CHAPTER - VI
SUMMARY AND CONCLUSION

A field experiment entitled “Response of rajmah (Phaseolus vulgaris L.) to spacing and fertility levels” was carried out during rabi season of 2015-16 at the Instructional Farm, Department of Agronomy, College of Agriculture, Junagadh Agricultural University, Junagadh. The results presented and discussed in the preceding chapters are summarised as follows.

6.1 EFFECT OF SPACING

(i) Various row spacing exerts their significant effect on plant population at initial and at harvest. Highest plant population recorded at closer row spacing (30cm x 10cm) of 3, 30,324 and 3, 22,083 ha⁻¹ at initial and at harvest, respectively.

(ii) Effect of different row spacing on plant height was significant at 60DAS and at harvest. Significantly taller plants were recorded when rajmah was sown at closer spacing of 30cm x 10cm (S1).

(iii) Sowing rajmah at 60cm x 10cm (S3) being at par with S2 (45cm x 10cm) produced significantly more number of leaves plant⁻¹ at harvest.

(iv) Number of branches plant⁻¹ recorded at 60 DAS and at harvest was significantly maximum when rajmah was sown at wider row spacing of 60cm x 10cm (S3).

(v) Periodical dry matter accumulation at 30, 60 DAS and at harvest was significantly higher when crop was sown at 60cm x 10cm (S3).

(vi) Different row spacing failed to exert their significant influenced on days to 50% flowering. Significantly more number of days were taken for maturity when crop was sown at wider row spacing of 60cm x 10cm (S3).

(vii) Wider row spacing of 60cm x 10cm (S3) produced significantly more number of pod plant⁻¹, pod length and number of seeds pod⁻¹ and it remained at par with S2.

(viii) Rajmah sown at 30cm x10cm row spacing 30cm x 10cm (S1) produced significantly higher seed yield ha⁻¹ and it was found on same bar with S2.
Summary and conclusion

(ix) Stover yield ha\(^{-1}\) was recorded significantly higher under 30cm x 10cm spacing (S\(_1\)) and found statistically at par with S\(_2\).

(x) Different row spacing did not manifest their significant influence on test weight and harvest index.

(xi) Protein content in seed was significantly higher when crop was sown at wider row spacing 60cm x 10cm (S\(_3\)).

(xii) Maximum nitrogen content in stover and phosphorus content in seed and stover were observed when crop was sown at wider row spacing 60cm x 10cm (S\(_3\)).

(xiii) Different row spacing failed to exert their significant effect on uptake of NPK by seed and stover.

(xiv) Available nitrogen, phosphorus and potash in soil after harvest of rajmah were not affected significantly due to different row spacing.

(xv) Maximum gross and net return of ₹ 81,338 ha\(^{-1}\), ₹ 50,010 ha\(^{-1}\) with 2.60 B:C ratio were achieved when rajmah was sown at 30cm x 10cm (S\(_1\)) which was numerically followed by 45cm x 10cm (S\(_2\)) with gross and net realization of ₹ 77,510 ha\(^{-1}\), ₹ 49,726 ha\(^{-1}\).

6.2 EFFECT OF FERTILITY LEVELS

(i) Different fertility levels failed to exert their significant effect on plant population at initial and at harvest.

(ii) Effect of different fertility levels on plant height was significant at 60DAS and at harvest. Significantly taller plants were recorded when rajmah was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\)) and it was on same bar with F\(_2\).

(iii) Fertilizing the crop with 100-60 NP kg ha\(^{-1}\) (F\(_3\)) produced significantly more number of leaves plant\(^{-1}\) and remained at par with 80-40 NP kg ha\(^{-1}\) (F\(_2\)) at harvest.

(iv) Number of branches plant\(^{-1}\) at 60DAS and at harvest was significantly maximum when crop was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\))

(v) Periodical dry matter accumulation at harvest was significantly higher when crop was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\)) and it was on same bar with F\(_2\) i.e. 80-40 NP kg ha\(^{-1}\).
(vi) Significantly more number of days to 50% flowering and days to maturity were taken by crop when it was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\)) followed by 80-40 NP kg ha\(^{-1}\) (F\(_2\)).

(vii) Higher fertility level of 100-60 NP kg ha\(^{-1}\) (F\(_3\)) recorded significantly more number of pod plant\(^{-1}\), longer pod and more number of seeds pod\(^{-1}\) and it was observed at par with F\(_2\) i.e. 80-40 NP kg ha\(^{-1}\).

(viii) Application of 100-60 NP kg ha\(^{-1}\) (F\(_3\)) to rajmah produced significantly maximum seed and stover yields and it was found statistically at par with F\(_2\) i.e. 80-40 NP kg ha\(^{-1}\) (F\(_2\)).

(ix) Test weight was noted significantly higher under 100-60 NP kg ha\(^{-1}\) (F\(_3\)) and observed on par with F\(_2\). Harvest index was not affected by fertility levels.

(x) Protein content in protein yield were significantly maximum when crop was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\)) and it was at par with F\(_2\).

(xi) Nitrogen and phosphorus content in seed and stover were significantly higher under 100-60 NP kg ha\(^{-1}\) (F\(_3\)). Whereas, potassium content in seed and stover were not significantly affected due to different fertility levels.

(xii) Significantly higher nitrogen, phosphorus and potassium uptake by seed and stover were observed when crop was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\)) and it was observed on par with F\(_2\) except nitrogen and phosphorus uptake by stover.

(xiii) Available nitrogen and phosphorus in soil after harvest of rajmah crop were significantly influenced by different fertility levels and found maximum when crop was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\)).

(xiv) Maximum gross and net realization of ₹ 81,338 ha\(^{-1}\), ₹ 50,010 ha\(^{-1}\) with B: C ratio 2.60 was obtained when rajmah was fertilized with 100-60 NP kg ha\(^{-1}\) (F\(_3\)) which was closely followed by 80-40 NP kg ha\(^{-1}\) (F\(_2\)) with gross and net return of ₹ 79,204 ha\(^{-1}\), ₹ 49,052 ha\(^{-1}\).

6.3. INTERACTION EFFECT

(i) Interaction between row spacing and fertility levels found to be significant for pod length and recorded maximum pod length in treatment combination S\(_3\)F\(_3\) and remained at par with S\(_3\)F\(_2\).

(ii) Significantly more number of seed pod\(^{-1}\) was recorded under S\(_3\)F\(_3\) followed by S\(_3\)F\(_2\) and S\(_2\)F\(_3\).
Summary and conclusion

(iii) Interaction between row spacing and fertility levels was significant for seed and stover yields ha\(^{-1}\). Sowing the crop at 30 cm x 10 cm and fertilizing the crop with 100-60 NP kg ha\(^{-1}\) (S\(_1\)F\(_3\)) produced significantly higher seed and stover yields and it was remained statistically at par with S\(_1\)F\(_2\) in case of seed yield.

(iv) Significantly higher protein content in seed was recorded under S\(_3\)F\(_3\) combination and it was found same bar with S\(_2\)F\(_3\), S\(_3\)F\(_2\) and S\(_2\)F\(_2\).

(v) Maximum protein yield was noted under S\(_1\)F\(_3\) and it was observed at par with S\(_1\)F\(_2\), S\(_2\)F\(_2\) and S\(_2\)F\(_3\).

(vi) Significantly maximum uptake of nitrogen by seed was observed under S\(_1\)F\(_3\) and it was remained statistically at par with treatment combination S\(_1\)F\(_2\), S\(_2\)F\(_2\) and S\(_2\)F\(_3\).

(vii) Interaction between row spacing and fertility levels was significant for phosphorus uptake by stover. Sowing the rajmah at 30 cm x 10 cm and fertilizing the crop with 100-60 NP kg ha\(^{-1}\) (S\(_1\)F\(_3\)) removed maximum phosphorus and found on same bar with S\(_2\)F\(_3\).

6.4. CONCLUSION

On the basis of one year field investigation, it seems quite logical to conclude that rabi rajmah (Gujarat rajmah-1) should be sown at 30 cm x 10 cm and fertilized with 100-60 NP kg ha\(^{-1}\) statistically followed by 80-40 kg NP ha\(^{-1}\) along with other recommended package of practices under medium black calcareous soil of South Saurashtra Agro-climatic Zone for getting higher yield and net realization.