

Effect of different organic nutrient sources on growth and yield of fenugreek

SG TAGAD, J SRINIVAS, VIJAY S KALE and SANJEEV NAYAK*

Department of Horticulture

*Department of Soil Science and Agriculture chemistry

Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola 444104 Maharashtra, India

*Email for correspondence: srinivasjogdande@gmail.com

ABSTRACT

The present investigation was carried out during the year 2013-2014 at the horticulture farm of Department of Horticulture, Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola undertaking twelve treatments with three replications using randomized block design. The fenugreek seeds were sown in rows (line sowing) at 20 cm apart in plot size of 0.02 x 1.6 m on 24 October 2013 and five plants per treatment were selected randomly to record observations. The results of the present investigation indicated that the vegetative growth in terms of plant height, number of branches per plant and leaf area was increased due to different organic sources of nutrients and *Rhizobium* with PSB as seed treatment. All sources of the nutrients influenced the growth and yield parameters of fenugreek. The combination FYM + *Rhizobium* and PSB as seed treatment 25 g/kg seed was found superior for increasing yield and quality of fenugreek followed by the combination vermicompost + *Rhizobium* and PSB as seed treatment 25 g/kg seed. The qualitative parameters viz total chlorophyll content, leaf moisture, leaf protein content and fiber content were also superior in the combination FYM + *Rhizobium* and PSB seed treatment. The use of different organic sources of nutrients and *Rhizobium* with PSB as seed treatment increased leaf nutrient uptake of total nitrogen, phosphorus and potash content.

Keywords: Fenugreek; organic sources; seed treatment; growth; yield

INTRODUCTION

Fenugreek (Leguminaceae) commonly known as Methi is grown in our country mainly as leafy vegetable. Its seeds are also used for condiment and medicinal purposes.

Leafy vegetables uptake more heavy metals which are having hazardous effects

on human health. Organic farming is holistic management system which promotes and improves the health of agro-system related to biodiversity nutrient bio-cycles and soil microbial and bio-chemical activities. Organic farming in India is not new. Before the use of chemicals, manures like FYM, compost, neem cake etc were already known to the Indian farmers for improving soil fertility and crop productivity. However

negligence of organic inputs resulted in deterioration of productive soil for maintaining soil physio-chemical and biological properties. Considering these facts the present investigation was undertaken.

MATERIAL and METHODS

The present investigation was carried out during 2013-2014 at the horticulture farm of Department of Horticulture, Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola undertaking twelve treatments with three replications using randomized block design. The fenugreek seeds were sown in rows (line sowing) at 20 cm apart in plot size of 0.02 x 1.6 m on 24 October 2013 and five plants per treatment were selected randomly to record observations. The treatments were T1 (RDF 100% + NPK 50:0:0 kg/ha) (control), T2 (FYM 10 tons/ha), T3 (neem cake 1 ton/ha), T4 (vermicompost 1250 kg/ha), T5 (FYM + *Rhizobium* and PSB seed treatment 25 g/kg of seed), T6 (neem cake + *Rhizobium* and PSB seed treatment 25g/kg of seed), T7 (vermicompost + *Rhizobium* and PSB seed treatment 25 g/kg of seed), T8 (FYM + *Rhizobium* and PSB soil application 2.5 kg/ha), T9 (neem cake + *Rhizobium* and PSB soil application 2.5 kg/ha), T10 (vermicompost + *Rhizobium* and PSB soil application 2.5 kg/ha), T11 (*Rhizobium* and PSB seed treatment 25 g/kg of seed + *Rhizobium* and PSB soil application 2.5 kg/ha) and T12

(absolute control). The observations were recorded on growth and yield parameters.

RESULTS and DISCUSSION

Growth parameters

The data regarding different parameters are presented in Table 1. The treatment T5 (FYM + *Rhizobium* and PSB seed treatment 25 g/kg of seed) recorded significantly maximum plant height (18.33 cm) 30 days after sowing (DAS) and it was found to be at par with the treatment T7 (18.03 cm), T6 (17.95 cm), T8 (17.69 cm), T10 (17.52 cm) and T9 (17.41 cm) as compared to minimum plant height (14.20 cm) in control.

The maximum number of branches per plant (3.44) was observed in the treatment T5 (FYM + *Rhizobium* and PSB seed treatment 25 g/kg of seed) and minimum (1.98) under the control treatment T12. The treatment T5 recorded maximum dry weight of plant (8.10 g) which was at par with T7 (7.88 g), T6 (7.66 g), T8 (7.55 g), T11 (7.41 g), T10 (7.36 g) and T9 (7.21 g) and minimum (4.20 g) was in T12 (control).

The results of the present investigation are in agreement with the findings of Purbey and Sen (2005) and Zalate and Padmani (2009).

Significantly maximum leaf area (45.13 cm²) was observed in the treatment

Nutrient sources effect on fenugreek

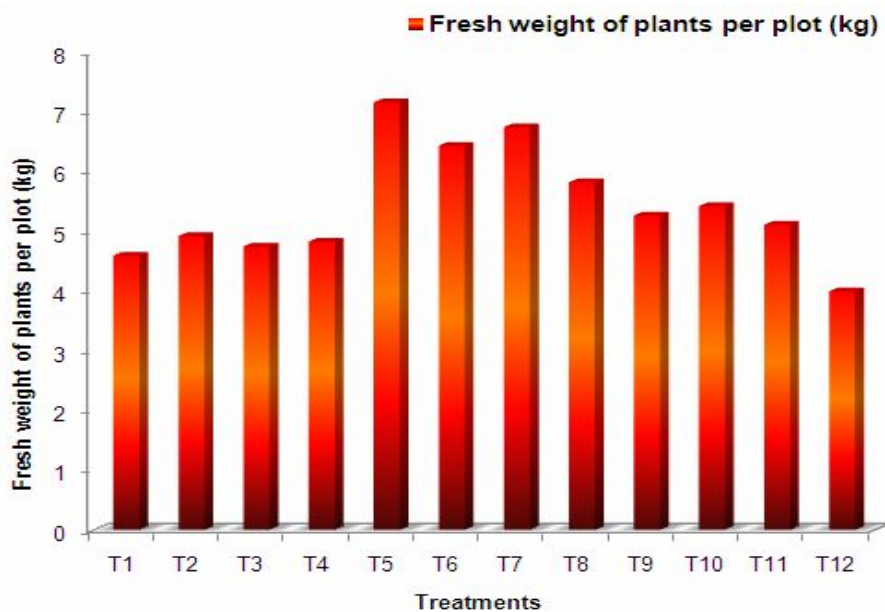


Fig 1. Fresh weight of plants per plot of fenugreek as affected by different organic sources 30 DAS

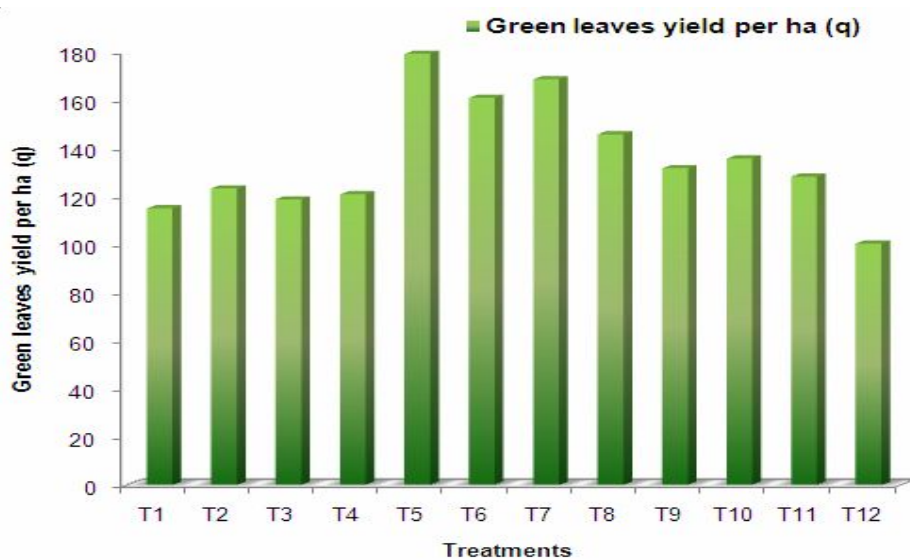


Fig 2. Green leaf yield per hectare of fenugreek as affected by different organic sources 30 DAS

Table 1. Effect of different organic sources of nutrients on growth and quality parameters of fenugreek 30 DAS

Treatment	Plant height (cm)	# branches /plant	Dry weight/ plant (g)	Leaf area (cm ²)	Fresh plant weight (kg/plot)	Green leaf yield (q/ha)	Protein content (%)	Fiber content (%)
T1	15.84	2.39	5.99	26.11	4.60	115.00	22.68	61.80
T2	16.43	2.45	6.91	29.11	4.93	123.25	23.89	62.85
T3	16.19	2.41	6.56	27.08	4.75	118.67	23.31	62.34
T4	16.31	2.43	6.75	28.18	4.83	120.83	23.45	62.53
T5	18.33	3.44	8.10	45.13	7.17	179.25	26.35	65.02
T6	17.95	2.76	7.66	43.26	6.44	160.92	25.29	64.41
T7	18.03	2.93	7.88	44.20	6.75	168.67	25.85	64.82
T8	17.69	2.63	7.55	38.77	5.83	145.75	24.85	63.74
T9	17.41	2.43	7.21	36.41	5.27	131.67	23.89	63.31
T10	17.52	2.53	7.36	37.11	5.43	135.75	24.10	63.63
T11	16.76	2.50	7.41	32.08	5.12	128.17	24.70	63.03
T12	14.20	1.98	4.20	20.05	4.00	100.25	20.02	60.05
F-test	S	S	S	S	S	S	S	S
SE _m ±	0.49	0.13	0.36	1.69	0.18	4.58	0.71	0.76
CD _{0.05}	1.45	0.39	1.05	4.97	0.54	13.45	2.08	2.23

S= Significant

T5 and it was found to be at par with T7 (44.20 cm²) and T6 (43.26 cm²) and minimum (20.05 cm²) was in T12 (control). The treatment T5 also recorded maximum fresh plant weight per plot (7.17 kg) which was at par with T7 (6.75 kg) as compared to minimum (4.00 kg) in T12 (Fig 1). The treatment T5 recorded significantly highest green leaf yield (179.25 q/ha) which was at par with T7 (168.67 q/ha) as compared to minimum in T12 (100.25 q/ha) (Fig 2). Same observations were made by Raghav and Shashi Kamal (2007).

Quality parameters

The maximum protein content was recorded in the treatment T5 (26.35%) which was at par with T7 (25.85%), T6 (25.29), T8 (24.85%) and T11 (24.70%) and minimum (20.02%) was in T12 (Table 1). The maximum fiber content was also

recorded in the treatment T5 (65.02%) being at par with T7 (64.82%), T6 (64.41), T8 (63.74%), T10 (63.63%), T9 (63.31%), T11 (63.03%), and T2 (62.85%) and the treatment T12 recorded the minimum fiber content (60.05%).

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