INFLUENCE OF SOIL MANAGEMENT (NATURAL VEGETATION AND TILLAGE) ON PHYSIOLOGICAL PARAMETERS IN *OLEA EUROPAEA CV.* COBRANÇOSA

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Olive trees (*Olea europaea*) have great social and economic interest in Trás-os-Montes. In this region, conventional tillage has long been used for control of weeds, with a frequency of three to four times a year. The aim of this work was to study the effect of soil cover with natural vegetation (***nv***) in comparison to the traditional tillage (***tt***) on photosynthetic parameters and leaves mass in the Cobrançosa cultivar. The work carried out in 2003 in a no-irrigated olive orchard located in Paradela-Mirandela (North east of Portugal). The orchard has about 4.0 ha of surface, and two plots with different management were constituted, one was tilled every time that was necessary to control the weeds and in the other the natural vegetation grew freely over the last one year. In each plot, five randomly trees were sampled and Dry weight (Dw), chlorophyll contents (Chla, Chlb, Total Chl and carotenoides) and gas exchanges (E - transpiration, A - photosynthesis and gs- stomatal conductance) were determined in July and September. No significant differences were found in Dw between plots in July (***tt*** - 48.78% and ***nv*** - 48.97%) and September (***tt*** - 51.60% and ***nv*** - 52.71%). In July, the Chla, Chlb and Total Chl contents were significantly greater in the olive trees under ***nv*** treatment (p = 0.025; p = 0.0125 and p = 0.018, respectively). In September similar results were found, however, they didn't differ statistically between treatments. The carotenoids contents were higher in ***nv*** than ***tt*** (***tt*** – 2.6 mg/g Wf and ***nv*** – 2.8 mg/g Wf, in July, and ***tt*** – 3.31 mg/g Wf and ***nv*** – 3.77 mg/g Wf, in September), but only differs significantly in September (p=0.012). Photosynthesis parameters (gs, E and A) were significantly higher in olive trees under ***nv***. In September, E was 0.773 mol $H_2Om^{-2}s^{-1}$ and 1.136 mol $H_2Om^{-2}s^{-1}$; A was 3.60 µmol CO_2 $m^{-2}s^{-1}$ and 5.28 µmol CO_2 $m^{-2}s^{-1}$; gs was 0.013 mol $m^{-2}s^{-1}$ and 0.027 mol $m^{-2}s^{-1}$ respectively in ***tt*** and ***nv***.