CHAPTER VI
SUMMARY AND CONCLUSION

An investigation was carried out during *rabi* season of 2016-2017 at Instruction Farm, Department of Agronomy, College of Agriculture, Junagadh Agricultural University, Junagadh to study the “Integrated nutrient management in fenugreek (*Trigonella foenum-graecum* L). Total ten treatments comprising of nutrient management practices viz., T₁ (100 % RDF i.e. 20-40-00 kg N-P₂O₅-K₂O ha⁻¹), T₂ [100 % RDN through FYM (4 t ha⁻¹)], T₃ [100 % RDN through Vermicompost (1.5 t ha⁻¹)], T₄ [75 % RDF + 25 % RDN through FYM (1 t ha⁻¹)], T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)], T₆ [50 % RDF + 25 % RDN through FYM (1 t ha⁻¹) + Bio fertilizer (*Rhizobium* + PSB)], T₇ [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹) + Bio fertilizer (*Rhizobium* + PSB)], T₈ [25 % RDF + 50 % RDN through FYM (2 t ha⁻¹) + Bio fertilizer (*Rhizobium* + PSB)], T₉ [25 % RDF + 50 % RDN through Vermicompost (0.75 t ha⁻¹) + Bio fertilizer (*Rhizobium* + PSB)] and T₁₀ (Control) were evaluated in randomized block design with three replications.

The results presented and discussed in the previous IVth and Vth chapters. The salient features of the findings are summarized here under:

6.1 EFFECT ON GROWTH PARAMETERS

- Plant population of initial and final stage were remained unaffected due to various treatments under study.
- Significantly the maximum plant height at 30 DAS, 60 DAS and at harvest was recorded under treatment T₇ [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹) + Bio fertilizer (*Rhizobium* + PSB)] and it remained statistically at par with the T₃ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)] and T₆ [50 % RDF + 25 % RDN through FYM (1 t ha⁻¹) + Bio fertilizer (*Rhizobium* + PSB)] at 30 and 60 DAS and T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)], T₆ [50 % RDF + 25 % RDN through FYM (1 t ha⁻¹) + Bio fertilizer (*Rhizobium* + PSB)] and T₁ (100 % RDF i.e. 20-40-00 kg N-P₂O₅-K₂O ha⁻¹) at harvest.
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- Significantly the maximum plant spread at 30 DAS, 60 DAS and at harvest was recorded with treatment T7 [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)], which was remained statistically at par with treatments T5 [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1})], T6 [50 % RDF + 25 % RDN through FYM (1 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)] and T4 [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1})] at 30 DAS, T5 [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1})] and T6 [50 % RDF + 25 % RDN through FYM (1 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)] at 60 DAS and at harvest. The lowest plant spread was recorded with treatment T10 (control).

- Number of branches per plant at harvest was significantly higher with application of T7 [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)], which was found at par with application of T5 [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1})] and T6 [50 % RDF + 25 % RDN through FYM (1 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)]. Significantly the lowest number of branches was recorded with treatment T10 (control).

- The results indicated that days to 50% flowering of fenugreek were not affected significantly due to different treatments tried in this experiment.

6.2 EFFECT ON YIELD ATTRIBUTES AND YIELD

- Application of T7 [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)] recorded significantly higher number of pods per plant, number of seeds per pod, seed yield per plant and test weight, which was remained statistically at par with treatments T5 [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1})] and T6 [50 % RDF + 25 % RDN through FYM (1 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)] in respect of number of pods per plant, number of seeds per pod and seed yield per plant, T5 [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha\textsuperscript{-1})], T6 [50 % RDF + 25 % RDN through FYM (1 t ha\textsuperscript{-1}) + Bio fertilizer (\textit{Rhizobium} + PSB)] and T1 (100 % RDF i.e. 20-40-00 kg N-P\textsubscript{2}O\textsubscript{5}-K\textsubscript{2}O ha\textsuperscript{-1}) in case of test weight. While, treatment T10 (control) recorded significantly the lowest pods per plant, number of seeds per pod, seed yield per plant and test weight.
Summary and Conclusion

- Significantly the highest seed yield, straw yield and biological yield was recorded under treatment T7 [50% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)], but it was found statistically at par with treatments T5 [75% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\))] in case of seed yield and treatments T5 [75% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\)), T6 [50% RDF + 25% RDN through FYM (1 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)] and T1 (100% RDF i.e. 20-40-00 kg N-P\(_2\)O\(_5\)-K\(_2\)O ha\(^{-1}\)) in case of straw yield. However, significantly the lowest seed yield, straw yield and biological yield was observed under treatment T10 (control).

- The nutrient management practices did not exhibit any significant influenced on harvest index.

6.3 EFFECT ON QUALITY PARAMETERS

- Quality characters like protein content significantly increased with application of T7 [50% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)], which was statistically equivalent to the treatments T5 [75% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\))] and T6 [50% RDF + 25% RDN through FYM (1 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)]. Significantly, lower quality parameters were observed under the control (T10).

6.4 EFFECT ON NUTRIENT CONTENT AND UPTAKE

- Application of treatment T7 [50% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)] was recorded significantly the highest N, P and K content in seed. It was remained statistically at par with treatments T5 [75% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\))], T6 [50% RDF + 25% RDN through FYM (1 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)] and T1 [100% RDF i.e. 20-40-00 kg N-P\(_2\)O\(_5\)-K\(_2\)O ha\(^{-1}\)] in case of N and P content in seed, while T5 [75% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\))] in case of K content in seed. The lowest N, P and K content in seed was recorded under treatment T10 (control).

- Significantly the highest N and P content in straw was recorded by application of T7 [50% RDF + 25% RDN through Vermicompost (0.375 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)], while it was remained at par with treatments T6 [50% RDF + 25% RDN through FYM (1 t ha\(^{-1}\)) + Bio fertilizer (Rhizobium + PSB)] in case
of N content in straw, T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)] and T₆ [50 % RDF + 25 % RDN through FYM (1 t ha⁻¹) + Bio fertilizer (Rhizobium + PSB)] in case of P content in straw. Whereas, the lowest N and P content in straw was observed under treatment T₁₀ (control).

- Despite integrated nutrient management practices had no significant influence on K content in straw.

- Significantly higher N, P and K uptake by seed was recorded under treatment T₇ [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹) + Bio fertilizer (Rhizobium + PSB)], which maintained statistical equivalent with T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)] in respect of N, P and K uptake by seed. Treatment T₁₀ (control) was recorded the lowest N, P and K uptake by seed.

- Application of T₇ [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹) + Bio fertilizer (Rhizobium + PSB)] was recorded significantly higher N, P and K uptake by straw, which was remained statistically at par with T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)] and T₆ [50 % RDF + 25 % RDN through FYM (1 t ha⁻¹) + Bio fertilizer (Rhizobium + PSB)] in respect of P uptake by straw. T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)] for K uptake by straw. In contrast, significantly the lowest N, P and K uptake by straw was noted under treatment T₁₀ (control).

- Significantly higher total N, P and K uptake by crop with the application of T₇ [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹) + Bio fertilizer (Rhizobium + PSB)], which remained statistically at par T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)] in respect of total P uptake by crop. Significantly the lowest total N, P and K uptake by crop was observed in the treatment T₁₀ (control).

6.5 EFFECT ON AVAILABLE NUTRIENT IN SOIL AFTER HARVEST

- Significantly the maximum available N and P₂O₅ status in soil after harvest of fenugreek crop was noted in treatment T₇ [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹) + Bio fertilizer (Rhizobium + PSB)], which was remained statistically at par with treatments T₅ [75 % RDF + 25 % RDN through Vermicompost (0.375 t ha⁻¹)] and T₆ [50 % RDF + 25 % RDN through FYM (1 t
ha\(^{-1}\) + Bio fertilizer \((Rhizobium + PSB)\) in respect of P\(_2\)O\(_5\) status in soil after harvest of fenugreek crop. Significantly, the lowest values of available N and P\(_2\)O\(_5\) in soil after harvest were registered with control (T\(_{10}\)).

- Despite integrated nutrient management practices had no significant influence on residual availability of K\(_2\)O and organic carbon in soil.

6.6 EFFECT ON ECONOMICS

The maximum net returns of ₹38598 ha\(^{-1}\)and the highest BCR of 2.50 was secured with the treatment T\(_7\) [50 % RDF + 25 % RDN through Vermicompost (0.375 t ha\(^{-1}\)) + Bio fertilizer \((Rhizobium + PSB)\)]. The lowest net return of ₹15631 ha\(^{-1}\) and BCR of 1.70 was recorded under the treatment T\(_{10}\) (control).

6.7 CONCLUSION

- On the basis of one year field experimentation, it seems quite logical to indicate that higher production and net returns from fenugreek (var. Gujarat Methi-2) can be secured with application of 50 % RDF (10-20 kg N-P\(_2\)O\(_5\) ha\(^{-1}\)) + 25 % RDN through Vermicompost (0.375 t ha\(^{-1}\)) + Bio fertilizer \((Rhizobium @ 30 ml kg\(^{-1}\) seed + PSB @ 3.0 l ha\(^{-1}\) in soil) on clayey soil of South Saurashtra Agro-climatic Zone.

6.8 FUTURE LINE OF WORK

- The present experiment should be repeated for two or three years to know the consistency of treatment effects.

- The study should be conducted under different agro-ecological situations of the zone to make valid recommendation for the farmers.

- Integrated nutrient management practices should be studied with different source of nutrients for efficient and economical yield and quality for sustainable fenugreek production.