Organized by:

NAGREF
Institute for Olive Tree
& Subtropical Plants
of Chania

OLIVEBIOTEQ 2011

"For an innovative, sustainable and profitable olive industry around the world"

Chania, Crete, GREECE, October 31st - November 4th, 2011

In cooperation with:

International
Olive Council

BOOK OF ABSTRACTS

www.nagref-cha.gr/olivebioteq/index.htm

Under
the Auspices of:

The Greek Ministry
of Rural Development
& Food

Conference Center:
Caldera Creta Paradise Resort
Chania, Crete, GREECE

Growth and nutrient status of five Greek olive (*Olea europaea* L.) varieties subjected to sodium chloride stress

P. A. Roussos[1], A. Dimou[2], A. Assimakopoulou[3], D. Gasparatos[2], G. Kostelenos[4]

[1]*Agricultural Uni. of Athens, Lab. of Pomology, Iera Odos 75, Athens 118 55, Greece*
[2]*Agricultural Uni. of Athens, Lab. of Soil Science and Agricultural Chemistry, Iera Odos 75, Athens 118 55, Greece*
[3]*Technological Educational Institute, Lab. of Pomology, 24100 Antikalamos, Kalamata, Greece*
[4]*Kostelenos nurseries, Poros Troizinias, Greece*

One year old olive (*Olea europaea* L.) trees, of five Greek varieties (Gaidourelia, Koroneiki, Thassitiki, Mastoidis N.K. Gigas and Lefkolia Serron), were subjected to four levels of sodium chloride salinity stress (control, 50 mM, 100 mM and 200 mM sodium chloride) for 40 days. At the end of the stress period, plant growth was evaluated by measuring leaf, shoot and root dry weights, as well as the intensity of salt toxicity symptoms which was macroscopically evaluated in the leaves. In order to assess salinity effect on plant nutrition, the concentration of potassium, calcium, magnesium, sodium and chloride was determined in leaf and root samples. Leaf and entire tree dry weights exhibited a significant decrease with salt stress, while there was not any significant effect on both shoot and root dry weights. Salt stress induced a significant accumulation of sodium and chloride in leaves reaching maximum values already by 100 mM sodium chloride treatment. On the other hand, the higher the salt concentration was in the irrigation water, the higher was the concentration of the two ions in the roots, with significant differences among treatments. There were significant differences in mineral concentrations among varieties, as Koroneiki, Thassitiki and Mastoidis N.K. Gigas presented the highest sodium concentration in leaves and Gaidourelia the highest chloride concentration both in leaves and roots. Lefkolia Serron exhibited the highest root sodium concentration and Gaidourelia the lowest. Soil electrical conductivity increased with increasing salt concentration in the irrigation water, reaching values of approximately 35 mS cm^{-1} under the high salt treatment. The intensity of leaf salt toxicity symptoms revealed significant differences among varieties, as Lefkolia Serron exhibited the least intense symptoms, even under the highest salt concentration, while Gaidourelia and Thassitiki the most intense ones, loosing the majority of their leaves under the highest salinity level. Based on the present results, it seems that Lefkolia Serron tolerates sodium chloride salinity due to its capacity to retain sodium ions in the roots, while Gaidourelia seems to be the most sensitive, possibly due to the high accumulation of chloride ions in the leaves (almost double than that of Lefkolia Serron).

Keywords: leaves, nutrients, root, salinity, soil, toxicity symptoms