FORMS AND DISTRIBUTION OF SOME NUTRIENTS IN SOILS UNDER ORGANIC FARMING CONDITION

By

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B.Sc. Agric. Sci. (Soil & Water), Fac. Agric., Jordan Univ., (1996)
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APPROVAL SHEET

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SUPERVISION SHEET

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Title of Thesis: Forms and Distribution of Some Nutrients in Soils Under Organic Farming Condition.
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Department: Soil Science.
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ABSTRACT

Last two decades showed a high conversion to organic farming in Egypt. In this study we investigated the effect of long term organic agriculture on some soil chemical properties. Different sources of OM (Sicum compost (SEC), Faium compost (FAC), animal manure compost (AMC), crop manure compost (CMC), and town refuse compost (TRC)) were incubated under different soil types (alluvial, calcareous, and sandy soils) to investigate their effect on soil KCl-NH^{+}_{4}, KCl-NO^{-}_{3}, Olsen-P, dissolved organic matter, pH, EC, and DTPA-(Na^{+}, Ca++, Mg++, Fe, Cu, Mn, and Zn). The laboratory incubation of the amended soils was accomplished by two methods, batch method (lasting for one year) and column method (lasting for 4 months).

High concentration of most nutrient was observed at the beginning of the incubation, following with decreasing until end of the first month. After that concentrations showed an increasing manner up to the end of the incubation.

The concentration of entire nutrients was higher under column method, at the same time. Column incubation allowed higher release of nutrient from organic compost comparing with batch method, due to the removing of decomposition products which enhance more decomposition.

Two organic farms, with different soil type, were used to clarify their effect on total organic matter (TOM), ammonium, nitrate, cation exchange capacity (CEC), and the behavior of phosphorus. Sicum farm (as loamy sand soil) with 0, 12, 15, 18, and 23 yrs under organic farming, and Faium farm (sandy clay loam soil) with sectors, 2, 4, 8, and 10 yrs under organic farming, were chosen.

Results showed increases in TOM, NH^{+}_{4}, ON^{-}_{3}, and CEC with time under Sicum farm, with high correlation. Same results were obtained for Faium farm, but with lower correlation.

P-adsorption isotherm was studied using two different methods, namely the standard batch method and a new flow method. Amount of phosphorus adsorbed, at equilibrium, and Freundlich partition coefficients **(K_d)** were higher for soils with lower organic matter, for both farms and both methods.

Key words: Organic farming, column, batch, incubation, composts

DEDICATION

I dedicate this work to whom my heartfelt thanks; to my brothers Belal and Omar for their patience and support, as well as to my parents and brothers for all the help they lovely offered along the period of my post graduation.

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