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Effect of application spent mushroom compost as organic amendment in vineyard soil of the Origin Denomination Rioja (Spain).

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The region of La Rioja produces 306.000 tm per year of spent mushroom compost (SMC), that until now it is accumulated in waste pile without any specific treatment. SMC is a material rich in organic matter (63-50 % O.M.) with adequate relation C/N (20-30). The typic vineyard soil in La Rioja, have low levels of organic matter (<1 %). A possible alternative use for SMC, is as organic amendment of soil, but in Mediterranean soils there is scarce information about its use. Therefore the purpose of this work is study of the potentiality of SMC like organic amendment for soil, in the most important cultivation in La Rioja region, as is the vineyard.

The experimental field was in the vineyard of the "La Grajera". The soil is a Haploxerepts (Soil Survey Staff, 2006). Particle size distribution of the surface horizon (0–30 cm depth) was 33,7 % sand, 43,3 % silt, 23,0 % clay. Carbonate content was 14,9 % , pH H_2O 8,62 and organic matter 0,93 %. Mean annual precipitation was 433 mm and mean annual temperature was 13,2 ° C. Our experiment was conducted on three treatment subplots (35 m^2). Two treatments were applied with two types of SMC:

a) Fresh-SMC (F-SMC), without any processed, with a 47,8 % O. C. and C/N 23,9; rate 19.889 kg (dry matter) ha^{-1} .

b) Recomposted-SMC (R-SMC), subjected to composted process under aerobic conditions, with periodic turn and control of the temperature, humidity and the oxygen, with 38,3 % O. C. and C/N 27,3; application rate 23.925 kg (dry matter) ha^{-1}.

The first application was in May 2006, the second in April 2007 and the third in February 2008. The compost was distributed homogeneously on surface by hand, and mixed with the soil (15 cm) by cultivator.

In June 2008, soil samples were collected for each plot at three depths (0-5, 5-15 and 15-25 cm). Were determined the % Organic Carbon, the % water stables aggregates (Kemper-Rosenau), the potentially mineralizable nitrogen (Nmin) in anaerobic conditions, the NO_3^- extractable with 0,02 M $CaSO_4$and in this extract also was determined the absorbance to 250 nm, that due to the organic matter dissolved in the extract.

The results more interesting were that F-SMC and R-SMC treatments increased the % O. C. in 0-5 and 5-15 cm depths, also the % water stables aggregates increased with F-SMC and R-SMC treatments in the 5-15 cm depth. NO_3^- and Nmin increased with the F-SMC application in 5-15 cm depth. The Absorbance to 250 nm was correlated with the % O.C. and with Nmin, so the organic carbon increase in the compost treatments, was related with the organic matter extractable with 0,02 M $CaSO_4$ and with the Nmin.

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