

RESPONSE OF TWO RICE CULTIVARS TO SCHEDULING IRRIGATION BASED ON CLASS A PAN EVAPORATION

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ABSTRACT

With decreasing water availability for agriculture, and increasing demand for rice, water apply in rice production systems has to be well managed to increase its productivity. This investigation aimed to study the effect of scheduling irrigation based on Class A Pan Evaporation on grain yield and water use of two rice cultivars. Two field experiments were carried out at the Experimental Farm of Rice Research and Training Center, Sakha, Kafr El-Sheikh governorate, Egypt during 2003 and 2004 summer seasons. The two experiments were laid out in a split plot design, with four replications, where the main plots were occupied by irrigation every six days with applied water equal 1.0 , 1.5 and 2.0 times of accumulative pan evaporation (APE) as well as continuous flooding as a traditional irrigation (check treatment). However, the sub plots were assigned to rice cultivars i.e. Sakha 101 and Sakha 102.

The main results revealed no significant differences in grain yield among irrigation treatments having continuous flooding and irrigation every six days interval with applied water equal 1.5 and 2.0 times of APE . At the same time, they significantly produced higher grain yield and most of its components than irrigation every six days interval with applied water equal 1.0 of APE.

Rice cv. Sakha 101 produced higher dry matter, number of tillers/m², number of panicles/m², panicle length, total grains/panicle, sink capacity, panicle weight, and grain yield. However, cv. Sakha 102 surpassed Sakha 101 in plant height and 1000-grain weight. Over both seasons, irrigation water amounts applied were 10495, 13769, 17044, and 15878 m³/ha for irrigation every six days interval with applied water equal 1.0, 1.5 and 2.0 times of APE as well as continuous flooding treatments, respectively. Water requirements for rice cvs. Sakha 101 and Sakha 102 were 14868 and 13725 m³/ha, respectively. Irrigation water applied equal 1.0 of APE had the highest value of water utilization efficiency (WUE) compared to other irrigation schedules using Class A Pan and the continuous flooding as well. Mean WUE ranged from 0.659 to 0.704 kg rice/m³ water for Sakha 101, while it was between 0.681 and 0.721 kg rice/m³ water for Sakha 102 in 2003 and 2004 seasons, respectively. The quantity of water used in producing one kg of rice was higher in irrigation every six days with water applied equal 2.0 times of APE, followed by continuous flooding, however, irrigation water every six days with applied equal 1.5 and 1.0 of APE came in between.

Therefore, watering every six days interval with applied water equal 1.5 times of APE using Sakha 101 and Sakha 102 could be applied under shortage of irrigation water.