

EFFECT OF SULPHUR AS SOIL AMENDMENT ON BEHAVIOUR OF SOME MICRONUTRIENTS IN CALCAREOUS SOIL

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DEDICATION

*I wish to express gratitude and indebtness to the soul
of my father who gave me everything I gained through his
excellent care during his life, and also my mather and to
all my family members.*

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ABSTRACT

An investigation was carried out to study the effect of elemental sulphur, sulphuric acid and spent slurry on some soil properties and the availability of P, Fe, Mn and Zn as well as the dry weight and mineral content of pea plants grown on calcareous soils.

The results of the experiments showed the followings:

1. Incubation experiment:

a. Soil pH was decreased due to the addition of different

amendments to all the studied soils except the addition of spent slurry which had no effect on soil pH.

b. Electrical conductivity (EC) values were increased due to the addition of different amendments to all the studied soils. However, spent slurry alone was less effective than other treatments.

c. Soluble sulphate in all soils was increased due to the addition of different amendments except spent slurry alone. Sulphuric acid treatment was superior to other treatments.

d. Available P was increased by applying different amendments to all soils and sulphuric acid treatment was superior to other treatments.

e. Available Fe, Mn and Zn values were increased by applying all amendments to the studied soils. Elemental sulphur + spent slurry was superior to other treatments.

2. Pot experiment: ion of pea plant, soil pH was decreased due to the addition of different amendments to all studied soils, except spent slurry alone which had no effect on soil pH. Generally, soil pH after cultivation was lower than before it.

b. EC values were increased with all applied treatments. EC values after cultivation were higher than before it.

c. Similar trend to that observed for EC was also obtained for sulphate.

d. Values of available P, Fe, Mn and Zn were increased by applying all amendments. Nutrients availability after

cultivation was higher than before it.

e. Dry weight of pea plants was increased by applying all amendments to El-Hawaria soil. The combination of elemental sulphur + spent slurry was superior to other treatments for the other soils.

f. P, Fe, Mn and Zn contents of pea plants were increased by the application of all amendments and the combination of elemental sulphur + spent slurry was superior to other treatments.

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1. INTRODUCTION

Calcareous soils are of wide occurrence in Egypt. These soils contain considerable amounts of calcium carbonate which affect the chemical and physical properties of these soils. Therefore, amendments must be used to increase the potential of such soil.

Sulphur, gypsum, sulphuric acid and organic manures are used as soil amendments. The addition of such materials to soil promotes its physical, chemical and biological properties.

Sulphur is generally added to soil either as elemental sulphur or as associated sulphate anion (SO_4^{--}) with different cations in the fertilizers such as potassium sulphate, ammonium sulphate or calcium sulphate.

In (1978) world sulphur production increased to 52.5 million tons. Sulphur in the elemental form or in the form of gypsum is used as plant nutrient. Sulphur is widely used because the higher grade phosphatic fertilizers (triple superphosphate and ammonium phosphate), especially those produced by wet process, contain a considerable amount of it, therefore phosphatic fertilizers do not necessitate sulphur incorporation with it.

Since the improvement of calcareous soils is usually reclaimed by the application of organic manures; such as farmyard manure, compost, green manures and domestic and