PARTIAL ROOT ZONE DRYING IRRIGATION AND DIFFERENT NITROGEN LEVELS AFFECT ON NITROGEN RECOVERY EFFICIENCY FOR DRIP IRRIGATED SUGAR BEET CROP

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Abstract

This study was conducted to determine different nitrogen levels affect on nitrogen recovery efficiency, NRE, by use of drip irrigation under partial root zone drying irrigation and fertigation techniques for sugar beet plant. Research was performed in 2012 and 2013 at Konya - Çumra Plain of Turkey and Stine sugar beet cultivar was used. In study, application of 100% irrigation water requirement of plant, FI (Full Irrigation) and 50% application of FI by using fixed (FPRD50) and alternative partial root drying (APRD50) irrigation techniques, and application of 100% nitrogen requirement of sugar beet, FN (Full Nitrogen) with two deficit nitrogen treatments of 75% (DN75) and 50% (DN50) of FN levels were applied by drip irrigation. Different deficit nitrogen applications affect on crop nitrogen use was researched comparatively under different irrigation techniques and fertigation method. The results showed that among the irrigation treatments, differences in NRE from nitrogen fertilizer were found not significant. DN50 was found the highest NRE of crop from nitrogen fertilizer. The greatest performances combinations in NRE of crop from fertilizer nitrogen were, FIDN50 as 52.6%, APRD50DN50 as 48.5% and FPRD50DN50 as 41.0% interactions. Those results showed that nitrogen requirement of crop can be reduced for drip irrigated sugar beet farming.

Key words: Sugar beet, drip irrigation method, PRD, deficit nitrogen, fertigation, nitrogen recovery.