

Efficacy of fungicides on leaf blight of chilli caused by *Cercospora capsici*

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SUMMARY

In vitro effect of ten popular fungicides viz., carbendazim, captafol, thiram, captan, hexaconazole, chlorothalonil, companion, copper oxychloride, ridomil MZ-72 and mancozeb in single and combination were evaluated against mycelial growth of *Cercospora capsici* causing leaf blight of chilli. Among the fungicides used, there was no mycelial growth in carbendazim treated which showed 100% inhibition over the control.

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Key words : Fungicides, Leaf flight, Chilli, *In vivo* effect

In vivo effect of ten fungicides viz., carbendazim, captafol, thiram, captan, ridonil, MZ-72, copper oxychloride, chlorothalonil and companion were tested singly and in combination against disease intensity (%) and yield (q/ha) of chilli. Among all the eight fungicides, most popular fungicide carbendazim gave the lowest (12.20%) disease intensity and maximum ripe fruit yield (28.94 q/ha). Next best fungicide was captafol, which gave (14.40%) disease intensity and (25.38 q/ha) ripe fruit yield.

MATERIALS AND METHODS

In vitro effect of ten popular fungicides viz., Carbendazim, Captafol, Thiram, Captan, Hexaconazole, Chlorothalonil, Companion, Copper oxychloride, Ridomil MZ-72 and Mancozeb in single and in combination were tested against mycelial growth of *Cercospora capsici* by employing poison food technique devised by Nene and Thapliyal, 1979 for screening the fungicides. The requisite quantities of the fungicides were incorporated in 2 per cent sterilized Potato dextrose agar medium and shaken well to make it homogenous. These fungicides impregnated medium was then poured in 10 cm sterilized

Petri dishes with three replications for each treatment and allowed to solidify. These dishes were then inoculated with 5 mm circular disc of inoculum from 10 days old culture and this disc was placed in the centre of each Petriplate in such a way so that fungus may come in direct contact with the medium. The medium, without any fungicide, poured and inoculated similarly served as control. These Petridishes were incubated at $28 \pm 1^\circ\text{C}$ for 7 days. The efficacy of fungicides was assessed by measuring the radial growth of the fungal colony in mm along with control. The data so obtained were computed to per cent inhibition of growth (I) over by using the formula :

$$I = \frac{C-T}{C} \times 100$$

where C= Radial growth of control, T=Radial growth of treatment.

In vivo, an experiment was conducted at the Research Farm of Department of Vegetable Science, C.S. Azad University of Agriculture and Technology, Kanpur to find out the best foliar treatment of *Cercospora* leaf spot of chilli during 2008-09 and 2009-10 with eight treatments and three replications. Treatments viz., two foliar sprays of carbendazim (0.1%), two foliar sprays of captafol (0.3%), two foliar sprays of Thiram + carbendazim 1:1 (0.2%), two foliar sprays of captan + carbendazim 1:1 (0.2%), ridomil MZ-72 (0.2%), copper oxychloride (0.3%), chlorothalonil (0.3%) and companion (0.25%) were used. All the recommended agronomic practices for raising the nursery and in main field crop were followed. Thirty plants were transplanted and maintained at 50 cm x 40 cm distance in 3mx2m plot. The

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artificial epiphytotic of the diseases were created by inoculation of mycelial-cum-spores suspension of the pathogen. Spraying of fungicides was started 48 hours after inoculation and repeated at an interval of ten days with two subsequent sprays. The plants sprayed with water served as control. Data on disease intensity were recorded 10 days after second spray and yield per plot was recorded after ripening of the plant.

RESULTS AND DISCUSSION

The results obtained from the present investigation are presented in Table 1 and 2.

Mycelial growth:

The result present in Table 1 indicated that all the fungicides under least proved inhibitory to *Cercospora capsici* by reducing the colony diameters as compared

to control. Carbendazim was found most effective in growth inhibition (100%) as compared to other fungicides under *in vitro* test. Next best fungicides were Captan + Carbendazim, Captan + Hexaconazole, Thiram + Carbendazim and Captafol which gave 96.00%, 94.00%, 94.00% and 94.00% inhibitory effect, respectively. Other fungicides were found less effective but significantly superior over the control. Similar result has been obtained by Chand *et al.*, 2009.

Disease intensity:

The result noted in Table 2 revealed that in both the years, all the eight fungicides checked the intensity in comparison to control. Most popular systemic fungicide carbendazim (0.1%) gave the average minimum (11.41%) disease intensity followed by Captafol (0.3%), Thiram + Carbendazim (0.2%), captan + Carbendazim (0.2%),

Table 1 : Effect of fungicides on the mycelial growth *in vitro*

Sr. No.	Treatments	Av. colony diameter (mm)	Growth inhibition (%)
T ₁	Carbendazim (0.1%)	0.00	100
T ₂	Captafol (0.3%)	0.50	94
T ₃	Thiram + Carbendazim (1:1) (0.2)	0.50	94
T ₄	Captan+Hexaconazole (1:1) (0.2%)	0.50	94
T ₅	Captan + Carbendazim (1:1) (0.2%)	0.33	96
T ₆	Thiram+Hexaconazole (1:1) (0.2%)	1.25	86
T ₇	Chlorothalonil (0.3%)	1.65	74
T ₈	Companion (0.25%)	5.50	36
T ₉	Copper oxychloride (0.3%)	1.00	86
T ₁₀	Ridomil MZ -72 (0.2%)	1.20	88
T ₁₁	Mancozeb (0.25%)	6.50	25
T ₁₂	Control	8.64	-
	C.D. (P=0.05)	0.62	-
	C.V. %	15.39	-

Table 2 : Effect of fungicides on disease intensity and yield of chilli

Sr. No.	Treatments	Yield q/ha		Av. yield (q/ha)	Disease intensity		Av. disease intensity (%)
		2007-08	2008-09		2007-08	2008-09	
T ₁	Carbendazim (0.1%)	28.94	28.98	28.96	12.20	10.62	11.41
T ₂	Captafol (0.3)	25.38	25.20	25.29	14.40	14.15	14.28
T ₃	Thiram + Carbendazim (1:1) (0.2%)	21.55	21.48	21.52	29.50	30.00	29.75
T ₄	Captan + Carbendazim (1:1) (0.2%)	19.38	18.88	19.13	30.40	31.42	30.91
T ₅	Ridomil MZ-72 (0.2%)	17.61	18.66	18.14	33.60	32.65	33.13
T ₆	Copper oxychloride (0.3%)	16.44	17.92	17.18	36.50	34.15	35.33
T ₇	Chlorothalonil (0.3%)	12.16	12.75	12.46	36.60	35.10	35.85
T ₈	Companion	10.77	11.12	10.95	41.50	41.00	41.25
T ₉	Control	7.44	8.12	7.78	67.50	64.15	65.83
	CD (P= 0.05)	1.50	1.94	-	7.12	6.42	-
	C.V. %	4.89	5.26	-	12.25	12.50	-

Ridomil MZ-72 (0.2%) Copper oxychloride (0.3%), Chlorothalonil (0.3%) and companion (0.25%) with 14.28%, 29.75%, 30.91%, 33.13%, 35.33%, 35.85% and 41.25% average diseases intensity (Sharma and Sohi; 1981).

Yield :

The average yield of ripe fruit of chilli was 28.96 q/ha, 25.29 q/ha, 21.52 q/ha, 19.13 q/ha, 18.14 q/ha, 17.18q/ha, 12.46q/ha and 10.95 q/ha in two foliar sprays of Carbendazim (0.1%), two foliar sprays of Captafol (0.3%) two foliar sprays of combination of Thiram+ Carbendazim

(1:1) (0.2%), two foliar sprays of combination of Captan + Carbendazim (1:1) (0.2%), two foliar sprays of Ridomil MZ-72 (0.2%), two foliar sprays of Copper oxychloride (0.3%), two foliar sprays of Chlorothalonil (0.3% and two foliar sprays of companion (0.25%) (Sharma and Sohi, 1981).

Conclusion :

Use of Carbendazim as poison food *in vitro* checked the mycelial growth and use as two foliar application with (0.1 %) of Carbendazim control the disease intensity and increased the ripe fruit yield in field condition.

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