## ABSTRACT

Yield and quality of high value crops are principally regulated by nutrient management at field level. Field experiments were conducted to study the effect of organic and chemical fertilizer sources on growth, yield, nutrient uptake and quality of tomato and sweet corn crop and on changes in soil chemical and biological properties in acid lateritic soil of eastern India. The tomato was grown during dry season (November - February) and sweet corn during wet season (May - July) in the cropping system during the years 2008 to 2010. The organic inputs were vernicmpost (VC), vermiwash (VW), biofertilizer (BF) and crop residue (CR) and the inorganic input was chemical fertilizer (CF). The treatments were CF at 100% recommended dose of N, P and K ( $CF_{100}$ ), VC at 100% N recommendation ( $VC_{100}$ ),  $VC_{50}+CF_{50}$ , CR, VC<sub>50</sub>+CR, VC<sub>50</sub>+VW+BF, and a control, where no fertilizer was added. The treatments with optimal dose of fertilizer application i.e.  $CF_{100}$ ,  $VC_{100}$  and  $VC_{50}$  +  $CF_{50}$  were at par and were significantly superior to suboptimal dose of VC with other organic sources, in increasing yield components and yield of both tomato and sweet corn. Among the fertilized treatments, maximum uptake of nutrients (N, P and K) was noted in  $CF_{100}$  treatment, but maximum N use efficiency in VC-based treatments. The quality parameters of tomato such as color value, soluble solids, ascorbic acid, lycopene and beta carotene were improved under different fertilizer treatments, maximum being in VC<sub>100</sub>. In case of sweet corn, the quality parameters such as ascorbic acid and total phenolics were higher and crude protein and sugar content were lower in  $VC_{100}$  as compared to  $CF_{100}$  treatment. The soil available macronutrients (N, P and K) were lower, whereas organic carbon and micronutrient (Fe, Mn, Zn and Cu) were higher in VC-based treatments as compared to CF treatment at the end of two years cropping system. Inclusion of BF in VC-based treatment was more promising in increasing the microbial count by three fold as compared to the CF treatment. Organic fertilizer application, therefore exhibited potential in improving soil health, crop yield and quality of tomato and sweet corn in acid lateritic soil of the subtropical climate.

**Key words:** Ascorbic acid, Chemical fertilizer, Crop quality, Crop yield, Organic fertilizer, soluble solids, Soil nutrient, Sweet corn, Tomato