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Effects of Different Organic Amendment Sources on the Physico Chemical Properties of a Nutrient Depleted Vertisol

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Abstract

The decline in soil organic matter, nutrient depletion, and loss of soil fertility due to soil degradation contribute to low agricultural productivity. Organic amendments (OAs) have the potential to reverse soil degradation processes by improving the soil's physical and chemical properties and consequently improve crop growth and yield performance. At Cranfield University, United Kingdom, a greenhouse study investigated the effects of Mushroom Compost, Anaerobic Digestate Waste, and Poultry Manure amendments applied at 10 t ha-1 and 30 t ha-1 equivalent rates on the physical and chemical properties of degraded soil. The treatments were laid out in the greenhouse in a completely randomized design replicated four times. The results showed that all the OA treatments significantly increased the soil water holding capacity, total porosity, and significantly reduced bulk density when compared with the un-amended control treatment. Further, the OA treatments showed significant increases in the soil Total-P, Olsen-P, Total-N, total oxides of N, ammonium-N, Available-K, and Available-Mg, relative to the control treatment. The results demonstrate the effectiveness of these OAs in improving soils' physical and chemical properties, and so enhancing soil health and overall ecosystem functioning. The study demonstrated that these OAs improve the physicochemical properties of degraded soil.

Keywords: nutrient depletion, soil degradation, organic amendments, Poultry Manure amendments, physicochemical properties