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Effect of deficit irrigation, partial irrigation and superabsorbent polymer on yield and yield components of corn (cv. KSC703)

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Abstract

To study the effect of deficit irrigation, partial irrigation and superabsorbent polymer on yield and yield components of corn, a field experiment was carried out in factorial split plot arrangement using randomized complete block design with four replications at Research Farm of Islamic Azad University, Karaj branch, Iran in 2014-2015 growing year. Deficit irrigation with three levels including irrigation with 100, 75 and 50 percent crop water requirement, furrow irrigation methods with two levels including partial irrigation (fixed alternate furrow) and conventional furrow irrigation that were located in the main plots and superabsorbent polymer with two levels including non-use superabsorbent polymer and used of superabsorbent (30kg/ha) that were located in the sub plots. Grains yield in partial irrigation method as compared to conventional furrow irrigation in condition of 100% crop water requirement decreased (38.5%). However difference of grain yield between fixed alternate furrow irrigation and conventional furrow irrigation in condition of irrigation with 75% and 50% crop water requirement was not significant. The use of superabsorbent saved irrigation water consumption by 13.4% during the growth period. According to a 26% reduction in the amount of irrigation water during the growing season in partial irrigation method, for achieve of corn grain yield in condition of irrigation with 75% and 50% crop water requirement can be used from partial irrigation method (alternate furrow irrigation) instead of conventional furrow irrigation method in the studied area. Also, along with partial irrigation method, to raise the water use efficiency can be used superabsorbent.

Keywords: alternative furrow irrigation, corn, drought stress, water resources limitation