Growth of Tomato Seedlings as Affected by Nutrient Solution Concentration

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Abstract

Production of seedlings is an important growth phase which can significantly affect early plant development. The aim of this study was to determine the effect of three concentrations of nutrient solution (Sonneveld, EC = 2, 4 or 6 dS m^{-1}) on vegetative growth of three tomato cultivars (Belle, Fado i Cheramy) grown in rockwoll cubes (7.5 cm). One month after sowing, significantly higher seedlings were at 2 dS m^{-1} (33.8 cm), and for cv. Cheramy (33.6 cm). Cv. Cheramy had more leaves (9) compared to other cultivars, while internodes were longest for cv. Fado (4.1 cm). The widest stems were observed for cv. Belle (4.7 mm) and for seedlings grown at 2 dS m^{-1}. The leaf area was higher for cv. Fado (380 cm^2) than for cvs. Belle (324 cm^2) or Cheramy (301 cm^2). Leaf area was significantly decreased as EC-value of nutrient solution increased from 2 to 6 dS m^{-1}. Specific leaf area (cm^2 g^{-1}) was not affected by cultivar, however it was decreased as EC-value of nutrient solution increased from 2 to 6 dS m^{-1}. Dry matter content of fresh leaves was lowest in seedlings grown at 2 dS m^{-1} (6.2%), and it was increased as EC-value of the nutrient solution increased. Leaf concentration of NO_3^- and K^+ ions was increased with increase of EC-value of nutrient solution. Compared to others, cv. Cheramy had higher leaf concentration of NO_3^- (3989 ppm) and K^+ (4878 ppm) ions. Vegetative growth of tomato seedlings was generally retarded as EC-value of the nutrient solution was increased above 2 dS m^{-1}.

Key words: leaf area, *Lycopersicon esculentum,* nitrate, plant height, potassium

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Rast presadnica rajčice pri različitim koncentracijama hranjive otopine

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Sažetak

Proizvodnja presadnica povrća je značajna faza u uzgojnom procesu koja može uvelike utjecati na početni razvoj biljke. Cilj istraživanja je bio utvrditi utjecaj tri koncentracije hranjive otopine (po Sonneveldu, EC = 2, 4 i 6 dS m^{-1}) na vegetativni rast tri kultivara (Belle, Fado i Cheramy) rajčice uzgojena u kockama kamene vune (7.5 cm). Mjesec dana nakon sjetve značajno više (33.8 cm) presadnice zabilježene su pri 2 dS m^{-1}, te kod Cheramy (33.6 cm). Najveći broj listova (9) imale su presadnice kultivara Cheramy, dok je najduže internodije imao kultivar Fado (4.1 cm). Veći promjer stabljike zabilježen je u kultivara Belle (4.7 mm) i kod presadnica uzgojenih pri elektrovodljivosti 2 dS m^{-1}. Površina lista bila je veća kod kultivara Fado (380 cm^2) u odnosu na kultivare Belle (324 cm^2) i Cheramy (301 cm^2), a značajno se smanjila s porastom EC-a hranjive otopine s 2 na 6 dS m^{-1}. Kultivar nije utjecao na specifičnu površinu lista (cm^2 g^{-1}), no ona se značajno smanjila s povećanjem EC-vrijednosti hranjive otopine s 2 na 6 dS m^{-1}. Najmanja količina suhe tvari u svježem listu zabilježena je u presadnica uzgojenih pri 2 dS m^{-1} (6.2%) te je rasla s povećanjem EC-vrijednosti hranjive otopine. Koncentracija NO_3^- i K^+ iona u listu povećavala se s porastom EC-vrijednosti hranjive otopine. U odnosu na druge, kultivar Cheramy je imao veću koncentraciju NO_3^- (3989 ppm) i K^+ (4878 ppm) iona u listu. Povećanje koncentracije hranjive otopine iznad 2 dS m^{-1} usporilo je većinu parametara vegetativnog rasta presadnica rajčice.

Ključne riječi: *Lycopersicon esculentum,* kalij, nitrati, površina lista, visina biljke

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