FifthArticle :

Article title	**Improving wheat production in new soils under ammonia fertilizer rates and water management.**
Participants	El-Akram, M.F.I[*] and **S. M. Emam**[**] [*]Soil, Water and Environment Res. Inst., A.R.C., Giza, Egypt. [**]Agron., Dept., Fac., of Agric., Fayoum Univ., Egypt.
Article status	Published - 2014
The Journal	Fayoum J. Agric. Res. & Dev.29 (2): 122-140.

Abstract

Field experiment was carried out at Demo farm of Faculty of Agriculture, Fayoum University, Egypt during 2012/2013 and 2013/2014 seasons to study the effect of ammonia gas rates, i.e., F_1: 80 and F_2: 100 kg N fed^{-1} and irrigation regime i.e., I_1: irrigation at 40%, I_2: 60% and I_3: 80% from available soil moisture depletion (ASMD), at sandy and calcareous soils, on yield, yield components and some water relations of wheat crop (Giza 168). A split plot design with four replications was used in both seasons. The obtained results showed that using 100 kg N fed^{-1} at 40% ASMD gave the highest averages of plant height, spike number m^{-2}, 1000-garin weight, spike weight m^{-2}, straw yield fed^{-1} (2011.4 and 2334.1 kg fed^{-1}) in sandy soils (Site 1), and (2539.5 and 2716.7 kg N fed^{-1}) in calcareous soils (Site 2), and grain yield fed^{-1} (1888.4 and2077.4 kg fed^{-1}) in Site 1 and (2209.4 and 2468 kg fed^{-1}) in Site 2, in the two successive seasons, respectively. The lowest averages of yield and its components were obtained from applying 80 kg N $fed^{-1}$and irrigation at 80% ASMD, at the two sites in both seasons. Seasonal consumptive use (ET_C) averages were 44.47 and 43.95 cm in 1st season and 45.53 and 45.17 cm in 2nd season, in both sites, respectively. The highest ET_C values were recorded with the interaction (F_2I_1), whereas, the lowest values resulted from the interaction (F_1I_3) in all sites and seasons. Daily ET_C rates were low during November and December, then increased during January and February, to reach its maximum values during March and then declined again at April till harvesting. The values of daily ET_C decreased due to decreasing ammonia gas rate in the two growing season's months. The crop coefficient (K_C) values (averages of the two seasons) were 0.47, 0.54, 0.66, 0.70, 0.87, 0.67 and 0.47 in the Site 1 and 0.47, 0.55, 0.63, 0.67, 0.86, 0.67 and 0.49 in the Site 2, for, Nov., Dec., Jan., Feb., Mar., Apr. and May, respectively. The highest water use efficiency, i.e., 0.96 and 1.04 kg grains m^{-3} water consumed at the Site 1, and 1.14 and 1.24 kg grains m^{-3} water consumed at the Site 2, were obtained from (F_2I_1) treatments in first and second seasons, respectively. The highest water utilization efficiency (kg grains m^{-3} water applied) were detected from applying 100 kg N fed^{-1} and irrigation at 40% ASMD at the two sites in both successive season.