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RESEARCH ARTICLE :

Effect of long term fertilization on soil nitrogen dynamics and balance in an irrigated inceptisol under finger millet-hybrid maize cropping sequence

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SUMMARY : A field study was conducted in the year 2013-14 at TNAU, Coimbatore as a part of ongoing AICRP-LTFE to assess the effect of long-term fertilization on soil nitrogen (N) dynamics, N uptake and yield of hybrid maize under finger millet-hybrid maize cropping sequence. There were ten treatments each replicated four times in Randomized Block Design *viz.*, T_1 - 50 % NPK, T_2 - 100% NPK, T_3 - 150% NPK, T_4 - 100% NPK + hand weeding, T_5 - 100%NPK + $ZnSO_4$, T_6 - 100% NP, T_7 - 100% N alone, T_8 - 100% NPK + FYM, T_9 - 100% NPK (-S) and T_{10} - Absolute control. Results showed a significant higher value of available N in soil under 100% NPK+FYM treatment irrespective of critical growth stages of hybrid maize. Among N fractions, inorganic fractions *viz.*, NH_4-N, NO_3-N and fixed NH_4-N were significantly affected by the incremental addition of N. Integration of organics with inorganic fertilizers had a complementary effect on all fractions of nitrogen. Grain and straw yield of hybrid maize were significantly higher under 100% NPK + FYM treatment which showed a yield increase of 12.6 % over 100% NPK alone. Hence, integrated nutrient management (100% NPK+ 10 t FYM ha^{-1}) has maximized yield of hybrid maize and improved the soil N pools by facilitating N transformation in soil.

KEY WORDS:
FYM, Hybrid maize, Integrated nutrient management, Nitrogen dynamics, N fractions

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