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List of Abbreviations

CAT	Catalase
Chl.	Chlorophyll
Cl	Chlorine
DM	Dry matter
DNA	Deoxyribonucleic acid
DW	Dry weight
ET	Evapotranspiration
FW	Fresh weight
K	Potassium
LRWC	Leaf relative water content
Mg	Magnesium
N	Nitrogen
Na	Sodium
WUE	Water use efficiency
P	Phosphorous
PCR	Polymerase chain reaction
RAPD	Random Amplification of Polymorphic DNA
Ros	Reactive oxygen species
SOD	Superoxide dismutase
SSC	Soluble solid content

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ABSTRACT	
<p>Three field experiments were conducted to examine tolerance of grafted watermelon to abiotic (salt, water and cold) stress during 2014-2016. Watermelon cv. Aswan scions were grafted onto different cucurbit rootstocks, namely Giada, Shintoza, Strong toza, Ferro and Pumpkin. Grafted seedlings were exposed to salt stress by applying nutrient solution containing 0.0, 50 or 100 mM NaCl. In the second experiment, grafted plants were exposed to deficit irrigation treatments (100%, 70% or 50% ET). In the third experiment, plants were grown under low temperature by planting during the winter season to be compared with those planted in the warm summer season. Results indicated that all abiotic stress treatments resulted in decrease growth, yield and some fruit characters, in different degree, depending on the rootstock used, and un-grafted plants exhibited the highest decreases. Based on several growth and yield parameters, watermelon plant cv. Aswan grafted on the rootstock Giada or Ferro exhibited better performance under the tested abiotic stress treatments. Under high salt (100mM NaCl), deficit irrigation (50% ET) and growth under sub-optimal temperature, photosynthetic pigments and NPK contents were significantly lower than the control treatments (0.0 NaCl, 100 ET, or warm season). Under salt stress, Na accumulation was higher in the roots of grafted plants than in their leaves, and the reverse was true in un-grafted plants. Proline content, antioxidant enzyme (SOD and CAT) activities were higher, under the three types of abiotic stress examined, than the control. The increase in proline and antioxidant enzyme activities, along with the accumulation of Na more in the roots than leaves are suggested to be key factors for grafted watermelon plants having higher tolerance to salt stress and the other tested abiotic stresses than un-grafted ones. DNA analysis using RAPD technique indicated no transfer of genetic material from the rootstock to the scion.</p>	
Keywords:	<i>Citrullus Lanatus</i> , salt stress, deficit irrigation, cold stress, grafting, RAPD