

Nutrient Management of Fenugreek (*Trigonella foenum-graecum* L.) under Cashew (*Anacardium occidentale* L.) Scion Bank

Mini Poduval, Mohinur Rahaman Biswas

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Abstract Almost no study was made about the adoptability nutrient requirement of fenugreek in this region under cashew scion bank. Therefore, the present investigation was carried out with the fenugreek variety Rajendra Methi-1 with 7 nutritional treatments under Jhargram-1 cashew scion bank. Yield of fenugreek was minimum with T_0 (Control) due to scarcity of nutrients. In case of fenugreek-cashew scion bank intercropping system maximum benefit cost ratio was recorded with T_5 (Farm Yard Manure @ 5 t/ha + Biofertilizers each @ 2.5 g/plot) treatment (0.43) followed by T_2 (Vermicompost @ 5 t/ha) (0.31).

Keywords Economics, Manure, Nutrient uptake, Quality, Yield.

Introduction

The cultivation of spices in West Bengal is not only restricted to very few crops but that too not in a scientific way. The spices mainly seed spices produced in the state are extremely insufficient even to meet its own requirement. Thus the state has the scope for

cultivation of seed spices with a more concerted effort. Moreover the seed spices and its various products have high demand both in domestic and foreign markets. Fenugreek requires a climate free from severe frost during the month of February–March, when the crop is in flowering and seed setting stage. The plants require relatively cool weather during the early stage for better vegetative growth while a dry and relatively high temperature favors higher seed production. The soils of red and laterite zone in general, are acidic in nature (pH-5.5—6.5), with low organic matter content, light in texture and prone to leaching due to heavy rainfall, during August–September. Climate of this zone is semiarid. Hot summer and cool-dry winter are the specialities. The area is also known for cashew nut cultivation. Fenugreek can be grown in this zone on residual moisture immediately following the end of monsoon. Almost no study was made about the nutrient requirement of fenugreek under the cashew scion bank in this region.

Materials and Methods

The present investigation was carried out at the Regional Research Station, Bidhan Chandra Krishi Viswavidyalaya, Jhargram, Paschim Medinipur, West Bengal during 2008–2009 and 2009–2010. The variety of Fenugreek was Rajendra Methi-1. There were 7 nutritional treatment. T_0 : Control. T_1 : Recommended dose of fertilizer, T_2 : Vermicompost @ 5 tonnes/ha, T_3 : Farm Yard Manure @ 5 tonnes/ha, T_4 : Poultry Manure @ 5 tonnes/ha, T_5 : Farm Yard Manure @ 5 tonnes/ha + Biofertilizer each @ 2.50 g/plot, T_6 :

M. Poduval*, M. R. Biswas
 Regional Research Station, Bidhan Chandra Krishi
 Viswavidyalaya, Jhargram, Paschim Medinipur 721507, West
 Bengal, India
 e-mail: poduvalmini@gmail.com
 *Correspondence

Table 1. Effect of different nutritional treatment on plant height (cm) of fenugreek.

Year Treatments ↓	2008–2009					2009–2010				
	15 DAS	30 DAS	45 DAS	60 DAS	75 DAS	15 DAS	30 DAS	45 DAS	60 DAS	75 DAS
T ₀	6.39	12.66	23.39	32.92	50.97	6.04	12.00	23.90	37.15	55.12
T ₁	7.82	14.69	25.76	38.66	68.20	8.12	17.32	30.45	50.54	75.52
T ₂	9.02	14.68	26.14	35.00	63.34	8.72	20.97	36.13	56.08	83.30
T ₃	7.31	13.88	23.21	33.77	65.04	9.46	20.47	31.76	50.65	73.26
T ₄	6.96	13.90	26.18	35.34	54.02	6.92	19.92	27.19	37.34	56.85
T ₅	9.01	18.90	32.54	48.26	69.00	9.64	19.14	33.55	49.98	68.90
T ₆	6.55	13.06	23.98	35.05	54.18	7.20	13.84	26.08	38.22	62.94
T ₇	15.76	29.85	43.56	55.75	70.60	15.49	29.86	50.92	64.54	79.92
SEm±	1.58	2.05	3.10	4.38	5.88	1.52	2.27	2.81	3.06	3.68
CD at 5%	3.39	4.40	6.65	9.39	12.62	3.27	4.87	6.02	6.57	7.90

Table 1. Continued.

Year Treatments ↓	Pooled				
	15 DAS	30 DAS	45 DAS	60 DAS	75 DAS
T ₀	6.2 ^d	12.33 ^{bc}	23.64 ^d	35.03 ^c	53.05 ^c
T ₁	7.97 ^{bc}	16.00 ^{bc}	28.10 ^{bcd}	44.60 ^{bc}	71.86 ^a
T ₂	8.87 ^b	17.82 ^{bc}	31.13 ^{bc}	45.54 ^{bc}	73.32 ^a
T ₃	8.38 ^{bc}	17.17 ^{bc}	27.48 ^{bcd}	42.21 ^{bc}	69.15 ^{ab}
T ₄	6.94 ^{cd}	16.91 ^b	26.68 ^{bcd}	36.34 ^{bc}	55.44 ^c
T ₅	9.32 ^b	19.02 ^{bc}	33.04 ^b	49.12 ^{ab}	68.95 ^{ab}
T ₆	6.87 ^{cd}	13.45 ^c	25.03 ^{cd}	36.63 ^{bc}	58.56 ^{bc}
T ₇	15.62 ^a	29.85 ^a	47.24 ^a	60.14 ^a	75.26 ^a
SEm±	0.65	2.42	2.96	5.70	4.67
CD at 5%	1.39	5.18	6.35	12.23	10.02

Vermicompost @ 5 tonnes/ha + Biofertilizer each @ 2.50 g/plot and T₇: Poultry Manure @ 5 tonnes / ha + Biofertilizer each @ 2.50 g/plot. Observations were recorded on growth, nutrient uptake and yield param-

eters of fenugreek. Growth parameters as well as number of scion production of cashew plants were also recorded. The data collected were statistically analyzed by Fishers analysis of variance [1]. Economics

Table 2. Effect of different nutritional treatment on stem girth (cm) of fenugreek.

Year Treatments ↓	2008–2009			2009–2010			Pooled		
	45 DAS	60 DAS	75 DAS	45 DAS	60 DAS	75 DAS	45 DAS	60 DAS	75 DAS
T ₀	0.36	0.53	1.06	0.29	0.43	0.59	0.325	0.480	0.825
T ₁	0.43	0.59	0.70	0.38	0.54	0.71	0.405	0.565	0.705
T ₂	0.40	0.53	0.67	0.44	0.62	0.81	0.420	0.575	0.740
T ₃	0.37	0.52	0.67	0.35	0.54	0.70	0.360	0.530	0.685
T ₄	0.41	0.55	0.66	0.34	0.46	0.61	0.375	0.505	0.635
T ₅	0.33	0.49	0.62	0.36	0.50	0.97	0.345	0.495	0.795
T ₆	0.36	0.52	0.64	0.30	0.45	0.60	0.330	0.485	0.620
T ₇	0.43	0.57	0.76	0.48	0.64	0.84	0.455	0.605	0.800
SEm±	NS	NS	NS	0.02	0.02	NS	NS	NS	NS
CD at 5%				0.04	0.04				

Table 3. Effect of different nutritional treatment on plant spread (cm) of fenugreek.

Year → Treatments	2008–2009			2009–2010			Pooled		
	45 DAS	60 DAS	75 DAS	45 DAS	60 DAS	75 DAS	45 DAS	60 DAS	75 DAS
T ₀	10.14	14.91	23.64	6.07	13.91	30.99	8.11	14.41	27.32
T ₁	13.27	23.53	34.93	18.99	32.16	44.85	16.13	27.85	39.89
T ₂	10.22	15.76	30.90	16.05	27.30	43.98	13.14	21.53	37.44
T ₃	7.79	13.52	28.58	15.48	29.56	42.42	11.64	21.54	35.50
T ₄	12.65	21.02	32.60	11.74	20.30	31.99	12.20	20.66	32.30
T ₅	17.15	25.30	34.84	18.39	26.84	36.90	17.77	26.07	35.87
T ₆	11.02	18.18	28.88	10.35	17.63	28.70	10.69	17.91	28.79
T ₇	17.47	26.92	36.32	19.96	32.58	40.30	18.72	29.75	38.31
SEm±	NS	NS	NS	1.94	2.75	2.61	NS	NS	NS
CD at 5%	NS	NS	NS	4.16	5.90	5.60	NS	NS	NS

of fenugreek cultivation under cashew scion bank was calculated.

Results and Discussion

The data on plant height was recorded at an interval

of 15 days initiating from 15 DAS up to 75 DAS during 2008-2009 and 2009-2010 and other growth characters were recorded at an interval of 15 days initiating from 45 DAS up to 75 DAS. Pooled analysis of plant height of fenugreek reveals that (Table 1) T₇ was the best treatment having 15.62 cm, 29.85 cm,

Table 4. Effect of different nutritional treatment on no. of primary branches (tiller) per plant of fenugreek.

Year → Treatments	2008–2009			2009–2010			Pooled		
	45 DAS	60 DAS	75 DAS	45 DAS	60 DAS	75 DAS	45 DAS	60 DAS	75 DAS
T ₀	0.53	1.67	2.13	0	1.13	2.66	0.27	1.40	2.40
T ₁	1.27	3.47	5.07	1.53	4.73	6.20	1.40	4.10	5.63
T ₂	0.67	2.00	4.40	1.40	3.07	5.93	1.03	2.53	5.17
T ₃	0.47	1.93	3.40	1.47	3.13	5.60	0.97	2.53	4.50
T ₄	1.40	3.40	4.87	0.20	1.80	3.07	0.80	2.60	3.97
T ₅	0.20	2.27	4.33	0.33	2.73	4.47	0.27	2.50	4.40
T ₆	1.07	3.47	4.87	0	2.20	3.53	0.53	2.83	4.20
T ₇	0.33	2.60	4.00	2.87	4.67	6.73	1.60	3.63	5.37
SEm±	NS	NS	NS	0.21	0.41	0.56	NS	NS	NS
CD at 5%	NS	NS	NS	0.44	0.88	1.20	NS	NS	NS

Table 5. Effect of different nutritional treatments on number of seeds germinated/m² fresh weight (g) and dry weight (g) of plants of fenugreek.

Treatments	No. of seeds germinated/m ²			Fresh weight of plant (g)			Dry weight of plant (g)		
	2008- 2009	2009- 2010	Poo- led	2008- 2009	2009- 2010	Poo- led	2008- 2009	2009- 2010	Poo- led
T ₀	195.7	174.7	185.2	27.43	30.67	28.13 ^c	9.46	9.49	9.48 ^c
T ₁	249.7	265.3	257.5	37.97	33.07	35.52 ^a	9.05	10.28	9.66 ^c
T ₂	257.0	255.7	256.3	34.93	37.53	32.73 ^b	9.47	10.32	9.89 ^{bc}
T ₃	220.7	256.7	238.7	26.87	37.63	32.25 ^b	9.83	10.19	10.01 ^b
T ₄	258.0	276.0	267.0	27.43	33.47	31.07 ^{bc}	9.49	10.16	9.82 ^{bc}
T ₅	257.7	221.0	239.3	31.90	30.23	30.45 ^{cd}	9.76	10.42	10.09 ^b
T ₆	194.3	186.0	190.2	33.00	32.47	29.05 ^d	10.50	10.90	10.7 ^a
T ₇	256.7	258.0	257.3	29.53	26.73	36.23 ^a	10.38	10.68	10.53 ^a
SEm±	NS	NS	NS	1.05	1.02	0.73	NS	NS	0.15
CD at 5%	NS	NS	NS	2.25	2.19	1.57	NS	NS	0.32

Table 6. Effect of different nutritional treatment on date of first flowering, last flowering and duration of flowering of fenugreek.

Treatments	Date of first flowering	2008-09		Duration (days)	2009-10	
		Date of last flowering	Date of last flowering		Date of first flowering	Date of last flowering
T ₀	14-01-09	11-03-09	56	11-01-10	02-03-10	50
T ₁	13-01-09	19-03-09	65	06-01-10	06-03-10	59
T ₂	16-01-09	21-03-09	64	08-01-10	07-03-10	58
T ₃	14-01-09	17-03-09	62	10-01-10	08-03-10	57
T ₄	15-01-09	16-03-09	60	09-01-10	12-03-10	62
T ₅	16-01-09	20-03-09	63	10-01-10	13-03-10	62
T ₆	14-01-09	18-03-09	63	07-01-10	10-03-10	62
T ₇	12-01-09	19-03-09	66	05-01-10	11-03-10	65

Table 7. Effect of different nutritional treatments on number of flowers per plant of fenugreek.

Year → Treatments	2008-2009		2009-2010		Pooled	
	60 DAS	75 DAS	60 DAS	75 DAS	60 DAS	75 DAS
T ₀	22.5	31.3	6.3	13.1	14.4	22.2
T ₁	27.9	40.5	22.8	37.8	25.3	39.1
T ₂	14.6	27.1	11.7	24.0	13.1	25.6
T ₃	15.2	23.5	11.1	24.0	13.2	23.7
T ₄	30.7	45.1	5.9	13.3	18.3	29.2
T ₅	15.7	23.9	9.1	18.1	12.4	20.0
T ₆	22.1	32.3	8.9	18.9	15.5	25.6
T ₇	17.1	26.3	16.3	32.7	16.7	29.5
SEm±	NS	NS	1.8	3.3	NS	NS
CD at 5%	NS	NS	3.8	7.2	NS	NS

47.24 cm, 60.14 cm and 75.26 cm at 15 DAS, 30 DAS, 45 DAS, 60 DAS and 75 DAS respectively. At 75 DAS fenugreek plants were taller in case of T₇, T₁ and T₂ treatments. In an experiment by Patel et al. (2) the plant height of fenugreek was recorded as 56.38 cm

with the application of FYM @ 5 t/ha + Azotobacter @ 5 kg/ha. The results were in close conformity of the present experiment, where FYM @ 5 t/ha + Biofertilizers (Azotobacter + Azospirillum + PSB) @ 4.68 kg/ha were applied together and recorded a height of 68.95 cm. The treatments were non-significant with respect to stem girth (Table 2), plant spread (Table 3), and number of primary branches of fenugreek (Table 4). As in this experiment non-symbiotic nitrogen fixers were used as biofertilizer source, therefore, no improvement was recorded in case of primary branch production. Table 5 represents that effect of different nutritional treatments on number of seeds germinated/m², fresh weight (g) and dry weight (g) of plants of fenugreek. In case of fenugreek, T₇ treatment was recorded the best treatment with respect to fresh weight and dry weight of plants. The most succulent plants were under the treatment of recommended dose of fertilizers (20–40–20 kg NPK/ha), where the weight reduction of plants was more due to moisture loss. Minimum weight loss was with

Table 8. Effect of different nutritional treatment on yield attributes of fenugreek.

Treatments	Pods/Plant			Seeds/Pod			Pod length (cm)		
	2008-2009	2009-2010	Pooled	2008-2009	2009-2010	Pooled	2008-2009	2009-2010	Pooled
T ₀	13.0	15.7	14.3 ^d	16.3	14.7	16.3 ^b	7.7	8.1	7.9 ^c
T ₁	22.0	24.0	23.0 ^b	14.7	14.7	14.7 ^c	10.4	10.6	10.5 ^b
T ₂	25.7	24.7	25.2 ^a	17.7	18.3	17.7 ^a	13.2	12.9	13.0 ^a
T ₃	27.7	24.0	25.8 ^a	12.3	13.0	12.3 ^d	12.3	13.9	13.1 ^a
T ₄	29.3	24.0	26.7 ^a	13.0	14.3	13.0 ^d	13.2	12.8	13.0 ^a
T ₅	24.0	22.0	23.0 ^b	14.7	15.3	14.7 ^c	12.6	13.8	13.2 ^a
T ₆	18.0	14.3	16.2 ^c	14.7	14.7	14.7 ^c	9.4	11.4	10.4 ^b
T ₇	14.7	21.0	17.8 ^c	15.0	14.7	15.0 ^c	13.2	14.2	13.7 ^a
SEm±	1.3	1.0	0.8	0.5	0.7	0.4	1.28	1.53	0.67
CD at 5%	2.79	2.15	1.72	1.07	1.50	0.86	2.75	3.29	1.44

Table 8. Continued.

Treatments	Seeds / Plant			Test weight (g)		
	2008- 2009	2009- 2010	Pooled	2008- 2009	2009- 2010	Pooled
T ₀	162.0	223.3	192.7 ^e	14.8	13.4	14.1 ^a
T ₁	322.3	352.0	337.2 ^c	13.3	13.6	13.4 ^{bc}
T ₂	371.7	462.0	416.8 ^a	12.4	13.5	13.0 ^{cd}
T ₃	341.7	312.0	326.8 ^c	12.6	13.2	12.9 ^d
T ₄	438.3	319.3	378.8 ^b	13.2	13.9	13.5 ^b
T ₅	353.3	326.7	340.0 ^c	12.4	13.9	13.2 ^{bcd}
T ₆	261.7	215.3	238.5 ^d	13.3	13.4	13.4 ^{bc}
T ₇	217.3	300.3	258.8 ^d	12.6	12.9	12.8 ^d
SEm±	20.2	23.8	15.4	0.3	0.3	0.2
CD at 5%	43.33	51.05	33.03	0.64	0.64	0.43

T₆ treatment. According to Mehta et al. [3] dry matter accumulation at maturity of fenugreek plants was (11.95 g and 15.68 g) with the application of nitrogen @ 10 kg/ha and 20 kg/ha respectively. Dry matter accumulation was maximum with T₇ (10.53 g) treatment at maturity, which is in close conformity of the findings of Mehta et al. [3]. It means Poultry Manure @ 5 t/ha+ Biofertilizer treatments could be comparable with the results obtained with inorganic nitrogen application to fenugreek plants.

Throughout the period of study, among the different treatments, earliness in flowering was noticed with the plants treated with T₇ (Table 6). Plants of the particular plot produced flowers on 12.01.09 during 2008-2009 and 05.01.10 during 2009-2010. On the other hand, during 2008-2009 the flowering was found to extend upto 21.03.09 in case of T₂ followed by T₅ (20.03.09). But during 2009-2010 flowering date was

extended upto 13.03.10 with T₅ followed by T₄ (12.03.10). Among the different treatments, the longest duration of flowering was 66 days during 2008-2009 and 65 days during 2009-10 with T₇. While the shortest duration of flowering was with T₀ (control) (56 days and 50 days during 2008-2009 and 2009-2010 respectively). Maximum number of flowers (37.8) per plant was recorded with T₁ followed by T₇ (32.7) and lowest production of flowers was 13.1 with T₀ (control) (Table 7).

Pooled data analysis also depicts that, treatments were non-significant. Table 8 depicts that pooled analysis of the yield attributes of fenugreek is subjected to DMRT test at 5% level of significant. The data clearly reveals that T₂, T₃ and T₄ treatments were on par with respect to pods/plant. Plants those received a combination of bulky organic manure and bio-fertilizer produced less number of pods/

Table 9. Performance of cashew plants with fenugreek as intercrop.

Treatments	Plant height (m)			Plant spread (m)			Canopy area (sq m)		
	2008- 2009	2009- 2010	Poo- led	2008- 2009	2009- 2010	Poo- led	2008- 2009	2009- 2010	Poo- led
T ₀	1.63	2.31	2.16 ^d	2.5	2.95	2.91 ^a	6.464	9.116	8.91 ^a
T ₁	1.79	2.31	2.42 ^{bc}	2.63	2.4	2.92 ^a	7.129	7.115	9.83 ^{ab}
T ₂	1.6	2.12	2.33 ^c	2.61	2.63	2.50 ^b	6.922	8.028	7.70 ^c
T ₃	2.17	2.39	2.41 ^{bc}	2.95	2.75	2.81 ^a	10.02	9.345	8.85 ^b
T ₄	2.08	2.68	2.72 ^a	2.96	2.74	2.87 ^a	9.528	9.416	10.14 ^a
T ₅	1.88	2.51	2.55 ^b	2.97	2.49	2.88 ^a	9.53	8.739	10.24 ^a
T ₆	1.7	2.24	2.16 ^d	2.82	2.63	2.89 ^a	8.431	7.966	8.81 ^b
T ₇	1.51	2.5	2.39 ^c	2.47	2.66	2.75 ^a	6.104	9.134	9.09 ^b
SEm±	0.09	0.07	0.06	0.10	0.12	0.08	0.63	0.60	0.43
CD at 5%	0.19	0.15	0.12	0.21	0.26	0.16	1.35	1.29	0.93

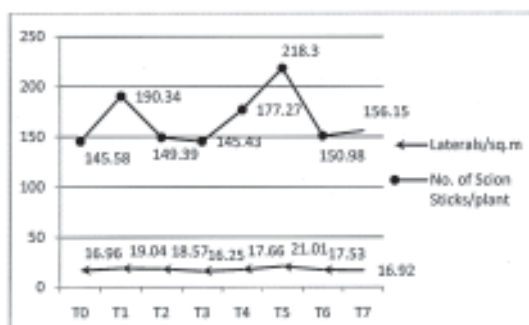


Fig. 1. Performance of cashew plants with fenugreek as intercrop (based on pooled data).

plant. It might be due to the fact that fenugreek is a leguminous plant. Therefore, with the application of bulky organic manures increased the nodulation in the fenugreek plants. But when bulky organic manures were combined with biofertilizers (Azotobacter + Azospirillum + PSB), existence of free living nitrogen fixers that competed for nutrients from bulky organic manures. So, natural nodulation of fenugreek might have decreased and thereby the fenugreek plants could not perform well with respect to pod production. Similar results were noticed in case of seeds/pod, seeds/plant. The average length of pod was maximum (13.20 cm and 14.20 cm respectively) with T₇ during two consecutive years (i.e. 2008 and 2009-2010), while the minimum length of pod (7.7 cm and 8.1 cm respectively) was recorded with T₀ (con-

trol). Pooled analysis mean shows that T₇, T₅, T₃, T₂ and T₄ were on par and the better treatments with respect to pod length of fenugreek.

Table 9 shows that performance of cashew plants with fenugreek as intercrop. Cashew plants grew at the border of the plot of fenugreek that received poultry manure @ 5 t/ha were the tallest. The growth of fenugreek plants was less in case of T₄ treatment. It means that fenugreek plants did not compete for nutrients with the cashew plants where inorganic fertilizers were applied at 70 cm to 1 meter away from the base of the cashew plant. In case of plant spread and canopy area of cashew plants were uniformly grown and therefore, almost no significant variation with respect to growth characters was noticed among the cashew plants planted on the borders of different treatments. Yield of fenugreek was maximum in case of T₂ and T₄ treatments, which were more than 5 g/plants (Table 10). Yield per ha was also maximum with T₂ (14.2 q/ha) and T₄ (13.4 q/ha). As Rhizobium culture had not been utilized as a source of biofertilizers for fenugreek, there might be less nodulation in the presence of other organism cultures used as biofertilizers. The natural nodulation in the roots of fenugreek also might have decreased. So, fenugreek plants received the treatments of bulky Organic Manure + Biofertilizers produced less yield than the treatments where bulky organic manures were applied singly. Test weight was maximum with control (14.1 g) followed by T₄ (13.5 g). In the present experiment 14.4 q/ha yield was obtained with the application of vermicompost @ 5 t/ha alone and 13.4 q/ha seed yield

Table 10. Effect of different nutritional treatment on yield of fenugreek.

Treatments	Yield / Plant (g)			Yield/Plot (kg)			Yield / Ha (q)		
	2008-2009	2009-2010	Pooled	2008-2009	2009-2010	Pooled	2008-2009	2009-2010	Pooled
T ₀	2.4	3.0	2.7 ^d	1.3	1.6	1.4 ^e	6.3	7.9	7.1 ^e
T ₁	4.3	4.8	4.6 ^b	2.3	2.5	2.4 ^b	11.3	12.7	12.0 ^{bc}
T ₂	4.6	6.4	5.5 ^a	2.4	3.4	2.9 ^a	12.1	16.8	14.4 ^a
T ₃	4.3	4.1	4.2 ^b	2.3	2.2	2.2 ^b	11.4	10.8	11.1 ^c
T ₄	5.8	4.4	5.1 ^a	3.1	2.3	2.7 ^a	15.4	11.5	13.4 ^{ab}
T ₅	4.4	4.6	4.5 ^b	2.3	2.4	2.4 ^b	11.7	12.1	11.9 ^c
T ₆	3.5	2.9	3.2 ^c	1.8	1.5	1.7 ^d	9.1	7.5	8.3 ^{de}
T ₇	2.8	3.9	3.3 ^c	1.5	2.1	1.8 ^c	7.3	10.3	8.8 ^d
SEm±	0.3	0.4	0.2	0.1	0.2	0.1	0.7	0.9	0.6
CD at 5%	0.64	0.86	0.43	0.21	0.43	0.21	1.50	1.93	1.29

Table 11. Effect of different nutritional treatment on quality attributes of fenugreek.

Treatments	Moisture %			Ash content (%)			Oleoresin %		
	2008-2009	2009-2010	Pooled	2008-2009	2009-2010	Pooled	2008-2009	2009-2010	Pooled
T ₀	10.00	8.60	9.30 ^e	4.00	5.53	4.77 ^d	27.53	30.53	29.03 ^c
T ₁	10.03	12.80	11.42 ^{cd}	4.23	4.33	4.28 ^e	25.13	30.40	27.7 ^{cd}
T ₂	11.93	12.30	12.12 ^{bc}	6.20	3.97	5.08 ^c	26.27	27.47	26.87 ^d
T ₃	11.57	11.80	11.68 ^{bcd}	5.13	4.30	4.72 ^d	37.53	30.37	33.95 ^a
T ₄	11.17	13.47	12.32 ^b	4.37	5.00	4.68 ^d	32.07	30.37	31.22 ^b
T ₅	13.73	12.93	13.33 ^a	5.70	5.53	5.62 ^a	20.63	25.33	22.98 ^e
T ₆	13.37	9.77	11.57 ^{cd}	5.40	4.83	5.12 ^c	27.80	25.10	26.45 ^d
T ₇	10.97	11.77	11.37 ^d	5.43	5.57	5.50 ^b	27.30	26.97	27.13 ^d
SEm±	0.40	0.47	0.30	0.17	0.15	0.11	1.26	0.84	0.75
CD at 5%	0.858	1.008	0.644	0.365	0.322	0.236	2.70	1.80	1.61

of fenugreek was recorded with poultry manure @ 5 t/ha alone. In combination of biofertilizers (other than Rhizobium) and bulky organic manures yielded between (8.3–13.9) q/ha.

Fig. 1 shows the production of scion sticks where fenugreek was cultivated as intercrop. The production of scion sticks of cashew plant was maximum when fenugreek was intercropped with the treatment T₅. Maximum 218.30 scion sticks / plant/year was harvested, with the highest return of Rs 109,151/ha. Significant variation was noticed among the treatments in terms of their response of ash content, oleoresin content and moisture content. Maximum ash content was recorded with T₄ and oleoresin content was maximum in case of T₃ (Table 11). Qualitative parameters of fenugreek were inferior when fenugreek received only recommended dose of inorganic fertilizers (NPK

@ 20–40–20 kg/ha) without any organic supplement. Table 12 represents the effect of different nutritional treatments on nutrient content (%) and uptake (kg/ha) by fenugreek plants (Based on pooled analysis data). T₄ and T₆ treatments were on par and were the best treatments recorded to have beneficial effect on nitrogen uptake of fenugreek while T₇, T₆ and T₄ treatments had beneficial effect on phosphate and potassium uptake.

Conclusion

Table 13 depicts the economics of fenugreek cultivation under cashew scion bank in one hectare area. Minimum cost was required for T₀ (Control) for fenugreek, as because no fertilizer or manures were applied. But at the same time yield of fenugreek was also very less with T₀ (Control) due to scarcity of

Table 12. Effect of different nutritional treatments on nutrient content (%) and uptake (kg/ha) by fenugreek.

Treatments	Nitrogen %	Nitrogen uptake (kg/ha)	Phosphorus %	Phosphorus uptake (kg/ha)	Potassium %	Potassium uptake (kg/ha)
T ₀	0.75	19.27	0.15	3.75	0.78	19.91
T ₁	0.94	21.76	0.23	5.46	0.93	21.70
T ₂	0.89	20.76	0.21	4.97	0.80	18.75
T ₃	0.90	21.63	0.20	4.80	0.89	21.44
T ₄	0.98	23.00	0.28	6.64	0.92	21.62
T ₅	0.77	18.46	0.21	4.86	0.79	18.84
T ₆	0.95	24.33	0.23	5.81	0.93	23.81
T ₇	0.93	21.15	0.30	6.77	0.96	21.73
SEm±	0.02	0.52	0.01	0.26	0.02	0.52
CD at 5%	0.04	1.12	0.02	0.56	0.04	1.12

Table 13. Economics of fenugreek cultivation under cashew scion bank (per hectare).

Treatments →	T ₀	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇
Cost of cultivation of fenugreek (Rs)/ha	22914	24634	31634	27934	29134	28047	31747	29247
Cost of establishing and maintaining cashew scion bank (Rs/ha)						50000		
Cost of cultivation of (Fenugreek+cashew) (Rs)/ha	72914	74634	81634	77934	79134	78047	81747	79247
Yield of fenugreek (q/ha)	7.10	12.00	14.40	11.10	13.40	11.90	8.30	8.80
Return from fenugreek (Rs)/ha	1633	2760	3312	2553	3082	2737	1909	2024
Return from cashew scion (Rs)/ha	72790	95170	74697	72716	88637	109151	75491	78077
Return from (cashew scion + fenugreek) (Rs)/ha	74423	97930	78009	75269	91719	111888	77400	80101
Net return	1509	23296	-3625	-2665	12585	33841	-4346	855
B:C	0.02	0.31	-0.04	-0.03	0.16	0.43	-0.05	0.01

nutrients. In case of fenugreek–cashew scion bank intercropping system maximum benefit cost ratio was recorded when T₅ (Farm Yard Manure @ 5 t/ha+Biofertilizers each @ 2.5 g/plot) was applied (0.43) followed by the treatment T₂ (Vermicompost @ 5 t/ha) (0.31).

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