



Theme 1

Status and trends of global soil nutrient budget



Effect of different organic nutrient solutions on the growth and yield of Blackgram

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Introduction

Black gram plays a vital role in improving soil health, ensuring environmental security and considered option in organic farming. Although importance of macronutrients in plant metabolism is well known, yet the role played by the different organic nutrient solutions in plants and their important on yield and quality components of pulses is not well understand. In India, blackgram is cultivated with minimum use of resources. It is mostly cultivated under rainfed conditions, which reduces the yield potential of Blackgram. Poor cultivation practices under marginal and sub marginal lands negatively influences the blackgram yield. Yield potential of crop is highly plummeted by various physiological, biochemical and genetic factors in Blackgram (Devaraju and Senthivel, 2018).Foliar application of nutrients makes the crop to efficiently utilize the nutrients in a prompt manner without losses like leaching and fixation (Manonmani and Srimathi, 2009). However, the different organic nutrient solutions on the growth and yield of black gram has not been attempted so far in the coastal region of Karaikal.

Materials and methods

The pot culture experiment was conducted in backyard of Agronomy block at PAJANCOA&RI, Karaikal. The soil character was clay loam in texture. The soil fertility status was low in available nitrogen and medium in phosphorus and potassium. The crop was raised during February 2017 under irrigated condition. Black gram variety ADT 3 was chosen for the study. The pot culture experiment was laid out in a completely Randomized Design (CRD) with three replications. Different foliar spray treatments were randomized as per statistical procedures. T0- Control (No FYM+ No RDF+ No Organic Nutrient solution), T1-RDF(25:50:25 NPK Kg ha⁻¹), T2-FYM @12.5 t ha⁻¹, T3-Amudham solution @ 10%, T4-Coconut buttermilk solution @ 5%, T5-Fish Extract @ 0.5%, T6-T2 +T3, T7-T2+T4, T8-T2+T5. Foliar application was done on 15th, 30th and 45th DAS. The pot size was 22.5 × 22.5 × 25 cm. The soil from the field B9 was taken, weighed (17 kg soil) and filled into the pot. The mature pods of black gram from the pot were harvested on 75th DAS. The observation was taken in the five plants. The recommended dose of fertilizers in the form of Urea, super and potash were calculated and applied as per the treatment schedule. The biometric observations recorded were put to statistical scrutiny as per the procedure suggested by Gomez and Gomez (1984).. In the result, wherever it was found to be significant, the critical differences were worked out at five percent probability level and when the treatment differences were not significant, it was denoted as NS.

Result

Recording the plant height at 20 DAS, among the different treatment, recommended dose of fertilizer had significantly recorded higher plant height at 20 DAS which was at par with FYM @ 12.5 t ha⁻¹ + foliar spraying of coconut buttermilk solution alone at 10% on 15th, 30th and 45th DAS was found to be the next best treatment. The least plant height was recorded under control. All the treatments under study had not significantly influenced the leaf area of blackgram at 40 DAS and dry matter production of blackgram (g plant⁻¹) at harvest (Fig. 1).

Foliar spray of coconut buttermilk @ 10% in combination with FYM @ 12.5 t ha⁻¹ had significantly produced higher number of pods plant⁻¹ which was however at par with foliar spray of coconut buttermilk alone or fish extract alone. They had number of pods plant⁻¹ was recorded under control. There is a no significant difference between number of seeds pod⁻¹. Foliar spray of coconut buttermilk @ 10% in combination with FYM @ 12.5 t ha⁻¹ had significantly produced higher grain yield which was however at par with foliar spray of coconut buttermilk alone or fish extract alone. (Fig. 2).

Conclusion

From the present pot culture experiment, it could be concluded that black gram can be grown organically by following the organic nutrient management practice of either applying Farm Yard Manure @ 12.5 t ha⁻¹ in combination with foliar spraying of coconut butter milk solution @ 5% on 15, 30 and 45 DAS or spraying of 5% coconut butter milk solution alone or 0.5% fish extract alone on 15, 30 and 45 DAS for increased productivity in the coastal region of Karaikal.

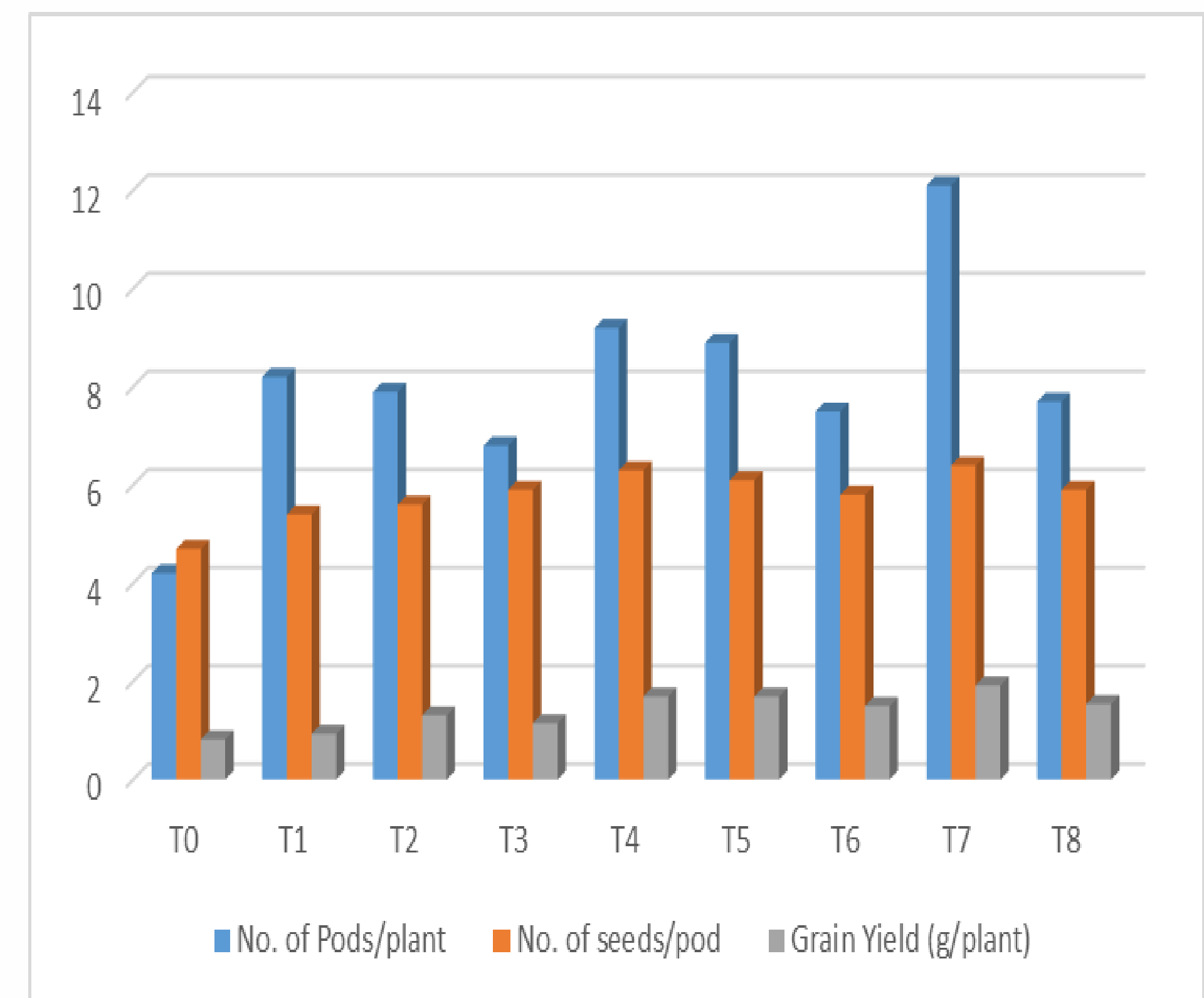


Fig. 2 Effect of different organic nutrient solutions on the yield attributes and yield of blackgram

References

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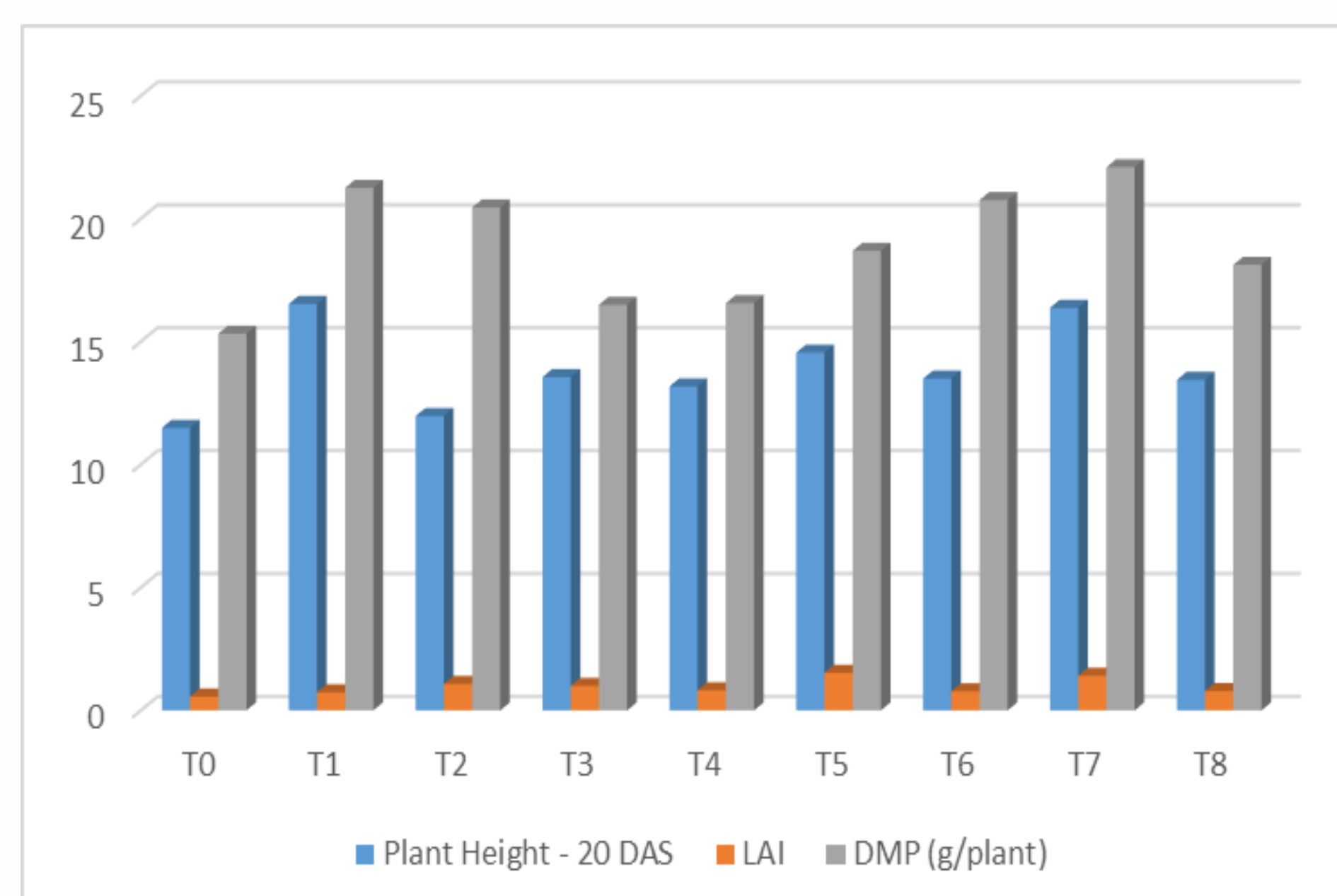


Fig. 1 Effect of different organic nutrient solutions on the plant height, LAI and Dry Matter Production of blackgram

