

Effect of Organic Fertilizers and Chemical Fertilizers on Soil Biology: A short-term field trial

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Soil quality degradation is a major challenge in agriculture and common to short-term high demanding crops. Properly managed, live soil is crucial for agriculture. Soil microbial biomass and the organic matter content are essential components to maintain the soil biology, a major part of soil quality. Incorporation of chemical inputs severely affects soil biology. Therefore, to find solutions, a 100% environmentally friendly, low-cost organic fertilizer was tried as a short - term field trial. The focus was to increase soil biology in low fertile lands within a short period. The study was conducted for seven weeks using Cabbage (*Brassica oleracea*) as an indicator crop in a low fertile land. Randomized Complete Block Design was used, with five replicates and three treatments- (i) Super compost, bio-fertilizer, sterilized farm soil (T1), (ii) Chemical fertilizers recommended by the Department of Agriculture for *Brassica oleracea*, sterilized farm soil (T2), and (iii) Control–sterilized farm soil (T3). Parameters were analysed following standard laboratory procedures at the beginning and at the end of the experiment. In general, soil parameters were significantly different in T1 ($p < 0.05$). It manifested the highest increment in organic carbon (2.12%) and microbial activity (14.84%) due to the addition of nutrient-rich organic fertilizer with beneficial microorganisms. At the same time, T2 showed the second highest increment - 0.585% in organic carbon and 7.36% in microbial activity. There was no significant difference between the increment values of T2 and T3 related to microbial activity. T3 showed the lowest increment as the soil was sterilized to eliminate the microorganisms. The results indicate, the application of organic fertilizers has the potential to upgrade soil biology in low fertile lands even within a short time. Therefore, this would be an ideal solution to conquer the challenges in agriculture related to low fertile abandoned lands.

Keywords: *Chemical fertilizers, Microorganisms, Organic Fertilizers, Organic Matter, Soil Biology*