

Salt Stress in Horticultural Production

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Abstract

Salt stress as one of the most important abiotic disorders in plant production is a consequence of increased concentration of water soluble salts (salinity) in rhizosphere, namely increased ions uptake. Depending of intensity, duration and species tolerance, effects of salt stress are manifested in form of osmotic, ionic and different secondary plant disorders. Salinized areas represent a global problem whereas currently in the world almost 1000 Mha (in RC < 1000 ha) is salt affected to certain extent with growing tendency by 0.3-0.5 Mha annually. Food production, especially of vegetable and fruit, at salt affected areas in technological and economical aspect is very complex and acquiring accompanied regularly with yield and quality reduction. During three-year (2004-2007) study in controlled greenhouse conditions influence of 4 salinity levels (0, 20, 40 i 60 mM NaCl) in nutrient solution was observed on certain vegetative parameters of peat growing cultures. Results confirm that at NaCl variants number of vines was reduced in melon 6-24%, strawberry 23-86%, and number of radish leaves 10-30% compared to control (C). Moreover, at the same variants length of the longest vine was reduced in melon 3-17%, and strawberry even 24-62% compared to C, while the leaf area of salinized strawberry variants was decreased by 23-53% compared to C. Reduction of total yield with salinity increasing was the greatest in strawberry (28-59%), then in melon (11-49%), radish (4-34%) and the smallest was in lettuce (3-27%).

Key words: salinity, rhizosphere, yield reduction

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Stres soli u hortikulturnoj proizvodnji

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Sažetak

Stres soli kao jedan od najznačajnijih abiotskih poremećaja u biljnoj proizvodnji nastaje uslijed povećane koncentracije vodotopivih soli (saliniteta) u rizosferi, odnosno povećanog primanja iona. Ovisno o intenzitetu, trajanju i tolerantnosti vrste, posljedice stresa soli se očitiju u obliku osmotskih, ionskih te raznih sekundarnih poremećaja biljke. Salinizirane površine predstavljaju globalan problem obzirom da je trenutno u svijetu gotovo 1000 mil. ha (u RH < 1000 ha) zaslanjeno do određenog stupnja, uz tendenciju porasta od 0,3-0,5 mil. ha godišnje. Proizvodnja hrane, posebno povrća i voća, na saliniziranim površinama u tehnološko ekonomskom pogledu je vrlo zahtjevna i kompleksna uz redovito smanjenje prinosa i kakvoće. Trogodišnjim istraživanjem (2004.-2006.) u kontroliranim uvjetima plastenika pratio se učinak 4 razine saliniteta (0, 20, 40 i 60 mM NaCl) u hranjivoj otopini na određene vegetacijske parametre kultura uzgajanih u tresetu. Rezultati istraživanja ukazuju da je kod NaCl varijanata broj vriježa dinje reduciran 6-24%, jagode 23-86%, a broj listova rotkvice 10-30% u odnosu na kontrolu (K). Također, kod istih varijanata dužina najveće vriježe dinje je bila kraća 3-17%, a jagode čak 24-62% u odnosu na K, dok je površina listova jagode kod saliniziranih varijanata smanjena za 23-53% u odnosu na K. Smanjenje ukupnog prinosa s rastom saliniteta je bilo najveće kod jagode (28-59%), zatim kod dinje (11-49%), rotkvice (4-34%), a najmanje kod salate (3-27%).

Ključne riječi: salinitet, rizosfera, smanjenje prinosa

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