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Effect of mancozeb scheduling against *Alternaria* blight of cumin

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Abstract

A field experiment was conducted to study the effect of different spray schedules of mancozeb 75 WP against cumin blight (*Alternaria burnsii*) at Centre for Research on Seed Spices, S.D. Agril. University, Jagudan (Gujarat) during 2004-05, 2005-06 & 2006-07 under natural conditions using the variety Gujarat Cumin 3 (GC 3). The minimum intensity of blight disease (25.25%) was recorded in the treatment of four sprays of mancozeb @ 0.25% at 35, 45, 55 and 65 DAS (T_4) and it was at par with treatment of five sprays of mancozeb @ 0.25% at 35, 45, 55, 65 and 75 DAS (33.75%), treatment of three sprays of mancozeb @ 0.25% at 35, 45 and 55 DAS (39.33%) and treatment of four sprays of mancozeb @ 0.25% first at 35 DAS and remaining sprays at as and when required (42.42%). However, the maximum yield (408.89 kg/ha) was also recorded in treatment of four sprays of mancozeb @ 0.25% at 35, 45, 55 and 65 DAS (T_4) and it was at par with treatment of five sprays of mancozeb @ 0.25% at 35, 45, 55, 65 and 75 DAS (379.63 kg/ha.). The interaction of Y X T showed significant effect. Maximum net return with ICBR 1:15.97 was obtained by four sprays of mancozeb @ 0.25 at 35, 45, 55 and 65 DAS.

Keywords: Cumin blight, *alternaria burnsii*, mancozeb.

Introduction

India is the largest producer, consumer and exporter of spices in the world market (1). Among different spice crops, cumin (*Cuminum cyminum* L.) is an important seed spice crop grown mostly in specific areas in the country i.e. in arid regions of Gujarat and Rajsathan state where agro climatic and edaphic conditions are most congenial to cumin cultivation. Cumin seeds are used as spice in Indian culinary for flavouring soups, sauces, pickles and for seasoning breads and cakes. In Gujarat cumin was grown in 2,65,225 hectares with production of 1,57,351 tonnes (2).

Cumin crop is affected by many diseases but the important among them are blight (*Alternaria burnsii*), wilt (*Fusarium oxysporum f. cumini*) and powdery mildew (*Erysiphe polygoni DC L.*) (3). Blight is wide spread in distribution appear in devastating form every year and spread rapidly in humid and cloudy weather. Under such favorable conditions, losses may be as high as 80 per cent (4, 5, 6) in absence of effective control measures. Different fungicides have been tried by many workers. Conclusively, mancozeb was reported as an effective fungicide for blight (7, 8). Therefore, present investigation was undertaken with an objective to evaluate different spray schedules of mancozeb against *Alternaria* blight of cumin to generate awareness among the cumin growers.

Materials and methods

A field experiment was conducted at Centre for Research on Seed Spices, S.D.A.U., Jagudan during 2004-05, 2005-06 and 2006-07 on cumin variety GC 3. Different spray schedules of mancozeb @ 0.25% were evaluated in the randomized block design as detailed below.

- T_1 - *No fungicidal application (Control)*
- T_2 - *Two sprays of mancozeb @ 0.25%, at 35 and 45 DAS*
- T_3 - *Three sprays of mancozeb @ 0.25%, at 35, 45 and 55 DAS*
- T_4 - *Four sprays of mancozeb @ 0.25%, at 35, 45, 55 and 65 DAS*

T_5 - *Five sprays of mancozeb @ 0.25%, at 35, 45, 55, 65 and 75 DAS*

T_6 - *Two sprays of mancozeb @ 0.25%, first spray at 35 DAS and second spray as and when required*

T_7 - *Three sprays of mancozeb @ 0.25%, first spray at 35 DAS and remaining sprays as and when require*

T_8 - *Four sprays of mancozeb @ 0.25%, first spray at 35 DAS and remaining sprays as and when require*

T_9 - *One spray of mancozeb @ 0.25%, at appearance of disease*

T_{10} - *Two sprays of mancozeb @ 0.25%, as and when require*

T_{11} - *Three sprays of mancozeb @ 0.25%, as and when require*

Recommended agronomic practices were followed for all the treatments. First spray and subsequent sprays of mancozeb were given as shown in respective treatment detail. The observations on the intensity of the disease were recorded after the last spray from 20 plants randomly selected from each plot using 0-5 scale for blight as detailed below.

0 No incidence / Healthy
1 Leaf tips only showing blightening symptoms
2 Majority of leaves showing blight
3 Blight symptoms on leaf & umbellate
4 Blight symptoms on leaf + few lesions on stem
5 Leaves, umbellate, stem and seed showing the blight symptoms

Based on these observations, per cent disease intensity (PDI) of the disease was worked out. The seed yield from individual plots was also recorded and converted in per hector basis.

Results and discussion

Blight incidence

The results for control of blight disease were significant in all the year individually as well as polled. The minimum incidence of blight disease (25.25%) was found in treatment of four sprays of mancozeb @ 0.25% at 35, 45, 55 and 65 DAS (T_4) and it was at par (26.17%) with treatment of five sprays of mancozeb @ 0.25% at 35, 45, 55, 65 and 75 DAS (T_5). Remaining all the treatments also found effective with higher intensity than the above treatments. Overall, it is concluded that spraying of mancozeb at scheduled time gave better control of blight disease than spraying at as and when require (Table 1). These findings are in agreement with Dange *et al.* (9) and Mehta

Table 1. Effect of different spray schedules of mancozeb on blight disease.

Treatment No.	Blight(PDI)			
	2004-05	2005-06	2006-07	Pooled
1	90.00 (71.83)*	88.75 (70.74)	88.50(70.24)	89.25 (71.14)
2	47.50 (43.32)	57.50 (49.32)	58.00(49.64)	54.33 (47.45)
3	32.50 (33.23)	42.50 (40.66)	43.00(40.98)	39.33 (38.31)
4	30.00 (31.75)	24.25 (29.46)	21.50(27.26)	25.25 (29.51)
5	30.00 (31.75)	37.50 (37.70)	11.00(19.23)	26.17 (29.59)
6	68.75 (56.97)	80.00 (63.78)	79.00(62.77)	75.92 (61.20)
7	61.25 (51.97)	42.50 (40.66)	41.25(39.97)	48.33 (44.22)
8	60.00 (50.91)	32.50 (34.73)	34.75(36.13)	42.42 (40.61)
9	75.00 (60.17)	65.00 (54.05)	62.00(52.07)	67.33 (55.45)
10	60.00 (50.91)	53.75 (47.16)	52.75(46.59)	55.50 (48.24)
11	65.00 (53.79)	51.25 (45.70)	47.25(43.43)	54.50 (47.60)
S.Em. ±	4.52	2.08	1.64	2.94
CD at 5%	13.05	6.01	4.72	8.77
CV%	18.53	8.91	7.37	13.04
Y × T	-	-	-	8.56

* Data in parenthesis show ARC transform value

Table 2. Effect of different spray schedules of mancozeb on yield.

Treatment No.	Yield(kg/ha)			
	2004-05	2005-06	2006-07	Pooled
1	71.67	142.78	144.44	119.63
2	167.22	317.22	274.41	252.96
3	167.78	365.56	371.11	301.48
4	171.11	505.56	550.00	408.89
5	189.44	413.33	536.11	379.63
6	157.78	154.44	164.44	158.89
7	204.44	366.11	373.33	314.63
8	187.78	435.00	440.56	354.44
9	123.89	346.11	289.44	253.15
10	175.00	305.00	317.78	265.93
11	280.56	336.11	346.67	294.44
S.Em. ±	52.03	12.12	10.00	35.18
CD at 5%	NS	34.99	28.88	104.67
CV%	63.01	7.23	5.78	22.24
Y × T		-	-	88.31

Table 3. Effect of different spray schedules of mancozeb

Treat. No.	Yield (Kg./ha)	Yield increased over control (kg/ha.)	Gross extra income (Rs./ha)	Cost of treat. (Rs./ha)	Net Return	ICBR
1	119.63	-	-	-	-	-
2	252.96	133.33	13333	851	12482	14.66
3	301.48	181.85	18185	1277	16908	13.24
4	408.89	289.26	28926	1703	27223	15.97
5	379.63	260.00	26000	2128	23872	11.21
6	158.89	39.26	3926	851	3075	3.61
7	314.63	195.00	19500	1277	18223	14.27
8	354.44	234.81	23481	1703	21778	12.79
9	253.15	133.52	13352	851	12501	14.69
10	265.93	146.30	14630	1277	13353	10.46
11	294.44	174.81	17481	1703	15778	9.26

Mancozeb : Rs. 195/kg Cumin price: Rs. 100/kg Labour cost : Rs. 50/day

and Solanki (8) revealed that four spray of mancozeb (0.2%) have been recommended for effective control of cumin blight in Gujarat State.

Yield

The polled results of yield showed significant effect of mancozeb spraying. The maximum yield was found in T_4 (408.89 kg/ha) and it was at par with T_5 (379.63 kg/ha), T_8 (354.44 kg/ha) and T_7 (314.63 kg/ha) treatments. Again treatments of scheduled time and before initiation of disease gave more yield than the spraying at as and when require. The interaction of Y×T showed significant effect (Table 2).

Economics

Maximum net return of Rs.27223/- with ICBR 1:15.97 was obtained by four sprays of mancozeb @ 0.25% at 35, 45, 55 and 65 DAS followed by Rs.23872/- return with ICBR 1:11.21 by five sprays of mancozeb 0.25% at 35, 45, 55, 65 and 75 DAS followed by 21778/- return with ICBR 1:12.79 by four sprays of mancozeb @ 0.25% first at 35 DAS and remaining sprays at as and when require followed by Rs.18223/- return with ICBR 1:14.27 by three sprays of mancozeb, fist at 35 DAS and remaining sprays at as and when require (Table 3).

Conclusion

Overall, four and five sprays of mancozeb @ 0.25% at scheduled time gave better control of blight disease with higher yield. Moreover, four and three sprays of mancozeb, first at 35 DAS and remaining at as and when require were also effective, while spraying of mancozeb at as and when require is not more effective for control and also gave low yield than the above treatments. Hence, for the control of blight disease, mancozeb should be sprayed before initiation of disease.

References

1. **Peter, K.V., Srinivasan and Hamza, S.** 2000. Nutrient management in spices. *Fertilizer News.* **45** : 13-18.
2. **DOA** . 2007. District wise area, production and yield per hectare of important food and non-food crops in Gujarat State, Department of Agriculture.
3. **Dange, S.R.S., Pandey, R.N. and Savaliya, R.L.** 1992. Diseases of cumin and their management. A Review. *Agric. Rev.* **13**(4):219-224.
4. **Bandyopadhyay, B., Chakravorti, S., Chaudhari, A.K. and Mukhopadhyay, S.** 1979. Incidence of blight disease of cumin (*Cuminum cyminum* L.) in West Bengal. *Sci. Cult.* **46** : 341-342.
5. **Gemawat, P.D. and Prasad, N.** 1969. Efficacy of different fungicides for the control of *Alternaria* blight of *Cuminum cyminum* L. *Indian Phytopathol.* **22**:49-52.
6. **Savaliya, R.L.** 1991. First report *Alternaria* blight of cumin caused by *Alternaria brassicicola*. Ph.D. Thesis, Gujarat Agril. Uni., Sardarkrushinagar.
7. **Akabari, L.F., Dhraj, I.U., Khandhar, R.R. and Vaishnav, M.U.**1996. Management of cumin blight through fungicides. *Pl.Dis.Res.* **11** : 103-105.
8. **Mehta, K.G. and Solanki, V.A.**1990. A status report on plants pathological work carried out at Main Spices Research Station, G.A.U. Jagudan, Dist: Mehsana.
9. **Dange, S.R.S., Patel, R.L., Patel, S.I. and Patel K.K.** 2002. Management of cumin blight by different spray schedules of mancozeb. *Agric. Sci. Digest.* **22** : 99-101.