SUMMARY AND CONCLUSION

The present investigation entitled “Evaluation of crop establishment techniques and fertility levels on growth and yield of rice (Oryza sativa L.)” was carried out at the Crop Research Farm, Department of Agronomy, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Deemed-to-be-University, Allahabad, during Kharif season of 2007 and 2009, to study the effect of different crop establishment techniques, fertility levels, and their interaction on growth and yield of rice.

The field trial was laid out in randomized block design (5 x 3 factorial), having five crop establishment techniques and three fertility levels making 15 treatment combinations, each replicated three times. The allocation of treatments to the individual plots was done using random numbers in each replication.

The results of the investigation, regarding effect of crop establishment techniques, fertility levels and their interaction on growth, yield and economic returns of Rice have been presented and interpreted in the light of impact of different treatments during the experimentation, and discussed in the preceding chapter.

Results of the experiment are summarized below:

1. SRI technique of crop establishment (C5) recorded maximum plant height, number of tillers hill⁻¹, plant dry weight and crop growth rate at all the stages of growth followed by integrated crop management
(ICM) (C₁) while the minimum was recorded with drum seeder (C₄) at all the stages of growth during both the years of experimentation.

2. Fertility level F₃ (NPK 150: 75: 75 kg ha⁻¹) recorded maximum plant height, number of tillers hill⁻¹, plant dry weight and crop growth rate at all the stages of growth followed by F₂ (120: 60: 60 kg ha⁻¹ N: P: K) and F₁ (no fertilizer) recorded the minimum at all the growth stages during both the years (2007 and 2009).

3. Treatment combination C₅ F₃ (SRI technique + NPK 150: 75: 75 kg ha⁻¹) recorded maximum plant height, number of tillers hill⁻¹, plant dry weight and crop growth rate followed by C₁ F₃ (ICM + NPK 150: 75: 75 kg ha⁻¹) and the minimum was recorded with C₄ F₁ (Drum seeder + no fertilizer) during both the years of experimentation, at all the stages of growth.

4. SRI (C₅) recorded maximum crop growth rate followed by line planting (C₂) while the minimum was found with C₄ (drum seeder) during 61-90 DAT/DAS. F₃ (NPK 150: 75: 75 kg ha⁻¹) recorded maximum crop growth rate followed by F₂ (120:60:60 kg N: P: K ha⁻¹) while the minimum was found with F₁ (no fertilizer) during 2007 and 2009.

5. Combination of SRI technique + NPK 150: 75: 75 kg ha⁻¹ (C₅ F₃) recorded maximum crop growth rate closely followed by C₂ F₃ (line planting + NPK 150: 75: 75 kg ha⁻¹), whereas, C₄ F₁ (drum seeder + no fertilizer) recorded the minimum during 2007 and 2009.
6. Farmers’ practice (C3) recorded maximum relative growth rate followed by line planting (C2) while the minimum was found with ICM (C1) and SRI (C5). F1 (no fertilizer) and F2 (120:60:60 kg N: P: K ha⁻¹) recorded maximum relative growth rate followed by F3 (NPK 150: 75: 75 kg ha⁻¹) during 2007 and 2009. Combination of farmers’ practice + no fertilizer (C3 F1) recorded maximum relative growth rate followed by C2 F1 (line planting + no fertilizer), whereas, C5 F3 (SRI + NPK 150: 75: 75 kg ha⁻¹) recorded the minimum.

7. C5 (SRI technique of crop establishment) recorded maximum number of effective tillers hill⁻¹ and m⁻², number of panicles hill⁻¹, length of panicle, number of spikelets panicle⁻¹, test weight, grain and straw yield ha⁻¹ and harvest index followed by C1 (ICM) while C4 (drum seeder) recorded the minimum during both the years of experimentation.

8. F3 level of fertility (NPK 150: 75: 75 kg ha⁻¹) recorded maximum number of effective tillers hill⁻¹ and m⁻², number of panicles hill⁻¹, length of panicle, number of spikelets panicle⁻¹, test weight, grain and straw yield ha⁻¹ and harvest index followed by F2 (120: 60: 60 kg ha⁻¹ N: P: K), while F1 (no fertilizer) recorded the minimum during both the years (2007 and 2009).

9. Combination of SRI technique + NPK 150: 75: 75 kg ha⁻¹ (C5 F3) recorded maximum number of effective tillers hill⁻¹ and m⁻², number of panicles hill⁻¹, length of panicle, number of spikelets panicle⁻¹, test weight, grain and straw yield ha⁻¹ and harvest index followed by ICM.
+ NPK 150: 75: 75 kg ha\(^{-1}\) (C\(_4\) F\(_1\)). Drum seeder + no fertilizer (C\(_4\) F\(_1\)) recorded the minimum during both the years of experimentation.

10. Treatment combination C\(_5\) F\(_3\) (SRI technique + NPK 150: 75: 75 kg ha\(^{-1}\)) recorded maximum gross return, net return and benefit cost ratio followed by C\(_1\) F\(_3\) (ICM + NPK 150: 75: 75 kg ha\(^{-1}\)) during both the years (2007 and 2009). The minimum gross return and net return was recorded with C\(_4\) F\(_1\) (Drum seeder + 150:75:75 kg N: P: K ha\(^{-1}\)), whereas, the minimum benefit cost was recorded with C\(_4\) F\(_2\) (drum seeder + 120: 60: 60 kg ha\(^{-1}\) N: P: K) during both the years of experimentation.

11. SRI technique of crop establishment (C\(_5\)) and fertility level of NPK 150: 75: 75 kg ha\(^{-1}\) (F\(_3\)) were found appropriate crop establishment technique and fertility level, respectively. Their combination C\(_5\) F\(_3\) (SRI technique + NPK 150: 75: 75 kg ha\(^{-1}\)) emerged as superior over all other treatment combinations in relation to growth, yield and yield attributes, and economic viability for cultivation of rice under the agro-climatic conditions of Allahabad during both the years of experimentation (2007 and 2009).
CONCLUSION

In view of the experimental results obtained during the present investigation, SRI technique of crop establishment and fertility level of NPK 150: 75: 75 kg ha\(^{-1}\) were found appropriate crop establishment technique and fertility level, respectively, and their combination (SRI technique + NPK 150: 75: 75 kg ha\(^{-1}\)) emerged as superior over all other treatment combinations in relation to growth, yield and yield attributes, and economic returns for cultivation of rice under the agro-climatic conditions of Allahabad during both the years of experimentation.