



Effect of fungicides and bio-agents on powdery mildew of coriander (*Coriandrum sativum* L.)

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Abstract

Various fungicides and biocontrol agents were evaluated for the management of powdery mildew of coriander (*Coriandrum sativum* L.) at Raigarh (Chhattisgarh). The results showed that minimum disease intensity (20.6%) and maximum yield (810 kg ha⁻¹) were obtained with application of carbendazim as soil drench and 0.1% spray at 60 days after sowing which was on par with spray of wettable sulphur 0.2% at 60 days after sowing (T₆). Cost:Benefit ratio (2.08) was highest with wettable sulphur 0.2% spray at 60 days after sowing.

Keywords: biocontrol agents, disease intensity, *Erysiphe polygoni*, fungicides

Coriander (*Coriandrum sativum* L.) is affected by large number of diseases, among which powdery mildew caused by *Erysiphe polygoni* is economically important. Integration of several disease control tools is a logical solution to the problem, which has not been evaluated earlier.

The field experiments were carried out during 2004–08 (rabi) at Indira Gandhi Krishi Vishwavidyalaya, Regional Agricultural Research Station, Raigarh (Chhattisgarh). The trial was laid in a randomized block design in 4.0 m × 2.7 m plot size with 30 cm × 10 cm spacing and all the recommended package of practices were followed. There were seven treatments namely T₁- soil solarization + soil application of *Trichoderma viride* (1 kg plot⁻¹) + spray with tridemorph 0.1% at 60 days after sowing (DAS), T₂- seed treatment with *Pseudomonas fluorescens* (Pf) (IISR-6) + spray with Pf (IISR-6) 10⁸ cfu at 60 DAS, T₃- soil application of *Bacillus subtilis*

(Bs) 10⁸ cfu + spray with Bs at 60 DAS, T₄- seed treatment and soil drench with tridemorph 0.1% + spray with tridemorph 0.1% at 60 DAS, T₅- carbendazim as soil drench and spray 0.1% at 60 DAS, T₆- spray with wettable sulphur 0.2% at 60 DAS and T₇- control (untreated). For soil solarization, the moist plot was covered with white polythene sheet (200 gauge) and solarized for 15 days (Lodha 1989). *Trichoderma viride* was procured from Indira Gandhi Krishi Vishwavidyalaya, Thakur Chedi Lal Baristar College of Agriculture and Research Centre, Bilaspur (Chhattisgarh); *Pseudomonas fluorescens* (IISR-6) was procured from Indian Institute of Spices Reserach, Kozhikode (Kerala) and *Bacillus subtilis* was procured from Project Directorate of Biological Control, Bengaluru and multiplied on Kings' B and nutrient agar medium, respectively. Talc based formulation were prepared for application of bio-agents; 5 g bioagent l⁻¹ of water was used for spraying

Table 1. Effect of biological agents and fungicides on powdery mildew of coriander (pooled data of 4 years)

	Treatment	Disease intensity (%)	Seed yield (kg ha ⁻¹)	B:C ratio
T ₁	Soil solarization + Soil application of <i>Trichoderma</i> (1 kg plot ⁻¹) + Spray with tridemorph (calixin) 0.1% 60 DAS.	29.37	710	1.82
T ₂	Seed treatment with <i>Pseudomonas fluorescens</i> (Pf) (IISR-6) + Spray with Pf (IISR-6) 10 ⁸ cfu 60 DAS.	62.83	430	1.11
T ₃	Soil application of <i>Bacillus subtilis</i> (Bs) 10 ⁸ cfu + Spray with Bs 60 DAS.	61.21	400	1.03
T ₄	Seed treatment, soil drench with tridemorph 0.1% + Spray with tridemorph 0.1% 60 DAS.	30.66	670	1.72
T ₅	Carbendazim as soil drench and spray (0.1%) 60 DAS.	20.62	810	2.06
T ₆	Wettable sulphur as spray (0.2%) 60 DAS.	20.61	800	2.08
T ₇	Control (untreated).	73.61	303	0.78
	CD (P=0.05)	7.72	68.95	-

Average price of coriander=70 Rs. kg⁻¹; DAS= days after sowing

and the same dose was used for 1 kg of seed. Per cent disease index was calculated by the formula given by Wheeler (1969). Local variety of coriander was used in the study. Twenty plants were randomly selected in treated and untreated plots (control plot) in each replication for recording disease severity. Procedure for grading disease severity of powdery mildew were as follows: 0-healthy, 1-white small growth on leaf, 2-white growth covering the entire leaf, 3-white growth on leaf and stem, 4-white growth on leaf, stem and umbel/pods (Anonymous 2004). Observations on disease intensity (DI) were taken 15 days after spraying. On the basis of DI, per cent DI was calculated and then pooled data was analysed on the basis of four years of DI and yield. The benefit:cost ratio of each treatment was calculated.

Carbendazim (0.1%) as soil drench and spray (T₅) and wettable sulphur (0.2%) as spray (T₆) were significantly superior compared to other treatments with regard to DI (20.62% and 20.61%) and yield (810 and 800 kg ha⁻¹ respectively). Adiver & Rajanna (1991) and Ali *et al.* (1999) had also reported that sulphur fungicides were effective against powdery mildew of coriander. Bioagents were less

effective than chemicals but significantly reduced the disease as compared to control. Cost:benefit ratio (2.08) was highest in the spray of wettable sulphur 0.2% at 60 DAS followed by 2.06 with carbendazim as soil drench and spray 0.1% at 60 DAS.

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