



SHORT COMMUNICATION

Disease management of foot-rot disease of fenugreek caused by *Fusarium moniliforme* through late sowing practice in Bareilly

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ABSTRACT

Soil borne fungal diseases are effectively controlled by cultural practices. Effect of sowing period on diseases incidence of foot rot of fenugreek was studied in field crops for two consecutive years i.e. 2007-08 and 2008-09 in Bareilly. Three popular varieties of fenugreek (*Trigonella foenum-graecum* Linn.) were sown at five different dates after 15 days interval starting from 20th Sept. upto 20th Nov. in five selected localities. The occurrence of foot rot caused by *Fusarium moniliforme* was recorded on 18, 21, 24, 27 and 30th days after sowing dates. A variable range of disease incidence was recorded on all the three varieties. Deshi methi was most susceptible to the disease showing maximum disease incidence (21-46%) followed by Pusa early bunching and pusa kasuri (17-43 & 8-23%). The crops of all the three varieties which were sown earliest in the season i.e. on 20th Sept., showed maximum disease incidence (23-46%) while the crops sown on 20th Nov. showed minimum occurrence of the disease (8-21%). Invariably a marked gradual decrease of disease incidence in late sown crops can be attributed to the gradual fall of temperature and soil moisture contents from Sept. – Nov. each year. Late sowing of fenugreek in Nov. is recommended to prevent the loss from foot rot.

KEYWORDS: Fenugreek, *Fusarium moniliforme*, foot rot

INTRODUCTION

Foot rot disease caused by *Fusarium moniliforme* of fenugreek (*Trigonella foenum-graecum* Linn) is one of the important diseases resulting the heavy losses in Rohilkhand. Bareilly is one of the chief production centre of crop, facilitating the bulk supply to Uttaranchal and nearby states. The production of fenugreek is hampered by foot-rot disease. The fungus is soil borne and all parts of fenugreek are prone to infection. This fungus poses a serious threat to this crop in Tarai region. The attempts have been made to control the disease by cultural practices [1], biocontrol method [2], chemical control [3] and soil amendments with oil cakes, vermicomposed and FYM [4]. However, the effect of sowing period on the severity of disease has not been qualified in Indian condition particularly in foot hill areas. The cultivation of crop is usually done in September. The slight alteration in sowing period can be helpful in minimizing the disease incidence. Therefore the present investigation was undertaken to find out a suitable sowing period which lowers the disease incidence. For this purpose, three population varieties of fenugreek were used. The influence of late sowing practices minimizing the disease has been elucidated in this work.

MATERIALS AND METHODS

Soil borne fungal disease of foot-rot of fenugreek (*Trigonella foenum-graecum* Linn) was studied in field crops for two consecutive years i.e. 2007-08 and 2008-09 in Bareilly. The seed samples of fenugreek varieties viz. Deshi methi, Pusa early bunching and Pusa kasuri were taken for this study. The seed sowing was done on five different dates after 15 days interval starting from 20th Sept. upto 20th Nov. by randomized design in five selective localities of Bareilly viz. Nariyaval, Lal Phatak, City Shamshanbhoomi, Chhoti Bihar and Bareilly College, Bareilly. The disease intensity was recorded in each locality with the help of quadrates (1m x 1m). In each locality 10 quadrates were laid randomly and 100 random sampled plants from each quadrate were examined. The percent disease incidence (PDI) was calculated as under:

$$\text{Disease incidence \%} = \frac{\text{No. of infected plants}}{\text{Total no. of plants studies}} \times 100$$

The severity of foot-rot disease was recorded on five dates. After sowing in all the sowing dates and varieties. Average disease incidences for each field were calculated. To confirm the presence of *Fusarium moniliforme* pieces of sumptomatic root-tissue were placed on PDA and blotter paper. The growth of pathogen was checked after 5-8days with the help of trinocular research microscope (Olympus BHTU-312).

RESULTS AND DISCUSSION

The foot-rot disease of fenugreek (*Trigonella foenum-graecum* Linn.) was found in all experimental fields selected for the study in Rohilkhand. The occurrence of disease incidence in selected five localities were 37%, 31%, 26%, 21% and 15% which were sown at 20th Sept., 5 Oct., 20th Oct., 5 Nov. and 20th Nov. respectively (Table 1). A marked gradual decrease in occurrence of disease is significant related with respect to sowing dates and varieties of fenugreek (Desi methi, Pusa early bunching and Pusa Kasuri). Desi methi was most susceptible to the disease showing maximum foot-rot disease incidence 34% followed by pusa early bunching 29% and Pusa kasuri 15%. *Fusarium moniliforme* was isolated most frequently from root-rot infected plants in the early stage of plant growth. The fungus is also a major component of foot-rot disease in crops studied by [5]. *Fusarium* sp. Is a soil borne pathogen producing either a toxic metabolic or parasitizing hyphas of pathogenic fungi. The observed suppression of disease symptoms in fenugreek can be attributed to various factors when the soil is poorly drained and cold.

Table 1 Effect of sowing dates on percentage occurrence of foot rot disease caused by *Fugarium-moniliforme* in fenugreek varieties

Sowing date	Varieties			Mean
	Desi methi	Pusa early bunching	Pusa kasuri	
20 Sept.	46	43	23	37.3
5 Oct.	41	35	18	31.3
20 Oct.	35	29	13	25.6
5 Nov.	28	24	11	21.0
20 Nov.	21	17	8	15.3
Mean	34.2	29.6	14.6	

Effect of sowing dates and varieties of fenugreek on foot-rot development

Meteorological observation (Table 2) indicates that the min. /max atmospheric temperature and relative humidity play an important role in the development of foot-rot disease. The appearance of root-rot disease was noticed at 18, 21, 24, and 27 and 30 days after sowing in I, II, III, IV and V dates sown crop respectively. On 20th September the disease showed maximum incidence (23-46%) when the min. and max. temperature were 27.5°C & 34°C and relative humidity was 81.5% while the crop shown on the 20th Nov. min. disease incidence (8-21%) when the min. and max. temperature were 17°C & 31°C and relative humidity was 73%. However, the incidence of *Fusarium moniliforme* was favoured by min. and max. temperature ranging from 27.5°C & 34°C and relative humidity 81.5%. The minimum disease incidence was noted in late sown crop on 20th Nov. due to gradual fall of temperature i.e. ranging from 17°C & 31°C and 73% relatives humidity

Table 2 Effect of dates of sowing on foot-rot incidence and weather parameters

Date of sowing	Occurrence after days	Min. temp. °C	Max. temp. °C	Relative humidity %
20 Sept.	18	27.5	34.0	81.5
5 Oct.	21	25.5	34.5	77.5
20 Oct.	24	20.0	33.0	75.5
5 Nov.	27	18.0	33.5	74.0
20 Nov.	30	17.0	31.0	73.0

A variable range of disease incidence was recorded on all the varieties of fenugreek. Deshi methi was most susceptible to the foot-rot disease showing maximum disease incidence (46%) followed by pusa early bunching and pusa kasuri (43% and 23%) respectively. The maximum disease incidence occurred at 18 days after sown crops on 20th Sept., while the crop sown on 20th Nov. minimum disease incidence (21%) on deshi methi followed by pusa early bunching and pusa kasuri (17% and 8%) at 30 days after sowing crop. Deshi methi most susceptible to the foot-rot disease incidences as it showed maximum ranged of disease occurred (21%-46%) followed by P.E.B. and P.K. (17%-43% and 8%-23%). The study indicates that the suitable sowing time of crops of fenugreek in Nov. is recommended to prevent the loss from foot-rot disease.

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