

Soil quality assessment in conservation agriculture systems

Basch, G.

University of Évora, Portugal, gb@uevora.pt

Soil is a key resource that provides the basis of food production and sustains and delivers several ecosystems services including regulating and supporting services such as water and climate regulation, soil formation and the cycling of nutrients carbon and water. During the last decades, population growth, dietary changes and the subsequent pressure on food production, have caused severe damages on soil quality as a consequence of intensive, high input-based agriculture. While agriculture is supposed to maintain and steward its most important resource base, it compromises soil quality and fertility through its impact on erosion, soil organic matter and biodiversity decline, compaction, etc., and thus the necessary yield increases for the next decades. New or improved cropping systems and agricultural practices are needed to ensure a sustainable use of this resource and to fully take the advantages of its associated ecosystem services. Also, new and better soil quality indicators are crucial for fast and in-field soil diagnosis to help farmers decide on the best management practices to adopt under specific pedo-climatic conditions. Conservation Agriculture and its fundamental principles: minimum (or no) soil disturbance, permanent organic soil cover and crop rotation /intercropping certainly figure among the possibilities capable to guarantee sustainable soil management.

The iSQAPER project – Interactive Soil Quality Assessment in Europe and China for Agricultural Productivity and Environmental Resilience – is tackling this problem with the development of a Soil Quality application (SQAPP) that links soil and agricultural management practices to soil quality indicators and will provide an easy-to-use tool for farmers and land managers to judge their soil status. The University of Évora is the leader of WP6 - Evaluating and demonstrating measures to improve Soil Quality. In this work package, several promising soil and agricultural management practices will be tested at selected sites and evaluated using the set of soil quality indicators defined for the SQAPP tool. The project as a whole and WP6 in specific can contribute to proof and demonstrate under different pedo-climatic conditions the impact of Conservation Agriculture practices on soil quality and function as was named the call under which this project was submitted.