Growth of wheat plant on alight textured soil as influenced by water stress and some soil conditioers

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Moisture and nutrients in soils are the main factors to measure crop yield and its quality in desert region. Application of fertilizer without sufficient water is not profitable and at times can lower yields. Water requirements needed to produce a unit weight of a crop can be reduced by adequate nutrition. The used of organic manure (either alone or in combination with biofertilizers) with lower moisture level can enhance plant growth and its nutrient content.Therefore, the objectives of this work were to study thefollowing:1:study the effect of mineral conditioner (NH4)2SO4 with and withoutbiofertilizers at three rates 0, 30 and 90 kg N/fed. on wheat plant growth and its nutrients uptake i.e., N, P, K, Fe, Zn and Mn underdifferent soil moisture levels.2:The effect of organic manures (chicken manure and organiccompost) at two rates of application i.e., 0.5 and 2% on wheat plant growth and its nutrients uptake i.e., N, P, K, Fe, Zn and Mn underdifferent soil moisture levels.3:The role of biofertilizers in minimizing the negative effect of soilmoisture deficit on plant growth and its nutrients uptake.The experimental work involved a pot experiment conducted at the greenhouse of Soils Department,Faculty of Agriculture,BenhaUniversity.In this experiment, plastic pots were uniformly packed with 5 Kgportion of air-dried loamy sand soil collected from El-deer Village, Kalubeia Governorate and sieved through a 2mm sieve. The soils of pots were treated with either mineral conditioners (NH4)2SO4 at rates of 0, 30 (N1) and 90 (N2) kg N/fed. or organic manures namely, chicken manure (CM) or composting manure (Comp.) at rates of 0.5 and 2%. However, there were treatments include inoculation with biofertilizer, the other treatments were conducted without biofertilization. Plants of all treatments were subjected to different soilSUMMARYmoisture levels, 50, 80 and 100% of field capacity. Two different plant samples were taken, the first sample was collected at 45 days ofgrowth and the other one was taken at 70 days from sowing, oven dried at 70°C, and sub samples of fine plant material were digested with mixture of H2SO4 and HC1O4 acids (1:1).Dry matter yield of wheat plant and the nutrients content of the digested solution were measured.The obtained results could be summarized in the following:1-Application of soil conditioners significantly increased wheat plantgrowth and the obtained values were increased as the rate of applied conditioner increased.2-Subjecting wheat plants to soil moisture stress i.e. decreasing soilmoisture levels from 100 to 80 and 50% of field capacity significantly decreased wheat plant growth as compared to the control (100% of field capacity).3-Inoculation of wheat grains before sowing with nitrogen fixer’s bacteria and phosphorus dissolving bacteria significantly increased wheat plant growth as compared with the un inoculation treatments.4-Chicken manure as organic conditioners produced higher values ofstraw wheat dry weight followed by mineral conditioner then organic compost and control treatment (zero application).5-Application of conditioners either in mineral form or inorganic significantly increased values of both macro and micronutrients i.e. N,P,K, Fe, Zn and Mn taken up by wheat plants at both growth stages45 and 70 days, however higher values were achieved at 70 days from sowing.6-Subjecting of wheat plants to moisture stress (50% of field capacity) decreased values of both macro and micronutrients uptakeby wheat plants. Meanwhile, the highest moisture levels resulted in the highest values of nutrients taken up by wheat plants.7-Inoculation of wheat grains

before sowing produced higher values of nutrients uptake especially when conditioners were applied. Meanwhile, the biofertilization maximized the effect of soilconditioners and minimized the negative effect of soil moisture deficit.