Geophysical Research Abstracts
Vol. 15, EGU2013-13711, 2013
EGU General Assembly 2013

Nitrogen balance as a tool to assess nitrogen mineralized from winery wastes under different irrigation strategies

Maria Isabel Requejo (1), Maria Teresa Castellanos (1), Raquel Villena (2), Francisco Ribas (1), Maria Jesús Cabello (1), Augusto Arce (2), and Maria Carmen Cartagena (2)

(1) Servicio de Investigación y Tecnología Agraria. Consejería de Agricultura de Castilla-La Mancha. Centro Agrario El Chaparrillo. Ciudad Real, Spain. , (2) Dpto. Química y Análisis Agrícola. ETSIA. Technical University of Madrid, Spain.

Grape marc is a by-product coming from the winery industry, composed of skins, seeds and stalks generated during the crushing process. In Spain, large quantities of wine are produced every year (3,610,000 tonnes in 2010 (FAO, 2010)) with the consequent waste generation. With an adequate composting treatment, this waste can be applied to soils as a source of nutrients and organic matter. Compost N forms added to soil are mostly organic N forms, so organic N can be mineralized during the crop period and thus be taken up by the plants, immobilised, or leached. Compost N mineralization depends on factors such as compost C/N ratio but also on climate conditions. Estimation of N mineralization is necessary to optimise crop yield and minimize the risk of N losses to the environment, especially in zones vulnerable to nitrate pollution.

The aim of this work was to assess mineralized N during the crop season when applying grape marc compost as fertilizer in a melon crop cultivated under different drip irrigation rates. A nitrogen balance in field conditions was carried out with three different doses of compost: 0 (D0), 6.7 (D1), 13.3 (D2) and 20 T/ha (D3); and two irrigation rates (100% ETc and 120% ETc). The field experiment was carried out in Ciudad Real, designated “vulnerable zone” by the “Nitrates Directive” 91/676/CEE. The soil was a shallow sandy-loam (Petrocalcic Palexeralfs), with 0.6 depth and a discontinuous petrocalcic horizon between 0.6 and 0.7 m. Nitrogen plant uptake and nitrate losses were measured weekly; mineral N in soil was determined before compost addition and at the end of the crop cycle.

An estimation of soil mineralized N during the crop season using nitrogen balance is presented. Results are compared with data obtained in laboratory conditions.

Acknowledgements: This project has been supported by INIA-RTA2010-00110-C03-01.