

Studies on nutrient management and seed rate on growth and herbage yield of fenugreek (*Trigonella corniculata* L.) cv. Kasuri in Rajasthan

N S Deora, Jitendra Singh & M L Reager¹

Department of Horticulture
College of Agriculture
Rajasthan Agricultural University
Bikaner-334 006, Rajasthan, India

Received 4 November 2007; Revised 26 November 2008; Accepted 20 April 2009

Abstract

A field experiment was conducted at Bikaner and Jalore (Rajasthan) to study the effect of fertilizer and vermicompost and four levels of seed rate on growth attributes of fenugreek (*Trigonella corniculata*) cv. Kasuri. The results showed that application of fertilizer (20 kg N + 4 kg P₂O₅ ha⁻¹) increased plant height, number of branches plant⁻¹, dry matter accumulation and number of root nodules, over control. Vermicompost @ 4 t ha⁻¹ significantly improved growth attributes. Growth parameters such as plant height, herbage yield and dry weight of leaves, increased significantly with increasing levels of seed rate up to 7.5 kg ha⁻¹, whereas, nodules plant⁻¹, fresh root weight and number of branches plant⁻¹ decreased significantly up to 7.5 kg ha⁻¹.

Keywords: fenugreek, nutrition, *Trigonella corniculata*, seed rate, yield.

Introduction

The productivity of fenugreek (*Trigonella corniculata* L.) is low in Rajasthan, since the crop is generally grown on marginal and sub-marginal lands with limited fertilizer and organic matter addition. An adequate supply of nitrogen and phosphorus and organic manures to fenugreek will provide an efficient source to sink relationship leading to higher productivity. Furthermore, adoption of improper dose of seed rate is another impediment in realizing higher yield potential of the crop. In view of the scant information on these aspects, the present study was undertaken to standardize optimum nutrient

management and seed rate on growth and herbage yield of fenugreek cv. Kasuri in Rajasthan.

Materials and methods

The first experiment was conducted at Department of Horticulture, College of Agriculture, Bikaner (Rajasthan) during *rabi* 2005-06. The soil of the experimental field was loamy sand with 85.20% sand, 6.75% silt and 8.05% clay. The experimental soil was alkaline in reaction (pH 8.4) and was low in organic carbon (0.08 %), nitrogen (62.85 kg ha⁻¹) and phosphorus (20.70 kg ha⁻¹) and had medium potassium content (170.0 kg ha⁻¹). Another experiment was conducted during *rabi*

¹Present address: Krishi Vigyar Kendra, Jalore, Rajasthan, India.

Table 1. Effect of nutrient management and seed rate on plant population, growth and yield of fenugreek cv. Kasuri (Pooled data of 2005-06 & 2006-07)

Nutrient and seed rate	Plant population (ha ⁻¹)		Plant height (cm)		Herbage yield (kg ha ⁻¹)		No. of branches plant ⁻¹	No. of nodules plant ⁻¹		Fresh root weight plant ⁻¹	Dry root weight plant ⁻¹	
	15 DAS	150 DAS	First cutting	Second cutting	At harvest	First cutting		Second cutting	60 DAS			90 DAS
	Fertilizer (kg ha ⁻¹)											
No fertilizer	6244	3512	6.6	17.3	16.8	3224	489	4.6	11.8	37.8	2.39	0.81
20 N+40 P ₂ O ₅	6396	3564	7.4	20.5	24.4	3444	7072	7.9	16.6	70.0	2.87	0.99
SEM±	56.8	46.4	0.08	0.35	0.13	40.00	86.80	0.09	0.20	1.21	0.05	0.02
CD (P=0.05)	NS	NS	0.23	0.99	0.38	113	246	0.27	0.55	3.43	0.13	0.05
Vermicompost (t ha ⁻¹)												
No vermicompost	6228	3492	6.7	18.1	20.1	3232	5532	5.7	12.9	46.5	2.45	0.85
4.0	6412	3588	7.3	19.7	21.0	3432	6428	6.8	15.5	61.3	2.81	0.95
SEM±	56.8	46.4	0.08	0.35	0.13	40.00	86.80	0.09	0.20	1.21	0.05	0.02
CD (P=0.05)	NS	NS	0.23	0.99	0.38	113	246	0.27	0.55	3.43	0.13	0.05
Seed rate (kg ha ⁻¹)												
2.5	1352	1176	2.6	7.3	9.60	1076	2384	4.1	9.2	37.2	2.00	0.57
5.0	2756	1724	3.6	8.5	10.2	1580	2736	3.2	7.6	27.7	1.40	0.49
7.5	3808	2024	3.9	10.7	10.7	1924	3388	2.7	6.2	22.9	1.06	0.40
10.0	4728	2156	3.9	11.4	10.7	2088	3452	2.5	5.4	20.0	0.80	0.34
SEM±	80.4	65.6	0.12	0.49	0.19	56.40	122.80	0.13	0.28	1.71	0.07	0.02
CD (P=0.05)	227.2	186	0.33	1.39	0.53	160	348	0.38	0.78	4.85	0.19	0.07

NS=Non significant; DAS=Days after sowing

2006-07 at Krishi Vigyan Kendra, Jalore (Rajasthan) having silty loam soil with pH 8.2, EC 0.17 dSm⁻¹, organic carbon 0.25%, phosphorus 8.6 kg P ha⁻¹ and potassium 279.7 kg K ha⁻¹. The treatments comprised of two levels of fertilizers (0 and 20 kg N + 40 kg P₂O₅ ha⁻¹) and vermi compost (0 and 4.0 t ha⁻¹) and four levels of seed rate (2.5, 5.0, 7.5 and 10.0 kg ha⁻¹) and laid out in a factorial RBD with three replications. Vermicompost, nitrogen and phosphorus were applied as basal dose. Nitrogen and phosphorus were supplied through urea and single super phosphate, respectively. The crop was sown in rows spaced 25 cm apart through 'Kera' methods on 9th November 2005 and 17th November 2006 during respective years. Observations were recorded on different growth parameters of the crop.

Results and discussion

Effect of fertilizer

Application of 20 kg N + 40 kg P₂O₅ ha⁻¹ significantly enhanced plant growth as manifested by increased plant height at first and second cutting and at harvest, number of nodules at 60 and 90 days after sowing (DAS), fresh and dry weight of root at pre-flowering stage, herbage yield and dry weight of leaves at first and second cutting and number of branches plant⁻¹ over control during both the years as well as in pooled data of two years (Table 1). Patel *et al.* (1991) have also reported hastened plant growth in fenugreek following application of nitrogen and phosphorus.

Effect of vermicompost

Application of 4 t ha⁻¹ vermicompost significantly enhanced plant height at first and second cutting and at harvest, number

of nodules at 60 and 90 DAS, fresh and dry weight of root at pre-flowering stage, herbage yield and dry weight of leaves at first and second cutting and number of branches plant⁻¹ during both the years as well as in pooled data of two years (Table 1).

Effect of seed rate

Seed rate influenced crop growth and 10 kg ha⁻¹ produced maximum plant population which was significantly higher over rest of the seed rates (Table 1). Growth parameters such as plant height at first and second cutting and at harvest, herbage yield and dry weight of leaves at first and second cutting were influenced significantly due to adoption of seed rate @ 10 kg ha⁻¹ which was at par with the seed rate of 7.5 kg ha⁻¹ during both the years, whereas, the pooled data over years showed significant results up to 10 kg ha⁻¹. Growth parameters of fenugreek increased significantly with decreasing seed rate. Significantly more number of branches, more number of nodules, fresh and dry weight of root and number of branches plant⁻¹ were recorded with the seed rate of 2.5 kg ha⁻¹ than that obtained under higher seed rate. Probably, this may be due to more space available to individual plants at lower seed rate. Similar findings were also reported by Sharma (1990) in fenugreek.

References

- Patel B A, Patel R G, Amin A & Patel M V 1991 Response of fenugreek to N, P and K Indian. J. Argon. 36: 389-391.
- Sharma P C 1990 Effect of seed rates, row spacing and growth regulators on the yield of methi (*Trigonella foenum-graecum* L.). MSc (Ag.) Thesis, Rajasthan Agricultural University, Bikaner.