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ABSTRACT

This study was carried out on clayey soil at kom Abou-Khallad village, Nasser district, Beni-Suef Governorate, Egypt during the winter season of 2014/2015 (Wheat) and summer season of 2015 (Maize) Also, this study aims at investigating effects of the studied treatments on improving some physical and chemical properties of saline soil, using magnetite (Magnetic iron), Vermicompost and mixture of filter mud and sugar lime 1:1 w/w experiment. In addition, improving some physical and chemical properties of saline soil using vermicompost, magnetite (magnetic iron) and sugar industry wastes (mixture of filter mud and sugar lime 1:1 w/w).

The main purpose of this work was:

1. Evaluate the effect of (sugar lime + filter mud) application in combination with magnetite and organo-stimulant (vermicompost) on improving of some chemical and physical properties of salt affected clay soils.

2. Evaluate the effective role of applied (Filter Mud+ Sugar Lime), magnetite and vermicompost as solely in combined treatments on the tolerance of wheat and maize plants grown under a slight soil salinity condition.

3. Evaluate the studied amendments economically.

The experiment had 13 treatments as follow:

T_1 = Control
T_2 = Magnetite (100 K.g fed^{-1})
T_3 = Magnetite (150 K.g fed^{-1})
T_4 = Magnetite (200 K.g fed^{-1})
T_5 = Vermicompost (2.5 Mg fed^{-1})
T_6 = Vermicompost (3.3 Mg fed^{-1})
T_7 = Vermicompost (4 Mg fed^{-1})
T_8 = Filter Mud and Sugar Lime Mix (1:1) (6.7 Mg fed^{-1})
T_9 = Filter Mud and Sugar Lime Mix (1:1) (10 Mg fed^{-1})
T_{10} = Filter Mud and Sugar Lime Mix (1:1) (13.3 Mg fed^{-1})
T_{11} = Magnetite (100 K.g fed^{-1}) and Vermicompost (2.5 Mg fed^{-1})
T_{12} = Magnetite (100 K.g fed^{-1}) and Filter Mud and Sugar Lime Mix (1:1) (6.7 Mg fed^{-1})
T_{13} = Filter Mud and Sugar Lime Mix (1:1) (6.7 Mg fed^{-1}) and Vermicompost (2.5 Mg fed^{-1})

From the obtained result, of this experiment it could be concluded that:

A. Adding magnetite (magnetic iron), vermicompost and sugar industry wastes (mixture filter mud and sugar lime 1:1 w/w) and their mixture, improved the chemical and physical properties of salt-affected soil.

B. Application of T10 = Filter Mud and Sugar Lime Mix (1:1) (13.3 Mg fed-1), gave the highest decrease in values of electrical conductivity (EC), (ESP), and increased of (O.M content and CEC) which lead to improving the chemical properties of salt-affected soil. Also, increased the total porosity and hydraulic conductivity, which render easy to get rid of the salts and the bulk density decreased.

C. Application of T10 = Filter Mud and Sugar Lime Mix (1:1) (13.3 Mg fed-1), gave the highest increase of wheat and maize yield.

D. The results showed that the top three practical and economic parameters of the field experiment were (T7, T13, T10) respectively where the increase values were (79.34, 66.91, 65.20) as compared to control.

Key words: ***magnetic iron, vermicompost, sugar industry wastes, amendments, wheat, maize, Salt-affected Soils.***