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٤٥٩٥

PRELIMINARY STUDIES OF THE POTENTIAL EFFECTS OF DIFFERENT ORGANIC RESIDUES COMBINATIONS ON N-FIXATION, YIELD OF SOYBEAN AND SOIL SUSTAINABILITY

By

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INTRODUCTION

1. INTRODUCTION

The agricultural world including Egypt, faces an unprecedented: how to achieve long term sustainability in the supply of adequate levels of food and fiber for domestic and international markets and humanitarian aid, without degrading the natural environment or resource base, including humans and their communities, upon which agriculture depends. It is the dual nature of this challenge that makes the current situation so daunting. Scientific organic farming or biologically based farming systems or alternative agriculture that are at once productive, profitable and sustainable for the indefinite future should be adopted (**Youngberg, 1992**).

In Egypt, as any arid or semi-arid region, soil content of organic matter is generally low, although, it is well known fact that soil productivity is significantly affected by the organic matter content due to the unlimited beneficial effects on soils and field crops. Abdel-Ghaffar (1982) stated that the common range of organic matter in cultivated clay soils is between 1% and 2.5% while in the calcareous and sandy desert soils it is usually less than 0.5%.

Application of crude or composted farm residues, municipal and industrial non-hazardous wastes to agricultural soils is of a special importance to increase soil organic matter and soil sustainability. It was reported that the total amounts of municipal waste only collected and disposed in urban areas in Egypt is roughly estimated at 5.6 millions or 15.200 tons/day although solid waste collection efficiency varies from 10-18% (**Egyptian Environ. Affairs Agency, 1992).** In addition to waste disposal considerations, the main advantage of applying organic residues

to agricultural land, is that residues contain N, P, K and trace elements and thus serves a substitute for conventional fertilizer materials.

On the light of the above mentioned informations, so, the objective of this study was to identify the proper management of some organic farm residues and sewage sludge, alone or in mixtures, that (1) maximize utilization of rural and urban wastes to improve soil fertility and productivity. (2) reduce the environmental hazard impact of anaerobic digested sewage sludge throughout mixing with cheap materials (3) enhance or degrade sustainability of soil characteristics, symbiotic N-fixation and crop yield of soybean with/without mineral fertilizers and (4) reduce or replace mineral fertilizers, i.e., inorganic N and increase residue and fertility inputs.

REVIEW OF LITERATURE