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Leguminous cover crop to adapt olive rainfed orchards to climate change

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Leguminous cover crops have the potential to contribute to soil protection against erosion and improve carbon sequestration, soil and water quality and might help agricultural systems become more resilient to climate change. The aim of this study was to investigate the effects of a cover crop of self-reseeding annual legumes of short growing cycle on physiological and biochemical responses of twenty-six-year-old olive trees (*Olea europaea* L. cv. Cobrançosa) grown under rainfed conditions, when compared with conventional tillage. The results showed that the leguminous cover crop ameliorates the physiological and biochemical performance of olive tree during the drought season, judging by the rise of net photosynthesis, transpiration rate and stomatal conductance, whereas the opposite pattern was observed for the concentration of total phenols and for total antioxidant activity in leaves. In addition, it was observed an increase on yield, size and weight of olive fruits. These results indicate that the use of well-designed, locally-tailored cover crop mixtures, associated with an appropriate mowing time, is a very promising strategy to implement in olive orchards under water scarcity. Thus, cover cropping is a win-win strategy as it increases farm benefits and provides ecosystem services.

Keywords: Adaptation measures; Climate change; Cover crops; *Olea europaea*.

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