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Organic Carbon and Micro Nutrients Distribution in Agricultural Systems along Rural-Urban Interface of Southern Transect Bengaluru

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Abstract

Urbanisation is a global trend rapidly transforming the biophysical and socioeconomic structures of metropolitan areas. Bengaluru being one of the megacities in the world, expanding rapidly over time. Urbanisation is witnessing consumer demand for vegetables, fruit trees and flowers which induced major shift in agricultural land use towards an intensive irrigated multi cropping system from conventional crops. Intensification of agriculture has an adverse effect on physical, chemical and biological properties of soils, and their potential to synchronise nutrient supply and demand in agricultural cropping systems. This change in cropping system made farmers to use inorganic fertilisers indiscriminately. This monopoly in the use of inorganic fertilisers (N fertilisers in particular) has led to decline in organic carbon content of agricultural lands and their by imbalance of micronutrients in the soil and tends to decline in the yield levels. Hence, study was conducted to know the distribution of organic carbon and micro-nutrient agricultural systems along rural-urban interface of southern transect of Bengaluru. The sampling was done across villages of southern transect based on survey stratification index (SSI), which is worked out by taking distance and buildup area into an account. The transect was divided into urban, transition and rural areas. Different cropping systems were considered while taking the samples from each urbanisation gradients. The mean organic carbon content of soil varies from 0.69, 0.474 and 0.38 per cent in rural, transition and urban areas, respectively. Nutrient index values for organic carbon is found to be low across transect. However, available Fe, Zn, Cu, Mn and B content of soils varied significantly along urbanisation gradient. Available Fe, Zn, Cu, Mn and B were 7.28, 0.83, 0.60, 5.41 and 0.75 ppm in rural areas, 11.44, 0.56, 1.12, 8.29 and 1.06 ppm in transition and 4.16, 0.54, 0.44, 3.44 and 0.44 in urban areas, respectively. Nutrient index values for all the micronutrients are found to be medium in rural areas, high in transition and low in Urban areas of Bengaluru.

Keywords: Agricultural systems, Bengaluru, micronutrients, organic carbon