



Particulate Organic Matter as a soil quality indicator in semiarid agricultural soils

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Soil quality indicators are site-specific and must thus be specifically selected for each studied soil and management system.

The objective of this work is to evaluate the suitability and feasibility of Particulate organic matter-associated C (C-POM) as an early indicator of changes in semi-arid Mediterranean soils under conservation agriculture (CA) management.

The results obtained in the growing season 2004/2005 in two different experimental fields in Navarre (NE, Spain) are reported. The fields belong to the same agro-climatic region but are established on soils with different textural characteristics. The trial on the more clayey soil, Olite, is a long-term one (11 yrs), while that on the silty soil, La Sarda, is more recent (4 yrs). Results shown here refer to C-POM data corresponding to the same rainfed barley monoculture under conventional tillage (CT), reduced tillage (RT) and direct seeding (DS). Two soil depths were studied: 0-150 and 150-300 mm.

Results in Olite showed that C-POM is an earlier and more sensitive indicator of changes in soil organic matter than total soil C. Soil under conservation systems (DS and RT) had greater C-POM contents than under CT. Although other soil parameters have also changed, C-POM was the earliest indicator of such changes taking place in the soil.

Results in La Sarda showed the same trend and confirmed C-POM to be an accurate soil quality indicator, despite of soil differences mainly the more dry soil conditions due to the textural class, aggregates stability and also of being a short-time experience.

Therefore, C-POM is a good quality indicator to be considered when assessing the effect on soil quality of different soil management practices as those of CA.