difference in the roots and stems among the treatments. Results of study showed that water table of -30 cm can cause reduction of photosynthesis and mineral composition of grapevine. The experiment concluded that depth and maintaining period of water table were important factors in the survival of ‘Campbell Early’ grapevine.

S16.034
The Effects of Different Levels of Irrigation to Uptake of Micro Nutrients in the Table and Wine Grapevine Cultivars Grown

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In this study, which was carried out in Koruka Village, in Alçaakale Şanlıurfa, the effects of different drip irrigation levels on nutrient uptake of grapevines at full anthesis and veraison were investigated. Grape cultivars Perlette, Cardinal, Italia, Hamburg Misiketi, Kahancık, Ölügöni, Carigianne, Semillon Blanc and some American rootstock cultivars, 5 BB, 420 A, 41 B, 1103 P, 110 R, and 99 R were used as plant materials. According to results obtained; Mn, Zn and Fe showed an increase in leaves beginning from the anthesis. Cu differed in the amount depending on the time leaves were taken. When the cultivars were evaluated depending on the nutrient uptake at the different irrigation levels, Italia followed by Perlette had the highest amount of Cu and Fe. The cultivars did not differ in Mn contents. It is from the study that high nutrient uptake could occur even at the lowest irrigation levels in Harran Plain for successful grape growing.

S16.035
Overexpression of the Vitis vinifera rd22 Gene Enhanced Tolerance to Salt Stress in Transgenic Tobacco

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Salinity is a major factor limiting crop production. In the setting up of a tolerance improvement program within Tunisian grapevine to abiotic stresses, we transformed Nicotiana benthamiana with the Vitis vinifera rd22 gene (Vrd22: responsive to the dehydration). Thus we focused on the evaluation of transgenic lines behaviors in order to analyse the functionality of the Vrd22 against salt stress. The in vitro germination tests of the T2 transgenic seeds and wild-types on the MS medium supplemented with NaCl at different concentrations (0; 150 and 200 mM NaCl) has shown that transgenic seeds exhibited best tolerance at germinatist and post-germinative stages. The test of the saline stress under greenhouse marked a better growth in length and biomass within the transgenic lines compared in the wild-types, in presence of increasing doses of NaCl (150 mM and 300 mM). Under these concentrations, unlike the wild-types, the transgenic lines showed a lower accumulation of Na+ and C1 and stable content of Ca2+ and Mg2+ in leaves. However no significant difference of K+ content was observed. Otherwise, the application of 400 mM NaCl during a second ex vitro assay permitted to note an important biomass and leaves surface, a light decrease in chlorophyll contents, maintenance of water status; a light decrease of RWC with a fall of the osmotic potential and an accumulation of the contents in total soluble sugars in the transgenic lines. The obtained results would translate a better salt tolerance of Vrd22 transgenic lines and would involve the over-expression of the transgene.

S16.036
Grape Polyphenols in a Changing Environment

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Grapes are grown throughout the world and represent a major horticultural crop. The quality of their products is particularly sensitive to changes in climatic factors such as light intensity, temperature and water availability. A major component of berry quality resides in the polyphenolic fraction, whose composition dictates technological and sensory attributes of the wine such as color and astrignency. The main families of grape berry phenolics are anthocyanins, flavonols, hydroxycinnamyliarctates, stilbenes and flavanols in free or polymerized form. The effects of climatic factors on the concentrations of these substances have been studied using different approaches, but usually isolating a single factor from the others. These studies have yielded established knowledge on some aspects such as the increases of anthocyanin, flavonol and stilbene concentrations by light intensity and the negative effects of temperature on anthocyanins. The biosynthesis of phenolics in the grape berry is under intense investigation, several genes responsible for some of the main biosynthetic pathways have been isolated and characterized, and in a few cases the effects of climatic factors such as temperature and light intensity on gene expression and enzyme activity have been described, offering a molecular explanation of the effects observed at the composition level. The influence of climate on the grape berry polyphenol profile however needs also to be studied using an integrative approach. The results which have been obtained using studies based on correlative analysis and on the modelling of the relationships between climate and polyphenol concentrations will be discussed.

S16.037
NMR-Based Metabolomics to Understand Biochemical Changes during Grape Berry Development in Different Grape Cultivars from Portugal

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In this study, 1H nuclear magnetic resonance (NMR) has been used for metabolic profiling of grapes from three Portuguese cultivars including ‘Trincadeira’, ‘Aragones’, and ‘Touriga Nacional’ at four different developmental stages. For identification of metabolites two-dimensional NMR techniques were employed. Multivariate data analyses like principal component analysis (PCA) and partial least squares-discriminant analysis (PLS-DA) were also performed to underline differences among cultivars and their developmental stages. Trincadeira was found different from the other two cultivars having low phenolic contents while high accumulations of compounds like methionine, and citric acid. The initial stages (green and veraison) showed comparatively high phenolic and organic acid contents with compounds like cectaric and malic acids while the later stages (ripe and harvest) showed high levels of glucose and catechins. Veraison was found to be metabolically critical stage of berry development as it caused a dramatic change in the metabolic profile of the berry, characterized by decline in phenolics and organic acids contents with the accumulation of sugars and tannins. On the basis of these findings, distribution of metabolites among different cultivars at different developmental stages is presented.

S16.038
Colour Evaluation on Red Winegrapes by CIELAB Parameters

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Anthocyanins are the most important pigments responsible for colour of red grapes and wine. A closer relationship can be expected between them and colour visual appearance. Traditionally, must and wine colour is assessed by several indexes, such as colour density tonality, and total and extractable anthocyanins, calculated after measuring absorbance at 420, 520 and 620 nm. In the last years