



International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
© Agronomy
NAAS Rating (2026): 5.20
www.agronomyjournals.com
2026; SP-9(3): 70-73
Received: 02-03-2026
Accepted: 24-03-2026

Mahima Patil D
Department of PSMA, College of
Horticulture, Bagalkot,
Karnataka, India

Krishna D Kurubetta
Department of NRM, College of
Horticulture, Munirabad, Koppal,
Karnataka, India

Ganeshgouda I Patil
Department of Agriculture
Economics, College of Horticulture,
Bagalkot, Karnataka, India

Chandalinga
Department of PSMA, College of
Horticulture, Koppal, Karnataka,
India

Yogeeshappa H
Department of NRM, College of
Horticulture, Munirabad, Koppal,
Karnataka, India

Mohammed Farooq
Department of PSMA, College of
Horticulture, Bidar, Karnataka,
India

Corresponding Author:
Krishna D Kurubetta
Department of NRM, College of
Horticulture, Munirabad, Koppal,
Karnataka, India

Response of Fenugreek Varieties to Seed Yield and Economics under Different Farming System modules

Mahima Patil D, Krishna D Kurubetta, Ganeshgouda I Patil, Chandalinga, Yogeeshappa H and Mohammed Farooq

DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i3Sa.5459>

Abstract

The field experiment was conducted at College of Horticulture, Bagalkot, Karnataka in *Rabi* season 2024-25 revealed that among the farming system modules the package of practices farming system module (M₄) recorded significantly higher seed 884 kg/ha however it was found on par with natural farming system module 831 kg/ha. The varieties found non significant for the seed yield. The interaction of package of practices farming system module with AFg-5 (V₄) variety recorded significantly higher seed yield of 914 kg/ha compare to the other interactions. The maximum expenditure was incurred was noticed in package of practice farming system module (M₄) and the minimum was noticed in organic farming system module (M₁). Significantly highest net returns and B:C ratio Rs. 39,844/ha, 2.41, respectively) was noticed with the interaction of natural farming with a variety AFg-5 (M₁V₄) which was on par with the interaction of natural farming with AFg-4, AFG-3, KPD-1 varieties.

Keywords: Farming system modules, Package of practices, Natural farming system

Introduction

Fenugreek (*Trigonella foenum-graecum* L.) is an important seed spice crop of the family Fabaceae, widely cultivated during the *rabi* season across northern and western parts India, particularly in Rajasthan, Madhya Pradesh, Gujarat and Uttar Pradesh. Both seeds and leaves are valued for their nutritional and medicinal properties, being rich in protein, minerals and bioactive compounds such as diosgenin and trigonelline. Despite its economic importance, fenugreek is often grown under marginal conditions with low soil fertility, resulting in poor productivity. Excessive dependence on chemical fertilizers in conventional farming has led to soil degradation and environmental issues, prompting renewed emphasis on organic and natural farming systems that improve soil health and sustainability. Integrating organic manures and balanced nutrient management can enhance crop seed yield while maintaining ecological balance. Hence, the present study on the evaluation of fenugreek varieties (*Trigonella foenum-graecum* L.) under different farming system modules for seed production potential in the Northern dry zone of Karnataka” was undertaken to assess the performance of varieties under varied farming modules with respect to yield and economics.

Material and Methods

The field experiment was conducted during the *rabi* season of 2024-25 at the College of Horticulture, UHS, Bagalkot. The site is located at 16°18' N latitude, 75°69' E longitude, and 542 m above MSL, representing the Northern dry zone (Zone III) of Karnataka. The soil was light black loam, slightly alkaline (pH 8.46). The experiment was laid out in a split-plot design with four farming system modules as main plots viz., natural (M₁), organic (M₂), integrated (M₃), recommended package of practices (M₄) and four fenugreek varieties viz., Krishna Prabha Devimenthe 1 (V₁), AFg-3 (V₂), AFg-4 (V₃), and AFg-5 (V₅), as subplots, replicated thrice. Seeds were sown at 30 × 10 cm spacing using healthy, disease-free seeds. For natural (M₁) jeevamrutha, beejamrutha and mulching practices were practiced, organic (M₂) vermicompost applied on nitrogen equivalent base, integrated (M₃) 50% RPP + vermicompost @ 2 t/ha +

FYM 5 t/ha and recommended package of practices (M₄) with application of NPK @ 50: 25: 40 kg/ha + FYM 10 t/ha were followed as per farming system practices. Full dose of phosphorus, potash and half dose of nitrogen is applied at the time of sowing as basal dose and remaining 50 per cent of nitrogen applied 30 after days sowing. Nutrient and crop management practices were followed as per respective modules.

RESULT AND DISCUSSION

a. Yield

Seed yield and biological yield per hectare was analysed to record yield potential of fenugreek seeds. Significantly, higher seed yield (884 kg/ha) and biological yield (2811 kg/ha) was recorded with M₄ module, M₁ module recorded *on par* results. The varietal response was found to be non-significant. The effect of interaction was differed significantly, the significantly highest seed yield (914 kg/ha) was noticed with M₄V₄ and it was found on par with M₄V₁, M₄V₂, M₄V₃, M₁V₁, M₁V₂, M₁V₃ and M₁V₄. The almost similar trend was noticed with respect to biological yield. Lowest seed yield (622 kg/ha) and biological yield (2024 kg/ha) recorded with interaction M₂V₃.

These findings are in conformity with the study by Ruan *et al.* (2023) [6] which showed that organic cultivation was less productive than conventional cultivation in terms of growth and yield of fragrant rice. Korat *et al.* (2020) [3] also found that conventional or package of the practices farming system module recorded significantly higher yield attributes and lowest yield recorded with natural farming system module in chickpea crop. Natural farming module recorded higher yield next to the package of practices farming system module these results were agreement with Goveanthan *et al.* (2020) [1] and Kaur *et al.* (2021) [2] where liquid formulation of Jeevamruth on foliar application resulted in higher biomass thereby increased seed yield.

b. Economics

The economic data reveals that, the expenditure on cultivation of fenugreek varied because of different cost with respect to different modules (table 2). The M₁, M₂, M₃ and M₄ modules cost of cultivation incurred was Rs. 28,350, Rs. 36,050, Rs. 37,900 and Rs. 41,900 per hectare, respectively due to various

treatments imposed during the course of investigation. Maximum expenditure was incurred on M₄ (package of practice farming system module). Whereas, minimum expenditure was incurred on M₁ (natural farming system module).

The gross returns, net returns and B:C ratio (table 2 and 3) differed significantly for farming system modules. The significantly highest gross returns of Rs. 70,749 per hectare was noticed package of practices farming system module (M₄) while least gross returns of Rs. 53,133 per hectare was noticed organic farming system module (M₂). But, significantly highest (Fig. 1) net returns and B:C ratio (Rs. 38,123/ha, 2.34, respectively) was noticed with natural farming system module (M₁). However, it was on par with package of practices farming system module (M₄). Significantly least net returns and B:C ratio (Rs. 17,095/ha, 1.47, respectively)

With respect to varietal performance the gross returns, net returns and benefit cost ratio were not differed significantly.

With respect to interaction effects, significantly highest net returns and B:C ratio Rs. 39,844/ha, 2.41, respectively) was noticed with the interaction of natural farming with a variety AFG-5 (M₁V₄) which was on par with M₁V₂, M₁V₃ and M₁V₁. Minimum net returns of Rs. 13,707 and benefit cost ratio of 1.38 were recorded with treatment M₁V₃. Due to the reason that natural farming system module incurred lowest cost of cultivation than the other farming system modules which leads to significantly highest net returns and B:C ratio. Natural farming system module also recorded on par seed yield per hectare with the recommended package of practices modules. But even though higher cost of cultivation was noticed with package of practices farming system module with four varieties and also incurred significantly highest gross returns. These results are in conformity with the findings of Kaur *et al.* (2021) [2] where in wheat under natural farming system at Palampur recorded highest economic returns. Lima *et al.* (2022) recorded similar with our findings on application of 100 q/ha FYM + Beejamritha + Ghanjeevamritha + Jeevamritha gave the maximum net returns per hectare (Rs. 3,61,785 per hectare) and benefit-cost ratio (3.08) in fenugreek, Mallikarjun *et al.* (2024), Tania *et al.* (2024) also recorded similar results.

Table 1: Seed yield and biological yield of fenugreek (*Trigonella foenum-graecum* L.) varieties as influenced by different farming system modules

Treatments	Seed yield (kg/ha)					Biological yield (kg/ha)				
	Fenugreek varieties (V)									
	V ₁	V ₂	V ₃	V ₄	Mean	V ₁	V ₂	V ₃	V ₄	Mean
Farming system modules (M)	KPD-1	AFg-3	AFg-4	AFg-5		KPD-1	AFg-3	AFg-4	AFg-5	
M ₁ : Natural farming system module	805	839	827	852	831	2573	2673	2640	2715	2651
M ₂ : Organic farming system module	639	714	622	683	664	2074	2299	2024	2207	2151
M ₃ : Integrated farming system module	794	741	777	716	757	2540	2382	2490	2307	2430
M ₄ : Package of practices farming system module	864	900	861	914	884	2748	2857	2740	2898	2811
Mean	775	798	772	791	784	2484	2553	2474	2532	2510
	S. Em ±		CD at 5 %			S. Em ±		CD at 5 %		
Main Plot (M)	34.21		118			102.0		355.0		
Subplot (V)	24.19		NS			72.0		NS		
Interaction (M × V) at same level	48.37		NS			145.0		NS		
Interaction (M × V) at same or different level	55.85		189.0			167.0		567.0		

Table 2: Cost of cultivation and gross returns of fenugreek (*Trigonella foenum-graecum* L.) varieties as influenced by different farming system modules

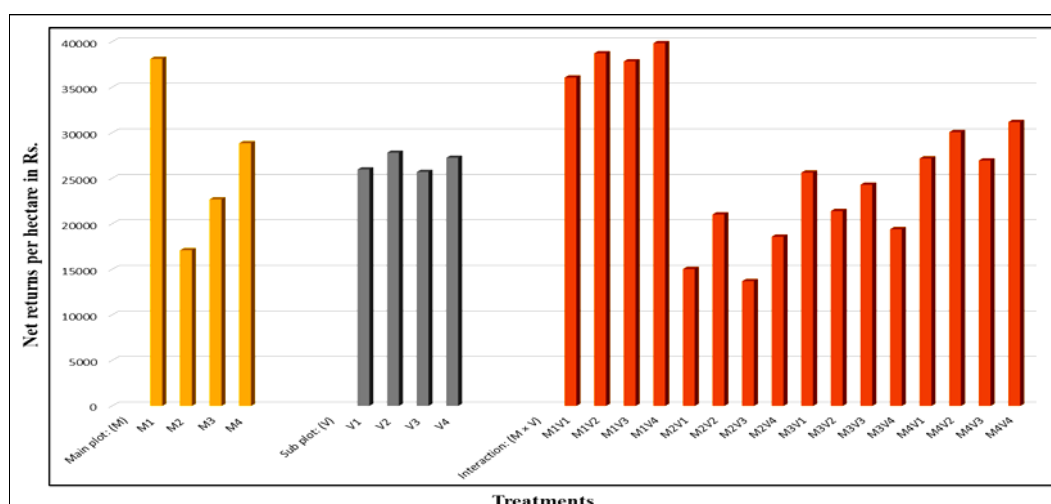
Treatments	Cost of cultivation (Rs/ha)					Gross returns (Rs/ha)				
Farming system modules (M)	Fenugreek varieties (V)									
	V ₁	V ₂	V ₃	V ₄	Mean	V ₁	V ₂	V ₃	V ₄	Mean
	KPD-1	AFg-3	AFg-4	AFg-5		KPD-1	AFg-3	AFg-4	AFg-5	
M ₁ : Natural farming system module	28,350	28,350	28,350	28,350	28,350	64,419	67,084	66,196	68,195	66,473
M ₂ : Organic farming system module	36,050	36,050	36,050	36,050	36,050	51,091	57,054	49,758	54,630	53,133
M ₃ : Integrated farming system module	37,900	37,900	37,900	37,900	37,900	63,096	59,358	62,163	57,310	60,482
M ₄ : Package of practices farming system module	41,900	41,900	41,900	41,900	41,900	69,083	71,971	68,861	73,082	70,749
Mean	36,050	36,050	36,050	36,050	36,050	61,922	63,866	61,744	63,304	62,709
	S. Em ±		CD at 5 %			S. Em ±		CD at 5 %		
Main Plot (M)	-		-			843.0		2920.0		
Subplot (V)	-		-			753.0		NS		
Interaction (M × V) at same or different level	-		-			1569.0		5319.0		

Note: KPD - Krishna Prabha Devimenthe 1, AFg – Ajmer fenugreek

Table 3: Net returns and B:C ratio of fenugreek (*Trigonella foenum-graecum* L.) varieties as influenced by different farming system modules

Treatments	Net returns (Rs/ha)					B:C ratio				
Farming system modules (M)	Fenugreek varieties (V)									
	V ₁	V ₂	V ₃	V ₄	Mean	V ₁	V ₂	V ₃	V ₄	Mean
	KPD-1	AFg-3	AFg-4	AFg-5		KPD-1	AFg-3	AFg-4	AFg-5	
M ₁ : Natural farming system module	36,068	38,734	37,845	39,844	38,123	2.27	2.37	2.33	2.41	2.34
M ₂ : Organic farming system module	15,040	21,038	13,707	18,594	17,095	1.42	1.58	1.38	1.52	1.47
M ₃ : Integrated farming system module	25,630	21,409	24,297	19,410	22,686	1.68	1.56	1.64	1.51	1.60
M ₄ : Package of practices farming system module	27,183	30,071	26,961	31,181	28,849	1.65	1.72	1.64	1.74	1.69
Mean	25,980	27,813	25,703	27,258	26,688	1.75	1.81	1.75	1.79	1.77
	S. Em ±		CD at 5 %			S. Em ±		CD at 5 %		
Main Plot (M)	843.0		2920.0			0.07		0.26		
Subplot (V)	753.0		NS			0.05		NS		
Interaction (M × V) at same or different level	1569.0		5319.0			0.12		0.42		

Note: KPD - Krishna Prabha Devimenthe 1, AFg – Ajmer fenugreek

**Fig 1:** Net returns (Rs/ha)

Conclusion

The package of practices farming system module found to get the higher seed yield (884 kg/ha) and it was found *on par* with natural farming system module. The interaction of package of practices farming system module with a variety AFg-5 (M₄V₄) recorded significantly highest seed yield (914 kg/ha) and it was found *on par* with M₄V₁, M₄V₂, M₄V₃, M₁V₁, M₁V₂, M₁V₃ and M₁V₄. Lowest seed yield was recorded with organic farming system module. Minimum expenditure was incurred on M₁ (natural farming system module). Significantly highest net returns and B:C ratio of Rs. 39,844/ha, 2.41, respectively was noticed with the interaction of natural farming with a variety AFg-5 (M₁V₄) which was *on par* with M₁V₂, M₁V₃ and M₁V₁. Minimum net returns of Rs. 13,707 and benefit cost ratio of 1.38 were recorded with treatment M₁V₃.

References

- Goveanthan AS, Sugumaran MP, Gudimetha GK, Akila S, Suganya K, Somasundaram E. Studies on organic inputs (jeevamruth and beejamruth) and their efficacy on fenugreek. *Pharma Innov J*. 2020;9:92-94.
- Kaur P, Saini JP, Meenakshi A. Optimization of jeevamrit doses and application time for enhancing productivity of wheat under natural farming system. *J Pharmacogn Phytochem*. 2021;10(1):405-408.
- Korat HV, Mathukia RK, Faldu MR. Influence of low-cost natural farming, organic farming and conventional farming on performance of wheat and chickpea. *Guj J Ext Edu*. 2022;Special Issue:33-37.
- Lima KP. Influence of manurial practices on leaf and grain yield of fenugreek for enhancing spice quality. M.Sc. (Hort.) Thesis, Dr. Yashwant Singh Parmar Univ Hort

Forestry; 2022.

5. Mallikarjun M, Kumari CR, Sireesha E, Naik KB, Yugandhar V, Harini M. Effect of organic, natural and inorganic farming practices on growth, yield and economics of paddy. *Int J Res Agron*. 2024;7(3):572-575.
6. Ruan S, Luo H, Wu F, He L, Lai R, Tang X. Organic cultivation induced regulation in yield formation, grain quality attributes, and volatile organic compounds of fragrant rice. *Food Chem*. 2023;405:134845.
7. Tania C, Bhupenchandra I, Devi CP, Phonglosa A, Sonia C, Singh MN, Chandramani P, Devi YP, Devi HL, Dasgupta M, Wahengbam ED. Unveiling the implications of organic nutrient management protocols on soil properties, economic sustainability, and yield optimization in fenugreek cultivation in acidic soils of Northeast India. *Sustainability*. 2024;16(16):7241.