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THE EFFECTS OF BIOCHAR APPLICATION ON WATER RELATION AND SOIL QUALITY IN VITIS VINIFERA

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Soil water status plays an important role on the growth-yield response on Vitis vinifera and on the quality of productions. Moderate water stress periods are in some cases needed to ensure high quality productions, but especially in dry Mediterranean environment, water stress may lead to an unbalance of the sugar/acidity ratio due to berry dehydration. Biochar is a co-product of thermochemical conversion of lignocellulosic biomass and it is well recognized to exert, if incorporated to the soil, an amendant action and an increase of water retention. The scientific literature on soil biochar application show a small overall, but statistically significant, positive effect of the biochar on plant productivity. In this work we investigated the effect of biochar amendments on Vitis vinifera (cv. Merlot) in a acid soil (pH 5.5) in Central Italy for two consecutive seasons. The biochar was applied at two rates 22 and 44 t ha⁻¹ in a strip plot design with 5 replicates During summer 2011 the seasonal course of leaf water potentials, chlorophyll content, and chlorophyll fluorescence were measured as potential indicators of water stress. Detailed soil samples were also made during the entire season to detect the effects of the biochar application on soil parameters and on their dynamic. Preliminary results that will be reported in this presentation are showing that the soil pH increased by about one unit after biochar application and that a substantial reduction of water stress effect of plant treated with biochar has occurred.