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Scheduling Maize Irrigation through Crop Water Stress Index (CWSI) in a Northern Part of Borkhar Province - Iran

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Abstract

Qualitative and quantitative constraints on water resources have given rise to large water stress on land and plants. Identifying such stresses can be of help in crop management. Due to the large impact on yield, water stress plays an important role in planning proper irrigation, the timing, and amount of water needed by plants as well. Crop Water Stress Index (CWSI) is one of the major factors for monitoring and quantifying water stress as well as for irrigation scheduling. Seeing as maize is the most widely produced crop in the world. this study was conducted in the crop year 2013 for the purpose of Maize (SC-701) irrigation scheduling under climatic conditions of northern part of Isfahan, Borkhar, through temperature of leaf, with five irrigation treatments of 35, 65, 75, 85, 100 % Total available water (TAW), in four replications. The results indicated the decline in Total available water from 35 to 100 %, and the differences of around 4°C in leaf temperature. CWSI increased about three. It is of note that CWSI index in the day before the irrigation for the treatment of T1 to T5 of was about 0.12 to 0.46, respectively. The results revealed that non-stress equation for corn in the treatment T3, was $(T_c - T_a)_{1.1} = -1.4101 \text{ VPD} - 1.7105$ and stress equation was fixed and it was to 2.3. Crop Water Stress Index was based on irrigation planning and it was 0.24. Examining yield results revealed that irrigation scheduling in this area should be done by treatment of 75 % Total available water.

Keywords: Crop water stress index (CWSI), deficit irrigation, leaf surface temperature, soil water deficit