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5. SUMMARY

A field experiment was conducted out on reclamation of a saline-alkali soil by agricultural drainage water (Nasr El-Din drain). The average values of EC and SAR among the experimental work were 1.91 dS/m and 6.68, respectively. This work was conducted at Mounshaet Bakhaty village, Shebin El-Kom district, Menofia Governorate to asses the efficiency of reclamation using different loeal amendments such as gypsum "G", sulphur "S", organic matter "FYM" and sand "d". These amendments were applied individually or in a eombination, where gypsum applieation rate was 5 ton/fed., sulphur, 1.0 ton/fed, organic matter (FYM) 20 m^3/fed and sand 20 m^3/fed., then the experimental plots were irrigated to leach the exeess of soluble salts. Maize and wheat seeds were sowing through summer and winter seasons and the yields were harvested and reeorded. The pre-leaehing values of soil parameters before reelamation were: EC: 8.3 dS/m, others were; ESP: 17.2, pH: 7.9 in the surface layer (0-30 cm).

The obtained results eould be summarized as following:

1- **Effect of amendments application on soil chemical properties:**
   - A great reduction in soil salinity values were recorded after the appleation of soil amendments being 54.3% under (G+S+FYM+d) treatment after wheat eompared to the control.
   - Soil acidity (pH) slightly decreased from 8.15 to 7.75 under the application of (G+S+FYM), (S+FYM+d) and (G+S+FYM+d) in the same value.
   - Exchangeable sodium percentage (ESP) similarly deereased by 32.3, 42.4, 48.5 and 52.0% using (G), (G+d), (G+S+d) and (G+S+FYM+d), respectively compared to the control.
   - A general decline in SAR values was observed with amendment applications, where (G+S+FYM) superior to other treatments and the control one by 81.8%.

2- Effect of amendments application on soil fertility (available NPK):

- In general, application of soil amendments enhanced soil fertility i.e. available N, P and K, particularly the treatments including organic matter (FYM). This increase was significantly observed after maize and slightly decreased after wheat.

3- Effect of amendments application on soil physical properties:

- All used amendments had a favorable effect to decrease soil bulk density especially that contains organic matter (FYM) and sand, and consequences and increase in the total porosity was obtained. Bulk density values were decreased by 6.5% under (G+S+d) and (G+FYM+d) after maize, and then sharply decreased after wheat by 25.5% under (G+S+FYM+d) as compared with the control treatment.
- Application of amendment treatments included sand increased the hydraulic conductivity values, where (G+S+FYM+d) treatment increased (HC) with 314 and 640% after maize and wheat, respectively.
- Both of field capacity and wilting point were increased after amendments application, in general, thus the available water content increased consequently. (G+S+FYM+d) treatment was the most efficient to enhance AW during the two successive seasons under study.
- Addition of soil amendments had maximized the favorable effect to increase aggregates formation. Aggregate diameters (1.0-0.5 mm) were superior the other ones, (G+FYM+d) treatment in particular, being the best (73.4%) at the end of the experiment (after wheat).

4- Effect of amendments application on yield of maize and wheat:

- Grain and straw yields of maize and wheat as well as plant heights and the weight of 100 grains were comparatively

increased after application of soil amendments than the control. These increases reached the maximum levels as (G+S+FYM+d) treatment was applied.

In general, it can be included that the sand application together with the other soil amendments may enhance their · effectiveness when applied to the heavy clay saline-alkali soil such . as the investigated area.