



Soil nitrous oxide emissions under climate change in Mediterranean dryland conditions

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Soils play a double role in relation with climate change. Soils have the ability to decrease atmospheric carbon dioxide concentration throughout soil carbon sequestration and, concurrently, they are also a main source of greenhouse gases. Particularly, agricultural soils are major emitters of nitrous oxide (N₂O) globally. Recent outputs from general circulation models show that in the near future drought stress would be especially critical in the Mediterranean basin. These predictions could have a noteworthy impact on soil N₂O emissions. Consequently, current mitigation options might be no longer valid in the near future. The main objective of this work was to determine the capability of different land uses under climate change conditions to mitigate soil N₂O emissions in Mediterranean dryland agroecosystems. Soil N₂O emissions were measured during 18 months (from December 2011 to June 2013) under different land uses in a typical Mediterranean agroecosystem. The observed data was used to test the ability of the Daycent model to simulate N₂O emissions in dryland Mediterranean soils. Next, the model was used to predict the impact of climate change on soil N₂O emissions under different land use scenarios in Mediterranean conditions.