

# Approach to a Potential Strategy for Improving Agricultural Soil Quality Through the Use of Pig Slurry in Olive and Cereal Crops

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## Abstract

This study analyzes the improvement of soil quality through the use of pig slurry as an organic fertilizer using an experimental approach developed on a representative agricultural holding in the municipality of Campillos (Malaga), an area with a high concentration of pig farms (Vadillo et al., 2016). Slurry management in this region presents a significant environmental problem due to the volume generated and the risk of soil and aquifer contamination through leaching (Marín and García, 2009). This research offers an alternative perspective that transforms slurry, traditionally seen as polluting waste, into a valuable resource within a circular economic strategy (Domínguez and Faz, n.d). The main objective is to design a scientific methodology based on technologies applied to precision agriculture to generate intelligent information. The specific objectives are to determine the optimal conditions for slurry application as fertilizer, develop a system for analysis and evaluation in olive and cereal farms, and establish procedures adapted to various agricultural scenarios (Carneiro et al., 2011). The methodology involves physiographic and edaphological characterization of the experimental plots, chemical and morphological soil analyses, controlled slurry applications, and monitoring through successive samplings. Drones are used to observe the response of soil and crops, complementing the statistical analysis of the results using tools as SPSS. Additionally, the research complies with current regulations regarding organic fertilization and livestock by-product management. The expected results include identifying optimal fertilization doses tailored to the specific needs of soil and crops, modeling ideal application conditions, and assessing the environmental viability of using slurry. The objective is not only to enhance crop yields but also to provide sustainable solutions for local farmers dealing with a long-standing problem. This project constitutes a major contribution to sustainable agriculture in Andalusia by offering a technically, legally, and environmentally viable approach that promotes resource efficiency and integration of circular economy principles into the agricultural and livestock sectors

**Keywords:** Pig slurry, Organic Fertilizers, Soils, Circular Economy, Sustainability

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