

Management of Ramularia blight in fennel

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ABSTRACT

Ramularia blight of fennel is a constraint to get potential yield. To manage it, field trials were conducted for three consecutive rabi/ kharif seasons with nine fungicides. Eincarb (mancozeb + carbendazim) @ 0.2 % recorded the minimum incidence of Ramularia blight followed by mancozeb @ 0.2 %. Seed yield were also high in these treatments. Maximum net return of Rs. 25456 with ICBR 1 : 10.86 was obtained by three sprays of Eincarb @ 0.2 % at (10) days interval. Overall, three sprays of Eincarb @ 0.2 % or mancozeb @ 0.2 % or carbendazim @ 0.05 % gave better control of disease with higher yield.

Key words : Fennel, Ramularia blight, Fungicides

INTRODUCTION

Fennel (*Foeniculum vulgare* Mill.) is one of the most important seed spices grown in a sizable area of Gujarat and Rajasthan. In India, and its neighbouring countries, fennel is used as masticatory or for chewing alone or in pans. It is also used for flavouring soups and liquors, making pickles, meat dishes, sauces, bread rolls, pastries and confectionary, cordials and liquors. Diseases are the major constraints in economic crop production as they inflict heavy losses. Like other crops, fennel is also attacked by many fungal diseases (Mukerji and Basin, 4). Ramularia blight caused by *Ramularia foeniculi* Sibilla is one of most important disease and cause considerable damage to the quality and quantity of the seed. Considering the seriousness of the disease in the state and no systemic work on management of disease, present experiment was taken up using different fungicides to manage disease effectively and economically.

MATERIALS AND METHODS

A field experiment was conducted in a randomized block design with four replications during kharif 2005-06, 2006-07 and 2007-08 at Centre for Research on Seed Spices, Jagudan. The seedlings of cv. Gujarat Fennel-2 (GF-2) were transplanted in the month of Augusts at a distance of 90 cm x 60 cm in a plot size 4.5 x 4.8 sqm. The nine fungicides with their respective concentrations (Table-1) were used. The efficacy of these fungicides were compared with control (without spray). Three sprays of different fungicides at their respective concentration at an interval of 10 days starting from the appearance of disease were given. The observation on the disease intensity was recorded after 10 days of last spray from 20

randomly selected plants from each plots using 0-5 scale as : 0 = No incidence/Healthy; 1 = Symptoms on leaf tip and leaves only; 2 = Symptoms on leaves and petiole; 3 = Symptoms on leaves, petiole and stem; 4 = Symptoms on leaves, stem and inflorescence; 5 = Symptoms on leaves, stem, inflorescence including seeds. Based on these observations, per cent disease intensity

(PDI) of the disease was worked out using formula developed by (Datar and Mayee, 2). The seed yield from individual plots was also recorded and converted in per hectare basis.

RESULTS AND DISCUSSION

Pooled and individual data from three years (2005-06 to 2007-08) trials revealed a significant effect of various treatments for the control of Ramularia blight in fennel. The minimum disease intensity (31.58 %) was obtained by in spraying of Eincarb (carbendazim + mancozeb) @ 0.2 % followed by the spraying of mancozeb @ 0.2 % (36.50 %), carbendazim @ 0.05 % (38.64 %) and tridemorph @ 0.04 % (39.72 %). The maximum disease intensity (58.25 %) was observed in control (Table-1). These finding are in agreement with respect of Patel and Patel (5) and Chaudhari and Patel (1) who have reported the effect of mancozeb @ 0.2 % followed carbendazim + mancozeb in reduction of Ramularia blight of fennel. Lakra (3) stated that three sprayings of benomyl or tridemorph 0.1 % proved the most effective against *Ramularia foeniculi* of fennel.

A maximum seed yield of 1619 kg/ha was obtained in spraying of Eincarb (carbendazim + mancozeb) @ 0.2 % which was at par with a spraying of mancozeb @ 0.2 % (1525 kg/ha). The next best treatment was

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Table 1. Effect of different fungicides on Ramularia blight management.

Treatments	Conc. (%)	Percent Disease Intensity (PDI)				Yield (Kg/ha.)				ICBR
		2005-06	2006-07	2007-08	Pooled	2005-06	2006-07	2007-08	Pooled	
Mancozeb	0.2	54.17* (47.39)	30.00 (33.19)	25.33 (30.19)	36.50 (36.92)	871	1492	2212	1525	9.85
Carbendazim	0.05	56.25 (48.59)	32.00 (34.42)	27.67 (31.71)	38.64 (38.24)	835	1458	1955	1416	10.40
Emcarb(Mancozeb + Carbendazim)	0.2	52.08 (46.18)	22.50 (28.28)	20.17 (26.65)	31.58 (33.70)	912	1646	2298	1619	10.86
Chlorotheloniil	0.2	64.58 (53.59)	39.67 (39.02)	32.33 (34.63)	45.53 (42.41)	825	1286	1903	1338	3.10
Propineb	0.2	62.50 (52.39)	36.00 (36.85)	34.00 (35.65)	44.17 (41.63)	823	1492	1715	1343	5.34
Tridemorph	0.04	56.25 (48.59)	32.50 (34.73)	34.33 (35.85)	41.03 (39.72)	862	1440	1595	1299	6.54
Difenaconazole	0.035	66.67 (54.80)	36.00 (36.85)	36.00 (36.85)	46.22 (42.84)	802	1337	1612	1251	1.14
Hexaconazole	0.005	66.67 (54.80)	37.00 (37.45)	38.33 (38.24)	47.33 (43.50)	768	1286	1492	1182	5.11
Penaconazole	0.00250	68.75 (56.17)	40.83 (39.70)	39.33 (38.82)	49.64 (44.90)	740	1235	1389	1121	4.45
Control		85.42 (68.24)	46.00 (42.69)	43.33 (41.15)	58.25 (50.69)	593	1012	1166	924	-
S.Em ±		5.01 (3.19)	0.87 (0.54)	1.08 (0.69)	1.74 (1.14)	22.67	63.67	77.28	89.62	
C.D. at 5 %		14.89 (9.48)	2.58 (1.60)	3.21 (2.05)	4.91 (3.23)	67.00	189.00	230.00	266.00	
CV		13.71 (10.42)	4.16 (2.56)	5.66 (3.42)	11.85 (7.98)	4.89	8.06	7.72	7.89	
Y X T	-	-	-	-	NS	-	-	-	168.00	

* Data presented in parenthesis are transform values

carbendazim @ 0.05 % (1416 kg/ha). The control treatment gave a minimum seed yield (924 kg/ha). Considering the yield and cost of different treatment, the highest net return Rs. 25456 was recorded in the treatment of Emcarb @ 0.2 % with ICBR 1: 10.86 followed by a return of 1: 9.85 in mancozeb @ 0.2 %. Therefore, based on three year's results it can be concluded that three sprays of Emcarb (carbendazim + mancozeb) @ 0.2 % at 10 days interval followed by mancozeb @ 0.2 % are most economical and effective for the management of Ramularia blight in fennel.

REFERENCES:

1. Chaudhari, S.M. and Patel, A.J. 1987. Chemical control of Alternaria blight and Ramularia blight of fennel. *Indian J. Mycol. Pl. Pathol.* **17** : 348-350.
2. Datar, V.V. and Mayee, C.D. 1981. Assessment of loss in tomato yield due to early blight. *Indian Phytopath.* **34**: 191-195.
3. Lakra, B.S. 1993. Epidemiology and management of Ramularia blight of fennel. *Indian J. Mycol. Pl. Pathol.* **23** : 70-77.
4. Mukerji, K.G. and Basin, J. 1986. "Plant Diseases of India". Tata McGraw Hill Pub. Comp. Ltd. New Delhi. pp. 122-123.
5. Patel, D.S. and Patel, S.I. 2008. Management of Ramularia blight of fennel caused by *Ramularia foeniculi* Sibilla. *Indian Phytopath.* **61** (3): 355-356.

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