VII Encontro de Estudantes de Doutoramento em Ambiente e Agricultura

12 e 13 de dezembro 2022

VII PhD Students Meeting in Environment and Agriculture

12th and 13th December 2022

Pólo da Mitra, Universidade de Évora

Book of abstracts

Title: VII PhD Students Meeting in Environment and Agriculture

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Largo dos Colegiais, 2

7004-516 Évora

Published:

UE – Universidade de Évora

ISBN: 978-972-778-298-7

Oral Communication 5

Improving the sustainability of rainfed olive orchards by using zeolites and early-maturing annual legumes cover crop

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Olive cultivation is considered as one of the most significant agricultural activities in Mediterranean region, from a financial, social and ecological point of view. Under climate change threats, there is a growing need to adapt the conventional agronomic practices used in rainfed olive orchards by sustainable practices, in order to preserve soil health, while ensure olive tree performance and olive oil quality. During three years, the effects of leguminous cover crops (LC) and its combination with zeolites (ZL) were evaluated on soil properties, olive tree physiological performance, yield, composition and quality of olive fruits and oil, and compared with soil tillage (T). Results show that both LC and ZL strategies were able to improve photosynthetic performance and crop yield, relatively to T. However, ZL strategy was clearly more efficient in improving soil quality, through decreasing acidity, improving soil N, P and B availability, CEC and soil microbiology. Considering the effects of these practices on olive fruit and oil composition, ZL increased the oleic/linoleic ratio on fruits, and the levels of 3,4-dihydroxyphenylglycol, tyrosol, verbascoside and caffeic acid on olive oil. In short, both sustainable soil management strategies appear to be promising practices to implement in olive orchards under rainfed conditions, but the innovative strategy of combining zeolites with legumes cover crops confer advantages from a nutritional and technological point of view, while preserving soil quality. Nevertheless, studies subjected to long-term use of these practices should be experienced to ensure the sustainability of crop yield and olive oil quality.

This work was funded by Doctoral fellowship under the Doctoral Program ''Agricultural Production Chains—from fork to farm'' (PD/00122/2012) provided by the FCT-Portuguese Foundation for Science and Technology to S. Martins (PD/BD/135327/2017). This research was funded by the Operational Group "Novas práticas em olivais de sequeiro: estratégias de mitigação e adaptação às alterações climáticas", funded by PT2020 and EAFRD (European Agricultural Fund for Rural Development). The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) and FEDER under Programme PT2020 for financial support to CQ-VR (UIDB/00616/2020), CIMO (UIDB/00690/2020) and CITAB (UIDB/04033/2020) and also to AgriFood XXI Project, No. NORTE-01-0145-FEDER-000041, co-financed by the European Regional Development Fund (ERDF) through NORTE 2020 (North Regional Operational Program 2014–2020).