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ABSTRACT

Field experiments were carried out at the Agricultural Experiments Desert Station, Faculty of Agriculture, Cairo university in Wadi El-Natroon Valley, Behera Governorate, Egypt during the two successive seasons of 2007 and 2008. The first study had conducted four Grape cultivars (Red Roum, Flame Seedless, Thompson Seedless and Crimson Seedless) and four grape rootstocks (Salt Creek, 1103Paulsen, Freedom and Teleki 5C). The first aim is to evaluate their growth under saline stress conditions. The obtained results showed that Grape cultivars generally, had a high vegetative growth which increase it's dry weight beside Salt Creek dry weight which surpass all of them due to more root length and dry weight. While, Grape rootstocks had relatively high physiological and low chloride and sodium absorption which support them to stand under these conditions more than Grape cultivars and Salt Creek beside 1103Paulsen rootstock recorded the best results in this regard.

The second aim of study was to evaluate the response of two rootstocks to some salt tolerance treatments. This study had conducted two grapevine rootstocks, Salt Creek (*Vitis champini*) and 1103Paulsen (V. *berlandieri* × V. *rupestris*) nurslings with or without some soil application treatments (humic acid, Uni-Sal), sulphur and mycorrhizae) under saline water irrigation. The obtained results indicated that, Salt Creek rootstock recorded the highest significant shoot length, leaf area, leaf number, root length, total plant dry weight, leaf transpiration rate and root Ca content and it had a significantly reduction in stomatal diffusion resistance (SDR) compared to 1103Paulsen rootstock. Whereas, 1103Paulsen had the highest values for plant survival %, leaf proline content and reduction in leaf and shoot Cl and Na contents. Moreover, Uni-Sal treatment gave the highest significant shoot length, leaf area, root length plant dry weight, chlorophylls and transparent rate plant K content and reduced significantly SDR and leaf Na content. Furthermore, Salt Creek rootstock with Uni-Sal treatment gave the best results.

Key word: Grape rootstock - Grape cultivar - Salt Tolerance - Humic acid - Uni-Sal - Sulphur - Mycorrhizae - Saline water- stress.