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Assessment cultivated period and farm yard manure addition on some soil properties, nutrient content and wheat yield under sprinkler irrigation system

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ABSTRACT

This study examined changes in some soil hydrophysical, chemical properties and wheat yield (grain; straw yield, N, P, K, Protein and carbohydrates contents) as trends under two cultivated period 10 and 25 year and Farm Yard manure (FYM) addition under sprinkler irrigation system on a newly reclaimed soils, Nubaria, Beheira Governorate, Egypt. Obtained results noticed that cultivation period has more pronounced effect than FYM addition on soil water content at field capacity, wilting point and available water with increase percent 15.1%, 9.3%; 19.0% and 25.7%, 19.5% and 30.0% for FYM and cultivation period comparing with control one. Hydraulic conductivity values were strongly affected by cultivation period and FYM addition and significantly decreased values by about 18.9% and 12.1% in same sequences. Wheat straw content from protein had a superior effect under 25 than 10 years cultivated periods with values 61.9 and 6.7 comparing with control, respectively as affected by FYM addition, while FYM alone improved protein content in straw by about 31.9% comparing with untreated one. Slightly increase in straw protein content was attained relative to the increase of cultivated period by about 7.8%. Nutrients content in grain is more than FYM, where the increase percentage were 5.2%, 13.5%; 3.8% and 26.5, 21.3; 22.6 comparing cultivated periods 25 with 10 years and FYM addition with control, respectively. FYM individually under two studied cultivated periods is more effective under 10 years (28.0%, 25.2%; 15.1%) than the 2nd one (25.1%, 25.2%; 15.1%) comparing with untreated FYM plots. While N, P and K content in wheat straw had unclear trend and the increase were 6.8, 23.23; 56.5% and 62.9, 6.0; 29.8 as a result of FYM addition under 10 and 25 years cultivated periods, respectively. The highest values of protein and carbohydrates content in wheat grains as affected by studied factors were 12.86% and 67.43%) were obtained under cultivated period 25 years after FYM addition. Cultivated periods had a highly significant effect on the field water use efficiency values of grain more than the effect of FYM. The highest values of grain and straw yield were recorded at 10 years cultivated periods + treated FYM (2966.8 kg/fed) and 25 years cultivated periods treated with FYM (3835.6 kg/fed). Cultivated periods increased grain and straw yield of wheat crop by about 57.6% and 8.3%. Whereas, FYM increased grain and straw yield by about 39.8% and 58.8% relative to the control, respectively.

KEYWORDS

Sandy Soil; Hydrophysical; Chemical Properties; Farm Yard Manure; Nutrient Content; Irrigation; Wheat Yield; Sprinkler

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