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# Effect of organic manures, micronutrients and AM on crop growth rate (CGR), relative growth rate (RGR) and yield under residual effect of maize-sunflower cropping system

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**ABSTRACT :** Field experiments were conducted to find out the influence of organic manures, micronutrients and arbuscular mycorrhiza (AM) on the crop growth rate (CGR), relative growth rate (RGR) and yield 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 and replicated thrice for sunflower during summer 2012 and 2013 to find out the crop growth rate (CGR), relative growth rate (RGR) and yield in the residual organic manures as well as micronutrients and arbuscular mycorrhiza in the experiment field. During 2011-12, application of poultry manure @ 5 t ha<sup>-1</sup> recorded higher crop growth rate (CGR) viz., 24.29 to 24.58 g<sup>-2</sup>day<sup>-1</sup> (between 30-60 DAS and 60-90 DAS, respectively). Among the micronutrients and AM, ZnSO<sub>4</sub> 37.5 kg ha<sup>-1</sup> recorded larger crop growth rate (CGR) of 22.25 and 23.37 g<sup>-2</sup>day<sup>-1</sup> (between 30-60 DAS and 60-90 DAS, respectively). The residual effect of applied poultry manure @ 5 t ha<sup>-1</sup> to previous maize crop registered highest crop growth rate of sunflower viz., 13.06 to 5.48 g<sup>-2</sup>day<sup>-1</sup> (between 30-60 DAS and 60-90 DAS, respectively) regarding the organic manures, higher RGR (0.076 and 0.042 mg g<sup>-1</sup> day<sup>-1</sup> between 30-60 and 60-90 DAS, respectively) was recorded under poultry manure 5 t ha<sup>-1</sup> followed by sericulture waste compost 5 t ha<sup>-1</sup>, goatmanure 5t ha<sup>-1</sup> and FYM 12.5 t ha<sup>-1</sup>. Among the micronutrients and AM treatments, ZnSO<sub>4</sub> 37.5 kg ha<sup>-1</sup> recorded higher RGR of 0.070 and 0.036 mg g<sup>-1</sup> day<sup>-1</sup> between 30 - 60 and 60 - 90 DAS, respectively. In 2012, regarding the organic manures, higher RGR (0.058 and 0.029 mg g<sup>-1</sup> day<sup>-1</sup> between 30-60 and 60-90 DAS, respectively) was recorded under poultry manure 5 t ha<sup>-1</sup> to preceding maize followed by sericulture waste 5 t ha<sup>-1</sup>. In the first crop during 2011-12, among the organic manures, poultry manure 5 t ha<sup>-1</sup> recorded the highest grain yield of 7230 kg ha<sup>-1</sup>. Micronutrients and AM had a positive influence on grain yield of maize. Among the micronutrients, ZnSO<sub>4</sub> 37.5 kg ha<sup>-1</sup> recorded the highest grain yield (7271 kg ha<sup>-1</sup>). Higher seed yield of sunflower (2086 kg ha<sup>-1</sup>) was recorded under poultry manure 5 t ha<sup>-1</sup> applied to preceding maize followed by sericulture waste 5 t ha<sup>-1</sup>.

**KEY WORDS :** Organic manures, Micronutrients, AM , Maize, Sunflower, CGR,RGR, Seed yield

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