



E-ISSN: 2278-4136

P-ISSN: 2349-8234

www.phytojournal.com

JPP 2020; 9(3): 1228-1229

Received: 21-03-2020

Accepted: 23-04-2020

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Assessment of yield losses in cultivars against powdery mildew disease (*Erysiphe polygoni* DC) of coriander (*Coriandrum sativum* L.)

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Abstract

Coriander (*Coriandrum sativum* L.) is one of the most important spice crops in India. The major constraints for low productivity are several biotic stresses. The powdery mildew disease caused by *Erysiphe polygoni* DC is one of the most destructive diseases of coriander causing severe losses yield in India. In present investigation, the assessment of yield losses due to *Erysiphe polygoni* was carried out in a spray schedule trial, in which losses in yield and intensity of disease were estimated. The corresponding yield was worked out further a regression equation was developed to predict the losses due to unit increase in diseases intensity A highly significant and negative correlation ($r = -0.99^{**}$) was obtained in between the disease intensity and yield, indicates that yield of coriander gradually decreases with the corresponding increase in the diseases intensity.

Keywords: Coriander, *Erysiphe polygoni*, powdery mildew, fungicides

Introduction

The coriander (*Coriandrum sativum* L.) is an important spice crop of India and its seeds (Fruits) and leaves are extensively used. Coriander (*Coriandrum sativum* L.) belongs to family Umbelliferae (Apiaceae) and is believed to be native of the Eastern Mediterranean region and Southern Europe. It is an aromatic annual herb of 1-2 ft. height having diploid chromosome ($2n=22$). India is one of the largest producer, consumer and exporter of seed spices (Peter *et al.*, 2000). Coriander is being used as natural additives in cooking added to food in order to improve its appearance, flavour, texture as well as appetite. The pleasant aroma is due to an essential element called at d-Linalol or coriandral. The essential oil content ranges from 0.1 to 1.3 percent in dry seeds. Besides essential oil, the seeds of coriander contain 18- 21 percent fatty oils which are used in the cosmetic industries. Coriander (*Coriandrum sativum* L.) grown in different countries such as India, USSR, Mexico, Poland, Hungary, U.S.A. The major coriander growing states are Rajasthan, Madhya Pradesh, Andhra Pradesh, Gujarat and Tamil Nadu, In Madhya Pradesh Several coriander cultivars are grown but the common ones are UD-1, CS-2, UD-2, UD-373 UD-436, CS-4, CS-208, G-5365 and R C R-41. Madhya Pradesh alone accounts an area of 37147 hectares with the average production of 9374 metric tons in 2002-2003. In M.P., coriander is grown in Gwalior, Guna, Indore and Mandasaur districts. The coriander crop suffers from different diseases which is one of the limiting factors in its production. Out of these some common fungal diseases are stem gal (*Protomyces macrosporus*), powdery mildew (*Erysiphe polygoni* DC), wilt (*Fusarium oxysporum* f.sp. *coriandrii*), stem rot (*Rhizoctonia* spp.) and blight (*Alternaria* spp.). Out of these powdery mildew is a very destructive disease and cause losses by deteriorating the quality of the seed and reducing the yield. It is observed that once the parasite establishes itself in the field it takes quits a heavy toll from year to year. Coriander crop is affected by number of diseases, out of which powdery mildew caused by *Erysiphe polygoni* L. is one of the most important disease (Dange *et al.*, 1992) ^[1]

Methodology**Assessment of Losses in Yield Field Trail**

Powdery mildew of coriander caused by *Erysiphe polygoni* has been considered causing heavy losses. No systematic studies have been made to determine yield losses caused by this disease in northern Madhya Pradesh (Gwalior Division). Therefore, a field experiment was carried out to determine the assessment of losses in yield due to powdery mildew in local susceptible variety. The present investigations were undertaken at the research farm, College of

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Agriculture, Gwalior (M.P.) during 2003-04 of powdery mildew of coriander to examine the local variety was sown, Design was randomized block design (RBD) replicated four times, in plot size 2×2m with 25cm row to row and 10cm plant to plant distance. The Wettable Sulphur was sprayed at 10 days intervals starting from the appearance of symptoms on stem and leaves till maturity of the crops. The unsprayed plot was maintained as control. Twenty five plants from each plot were tagged and the diseases intensity was record on the tagged plants. At the time of harvesting the yield of twenty five plants were recorded separately. The correlation between the diseases intensity and yield was worked out.

Results and Discussion

Assessment of yield losses

Spray schedule trial was carry out to obtain different degree of disease intensity and then the correlation between the diseases intensity with the corresponding yield was worked out further a regression equation was developed to predict the losses due to unit increase in diseases intensity (Table 1.1). A highly significant and negative correlation ($r = -0.99^{**}$) was obtained in between the disease intensity and yield, indicates that yield of coriander gradually decreases with the corresponding increase in the diseases intensity. The regression equation $y = 8.862 - 0.064x$ indicates that with one

unit increase in the diseases intensity the yield would decrease by 6.4 kg per hectare.

Total number of plants in hectare will be four lakhs under the specified row (25cm) and plant to plant (10cm) distance. Factor for the conversion of yield (q/ha) from the yield obtained by 25 plants. $4,00,000/25=16,000$. In present investigation, the assessment of yield losses due to *Erysiphe polygoni* was carried out in a spray schedule trial, in which losses in yield and intensity of disease were estimated. Shrivastava *et al.* (1971)^[8] also reported 15-20 per cent losses in the yield of coriander due to powdery mildew.

Table 1: Correlation coefficient between diseases index and yield

| S. no. | Particulars | Disease intensity | Yield of tagged 25 plants in gm | Yield (q/ha) |
|--------|-------------|-------------------|---------------------------------|--------------|
| 1. | One Spray | 52.64 | 35 | 5.6 |
| 2. | Two Spray | 42.79 | 36 | 5.9 |
| 3. | Three Spray | 35.42 | 41 | 6.7 |
| 4. | Four Spray | 21.43 | 48 | 7.8 |
| 5. | Five Spray | 10.85 | 50 | 8.1 |
| 6. | Six Spray | 7.13 | 51 | 8.3 |
| 7. | Seven Spray | 5.32 | 53 | 8.5 |
| 8. | Control | 53.39 | 33 | 5.4 |

Correlation coefficient $r = (x, y) = -0.99^{**}$

Regression line $y = 8.862 - 0.064x$

** Significant at 1% level

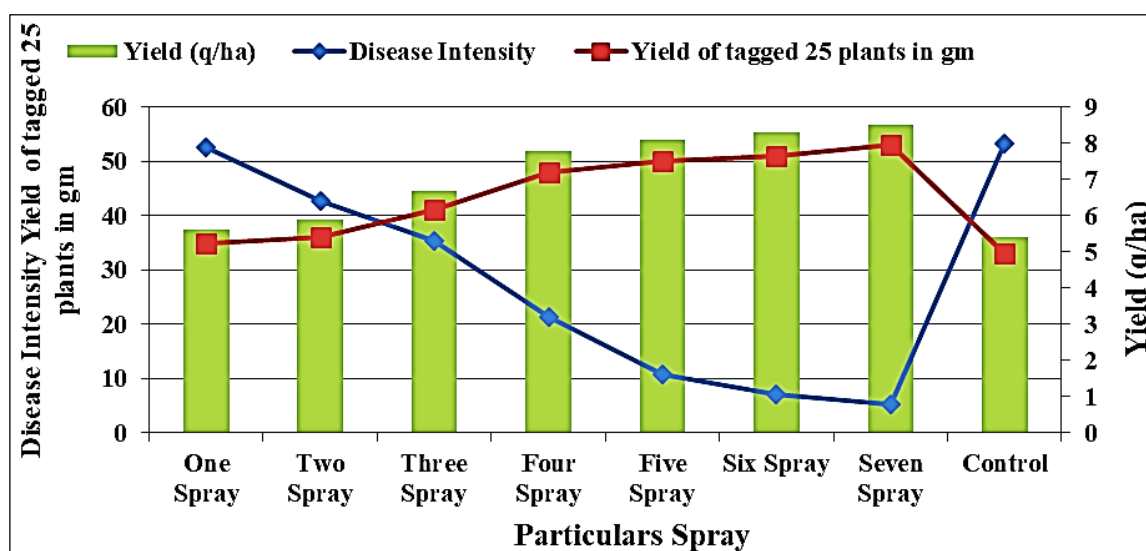


Fig 2: Evaluation of cultivars for resistance against powdery mildew

Conclusion

The corresponding yield was worked out further a regression equation was developed to predict the losses due to unit increase in diseases intensity A highly significant and negative correlation ($r = -0.99^{**}$) was obtained in between the disease intensity and yield, indicates that yield of coriander gradually decreases with the corresponding increase in the diseases intensity.

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