The use of grafting to improve salt tolerance of tomato in hydroponic conditions

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Abstract

Application of grafting technique could be an approach for increasing salinity resistance of tomato cultivars. To assess the impact of grafting on resistance of tomato to salinity, two varieties of conventional tomato called Hamra and Kevin were grafted on a salt-resistant base, called AR-9704, using chisel grafting method, and were grown in the greenhouse, using a hydroponic system, under three levels of salinity (EC of 2.3, 5.3 and 8.3 dS/m). The results showed that 8.3 dS/m treatment significantly reduced yield per plant. The main reason for this reduction was lower number and weight of the fruits. Interaction of salinity and cultivar was also statistically significant ($P<0.01$). The use of grafted cultivars of Hamra and Kevin increased yield per plant at different salinity levels. However, this increase was significant at 2.3 dS/m salinity level. At low salinity level (2.3 dS/m), the lycopene content in grafted Hamra and β-carotene content in both grafted Hamra and Kevin cultivars had significant advantage over other treatments. The amount of ascorbic acid and lycopene at moderate and high salinity levels (5.3 and 8.3 dS/m, respectively), and fruit's soluble solids concentration at salinity level of 8.3 dS/m in grafted cultivars were significantly higher than non-grafted cultivars.

Keywords: Grafting, Lycopene, β-carotene.

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