Optimizing Tomato Productivity and Water Use Efficiency Using Water Regimes, Plant Density and Row Spacing under Arid Land Conditions.


Abstract:

A field experiment was conducted to study the effect of water regime (W), row spacing (RS) and plant density (D) on growth and productivity of tomato cv. ‘Pito Pride’ at the Agriculture Experimental Station of King Abdulaziz University. Two water regimes, W1 (70% of water requirement) and W2 (full water requirement) were studied. Under each water regime three row spacings (RS1, RS2, RS3) and two plant densities D1 (single plant per dripper) and D2 (two plants per dripper) were investigated. Results revealed that W1 reduced number of days to flowering and fruit setting, plant height, plant fresh weight and total yield, while it increased water productivity (WP). Decreasing RS increased water supply and total yield but decreased growth characteristics. D2 increased total yield by 122–168% and WP by 131–180% compared to D1. Interaction between the three variables investigated was significant for all assessed characteristics except fruit yield per plant, total fruit yield and WP. These characteristics were affected by the interaction between RS and D. The highest total yield and WP were obtained from the RS2-D2 treatment. This treatment increased total yield per ha by 11–331% and WP by 12–300% compared with the maximum and minimum yield of other investigated treatments of both seasons. Copyright © 2014 John Wiley & Sons, Ltd.

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