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Effects of Salinity and B Excess on the Growth, Photosynthesis, Water Relation and Mineral Composition in Laurustinus Grown in Greenhouse

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A greenhouse study was conducted in order to determine interactive effects of NaCl salinity and boron on the growth, plant water status, gas exchange, chlorophyll fluorescence and concentrations of sodium (Na), chloride (Cl) and boron (B) in laurustinus (*Viburnum tinus* L.). Potted plants were grown in a factorial combination of salinity (2 and 6 $dS \cdot m^{-1}$) and boron (1 and 6 $mg \cdot L^{-1}$). Plant dry weight decreased with salinity and B excess, but this decrease was more pronounced by the former. Salinity × B interaction on the plant dry weight (DW) was not significant (additive effects). Salinity increased Na and Cl concentrations in leaf (36 and 20 $mg \cdot g^{-1}$ DW, respectively) resulting in foliar injures. The application of 6 $mg \cdot L^{-1}$ of B produced injury symptoms in basal and middle leaves (yellow or orange spots at the tips and margins of leaves). Both stresses dropped leaves, especially salinity. The 6 $mg \cdot L^{-1}$ of B treatment accumulated higher B concentrations in insured leaf (~1300 $mg \cdot Kg^{-1}$ DW) and salinity reduced it to 300 (B x salt antagonistic effect). The high B supply did no alter Na and Cl concentrations in leaf. Salinity decreased stomatal conductance (gs) as a regulatory mechanism against osmotic stress, which resulted in a photosynthesis (Pn) decline. Leaf water parameters were only affected by salinity, favoring a process of osmotic adjustment which improved the plant water status. Salt-stressed plants showed an adaptive response to salinity, which declined gs, Pn and quantum yield of photosystem II (éPSII) and dissipated the excess radiant energy as heat (Non-photochemical quenching [NPQ] increasing). However, B excess and salt treated plants maintained éPSII and decrease the effectiveness of stomatal regulation, NPQ and Pn. This caused the lowest plant DW and suggests disorders in electron transport (photorespiration).

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Doses of Nitrogen and Potassium Fertigation Cabbage in Greenhouse Culture

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The work evaluated reduction of doses of nitrogen and potassium applied by fertigation cabbage, Rampo hybrid, in relation to the recommended complete doses for conventional fertilization. The experiment was installed in area of the Department of Agricultural Engineering of the ESALQ/USP, Piracicaba-SP, Brazil. Ten treatments was evaluated: T1=100% de N + 100% of K_2O (Convencional); and excessively for fertigation in sixteen times: T2=100% de N + 100% of K_2O; T3=75% de N + 100% of K_2O; T4=50% de N + 100% of K_2O; T5=25% de N + 100% of K_2O; T6=100% de N + 75% of K_2O; T7=100% de N + 50% of K_2O; T8=100% de N + 25 of K_2O; T9=50% de N + 50% of K_2O; T10=25% de N + 25% of K_2O. They was evaluated horizontal diameter of heads (DH), vertical diameter (DV), weight of heads (PTCT), weight of plants (PEPL), weight of leaves (PEFO), produtivity (PROD) and relation DH/DV. It did not have significant difference between DH and DH/DV. It had significant difference between T1 and T10 for (DV and PTCT), with value of T1=15.3cm and T10=11.0cm. It did not have significant difference between treatments with fertigation for (PTCT). For PROD it had significant difference 5% of probability between data T1 (111.5 $t \cdot ha^{-1}$) and tratamentoT4= (55.2 $t \cdot ha^{-1}$). It did not have difference of (PROD) between treatments with fertigation.

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Incidence of Tomato Blossom-End Rot at Different Calcium Levels

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Blossom-end rot (BER) is one of the most significant physiological disorders in the greenhouse tomato cultivation. It often occurs during tomato growing in the soil, but also in the soilless culture. Since the water and nutrients supply could be regulated in the hydroponics, the aim of this research was to determine the intensity of blossom-end rot occurrence at different calcium concentrations in the nutrient solution. Along with the standard nutrient solution which contained 0.925 g of calcium nitrate per liter, solutions with 50% reduced, and also 50 and 100% increased concentration of calcium nitrate were applied. Varying the concentration started four weeks after planting. Four tomato cultivars grown on rockwool were tested. Application of solutions with different calcium nitrate concentrations resulted with the share of BER fruits between 11.6 and 14%. The share of affected fruits at different cultivars varied from 9.3 to 21.3%. Interaction of tested factors resulted with a BER fruits share in the range from 7.1 to 22.5%. Between 75 and 100 marketable fruits weighted from 144 to 263 g was picked per m^2. Marketable yield varied from 13.77 to 25.24 $kg \cdot m^{-2}$. Application of decreased or increased calcium concentration in the nutrient solution resulted with significant differences in BER affected fruits number between tested cultivars, which mean that the concentration should be adapted to the needs of each cultivar during the growing season. Beside the concentration of calcium and growing of cultivars resistant to the blossom-end rot incidence, special attention is paid to the regulation and maintenance an optimum microclimate conditions in the greenhouse, in order to promote the absorption and transport of calcium through the plant.

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The Effect of Scion's Root Pruning on Watermelon (*Citrullus lanatus* L.) Grafted Seedlings Growth and Stand Establishment Rate under Saline Conditions

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Two different commercial rootstocks, were grafted with each of two commercial watermelon cultivars. For each combination, splice grafting (SG) and root pruning splice grafting (RPSG) were simultaneously applied. End of nursery period, a sufficient number of 14 days old seedlings of each grafting combinations were transplanted in larger pots filled with vermiculite, divided in two equal groups. In the following 10 days all plants were periodically irrigated with equal amounts of the same nutrient solution, but differing from each other by the quantity of NaCl added in the nutrient solution. Two week after grafting, and 10 days after transplanting, 10 plants of each experimental plot were randomly selected. Growth rate during the nursery stage and stand establishment rate after transplanting, defined as the relative growths rate (RGR) and its components; net assimilation rate (NAR) and leaf area ratio (LAR), were computed for each experimental plot. Compared to root pruned splice grafted seedlings, a higher plant dry matter and larger leaf area per plant were recorded for splice grafted seedlings end of nursery stage. Despite that, a significantly higher relative growth rate was found for root pruned splice grafted seedlings, mostly due to higher net assimilation rate. The same advantage of root pruned splice grafted seedlings was kept during the stand establishment period. As a result, end of transplanting period, no significant differences were found between splice grafted and root pruned splice grafted watermelon seedlings regarding to plant dry matter and leaf area per plant. Generally speaking, the stand establishment rate of transplanted seedlings was drastically reduced due to the increase of nutrient solution salinity, but still significantly higher values were recorded in case of root pruned splice grafted seedlings.