

RESEARCH ARTICLE

Comparative evaluation of different fungicides against anthracnose of chilli caused by *Colletotrichum capsici*

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ABSTRACT

Chilli (*Capsicum annum* L.) is one of the most important vegetables among Solanaceae group like potato, tomato etc. Most of the promising chilli cultivars are under a great threat for profitable cultivation due to several abiotic and biotic factors. The major losses of chilli are caused by fungi, in which anthracnose due to *Colletotrichum capsici* is more important. For the management of anthracnose of chilli, an experiment was conducted for three years with twelve treatments and three replications. Treatment of three foliar sprays of Propiconazole @ (0.1%) at 10 days interval from initiation of the disease gave average minimum disease intensity (11.57%) and maximum ripe fruit yield (31.90g/ha) with maximum C:B ratio (1:3.18).

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INTRODUCTION

The domesticated chilli (*Capsicum annum* L.) is one of the most important vegetables among Solanaceae group like potato, tomato etc. India is the largest exporter of dry chilli. In India area, production and productivity of chilli were 792.10 million ha. 1223.40 million tonnes and 1.5 MT/ha, respectively (NHB 2011). In India, chilli is grown in almost all States of the country and the major chilli growing states in terms of total production are Andhra Pradesh (49%), Karnataka (15%), Orissa (8%), Maharashtra (6%), West Bengal (5%), Rajasthan (4%) and Tamil Nadu (3%) (Kochi, 2005). Most of the promising chilli cultivars are under a great threat for profitable cultivation due to the attack of several abiotic and biotic factors viz., fungi, bacteria, viruses, nematodes etc. and abiotic factors like nutritional deficiency, toxicity, water stress, temperature etc. Among them, anthracnose of chilli caused by *Colletotrichum capsici* is the most devastating and causes considerable losses in India. The management of the disease can be done through cultural, chemical, biological and use of resistant varieties. But chemicals management is the most effective and widely recommended method of disease management.

MATERIALS AND METHODS

The experiment was conducted at Vegetable Research Farm, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur during three consecutive years i. e. 2009-10 to 2011-12. The experiment was laid out in 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 2m x 2m. Recommended agronomical practices were followed to raise the healthy crop and normal 30 days old seedlings of chilli variety "Kalyanpur Chaman" were used. Foliar spray of chemicals and bio-agents started at onset of the disease and repeated three times at 10 days intervals. The twelve treatments each of 3 sprays of were taken as: (T₁) Thiophanate methyl @ 0.1%, (T₂) Flusilazole @ 0.1%, (T₃) Copper hydroxide @ 0.2%, (T₄) Azoxystrobin @ 0.03%, (T₅) Mancozeb @ 0.2%, (T₆) Propiconazole @ 0.1%, (T₇) Difeneconazole @ 0.05%, (T₈) Penconazole @ 0.1%, (T₉) Tebuconazole @ 0.1%, (T₁₀) *Pseudomonas fluorescens* @ 2%, (T₁₁) *Trichoderma viride* @ 2.0% and (T₁₂) control were used for management of disease. DI was calculated at every 10 days after each spray using the following formula :

$$\text{Disease incidence \%} = \frac{\text{Total number of diseased plant / polt}}{\text{Total plant population / plot}} \times 100$$

Data on disease intensity and yield were taken and C : B ratio was calculated.

RESULTS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

Disease intensity :

The perusal of Table 1 reveals that significantly (P< 0.05) average lower disease intensity (11.57%) of anthracnose of chilli was recorded in three foliar each of Propiconazole @ (0.1%) as compared to 12.13 % in Difeconazole @ (0.05%), (13.38%) Tebuconazole @ (0.1%), 13.97 % in Azoxystobin @ (0.03%), 14.75 % in Penconazole (0.1%), 15.58 % in Thiophanate methyle @ (0.1%), 15.88 % in Flusilazole @ (0.1%), 23.25 % in Copper hydroxide @ (0.2%), 26.37 % in *Pseudomonas flourscens* @ (2.0%), 28.10 % in *Trichoderma viride* @ (2.0%), 29.62 % in Mancozeb @ (2.0%) and 45.22 % in control plot in which only fresh water was used as spray. From the Table 1 it was observed that the fungicide belonging to Trizole groups were much effective than others, which might be due to the nature to effect the cytochrome P-450 enzymes of fungus. The present investigation is in conformity of findings reported by Hingole and Kurundkar (2004), Srinivas *et al.* (2005), Sharma *et al.* (2005) and Singh *et al.* (2000).

Yield :

As depicted in Table 1 the average yield of fresh ripped fruits of chilli was 31.09 q/ ha, 27.46 q/ha, 26.38q/ha, 24.81q/ha, 24.42q/ha, 22.76q/ha, 20.45q/ha, 19.37q/ha, 18.45q/ha, 13.97q/ha, 12.03q/ha, and 8.08q/ha, in T₆, T₇, T₉, T₄, T₈, T₁, T₂, T₃, T₁₀, T₁₁, T₅ and T₁₂, respectively. The maximum fresh fruits yield 31.09q/ ha was recorded in T₆ with foliar sprays of Propiconazole (0.1%). Higher C:B ratio was observed in T₆ (1:3.18) followed by 1:3.11, 1:2.94., 1:2.89, 1:2.33, 1:2.31, 1:1.89, 1:1.81, 1:1.75, 1:1.62, 1:1.51, and 1:1.15 in T₇, T₉, T₄, T₈, T₁, T₂, T₃, T₁₀, T₁₁, T₅ and T₁₂, respectively. Study concludes with remarks that anthracnose of chilli may be easily managed by three foliar sprays of Propiconazole 0.1 per cent (Kumar and Vyas, 2003; Hingole and Kurundkar, 2004).

Sr. No.	Trizole fungicides (C) @ 0.1% (q/ha)	Disease intensity (%)	Yield (q/ha)	C:B ratio
1	Propiconazole @ 0.1%	11.57	31.09	1:3.18
2	Difeconazole @ 0.05%	12.13	27.46	1:3.11
3	Tebuconazole @ 0.1%	13.38	26.38	1:2.94
4	Azoxystobin @ 0.03%	13.97	24.81	1:2.89
5	Penconazole @ 0.1%	14.75	24.42	1:2.33
6	Thiophanate methyle @ 0.1%	15.58	22.76	1:2.31
7	Flusilazole @ 0.1%	15.88	20.45	1:1.89
8	Copper hydroxide @ 0.2%	23.25	19.37	1:1.81
9	<i>Pseudomonas flourscens</i> @ 2.0%	26.37	18.45	1:1.75
10	<i>Trichoderma viride</i> @ 2.0%	28.10	15.51	1:1.62
11	Mancozeb @ 2.0%	29.62	13.97	1:1.51
12	Control (Fresh water)	45.22	8.08	1:1.15
	C.V. %	5.88	3.87	

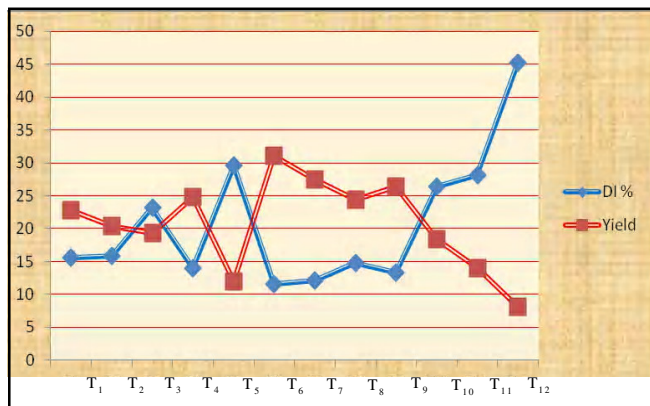


Fig. 1: Average disease intensity and yield for three years with C: B ratio

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