



**RESEARCH ARTICLE :**

## Impact on residual effect of different sources of organic manures, micronutrients and Arbuscular Mycorrhiza applied to preceding maize and fertilizer levels to succeeding sunflower on major nutrients uptake, availability and yield of maize-sunflower sequential cropping system

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**SUMMARY :** Field experiments were conducted to study the influence of organic manures, micronutrients and arbuscular mycorrhiza (AM) on the productivity of maize-sunflower cropping system at Tamil Nadu Agricultural University, Coimbatore during 2011-12 and 2012-13. The experiment was laid out in split plot design and replicated thrice for maize during winter 2011-12 and 2012-13 and the same experiment after dividing each plot into two was laid out in split-split plot design with three replications for sunflower during summer 2012 and 2013 to estimate the residual effects of organic manures. The popular maize hybrid NK 6240 was taken as test hybrid in maize and Co SFH2 as test hybrid in sunflower. Four sources of organic manures with RDF viz., Farmyard manure 12.5 t ha<sup>-1</sup>, sericulture waste 5 t ha<sup>-1</sup>, poultry manure 5 t ha<sup>-1</sup> and goat manure 5 t ha<sup>-1</sup> were evaluated in main plot along with one control (RDF only). Arbuscular mycorrhiza 100 kg ha<sup>-1</sup>, ZnSO<sub>4</sub> 37.5 kg ha<sup>-1</sup>, TNAU Micronutrient mixture 30 kg ha<sup>-1</sup> and a control without micronutrients and AM were studied in the sub plot. Organic manures, micronutrients and AM were applied to first crop of maize only and their residual effect was studied in the succeeding crop of sunflower with and without recommended dose of fertilizer. Observations were recorded on the uptake of Nitrogen (N), Phosphorus (P), Potassium (K), Zinc (Zn) and Iron (Fe) at different growth stages, post harvest soil for available NPK, of different treatments were also worked out for each crop and the system as a whole to justify the significance of treatments. Significantly higher NPK uptake by maize as well as higher soil available NPK was recorded in post harvest soil after maize under application of poultry manure @ 5 t ha<sup>-1</sup> followed by sericulture waste @ 5 t ha<sup>-1</sup>. Among the micronutrients and AM treatments, ZnSO<sub>4</sub> @ 37.5 kg ha<sup>-1</sup> recorded the highest NPK uptake and post harvest soil NPK during both the years of study. Among the two fertilizer treatments tried in sunflower, recommended dose of fertilizer application resulted in NPK uptake and post harvest available NPK as compared to no fertilizer treatment in maize-sunflower cropping system revealed that the maximum actual gain in the soil available nitrogen, phosphorus and potassium was recorded under the treatment combination of poultry manure @ 5 t ha<sup>-1</sup> with RDF and zinc sulphate @ 37.5 kg ha<sup>-1</sup> to maize and application of RDF to succeeding sunflower.