The effects of grafting to improve salinity tolerance in greenhouse cucumber cv. Spadana

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Abstract

Grafted rootstocks of fruit vegetables have been widely used in recent years. Due to the availability of local pumpkin germplasms, identification and selection of the landraces resistant to salinity and introducing for production of hybrid rootstocks is necessary. By grafting Spadana cucumber on 3 local landraces ofcucurbits (pumpkin, squash and bottle gourd), 3 imported hybrids of Ferro,19-64 and Shintoza, and Spadana cucumber as self-grafted and ungrafted, totally 8 treatments were compared with respect to NaCl salinity stress (0, 2, 4 and 6 dS/m) and saline agricultural well water (6.6 dS/m). The experiment was performed as factorial with randomized complete blocks design with three replications. Results showed that reduction of plant growth obviously started from 4 dS/m, such that in comparison to no-saline conditions (control), the vegetative growth was decreased by 22%. Salinity of 6 dS/m from NaCl source, interrupted the growth of plants. Saline well-water (6.6 dS/m) was less effective on plant growth than 6 dS/m saline water from NaCl source. Under salinity stress, the length of roots and roots/shoots ratio increased and volume and dry matter of roots decreased. The self-grafted Spadana cucumber had more vigorous growth than ungrafted plants. The local population of pumpkin was more tolerant rootstocks to salinity as compared to the imported landraces. Based on the results of vegetative growth, including plant length, leaf area, volume and dry matter of roots and shoots, the hybrid rootstocks of Ferro, Shinotza and 19-64, and pumpkin, were recognized as tolerant to salinity stress.

Keywords: Grafting, Cucumber, Growth, Salinity stress, Cucurbit.

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