

EFFECT OF COMPOSTED PLANT RESIDUES ON NEWLY RECLAIMED SOILS PROPERTIES AND ITS PRODUCTIVITY

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ABSTRACT:

A pot experiment was carried out in the Experimental Farm. Faculty of Agriculture, Minufiya University, Shibin El-Kom to study the effect of both application rate (0, 1 and 2% OM) and composting period (0, 2, 4 and 6 months) of either of rice or potato straw on some chemical properties of two newly reclaimed soils (sandy and calcareous) of Egypt and its content of available N, P and K. Also, the effect of those treatments on wheat (*Triticum aestivum* L.) plant growth and its content of N, P and K was studied. The obtained data show a decrease of soil pH and its content of CaCO₃ and increase in its EC (dSm⁻¹) and the content of OM (%) and available N, P and K (mg/kg) with the increase of added rate and composting periods of rice and potato straw in both sand, and calcareous soils. The found decrease or increase effects in the soils treated by composted potato straw were greater than those associated the treatments of rice straw. The obtained dry matter yield of wheat plants and its content of N, P and K were increased with the increase of composting period and application rate of composted rice and potato straw, where these increases resulted from the treatments of composted potato straw were higher than those found with the treatments of composted rice straw in both sandy and calcareous soils.

Key words: Compost, Potato, Rice, Wheat, Soil properties, Nutrients uptake.

EFFECT OF MINERAL PHOSPHATE AND ORGANIC FERTILIZERS ON PLANT GROWTH AND NUTRIENT CONTENTS OF FABA BEAN GROWN ON DIFFERENT SOILS

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ABSTRACT:

The present study was carried out to investigate the effect of phosphate fertilizers, organic manures and their interactions on growth and nutrient contents of faba bean plants at 60 days after sowing. A pot experiment was conducted using alluvial and sandy soils. Super phosphate and rock phosphate were used at rates of 0, 15, 30 and 60 kg P₂O₅ / fed., corresponding to 100, 200, and 400 kg / fed. of super phosphate, and 238, 476 and 952 kg / fed. of rock phosphate, based on their P₂O₅ content (15% for super and 6.3% for rock phosphate). Organic manures namely poultry, farmyard and poudrette were added at rates of 0, 2 and 4% organic matter. The obtained results are summarized in the following: Phosphorus fertilizers significantly increased the dry weight of faba bean plants in both soils. Super phosphate gave better results than the rock phosphate. Increasing the levels of phosphorus fertilizers enhanced the dry weight of the plants. Application of phosphorus fertilizers generally increased the contents of N, P, K, Ca, Mn, Mo, Cu, Fe, Cd and Pb in plant tissues. Increasing the levels of phosphorus up to 60 kg P₂O₅ / fed. increased the concentrations and uptake of elements by the plants. Organic manures significantly increased the dry weights of the plants in both the alluvial and sandy soils, poudrette gave the best effect. Organic additives increased concentrations and uptake of elements by the plants, where poudrette gave the best results, followed by farmyard and poultry manures. Higher doses of the applied manures resulted in better figures. The alluvial soil recorded the higher values of dry weights and nutrient uptake than the sandy one, whereas, the later had a higher response to the organic and inorganic fertilization. Combination of phosphate fertilizers and organic manures gave significant positive effects. Poudrette manure with super phosphate showed the best results of this study.

Key words: Phosphorus fertilization, Organic manures, Nutrients uptake, Faba bean, Legumes.