

Role of indigenous weed flora in carbon and main nutrient elements storage in Southern Greece olive orchards

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Within the framework of the LIFE+ project oLIVECLIMA, several alternative orchard management practices are applied to commercial olive orchards, as a way to cope with the upcoming climate changes and improve the carbon balance within the orchard ecosystem. Among others, applied practices include the conservation of the local weed population during winter (as compared to farmer practice of soil cultivation or chemical weed control) and intervention for alteration of the indigenous flora in order to achieve a more efficient carbon and nutrient fixation. In the present work, preliminary data on the carbon and nutrient fixation in the indigenous orchard flora are reported. Three representative sampling areas per orchard were established in 70 commercial olive orchards in the areas of Nileas in Peloponnese, and Meramvello and Peza in Crete. The percentage of surface coverage by weeds and the dominant weed species within each sampling area were recorded, while samples were analyzed for determining the carbon and mineral nutrient content in the above-ground weed mass. The results indicate that carbon fixation was significantly variable among the different areas and averaged 0.92, 0.55 and 0.80 tn of C per ha for Nileas, Meramvello and Peza respectively. This variation was in accordance to variation in annual precipitation among the three areas. A significant amount of readily available mineral nutrients was also removed from the soil into the weed above ground tissues. This was estimated as 38, 16 and 28 kg.ha⁻¹ for N, 8, 3 and 5 kg.ha⁻¹ for P and 56, 22 and 39 kg.ha⁻¹ for K respectively for Nileas, Meramvello and Peza. The following aim of the 5-year project is to introduce an appropriate mix of plant species as winter cover crop in each area, as a way to achieve a more efficient carbon and nutrient fixation within each orchard.

Keywords: *Olea europaea*, Mineral nutrients, Carbon, Weeds

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