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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

Chandalinga
Department of Plantation,
Spices, Medicinal and Aromatic
Crops, College of Horticulture,
Koppal, Karnataka, India

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

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

Mohammed Farooq
Department of Plantation,
Spices, Medicinal and Aromatic
Crops, College of Horticulture,
Bidar, Karnataka, India

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

Effect of farming system and varieties on grow than dry matter production of fenugreek in Northern dry zone of Karnataka

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

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Abstract

The field experiment was conducted at college of horticulture, Bagalkot, Karnataka on *rabi* season 2024-25 revealed that interaction of package of practices farming system module (M4) with AFG-5 (V4) variety recorded significantly higher dry matter production of 14.40 g compare to the other interactions there by influence of package of practices farming system module recorded higher results with respect to total number of branches (12.92), plant spread (296.67 cm²) and dry matter accumulation (13.20 g), which was on par with the Natural farming system module. The interactions of M4 and M1 modules with all varieties (KPD-1, AFG-3, AFG-4, AFG-5) found *on par* with respect to the growth parameter. However, interaction of organic farming system module (M2) with all varieties recorded least total number of branches and plant spread there by lowest dry matter production recorded with interaction of organic farming system module with AFG-4 (M2V3).

Keywords: Fenugreek varieties, farming system modules, dry matter production

Introduction

Fenugreek (*Trigonella foenum-graecum* L.) is valued for both the herb and seeds. It has traditionally been used as a food ingredient, a food additive and for medicinal purposes. Since ancient times in countries like India and Egypt, fresh tender pods, leaves and shoots of fenugreek, which are rich sources of iron, calcium, protein and vitamins A and C, have been consumed as a curried vegetable. In North India, the plant is mainly cultivated for its seeds, whereas in South India, it is predominantly grown as a green leafy vegetable. Fenugreek leaves possess cooling (refrigerant) and mild laxative (aperient) properties and are used internally to alleviate conditions related to an imbalanced pitta in traditional Indian medicine (Ahmad *et al.*, 2016) ^[1]. The present investigation was carried to study the effect of farming system and varieties on growth and dry matter production of fenugreek in northern dry zone of Karnataka.

Materials and Methods

The field experiment was conducted during the *rabi* season of 2024-25 at the College of Horticulture, University of Horticultural Sciences, Bagalkot. The site is located in 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 as a sub plots Krishna Prabha Devimenthe 1 (V₁), AFG-3 (V₂), AFG-4 (V₃) and AFG-5 (V₄) as sub plots viz., 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) 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 percent of nitrogen applied 30 after days sowing.

Nutrient and crop management practices were followed as per respective modules.

Results and Discussion

The height of fenugreek differed non-significantly due to the influence of different farming system module, varieties and interaction effect of farming system module and varieties (Table 1). Total number of branches found significant with respect to effect of farming system and interaction effect. Significantly highest number of branches (12.92) were recorded M4 (package of practices module) which was followed by M1 module. The varieties were differed non significantly for total number of branches per plant. Among the interaction effect, M4V4 recorded significantly higher number of branches (13.33) per plant, which was on par with M4V1, M4V2 and M4V3. The next best results were noticed with the Natural farming system with all varieties interactions. The organic farming module with varieties interaction showed least performance.

Almost similar trend was followed with respect to plant spread and dry matter accumulation (Table 2), Where M4 module recorded significantly higher results but found on par with M1 module with respect to plant spread dry matter accumulation. The M4V4 interaction recorded significantly higher plant spread (315 cm²) and dry matter accumulation (14.40 g/plant) at harvest stages (Fig. 1). Highest dry matter production in M4 module is directly correlated with growth

parameters viz total number of branches and plant spread. 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) [5] 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) [3] and Kaur *et al.* (2021) [4] where liquid formulation of Jeevamruth on foliar application resulted in higher biomass thereby increased seed yield. Devi *et al.* (2025) [2] also showed that in paddy that the tiller number, number of panicles per unit area, number of filled grains per panicle and grain yield in organic and natural farming practices was lower than conventional farming practice. Natural farming system module (M1) which recorded *on par* results with M4 module with respect to growth attributes due to application of Jeevamrutha, Beejamrutha and also mulching enhanced the microbial population in the soil, there by better availability of nutrients to the crop and also the effect of mulching resulted in enhanced soil moisture with reduced weed intensity these results were in agreement with Sutar *et al.* (2019) [7].

Table 1: Plant height and total number of branches of fenugreek (*Trigonella foenum-graecum* L.) varieties at harvest stage as influenced by different farming system modules

Treatments	Plant height (cm)					Total number of branches per plant				
	Fenugreek varieties (V)									
	V1	V2	V3	V4	Mean	V1	V2	V3	V4	Mean
Farming system modules (M)	KPD-1	AFg-3	AFg-4	AFg-5		KPD-1	AFg-3	AFg-4	AFg-5	
M1:Natural farming system module	50.67	58.33	53.33	55.00	54.33	10.67	11.00	11.00	11.33	11.00
M2:Organic farming system module	60.00	50.00	46.67	54.33	52.75	9.00	9.33	9.67	10.00	9.50
M3:Integrated farming system module	58.33	51.67	55.67	55.00	55.17	10.33	10.00	10.00	10.67	10.25
M4:Package of practices farming system module	59.33	61.67	51.67	59.33	58.00	13.00	12.67	12.67	13.33	12.92
Mean	57.08	55.42	51.83	55.92	55.06	10.75	10.75	10.83	11.33	10.91
	S. Em±		CDat 5%			S. Em±		CDat 5%		
Main Plot (M)	2.58		NS			0.34		1.18		
Sub plot (V)	1.83		NS			0.22		NS		
Interaction (M×V) at same level	3.65		NS			0.44		NS		
Interaction (M×V) at same or different level	4.21		NS			0.53		1.81		

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

Table 2: Plant spread at grand growth stage (45 DAS) and dry matter accumulation at harvest stage of fenugreek (*Trigonella foenum-graecum* L.) varieties as influenced by different farming system modules

Treatments	Plant spread (cm ²)					Dry matter accumulation per plant (g)				
	Fenugreek varieties (V)									
	V1	V2	V3	V4	Mean	V1	V2	V3	V4	Mean
Farmingsystem modules (M)	KPD-1	AFg-3	AFg-4	AFg-5		KPD-1	AFg-3	AFg-4	AFg-5	
M1:Natural farming system module	261.67	281.67	265.00	281.67	272.50	13.36	12.17	12.83	13.03	12.92
M2:Organic farming system module	241.67	214.67	227.00	210.00	223.33	10.80	10.20	9.10	10.17	10.07
M3:Integrated farming system module	226.67	233.33	258.33	243.33	240.42	11.57	10.43	9.53	11.33	10.72
M4:Package of practices farming system module	275.00	311.67	285.00	315.00	296.67	12.53	12.03	13.83	14.40	13.20
Mean	251.25	260.33	258.83	262.50	258.23	12.13	11.21	11.33	12.23	11.72
	S. Em±		CD at 5%			S. Em±		CD at 5%		
Main Plot (M)	11.00		38.00			0.36		1.25		
Sub plot (V)	8.00		NS			0.60		NS		
Interaction (M×V) at same level	15.55		NS			1.20		NS		
Interaction (M×V) at same or different level	18.00		60.00			1.06		3.60		

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

Conclusion

The package of practices farming module found to get the higher results with respect to total number of branches (12.92), plants spread (296.67 cm²) and dry matter accumulation (13.20 g) but natural farming system module found *on par* result. The interaction of package of practices farming system module with a variety AFg-5 recorded significantly highest number of branches (13.33), plant spread (315 cm²) and dry matter accumulation (14.40 g) and natural farming system module and varieties (KPD-1, AFg-3, AFg-4, AFg-5) interactions recorded *on par* results. Lowest dry matter accumulation (10.07 g) was recorded with organic farming system module.

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