



Studies on management of powdery mildew in coriander using new generation fungicides

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Abstract

Coriander is an important spice crop, affected by powdery mildew caused by *Erysiphe polygoni*. The present study was conducted to test the efficacy of new generation fungicides *i.e.*, azole compounds for the management of powdery mildew in coriander. Two sprays of propiconazole (0.15%) at 15 days interval *i.e.* on 30 and 45 days after sowing (DAS) were found to be effective in reducing powdery mildew incidence, which also recorded the highest seed yield.

Keywords: coriander, powdery mildew, fungicides, yield

Coriander (*Coriandrum sativum* L.) is an important spice which is widely used as foliage and seed. In India, it is cultivated in Rajasthan, Gujarat, Chhattisgarh, Andhra Pradesh and Tamil Nadu. Incidence of pests and diseases are the major limiting factor in the cultivation of coriander. Among the diseases, powdery mildew is one of the important disease which causes heavy yield loss in the field. Chemical control is reported to be the effective method for the management of powdery mildew (Adiver & Rajanna 1991; Ali *et al.* 1999). Traditionally, wettable sulphur is recommended for the management of powdery mildew. With a view to find out an alternative chemical, six new generation fungicides were tested for their efficacy against powdery mildew of coriander in this study.

Two experimental trials were conducted during 2014–15 and 2015–16 at Orchard farm, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore (Longitude 77° E : Latitude 11° N: MSL- 426.72 m) during *Rabi* season. Seeds of the variety Co (Cr 4) were used for sowing at 30 × 10 cm spacing and the plots were laid out in Randomised Block Design (RBD) with three replications.

The fungicides were sprayed at 30 and 45 days after sowing (DAS) and the incidence of powdery mildew was recorded on 60 DAS (15 days after second spray) *i.e.* at seed setting stage. The disease scoring was done using 0-4 scale (Anon 2004).

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- 0.0 - healthy
- 1.0 - whitish small spots on leaf
- 2.0 - whitish growth covering entire leaf
- 3.0 - growth on leaf and stem
- 4.0 - growth on leaf, stem and umbel

The percent disease index (PDI) was calculated according to the formula suggested by Datar & Mayee (1981).

$$\text{PDI} = \left[\frac{\text{Total grade}}{\text{Maximum grade}} \right] \times \left[\frac{100}{\text{No. of leaves scored}} \right]$$

Observations were also recorded on seed germination, plant height and seed yield.

The results of field trial conducted during 2014–15 indicated that, in all the treatments seed germination varied from 78.33% to 83.67%. Among the fungicides tested, propiconazole (0.15%) effectively controlled powdery mildew. The incidence in propiconazole sprayed plants was (5.14%) followed by tebuconazole, difenconazole (11.67%), while in control the incidence was 91.55%. The plant height was 50.97 cm in propiconazole sprayed plants. This treatment also recorded highest yield of 663.33 kg ha⁻¹, while in control the yield was 556.11 kg ha⁻¹ (Table 1).

The results of field trial conducted during 2015–16 indicated that, in all treatments seed germination ranged between 80.20% to 86.70%. Among the fungicides tested, propiconazole (0.15%) effectively reduced the powdery mildew incidence. The incidence in propiconazole sprayed plot was 4.26% followed by tebuconazole (7.60%), while in control the incidence was 83.2%. The plant height was 51.3 cm in propiconazole sprayed plants, which also recorded highest yield of 885.8 kg ha⁻¹, compared to control (721.7 kg ha⁻¹) (Table 2).

The pooled mean of two years trial indicated that, spraying propiconazole (0.15%) at 30 and 45 DAS was highly effective in reducing the powdery mildew incidence (4.7%), while in control the incidence was 87.37%. This treatment also recorded higher seed yield of 774.5 kg ha⁻¹ as against 638.9 kg in control (Table 3).

In the present study, spraying propiconazole (0.15%) was found to be effective in reducing the incidence of powdery mildew. Similar results were also recorded by Singh (2006), who reported spraying azole compounds were effective in reducing powdery mildew incidence in coriander. The efficacy of propiconazole

Table 1. Effect of new generation fungicides on the incidence of powdery mildew (Rabi, 2014-15)

Treatments	Germination (%)	Plant height (cm)	Powdery mildew incidence (PDI)	Seed yield plot ⁻¹ (g) (6 m ²)	Seed yield (kg ha ⁻¹)
FS* with tebuconazole (0.15%)	78.33	50.37	11.67	233.67	389.44
FS with propiconazole (0.15 %)	79.67	50.97	5.14	398.00	663.33
FS with azoxystrobin (0.15%)	83.33	43.30	11.67	290.66	484.44
FS with difenconazole (0.05%)	79.67	50.23	13.34	237.68	396.11
FS with wettable sulphur (0.25%)	81.67	48.50	43.44	204.00	340.00
FS with calyxin (0.1%)	83.33	50.83	12.57	336.68	561.11
Control	83.67	43.63	91.55	333.67	556.11
SEd	1.55	1.74	2.73	24.49	-
CD (P<0.05)	3.39	3.78	5.94	53.29	-
CV (%)	2.95	4.40	8.32	-	-

*FS- Foliar spray

Table 2. Effect of new generation fungicides on the incidence of powdery mildew (Rabi, 2015-16)

Treatments	Germination (%)	Plant height (cm)	Powdery mildew incidence (PDI)	Seed yield plot ⁻¹ (g) (4 m ²)	Seed yield (kg ha ⁻¹)
FS* with tebuconazole (0.15%)	82.3	50.8	7.60	296.7	739.2
FS with propiconazole (0.15 %)	83.0	51.3	4.26	354.3	885.8
FS with azoxystrobin (0.15%)	86.4	49.2	8.43	341.3	853.3
FS with difenconazole (0.05%)	80.2	50.6	8.57	308.3	770.8
FS with wettable sulphur (0.25%)	86.7	50.4	9.27	312.7	781.7
FS with calyxin (0.1%)	81.6	50.1	10.86	320.3	800.8
Control	85.7	43.8	83.2	288.7	721.7
SEd	1.95	0.76	1.07	11.08	-
CD (P<0.05)	4.26	1.66	2.34	24.14	-
CV (%)	2.86	1.89	6.34	4.28	-

*FS- Foliar spray

Table 3. Effect of new generation fungicides on the incidence of powdery mildew (Pooled mean of 2014-15 & 2015-16)

Treatments	Germination (%)	Plant height (cm)	Powdery mildew incidence (PDI)	Seed yield (kg ha ⁻¹)
FS* with tebuconazole (0.15%)	80.32	50.585	9.64	564.32
FS with propiconazole (0.15 %)	81.34	51.135	4.70	774.565
FS with azoxystrobin (0.15%)	84.87	46.25	10.05	668.87
FS with difenconazole (0.05%)	79.94	50.415	10.96	583.455
FS with wettable sulphur (0.25%)	84.19	49.45	26.36	560.85
FS with calyxin (0.1%)	82.47	50.465	11.72	680.955
Control	84.69	43.715	87.38	638.905
SEd	1.752	1.25105	1.905	-
CD (P<0.05)	80.32	50.585	9.635	564.32
CV (%)	81.34	51.135	4.7	774.565

*FS- Foliar spray

against powdery mildew was also reported in chilli (Sharmila *et al.* 2004) and in okra (Vijaya 2004).

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