

## **SAVING IRRIGATION WATER AND REDUCING MINERAL FERTILIZATION FOR MAIZE USING RICE STRAW COMPOST**

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### **ABSTRACT**

Two field experiments were carried out at Sakha Agricultural Research Station, Kafr El-Sheikh Governorate, during two successive seasons of 2007 and 2008. The objectives of the present study are increasing maize yield, decreasing the applied mineral fertilizer and saving irrigation water. Maize (hybrid single cross 10) was evaluated in a split plot design with four replicates. The main plots were assigned to three irrigation intervals, irrigation every (10 ( $I_1$ ), 15 ( $I_2$ ) and 20 days ( $I_3$ )). The sub plots were assigned to three fertilization treatments of  $F_1$  (application of the recommended dose of mineral NPK fertilizer, 120, 30 and 48 unit/fed. for N, P and K, respectively).  $F_2$  (5 ton/fed. Rice straw compost augmented with organic activator + 75% of the recommended mineral fert. 90, 22.5 and 36 unit/fed. NPK).  $F_3$  (10 ton/fed. rice straw compost augmented with organic activator + 50% of the recommended mineral fert. 60, 15 and 24 for N P K, respectively).

**The results can be summarized as follows:**

1. Irrigation treatment  $I_3$  was the best treatment since it saved water irrigation of about 19.8% (497 m<sup>3</sup>) and had no significant decrease in maize grain yield compared to the traditional irrigation treatment ( $I_2$ )
2. The highest maize yield value of 4113.43 kg/fed. was obtained with  $I_2F_3$  treatment, while the lowest one was with  $I_1F_2$ .
3. The highest water productivity (WP) of 1.92 kg/m<sup>3</sup> was obtained with  $I_3F_3$  treatment.

**Keywords:** Saving irrigation water, Maize yield, Rice straw compost, Water productivity.

### **INTRODUCTION**

In semiarid regions, irrigation is one of the most important inputs to increase crop productivity. The good management of water means application of water at the limited time of actual need of crop, with just enough water to refill the effective root zone. The interval between two irrigations should be as will as possible to save irrigation water without any adverse effect on the growth and yield (Majumder, 2002).

Mahfouz, (2003), Oraby *et al.*, (2005), indicated that water stress (irrigation every 25 days) caused sever reduction in yield and yield components of hybrids 10. Grain yield of maize was significantly increased with the decrease in irrigation period (Kamara *et al.*, 2003 and Ibrahim *et al.*, 2005). Seif *et al.*, (2005) found that the highest yield was obtained when maize plants were irrigated at 40% of available soil moisture depletion, whereas the lowest yield was recorded at 80% of the available soil moisture depletion where the irrigation role in corn production arises from crop sensitivity to drought