



Effect of Different Organic Amendments on Topsoil Structural Properties

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The first results of a long term trial on the effect of different organic amendments on topsoil structural properties at the end of the 3rd year are presented.

A silty loam soil (fine silty, mixed, mesic Udifluventic Ustochrepts), located in an experimental farm of the Emilia-Romagna Region (Northern Italy) under sorghum (*Sorghum bicolor* L.) continuous cropping, has been treated with different amount of organic amendments. Five different treatments were tested: manure (10 Mg ha⁻¹y⁻¹), low input compost (10 Mg ha⁻¹y⁻¹), high input compost (40 Mg ha⁻¹y⁻¹), no-tillage and control. The no-tillage treatment was introduced in order to verify the effect of conservation management systems on soil structural properties. In all plots soil samples were collected three times a year: at the beginning of the growing season, at full crop coverage and after harvest. At each time, samples were collected to measure the following physical properties: bulk density, soil macroporosity by image analysis and aggregate stability.

Results show that the influence of organic amendments on soil physical properties is different according to the considered soil property. While soil bulk density shows clear and statistically significant differences among the tested thesis, all with a marked seasonality and distinct temporal trends, such differences are not detectable in term of soil porosity, as far as general means at the end of the three-year trial are concerned. Total macroporosity decreased in all the amended thesis but the low input compost, which showed an increase in the 50-500 and >500 μm pore size classes. A significant effect

on soil aggregates stability is also observed, but in this case a temporal trend is not clearly detectable, suggesting that the amendments have no cumulative effect at least during the 3 years of observations. As for the no-tillage treatment, three years are not sufficient to detect differences in the soil structural characteristics under observation.

On the whole, the observed trends show some improvements in the tested soil physical properties, which are to be checked and evaluated in the following years of trial.