

**ROLE OF SOIL AMENDMENTS IN A VIRGIN DESERT SOIL
AND THEIR EFFECT ON PLANT NUTRITION**

BY

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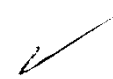
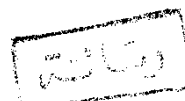
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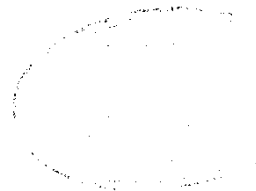
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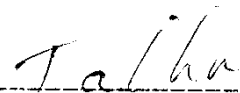
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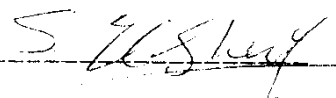
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ABSTRACT

An investigation to study the effects of application of natural and synthetic amendments on the rate of change in the main properties of a virgin calcareous soils under the conditions and interactions with four successive crops. Significant rates of improvement of the soil properties were determined with superiority of most of the natural amendments over the synthetic ones.

Key Words:

Natural and synthetic amendments - Rate of soil development - Calcareous desert soil - Crop succession - Organic matter - CEC - Soil Aggregates - Nutrients availability.

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1. INTRODUCTION

One of the major concern of reclamation of desert soils in Egypt is how to enhance the rate of improvement of the soil's inferior physical, chemical and nutritional properties in order to achieve maximum economic returns in the shortest possible time. Thus, with the beginning of large scale desert soil reclamation in Egypt in the sixties and seventies, the use of soil amendments of various types and sources received an ever increasing interest.

Investigations were conducted on the role of natural amendments such as organic matter of various origins, natural desert clay sediments and petroleum products. lately, synthetic soil conditioners with varied properties and functions came into focus. Soil conditioners vary in their effects and impact on soil properties according to their chemical composition and function. Despite the fact that there are numerous investigations that have been conducted on the use of such conditioners, however, the greater majority of these investigations were conducted for a short duration of one cropping season whether in pots or field experiments. The results of these

investigations would not allow for long term assessments of impact on soil properties, residual effects of amendments, effects on processes of nutrients accumulation or depletion, interaction with crops succession and achieving data that are appropriate for economic evaluations.

The objective of the present investigation is to study the effects of application of six natural and synthetic soil amendments, with varied properties, on the rate of change of the main properties of a virgin calcareous desert soil. Amendments under investigation were natural bentonite, organic manure of animal origin, poudrette, polyacrylamide, hydrogel and bitumen emulsion. The impact of these soil amendments under investigation were studied through four successive cultivation seasons including a test crop which was repeated within the duration of the present investigation to assess the rate of improvement of soil productivity, crop yield and nutrients content as a function of treatments and crop succession in four seasons.