

Yield losses due to powdery mildew disease in fenugreek (*Trigonella foenum-graecum* L.)

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Abstract

A field experiment was conducted at Hisar during winter (*rabi*) of 1998-99 and 1999-2000 to assess the reduction in growth and yield parameters of two susceptible fenugreek (*Trigonella foenum-graecum* L.) varieties (HM 65 and T 8) due to powdery mildew disease caused by *Erysiphe polygoni* DC. and *Leveillula taurica* (Lev.) Arnaud. The disease had no significant effect on plant height and number of branches even at more than 80 per cent disease intensity. However, more than 60 per cent disease intensity significantly reduced the number of pods per plant, number of seeds per pod and test weight. Reductions of 22.8-25.6, 16.2-18.8 and 14.3-17.2 per cent pods per plant, seeds per pod and test weight, respectively were recorded in both the varieties when disease intensity was more than 80 per cent.

Key words: *Erysiphe polygoni*, fenugreek, *Leveillula taurica*, powdery mildew, *Trigonella foenum-graecum*, yield loss.

Fenugreek (*Trigonella foenum-graecum* L.), popularly known as *methi/metha* is an important legume with multifarious uses. It is grown for seed, leafy vegetable and also for fodder. It has good medicinal values (Kirtikar & Basu 1975) and is used against the digestive disorders (Sharma *et al.* 1991). The productivity of fenugreek in our country is low due to its cultivation under rainfed, marginal and sub-marginal lands and also due to various diseases. Powdery mildew disease caused by *Erysiphe polygoni* DC. and *Leveillula taurica* (Lev.) Arnaud is the most destructive disease of fenugreek which causes damage to all above ground plant parts. The losses in seed yield may go up to 50 per cent (Anonymous

1990). In Haryana, the disease generally appears during first fortnight of February and becomes serious by second week of March, when the environmental conditions are favorable for the pathogen. Early sown varieties escape the infection (Sharma 1999), while late sown and late maturing varieties are affected by the disease. Although the disease can be managed by the use of fungicides (Rathore & Rathore 1995), their effectiveness and economics can be judged only after assessing the precise yield losses due to this disease. The present study was undertaken to assess the yield losses in fenugreek due to powdery mildew disease at varying disease intensities.

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Two susceptible fenugreek varieties (HM 65 and T 8) were sown in the last week of November in plots (size 3x4 m) in a randomized block design with two treatments and four replications during 1998-99 and 1999-2000 at CCS Haryana Agricultural University, Hisar. In one treatment, the plants of both the varieties were kept disease free by spraying Karathane EC @ 0.1%, thrice at an interval of 15 days starting from the initiation of disease symptoms. While in another treatment, plants of both the varieties were not sprayed with fungicide and were exposed to disease under natural field conditions. At the time of maturity, twenty plants each with different disease intensity as per the scale (Rathi & Tripathi 1994) mentioned below were selected from each replication.

Scale	Disease intensity
0 :	00-05%
1 :	06-20%
2 :	21-40%
3 :	41-60%
4 :	61-80%
5 :	> 80%

Disease free plants of 0 scale were selected from the treatment where Karathane was sprayed, while the plants with different disease intensity were selected from unpro-

tested treatment. Observations on plant height, number of branches per plant, number of pods per plant, number of seeds per pod and 1000 seed weight were recorded for these selected plants.

Powdery mildew disease had a non-significant effect on plant height and number of branches per plant even at the highest disease intensity of 5 (>80%). The plant height varied from 46.3 cm to 42.7 cm in the variety HM 65 while in T8 the height varied from 45.2 cm to 41.3 cm. Similarly the maximum reductions in number of branches were 4.5% and 3.6% in varieties HM 65 and T8, respectively. Rathi & Tripathi (1994) also recorded similar observations on the effect of powdery mildew disease on plant height and primary branches in peas. While, Nawaz & Narayanaswamy (1983) observed significant reduction in shoot length and plant growth due to powdery mildew in black gram under artificial inoculation conditions. The disease usually starts appearing at that time of flowering in fenugreek at Hisar, and by that time the plant completes its vegetative growth stage. If the disease occurred at seedling stage, it might have influenced the plant height and number of branches. Reductions in various yield parameters namely, number of pods per plant, number of seeds per pod and test weight were found directly proportional to the disease intensity (Table 1). More than 60 per cent disease intensity significantly reduced all these

Table 1. Effect of powdery mildew disease on yield parameters of two fenugreek varieties

Disease intensity (%)	No. of pods plant ⁻¹		No. of seeds pod ⁻¹		Test weight (g)	
	HM 65	T 8	HM 65	T 8	HM 65	T 8
0-5	37.3	31.6	14.9	13.6	12.2	11.2
6-20	35.3 (5.4)	30.4 (3.8)	14.6 (2.0)	13.3 (2.0)	12.0 (1.6)	10.9 (2.7)
21-40	33.6 (9.9)	28.5 (9.8)	14.4 (3.3)	12.8 (5.9)	11.6 (4.9)	10.7 (4.5)
41-60	31.7 (15.0)	25.6 (19.0)	13.4 (10.1)	12.0 (11.7)	10.7 (12.3)	10.1 (9.8)
61-80	30.3 (18.8)	25.2 (20.2)	12.7 (14.7)	11.8 (13.2)	10.4 (14.7)	9.8 (12.5)
> 80	28.8 (22.8)	23.5 (25.6)	12.1 (18.8)	11.4 (16.2)	10.1 (17.2)	9.6 (14.3)
SEm+	1.5	1.7	0.7	0.6	0.5	0.5
CD (5%)	4.5	5.3	2.0	1.8	1.6	1.4

All the figures are averages of two years data. Values in parenthesis are per cent reduction

yield parameters. Reductions of 22.8 and 25.6% in number of pods per plant, 16.2 and 18.8% in number of seeds per pod and 14.3 and 17.2% in test weight were recorded in variety HM 65 and T 8, respectively, at high disease of intensity (>80%) (Table 1). Losses in seed yields up to 50 % in fenugreek was also reported (Anonymous 1990). Significant differences in the number of seeds and pods due to this disease have also been observed in peas (Rathi & Tripathi 1994). Authors observed that reduction in all the yield contributing parameters was due to appearance of the disease in severe form at flowering and/or pod initiation stage. If the plants escape infection at this stage, better yields can be obtained.

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