

## **EFFECT OF IRRIGATION SCHEDULING AND DIFFERENT NITROGEN LEVELS ON WATER RELATION, YIELD AND YIELD COMPONENTS FOR WHEAT CROP GROWN IN MIDDLE EGYPT (GIZA REGION)**

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### **ABSTRACT**

Two field experiments were executed during the two successive seasons of 2005/2006 and 2006/2007 at Giza Agricultural Research Station to identify the most effective coefficient of daily pan evaporation accumulation selected from 1.25, 1.00 and 0.75 evaporation pan coefficient (EPC) in scheduling irrigation for wheat, cultivar Sakha 69, receiving 60, 75 and 90 kg N/fed in order to maximize crop and water productivity. The number of applied irrigations and water consumptive use (Cu) were increased as the value of EPC increased and, Cu differed significantly due to nitrogen level, with 90 kg N/fed consuming more water than the other N-levels. The highest Water Use Efficiency (WUE) was recorded under 1.00 EPC comparable to the other tested EPC values and values of WUE, differed due to nitrogen level. The 90 kg N/fed gave the lowest WUE while 75 kg N/fed gave the highest value. The plant height, grain weight/spike, number of spike/m<sup>2</sup> and 1000-grain weight were significantly affected due to the adopted irrigation regimes and generally, tended to increase as EPC increased. Grain and straw yields tended to increase with increasing EPC. The highest values were obtained with 1.25 EPC. All of agronomic yields and yield components were increased with the increase in N- level, as well as with the increase in EPC values. The maximum values of yields and their components were given by 90 kg N/ fed with 1.25 EPC.

### **INTRODUCTION**

Wheat is the most important cereal crop used as a major food crop in Egypt, but local production does not meet the consumption owing to the increased population with limited cultivated area as well as water resources (El-Shaer *et al.* 1997 and Eid *et al.* 1999). Therefore, Egypt would have to find new ways to increase agriculture productivity as an essential national target to fill the gap between production and consumption of wheat. This goal could be achieved by growing more high-yielding cultivars and improving the agronomic factors such as irrigation and fertilizer application.

Irrigation water has to be added timely and sufficiently (with least losses). This is difficult to be achieved in old arable lands in Egypt. One of most efficient irrigation technical methods which does this, is scheduling irrigation using evaporation pan. Moreover mathematical models study to calculate ET<sub>0</sub>, ET crop and water requirements under Egyptian conditions must be increased to meet the changes in the weather factor affecting water consumption by plant as temperature, rain, solar radiation and sunshine. Early in USA, Jensen and Midleton (1965) carried out studies scheduling crop irrigation via daily records of evaporation pan. In this respect, Abdel-Ghani *et al.* (1994), Shahin and Mosa (1994) stated that exposing wheat crop to high moisture stress was associated with a decrease in seasonal consumptive