

عنوان مقاله:

Effects of subsurface drip irrigation and furrow irrigation management on water productivity, growth and yield variables and root distribution in sugarcane cultivation

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خلاصه مقاله:

Introduction: Sugarcane fields of south west of Iran have heavy soil texture, high temperatures, and hot dry wind in spring and summer. Hydro-flume gated pipes were used for irrigation. Furrow irrigation was used in sugarcane fields. Considering the lack of water in Iran, efforts to improve the irrigation efficiency and water productivity can be promising. **Materials and Methods:** In the present study, the effect of drip lateral installation depths and emitter spacing on sugarcane crop water productivity and its yield was studied by installing laterals at ۱۵, ۲۰ and ۳۰ cm depths from surface, while the emitters were spaced at ۵۰, ۶۰ and ۷۵ cm. A factorial experiment in the form of randomly complete block design was carried out at the Sugarcane Research and Training Institute of Khuzestan in south-west of Iran. Study aimed to investigate the effect of subsurface drip irrigation on LAI (Leaf Area Index), yield and root distribution for sugarcane compared to the conventional irrigation. Two fields were investigated one field with subsurface drip irrigation and one field with conventional irrigation studied as control. Three measurement stations were selected in each field. The results were statistically analyzed. Number of plants, number of green leaves, leaf length and width over one meter were counted and measured six times at ۹۱, ۹۹, ۱۰۵, ۱۱۲, ۱۱۹ and ۱۲۸ days after harvesting, respectively. For comparison of root growth, one plant from each treatment was selected and thoroughly studied by root skeletal drilling. **Results:** Number of Leaf and leaf length and leaf width were not significantly different in both irrigations. The number of stems and leaf area index in subsurface drip irrigation had significant difference with irrigation in levels of ۹۵ and ۹۹ percent, respectively. The mean of leaf area index in subsurface drip irrigation and furrow irrigation were ۴.۱ and ۲.۷, respectively, and this index, in the subsurface drip irrigation was ۳۴% higher than the average of furrow irrigation. The active depth of preservative roots was up to ۱۲۰ and ۱۴۳ cm vertically and horizontally in subsurface drip irrigation and up to ۱۰۰ and ۱۰۴ cm in furrow irrigation, respectively. These indicates that the roots in subsurface drip irrigation are about ۱۷% and ۲۷% deeper and wider than furrow irrigation, and also were finer and deeper than the furrow irrigation. In subsurface and furrow drip irrigation, about ۹۶% and ۹۸% of the vertical roots, respectively, were ... propagated at a depth of ۶۰ cm. Sugarcane quantity specifications results showed there was significant differen

کلمات کلیدی:

Emitters, subsurface drip irrigation, sugarcane, Water productivity, Leaf area index, Root extension

