

***GROWTH OF CORN PLANTS CULTIVATED IN DIFFERENTLY MANURED ARID SOILS AND IRRIGATED WITH VARIOUS WATER QUALITIES.***

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***ABSTRACT:***

This work was carried out to study the individual and combined effects of organic manures and irrigation water quality on growth of corn plants (*Zea mays* L (triple hybrid 310) and their contents of some macro nutrients. Surface soil samples representing alluvial, calcareous and sandy soils were used in these greenhouse experiments. The soils were manured with farmyard manure (FYM at 2 % C) and alfalfa plants as a green manure (GR), plus the control treatments. The used irrigation water sources were tap water (TW) agricultural drainage water (DW), mixed TW + DW at a ratio of 1:1, synthetic saline water at 2000 mg/l of TSS of CaCl<sub>2</sub> + NaCl at Ca : Na ratio of 1:1 (SW1) and synthetic saline water at the same content of TSS and Ca : Na ratio of 2:1 (SW2). All pots were planted with 5 corn seeds /pot. Plant samples were taken after 45 and 65 days of planting. Dry weights of plant samples were recorded and their contents of N, P and K were determined. The dry matter yield of corn plants increased as a result of organic manures application. Those increases were clearer with FYM especially at the first growth period. Under the different treatments of manures, the dry matter yield increased with advancing the plant age. The highest dry matter yields were found for the plants grown on the alluvial soil followed by those on the calcareous soil, to leave the sandy soil last in such concern. Also, with the different manure treatments, the highest dry matter yields were found for the plants irrigated with DW, whereas the lowest values were found with the treatments of SW2. The obtained data also showed greater positive effects of manure treatments on corn plant contents (% and mg/Kg) of N, P and K at both growth stages under the different soil conditions. The highest contents of such nutrients were found in the corn plants grown on the alluvial soil manured with FYM and irrigated by DW.

***Key words:*** Maize, Organic fertilization, Irrigation water quality, Nutrients uptake, cereal crops.

***EFFECT OF MINERAL PHOSPHATE AND ORGANIC FERTILIZERS ON PLANT GROWTH AND NUTRIENT CONTENTS OF FABA BEAN GROWN ON DIFFERENT SOILS***

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***ABSTRACT:***

The present study was carried out to investigate the effect of phosphate fertilizers, organic manures and their interactions on growth and nutrient contents of faba bean plants at 60 days after sowing. A pot experiment was conducted using alluvial and sandy soils. Super phosphate and rock phosphate were used at rates of 0, 15, 30 and 60 kg P<sub>2</sub>O<sub>5</sub> / fed., corresponding to 100, 200, and 400 kg / fed. of super phosphate, and 238, 476 and 952 kg / fed. of rock phosphate, based on their P<sub>2</sub>O<sub>5</sub> content (15% for super and 6.3% for rock phosphate). Organic manures namely poultry, farmyard and poudrette were added at rates of 0, 2 and 4% organic matter. The obtained results are summarized in the following: Phosphorus fertilizers significantly increased the dry weight of faba bean plants in both soils. Super phosphate gave better results than the rock phosphate. Increasing the levels of phosphorus fertilizers enhanced the dry weight of the plants. Application of phosphorus fertilizers generally increased the contents of N, P, K, Ca, Mn, Mo, Cu, Fe, Cd and Pb in plant tissues. Increasing the levels of phosphorus up to 60 kg P<sub>2</sub>O<sub>5</sub> / fed. increased the concentrations and uptake of elements by the plants. Organic manures significantly increased the dry weights of the plants in both the alluvial and sandy soils, poudrette gave the best effect. Organic additives increased concentrations and uptake of elements by the plants, where poudrette gave the best results, followed by farmyard and poultry manures. Higher doses of the applied manures resulted in better figures. The alluvial soil recorded the higher values of dry weights and nutrient uptake than the sandy one, whereas, the later had a higher response to the organic and inorganic fertilization. Combination of phosphate fertilizers and organic manures gave significant positive effects. Poudrette manure with super phosphate showed the best results of this study.

***Key words:*** Phosphorus fertilization, Organic manures, Nutrients uptake, Faba bean, Legumes.

***WHEAT YIELD AND MICROBIAL ACTIVITIES IN NEWLY RECLAIMED SOIL AS INFLUENCED BY FOLIAR APPLICATION OF BIO-ORGANIC AGENTS***

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***ABSTRACT:***

Field experiments were carried out during two successive winter seasons of 2006/2007 and 2007/2008 on a sandy loam soil of newly reclaimed desert, to evaluate the effect of: Control (140 N, 36 P<sub>2</sub>O<sub>5</sub>, and 58 K<sub>2</sub>O kg/ha.), Azospirillum brasilense (10<sup>3</sup>-10<sup>4</sup> cells/ml), K-Humate "I" (1:10)g/liter (K-H "I") (= 288 g/ha.), K-Humate "II" (2:10)g/liter (K-H "II") (= 576 g/ha.), (each supplemented with iron at 300 ppm Fe, as FeSO<sub>4</sub>), Azospirillum brasilense + K-H "I", and Azospirillum brasilense + K-H "II", on wheat crop yield and microbial activities in wheat rhizosphere plants. Potassium humate plus iron, each applied either alone or combined with Azospirillum brasilense, which were incubated for three days to be then applied in foliar forms, at three intervals during the plant growth period (30, 60 and 80 days from sowing). Results indicated that foliar application of potassium humate at its rates (I&II) and supplemented with iron, on wheat plants, significantly increased the crop yield of both grains and straw. Plants receiving Azospirillum brasilense showed slight increases of both yield components. However, addition of K-humate + iron at both the rates (I&II) combined with Azospirillum significantly increased grain and straw yields of wheat crop compared to the control treatments as well as they improved microbial activities in the rhizosphere wheat plant represented by dehydrogenase activity and CO<sub>2</sub> evolution. Effect of the different treatments, on total dry weight of wheat yield components and their contents of N, P, K and F, as well as on microbial activities in wheat rhizosphere plants, could be arranged as follows: K-H "II" + Azos. > K-H "I" + Azos. > K-H "II" > K-H "I" > Azos. > control, the relative increases reached 137.81, 126.14, 80.59, 66.28, 37.24 %, respectively.

***Key words:*** Azospirillum, potassium humate, iron, cereals, crop yield, growth promotion.