EVALUATION OF DIFFERENT ORGANIC INPUTS ON SOIL CARBON STOCK AND SOIL CHEMICAL PROPERTIES (EC, pH, P, K, ORGANIC MATTER IN SOIL) AND BEAN (*Phaseolus vulgaris* L.) CROP YIELD

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ABSTRACT

Organic additives are vital for improving soil health, increasing carbon levels, and affecting crop production. This research seeks to evaluate the impact of different organic amendments like gliricidia, compost, cow dung, and guinea grass on soil chemical characteristics and bean (*Phaseolus vulgaris* L.) crop yield. The experiments were conducted in a Completely Randomized Block Design (RCBD) with different organic inputs including gliricidia, compost, cow dung and guinea grass. Soil samples were analyzed for chemical properties, including electrical conductivity (EC), pH, phosphorus (P), potassium (K) and organic matter content before and after the application of organic inputs. Plant growth parameters such as plant height, number of leaves, Soil Plant Analysis Development (SPAD) value, days to first flowering, days to 50% flowering and first harvesting were recorded. The decomposition rate of each organic input was measured using litter bag system. The application of organic inputs significantly improved the soil carbon stock, with gliricidia showing the highest increase in organic matter content. Soil pH, EC, P and K showed marked improvements in treatments with organic inputs, particularly Gliricidia and Guinea grass. Plant growth parameters exhibited a positive correlation with organic matter application, where plants treated with Guinea grass and Gliricidia had the tallest plant, highest number of leaves, and optimal Soil Plant Analysis Development (SPAD) values were got the compost treatment. The days to first flowering and days to 50% flowering were significantly earlier in plants treated with all organic amendments and not affect to the organic manure for flowering. The decomposition rate was fastest in Gliricidia, followed by compost, and slowest in cow dung according to C: N ratio. The findings demonstrate how quickly Gliricidia decomposition and subsequent nutrient release make it a promising organic input for enhancing soil health. The study underscores the importance of organic amendments in sustainable soil management and crop production systems. Compost could promote soil structure and moisture retention, while manure can give easily available nutrients. When combined, these inputs could operate together to create greater significant benefits than either could independently.

Keywords: compost, cow dung, decomposition rate, green manure, guinea grass, organic inputs, soil carbon stock, Soil Plant Analysis Development (SPAD) value.

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