

Assessment of Yield and Water Use Efficiency of Soybean under Deficit Irrigation

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Abstract : Water limitation is the main challenge for crop production in a semi-arid environment. Deficit irrigation is a strategy that allows a crop to sustain some degree of water deficit in order to reduce costs and potentially increase income. For this goal, a field experimental carried out at Asrieh fields of Gorgan city in the north of Iran, during summer season 2011. The treatments imposed were different irrigation water regimes (i.e. W1:70, W2:80, W3:90, and W4:100) percent of field capacity (FC). The results showed that there was Significant difference between the yield and (WUE) under different levels of irrigation, excepting of soil moisture content at field capacity (W4) and 90% of field capacity (W3) on yield and water use efficiency (WUE). The seasonal irrigation water applied were (i.e. 375, 338, 300, and 263 mm ha⁻¹) under different irrigation water treatments (100, 90, 80, 80 and 70%) of FC, respectively. Grain yield productions under treatments were 4180, 3955, 3640, and 3355 (kg ha⁻¹) respectively. Furthermore, the results showed that water use efficiency (WUE) at different treatments were 7.67, 7.79, 7.74, and 7.75 Kg mm ha⁻¹ for (100, 90, 80, and 70) per cent of field capacity, therefore the 90 % of FC treatment (W3) is recommended for Soybean irrigation for water saving. Furthermore, the result showed that the treatment of 90 % of field capacity (W3) seemed to be better adapted to product a high crop yield with acceptable yield coupling with water use efficiency in Golestan province.

Keywords : deficit irrigation, water use efficiency, yield, soybean

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