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THE INFLUENCE OF AVOCADO ROOTSTOCKS ON THE TREE RESISTANCE TO ENVIRONMENTAL STRESSES

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Due to acute water shortage in Israeli agriculture, more and more brackish water is being used for irrigation. One of the main characteristics of this water is a high concentration of chloride, sodium and boron. This research is trying to deal with the problems arising from irrigation of avocado with water containing high concentration of chloride and boron, in respect to tree growth and yield potential (productivity and fruit quality) and in respect to soil and the changes occurring in it (medium and heavy soil**). The research objectives are 1**. The influence of different levels of chloride and boron in irrigation water on avocado tree vegetative growth and productivity under field conditions. **2**. Evaluation of processes, that occur in the soil profile, as a result of irrigation with different quality water. **Research description**: Research is being conducted in two sites, in the main avocado growing areas: Chefer Valley (sandy loam soil), "Ha'maapil experiment", and in the Western Galilee (clay soil), "Acco experiment". Avocado trees were planted in the experiment sites in a randomized block design and the cultivars are 'Ettinger' and 'Hass', grafted on different rootstocks according to the cultivar and soil type. The rootstocks are both seedlings and vegetative clones (vc). The factors measured: Chloride and boron levels (90, 180 mg Cl/L and 0.01, 0.9 mg B/L in "Acco experiment" and 200, 240, 350 mg Cl/L and 0.01, 0.25, 0.8 mgB/L in "Ha'maapil experiment"). The parameters measured: Continuous monitoring of the plant (yields, vegetative growth, salt accumulation in branches and leaves), and of the soil (chloride and boron concentrations). Main results at present are: Differences in tree responses (vegetative growth and yield) were found with differing chloride and boron levels and extreme heat stress in accordance with the rootstock, soil type and variety. Salt accumulation is related to the soil type and irrigation management.

This research has a significant contribution for detecting problems that may arise, due to prolonged exposure of avocado trees to high levels of chloride and boron. Detecting and defining the problems will enable finding the right solutions. The uniqueness of this research is the quantitative examination of chloride and boron influence on avocado tree, and the interaction between them, in field conditions. This research will enable to learn the dynamics (availability and accumulation and movement through soil profile) of these salts in the soil profile and in the tree (rootstocks and scion).