



Effect of different agricultural management practices on soil quality in maize intensive production.

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Potential changes in soil quality as result of intensive agriculture are increasingly raising concerns about associated impacts and the need to implement more sustainable agricultural practices. Among several intensive crops, maize, an important human food source, is one of the most intensely produced around the world, representing harmful consequences for soil quality. Therefore, it is fundamental to understand how different agricultural management practices can influence soil quality. Hence, the main objective of this study was to compare the implications of the conventional tillage versus non-tillage in soil quality. Additionally, it was also an objective to evaluate how the implementation of herbage strips, non-irrigated and fallow areas, contribute to soil sustainability and biodiversity preservation, compensating the impacts of intensive maize cultivation. For this purpose, an integrative approach was adopted including physical-chemical parameters (e.g. bulk density, pH, electrical conductivity, field capacity, organic matter, nutrients) and biological parameters (e.g. phosphatase activity, urease activity, ecotoxicological tests with soil organisms).

The obtained results revealed the existence of differences between the analyzed practices, mainly associated with chemical parameters and nutrients. When comparing no-till and conventional sowing, higher mean values for no-till were observed for the following parameters: organic matter, cation exchange capacity, nitrogen, phosphorus, nitrates, calcium, copper, zinc, iron, manganese, urease activity and invertase activity. Hence, this study highlights the importance of the implementation of nonconventional agricultural practices, as is the case of no-till, as promoters of productivity and soil sustainability. Additionally, different management practices as herbage strip, non-irrigated and fallow areas around conventional areas play an additional role in soil quality and biodiversity preservation.