

Varietal performance of fenugreek under Akola conditions

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ABSTRACT

The varietal performance of fenugreek under Akola conditions was studied at the Department of Horticulture during 2014. Seven cultivars viz., Hisar Sonali, Hisar Madhavi, Hisar Suvarna, Hisar Mukta, Pant Ragini, Rajendra Kranti and Pusa Early bunching were evaluated for growth yield and quality parameters. The varieties showed significant variation in all aspect. The cultivar Hisar Suvarna took minimum days for seed germination, Hisar Sonali gave better growth performance in respect of plant height, number of branches and also found superior in respect of green leaf yield and fresh weight. Similarly in leaf quality attributes, Hisar Sonali had maximum leaf chlorophyll content while iron content was found maximum in Rajendra Kranti but maximum moisture content was recorded in Pant Ragini. The green leaf yield exhibited positive correlation with the plant height at 30 DAS, number of branches plant⁻¹ and fresh weight.

Key words: correlation, Fenugreek, green leaf yield, quality,

INTRODUCTION

Fenugreek or methi (*Trigonella foenum-graecum* L.) is an important leafy vegetable which is quite popular in India. It is cultivated as leafy vegetable, condiment and as medicinal plant. It belongs to the family leguminaceae. There are two species viz. *Trigonella foenum-graecum* (common methi) and *Trigonella corniculata* (kasuri methi). India is the largest producer of fenugreek vegetable throughout Karnataka. Rajasthan is considered as “fenugreek bowl” of the country (Anon., 2013). Recently Methi No. 14 and Methi No. 47 are high yielding cultivars released for leaf yield in Maharashtra and there is ample scope for its cultivation (Mini and Krishnakumary, 2004). Being a cool season crop, it is cultivated for leaf purpose throughout the country. As multifarious importance of this crop, every part of its plant is utilized in one or the other forms. The dried leaves and tender shoots are all consumed and are valued as food, flavouring agent and medicine. It is extensively used as fresh leaves (green leafy vegetable), chopped leaves (flavouring agent), sprouts (salad) and micro greens (salad) (Aggarwal *et al.*, 2013). Fenugreek leaves being rich in iron, calcium, protein and vitamins and suggested as iron chelator (Kumar *et al.*, 2010). Vidarbha region has potentiality for the cultivation of fenugreek as vegetable, farmers are growing local types and performance of local types is poor. It may be due to the lack of information about variety best suited under the prevailing agro-climatic conditions. Before recommendation of any variety suitable for the region, it is pertinent to evaluate varieties giving emphasis on the aspect of genotypic suitability and

yield. Considering all above mentioned facts, a pertinent need was felt to undertake an experiment on varietal performance of fenugreek under Akola conditions so as to ascertain and recommend the cultivar best suited for the agro-climatic conditions of Akola.

MATERIAL AND METHODS

A field experiment was laid out during 2014 at experimental field of College of Horticulture (20.7°N latitude, 77.02°E longitude and altitude 307.4MSL). During the experimental period from the January to February the mean maximum temperature ranges from 30.0°C to 31.0°C and 12.0°C to 12.6°C as minimum temperature. While maximum relative humidity 68 per cent and minimum 25 per cent during winter. The soil of the experimental field was well drained with uniform texture and structure. The experiment was laid out in Randomized Block Design with four replications. The plot size measured 1.5 m × 1.1 m and spacing was 15 cm apart in line. Seven cultivars viz., Hisar Sonali, Hisar Madhavi, Hisar Mukta, Hisar Suvarna, Pant Ragini, Rajendra Kranti and Pusa Early bunching were included in the experiment. Well rotten FYM @25 t/ha and NPK @ 20:60:30 kg/ha were applied in the experimental plot. Seeds were sown on 18th January, 2014. Recommended practices were followed to raise healthy crop. Five plants were selected randomly from each replication for recording observations on four growth characters viz., days required for germination, plant height (cm), number of branches per plant, leaf area (cm²), two yield parameters viz., fresh weight (g) and green leaf yield (q/ha) and quality parameters viz., chlorophyll content from

leaves was calculated by using spectrophotometer as suggested by Arnon (1949). Moisture content of fenugreek leaf was measured on electric moisture meter (Shimadzu-Make, electronic moisture balance, MOC-120H) and leaf iron content was estimated by using atomic absorption spectrophotometer, procedure suggested by Wolf (1982). The data were subjected to statistical analysis through Randomized Block Design by using Indian NARS Statistical Computing Portal, IASRI, New Delhi

RESULTS AND DISCUSSION

Performance of any crop in respect of growth, yield and quality is highly influenced by various factors like genetic constitution of variety, micro-climate of the area and crop management. The results obtained from the present investigation on growth parameters exhibited significant difference by all the cultivars. The variety Hisar Suvarna took minimum period for seed germination (3.93 days) followed by Pusa Early Bunching (4.17 days) and Hisar Mukta (4.40 days) whereas; the variety Rajendra Kranti recorded maximum days (5.38 days) for seed germination. All the cultivars showed significant variation in respect of plant height at 15 and 30 days after sowing. Hisar Sonali recorded maximum plant height (8.72 cm and 17.95 cm at 15 and 30 days after sowing), followed by Hisar Madhavi (7.38 cm and 16.98 cm) and Hisar Suvarna (6.18 cm and 16.38 cm) respectively. The maximum numbers of branches were produced by variety Hisar Sonali (5.08) which was found to be *at par* with Pusa Early Bunching (5.05), Hisar Suvarna (4.68) and Rajendra Kranti (4.30) whereas, the minimum number of branches (3.75) were recorded in Hisar Mukta (3.75). The maximum leaf area (12.92 cm²) found in Pant Ragini it was found to be *at par* with Hisar Madhavi (12.28 cm²) and Hisar Suvarna (12.27 cm²) whereas, the minimum leaf area was recorded in Pusa Early Bunching (10.08 cm²). The wide variation in growth parameters of all the cultivars might be due to their genetic makeup, which indirectly govern the morphology of plant. These results are in conformity with the findings of Aggarwal *et al.* (2013) and Datta

and Chaudhari (2005). All the genotypes showed the significant variations in yield attributing characters. In respect to fresh weight, significantly the cultivar Hisar Sonali recorded maximum fresh weight per plant (7.97 g) which was found to be *at par* with Pusa Early Bunching (7.68 g) whereas, the cultivar Pant Ragini recorded minimum fresh weight (5.98 g). The cultivar Hisar Sonali showed significant effect on green leaf yield. The maximum yield (302.63 q/ha) was recorded in the cultivar Hisar Sonali was found to be *at par* with variety Pusa Early Bunching (293.18 q/ha), Hisar Madhavi (279.72 q/ha), Rajendra Kranti (266.36 q/ha) and Hisar Suvarna (255.35 q/ha) whereas, the minimum leaf yield was recorded by Pant Ragini (194.81 q/ha). The variation in yield characters might be due to differences in response of different fenugreek varieties to agro-climatic conditions and different vegetative characters of cultivars might cause the significant difference. Similar results under different set of climatic conditions as influenced by the cultivars of fenugreek were reported by Mandal *et al.* (2013).

The data presented in Table 1 indicates that, there were significant differences in respect of leaf chlorophyll content of different fenugreek varieties. The maximum leaf chlorophyll content (43.73 mg/g) was recorded by the variety Hisar Sonali and found superior over all other cultivars followed by Pusa Early Bunching (42.18 mg/g) and Hisar Suvarna (41.63 mg/g) whereas, the minimum leaf chlorophyll content was observed in Hisar Madhavi (38.48 mg/g). Significantly maximum moisture content was observed in Pant Ragini (84.69 %) which was found *at par* with Pusa Early Bunching (84.43 %) whereas, the minimum moisture content was observed in Rajendra Kranti (81.98 %). Maximum leaf iron content (112.90 ppm) was recorded in cultivar Rajendra Kranti and found *at par* with Hisar Suvarna (110.70 ppm) whereas, the minimum leaf iron content was recorded in Hisar Sonali (102.28 ppm). The variation in quality parameter might be due to varietal characters and genetic inheritance of the fenugreek varieties (Aggarwal, 2013).

Table 1. Performance of different fenugreek varieties in respect to growth, yield and quality parameters.

Treatments	Days required for germination	Plant height (cm)		Number of branches plant ⁻¹	Leaf area (cm ²)	Fresh weight (g)	Green leaf yield (q/ha)	Leaf chlorophyll content (mg/g)	Leaf moisture (%)	Leaf iron content (ppm)
		At 15 DAS	At 30 DAS							
Pant Ragini	5.02	5.38	15.18	3.93	12.92	5.98	194.87	39.48	84.69	106.10
Hisar Suvarna	3.93	6.18	16.38	4.68	12.27	7.28	255.35	41.63	83.97	110.70
Hisar Mukta	4.40	6.10	16.05	3.75	10.43	6.15	234.94	39.60	83.29	109.08
Hisar Sonali	4.52	8.72	17.95	5.08	12.02	7.97	302.63	43.73	82.08	102.28
Hisar Madhavi	4.50	7.38	16.98	4.05	12.28	6.45	279.72	38.48	82.00	108.03
Rajendra Kranti	5.38	6.08	15.97	4.30	11.63	7.08	266.36	38.50	81.98	112.90
Pusa Early Bunching	4.17	5.84	15.99	5.05	10.08	7.68	293.18	42.18	84.43	103.63
SE(M)±	0.05	0.29	0.51	0.28	0.22	0.17	16.40	0.51	0.18	0.58
CD at 5%	0.14	0.85	1.08	0.82	0.66	0.49	48.75	1.53	0.54	1.72

Table 2. Correlation between yield and its contributing characters of fenugreek

	Green leaf yield (q/ha)	Plant height (cm) 30 DAS	Number of branches plant ⁻¹	Leaf area (cm ²)	Fresh weight (g)
Green leaf yield (q/ha)	1				
Plant height (cm) 30 DAS	0.763	1			
Number of branches plant ⁻¹	0.743	0.499	1		
Leaf area (cm ²)	-0.343	0.084	-0.185	1	
Fresh weight (g)	0.824	0.588	0.968**	-0.237	1

*, significant at 5% level; **, significant at 1% level, DAS- Days After Sowing

Correlation

Correlation among the yield and yield components in fenugreek are presented in Table 2. in the present investigation. Green leaf yield per hectare observed to be positive association with the plant height at 30 DAS, number of branches plant⁻¹ and fresh weight (g). The green leaf yield per hectare showed positive and non-significant association with plant height at 30 DAS (0.763), number of branches per plant (0.741) and fresh weight of plant (0.824) and negatively correlated with leaf area (cm²) (-0.343).

Plant height at 30 DAS expressed positive and non-significant association with number of branches per plant (0.499), leaf area (0.084) and fresh weight (0.588). The number of branches per plant had highly significant positive correlation with fresh weight of plant (0.968), but it was negatively correlated with leaf area (-0.185). Negative correlation among yield components reveals that selection for an increase of any component might not bring improvement for yield. These findings were in agreement to Sharma *et al.* (1990), Singh *et al.* (2013) and Lodhi *et al.* (2015) in fenugreek.

It can be concluded that, the cultivar Hisar Sonali performed best in respect of plant height, number of branches, fresh weight, dry weight, leaf chlorophyll content and found promising for green leaf production under Akola conditions.

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