.9 tones/

ha in production and productivity, respectively in year 2012-13 (NHB, 2013). Assessment of the effect of any disease on yield of a crop is pre-requisite for preparing rational disease management programme. Yield losses of many crops due to different species of *Alternaria* have been reported (Hossain and Mian, 2005).

However promising cabbage cultivars are under a great threat for profitable cultivation due to the attack of several biotic factors viz., Fungi, Bacteria, Virus, Nematode etc. and abiotic factors like nutritional deficiency toxicity water stress, temperature etc. The important diseases of cabbage crops caused by fungi are damping off (*Pythium* sp., *Rhizoctonia solani*)

White rust (*Albugo candida*), Club root (*Plasmodiophora brassicae*), Fusarium wilt (*Fusarium oxysporum* f.sp. *conglutinans*), Cottony soft rot (*Sclerotinia sclerotiarum*), Leaf spot (*Alternaria brassicae*) and nutritional disorder of stem cracks (Boron deficiency) and whiptail (Molybdenum deficiency). Among the fungal diseases, leaf blight of cabbage caused by *Alternaria brassicae* (Agropedia, 2015) is one of the most restating and limiting factor in the successful cultivation of this crop apart from other reasons. Management of the disease can be done through cultural practice, Chemical, Biological pesticides and use of resistant variety. But there is no doubt that application of chemicals pesticides for management of anthracnose is the most effective and widely recommended method of disease management. Therefore, the study was under in the present investigation.

## MATERIAL AND METHODS

A field trail was conducted at Main Vegetable Research Farm Kalyanpur of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur during two consecutive year *i.e.* 2012-13 to 2013-14. The experiment was laid out on Randomized Block Design (RBD) with three replications. The soil of experimental plot was sandy loam in nature, well drained with low C:N ratio. The plot size was 3.0 m x 2.4 m. The seed of cabbage variety “Golden acre” was used for nursery purpose of this experiment and 35 days seedlings were transferred in main field. The recommended agronomical

practice was followed to raise the crop healthy. Foliar spray of chemicals and bio-agents were started at onset of the disease and repeated three times at 10 days intervals. The twelve treatments were taken as :- Mancozeb @ (0.2%), Chlorothalonil @ (0.2%), Copper hydroxide @ (0.2%), Metiram @ (0.3%), Ridomil@ MZ-72 (0.2%), Acrobat@ (0.1%) + Mancozeb@ (0.2%), Sectin @ (0.3%), Aliette @ (0.1%), Curzate @ (0.2%), *Pseudomonas fluoresces* @ (2.0%), *Trichoderma viride* @ (2.0%) and control were used for management of disease. Yield data was recorded at every picking and PDI was calculated at every 10 days after each spray by using 0-9 disease rating scale on the basis of percentage area of foliage infected by the pathogen.

Disease rating scale for scoring the intensity of cabbage leaves and heads : 0 = No infection ; 1 = 1-10 per cent ; 3 = 11-25 per cent; 5 = 26-50 per cent; 7 = 51-75 per cent and 9 = > 75 per cent infection on foliage. The per cent Disease Intensity (PDI) was calculated by adopting the following equation as given by (Mayee and Datar, 1986)

$$PDI = \frac{\text{Summation of all numerical ratings}}{\text{No. of plant observed} \times \text{Maximum grade value (9)}} \times 100$$

Data on disease intensity and yield was taken also calculated.

## RESULTS AND DISCUSSION

The experiment on integrated disease management

Treatments	Disease Intensity (%)		Mean	Yield q/ha		Mean
	2012-13	2013-14		2012-13	2013-14	
1. Mancozeb (0.2%)	5.42 (13.36)	6.12 (14.30)	5.77	334.05	319.47	326.76
2. Chlorothalonil(0.2%)	5.15 (13.08)	6.05 (14.21)	5.60	343.08	323.64	333.36
3. Copper hydroxide (0.2%)	7.15 (15.48)	8.15 (16.58)	7.65	295.86	270.16	283.01
4. Metiram (0.3%)	4.65 (12.41)	5.12 (13.05)	4.89	383.36	362.53	372.95
5. Ridomil MZ-72 (0.2%)	4.20 (11.80)	5.00 (12.89)	4.60	379.20	368.09	373.65
6. Acrobat (0.1%) + Mancozeb (0.2%)	4.16 (11.76)	4.95 (12.80)	4.56	422.26	393.78	408.02
7. Sectin (0.3%)	6.80 (15.11)	7.90 (16.31)	7.35	298.64	280.58	289.61
8. Aliette (0.1%)	6.00 (14.14)	7.15 (15.49)	6.58	308.36	293.77	301.07
9. Curzate (0.2%)	8.45 (16.89)	9.20 (17.64)	8.83	288.22	253.58	271.90
10. <i>Pseudomonas fluorescens</i> (2.0%)	8.85 (17.29)	9.65 (18.09)	9.25	283.36	182.65	265.65
11. <i>Trichoderma viride</i> (2.0%)	11.22 (19.56)	12.60 (20.77)	11.91	255.58	251.41	253.00
12. Control	12.95 (21.09)	14.15 (22.09)	13.55	200.02	247.94	191.34
C.D. (P=0.05)	2.58	2.34	-	57.98	52.43	-
CV	7.17	6.27	-	7.97	7.70	-

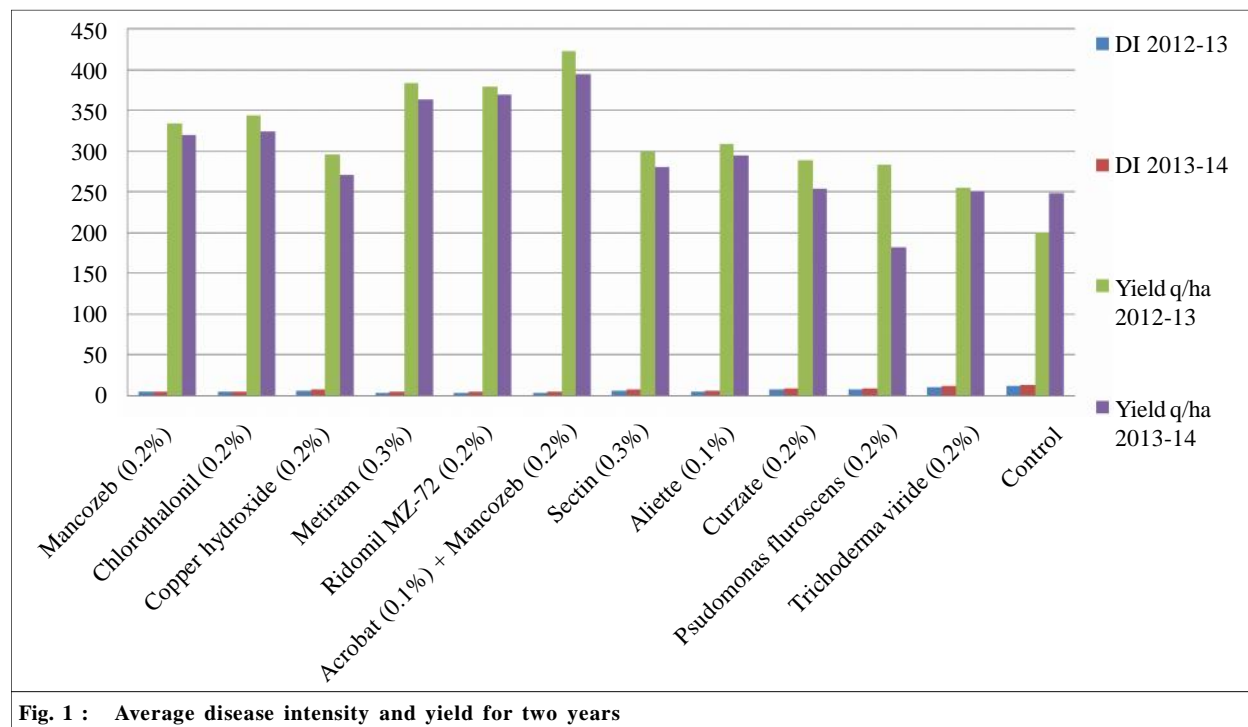


Fig. 1 : Average disease intensity and yield for two years

of cabbage leaf blight disease under field conditions indicate that out of 12 treatments using fungicides and bio-agent formulations was conducted during 2012-13 and 2013-14. The results indicate that, all the treatments were significantly superior over untreated control. Kodratikhoda *et al.* (2003) and Kohinoor *et al.* (2003) reported that effect of foliar spray of fungicides and botanicals to control *Alternaria* blight of cauliflower. The perusal of Table 1 and Fig. 1 depicts that significantly ( $P < 0.05$ ) average lower blight diseases intensity was recorded in foliar sprays of Acrobat @ (0.1%) + Mancozeb @ (0.2%) 4.56 % and maximum yield 408.02 q/ha as compared to foliar sprays of Ridomil MZ-72 (0.2%) 4.60 per cent and yield 373.65 q/ha, Metiram @ (0.3%) 4.89 per cent and yield 372.95 q/ha, Chlorothalonil @ (0.2%) 5.60 per cent and yield 333.36q/ha and mancozeb @ (0.2%) 5.77 per cent and yield 326.76 q/ha respectively. From the Table 1 it has been found that foliar spray with bio-agent was least effective against blight disease of cabbage. The data presented in the Table 1 shown that foliar spray with *Pseudomonas fluorescens* and *Trichoderma viride* at 10 days interval from initiation of disease showing 9.25 per cent and 11.91 per cent, yield 265.65q/ha and 253.00q/ha, respectively. Similar results have also been reported by Bhatti *et al.* (2002); Hossain *et al.* (2004); Hossain *et al.* (2005) and Moude

*et al.* (1984).

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#### REFERENCES

- Agropedia (2015). Cabbage crop diseases and their control. [www.agropedia.iitk.ac.in](http://www.agropedia.iitk.ac.in).
- Bhatti, A.G, Chandio, Sultan Metlo, Mithal, M.J., Abbasi, Z.A. and Oad, F.C. (2002). Chemical control of *Alternaria brassicae* (Berk. Sacc.) causing leaf spot of cabbage (*Brassica oleracea* L. var. *capitata*). *Pakistan J. Appl. Sci.*, **2**(1) : 24.
- Hossain, M., Sakhawat and Mian, I. H. (2004). Effect of foliar fungicides on the control of *Alternaria blight* of cabbage seed crop. *Bangladesh J. Plant Pathol.*, **20** : 43-48.
- Hossain, M., Sakhawat and Mian, I. H. (2005). Effect of planting date on *Alternaria blight* and seed yield of cabbage. *Bangladesh J. Plant Pathol.*, **21** : 33-37.
- ICMAR (1998). Food and Agricultural Organization of United Nation: Economic and Social Department. The Statistical Division.

**Kodratikhoda, S., Kohinoor, H., Mian, I.H. and Khan, M. A. (2003).** Application of foliar fungicides to control *Alternaria blight* of cauliflower seed crop. *Bangladesh J. Plant Pathol.*, **19** : 33-37

**Kohinoor, H., Kodratikhoda, S. and Mian, I. H. (2003).** Foliar spray of fungicides and botanicals to control *Alternaria blight* of cauliflower seed crop. *Bangladesh J. Plant Pathol.*, **19** : 63-67.

**Mayee, C.D. and Datar, V.V. (1986).** *Phytopathometry*. Technical Bulletin-I, Marathawada Agriculture University, Parbhani, India, 146pp.

**Moude, R.B., Humpherson, F.M.J. and Shuring, C.G. (1984).** Treatment to control phome and *Alternaria* infection of brassica seeds. *P. Path.*, **33**(4): 225-235.

National Horticulture Board (2013). Indian Horticulture Database, pp.04.

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