

Variability in Fenugreek (*Trigonella foenumgraecum* L.) Accessions Grown in Ethiopia

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Abstract

Fenugreek (*Trigonella foenumgraecum* L.) is among the leafy leguminous crop cultivated in Ethiopia as a condiment and for income generation purposes. Despite the importance of this crop the country's economy less consideration was being given to its research. As a result, there is great gap in knowledge regarding the variation of its yield and yield components. To fulfill the gap existing in its variability, forty six accessions of Fenugreek were evaluated at Sinana Agricultural Research Center during 2012. The accessions showed the highest variability for number of pods per plant with a variance of 97.96. Next to the number of pods per plant, plant height showed large variation. Low variability was recorded for number of seeds per pod, number of secondary branches per plant, seed length (cm) and number of primary branches per plant in their respective order of variability.

Keywords: Fenugreek; Accessions; Variation and yield components

Introduction

Fenugreek (*Trigonella foenum-graecum* L.) is an annual leguminous crop cultivated for its seeds as condiment and for their leaves as feed for animals. The crop is well known for having great medicinal values and plentiful pharmacological properties. It is also recommended for incorporation into crop rotation and for hay and silage making [1]. Moreover, it is well known for having the ability of building the soil fertility due to its ability of fixation of atmospheric nitrogen.

In Ethiopia, Fenugreek is one of the seed condiments grown for income generation and for flavoring purposes in solo or being intercropped with other crops [2]. The crop has been under research for the improvement of both quality and quantity to fill the existing gap in improved varieties.

The existence of sufficient level of genetic variability is essential and a requirement for the breeding program to be successful. Moreover, knowledge of the extent and pattern of the existing variability in a population of the concerned crop is certainly essential to further improve the crop [3]. Knowledge on variability is of fenugreek is limited and/or absent in spite of its importance and long history of cultivation in Ethiopia. This might be due to its neglect in the research system of the country in the past. This study was, therefore, designed to assess the variation that exists in Fenugreek accessions for some important yield components.

Materials and Methods

Forty six accessions of Fenugreek collected from potential growing areas of Arsi-Bale were assessed for the variation of yield components at Sinana Agricultural Research Center during 2012. A plot area of 2.4 m² was used to sow the accessions. The plants were planted in four rows with intra row spacing of 30 cm and a row length 2 meter. For the management of the experimental field three times weeding without any fertilizer and chemical application practice was followed.

Data collection and analysis

Data collection on the traits under study was carried out on five plants randomly selected from the middle rows in each replication at harvest. The analysis was carried out on the average values of the traits. The traits used in this study are the following:

Plant height: Plant height was recorded in centimeter from the ground level to the tip of the last pod on the main stem.

Number of primary branches per plant: the average number of primary branches was counted from the five randomly selected plants.

Number of secondary branches per plant: Average number of secondary branches was counted from the five randomly selected plants.

Number of pods per plant: Average number of pods counted from the five randomly selected plants.

Number of seeds per pod: The number seeds from the five randomly selected plants were counted and divided by the number of pods from the five plants to obtain the average number of seeds per pod.

Pod length (in centimeter): was measured from the five randomly selected pods. Variability among accessions was estimated using range and variance. Data analysis was made on the average value of each trait collected from the five randomly selected plants using SPSS software version 20 [4].

Results and Discussion

The result of the analysis was indicated in Table 1. The accessions showed the largest variation with respect to the number of pods per plant that ranged from 67.60 to 21.60 with a mean of 37.69 and variance of 97.96. The next variable trait was plant height that ranged from 64.80 to 40.80 with a mean of 24 and a variance of 27.40. Number of seeds per pod, number of secondary branches per plant, seed length and number of primary branches showed less variability with a variance of 1.31, 0.86, 0.47 and 0.17 in their respective order of decreasing variability.

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Traits	Range	Minimum	Maximum	Mean	Variance
Plant height	24.00	40.80	64.80	51.24	27.40
Number of Primary Branches per plant	1.80	3.00	4.80	3.87	0.17
Number of Secondary Branches per plant	3.40	0.20	3.60	1.57	0.86
Number of pods per plant	46.00	21.60	67.60	37.69	97.96
Seeds per pod	5.04	8.12	13.16	10.47	1.31
Pod length (cm)	3.23	8.71	11.94	10.11	0.47

Table 1: Mean and variation of yield component traits of 46 Fenugreek accessions.

Number of primary and secondary branches per plant ranged from 4.80 to 3.00 and 3.60 to 0.20 with a variance of 0.17 and 0.86 respectively. On the other hand, number of pods per plant and seed length (cm) ranged from 13.16 to 8.12 and 11.94 to 8.71 with a mean (10.47, 10.11) and variance of 10.47 and 10.11 respectively. The present result is in agreement with the work of Dashora et al. [5] who found that there was high range of variation for plant height and pods per plant.

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