



## **Sustainable land management practices as providers of several ecosystem services under rainfed Mediterranean agroecosystems**

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Little is known about the multiple impacts of sustainable land management practices on soil and water conservation, carbon sequestration, mitigation of global warming, and crop yield productivity in semiarid Mediterranean agroecosystems. We hypothesized that a shift from intensive tillage to more conservative tillage management practices (reduced tillage optionally combined with green manure) leads to an improvement in soil structure and quality and will reduce soil erosion and enhance carbon sequestration in semiarid Mediterranean rainfed agroecosystems. To test the hypothesis, we assessed the effects of different tillage treatments (conventional (CT), reduced (RT), reduced tillage combined with green manure (RTG), and no tillage (NT)) on soil structure and soil water content, runoff and erosion control, soil CO<sub>2</sub> emissions, crop yield and carbon sequestration in two semiarid agroecosystems with organic rainfed almond in the Murcia Region southeast Spain). It was found that reduction and suppression of tillage under almonds led to an increase in soil water content in both agroecosystems. Crop yields ranged from 775 to 1766 kg ha<sup>-1</sup> between tillage 18 treatments, but we did not find a clear relation between soil water content and crop yield. RT and RTG treatments showed lower soil erosion rates and higher crop yields of almonds than under CT treatment. Overall, higher soil organic carbon contents and aggregate stability were observed under RTG treatment than under RT or CT treatment. It is concluded that conversion from CT to RTG is suitable to increase carbon inputs without enhancing soil CO<sub>2</sub> emissions in semiarid Mediterranean agroecosystems.