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Long Term Winery Wastewater Applications and Soil Carbon increases.

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A long history of winery wastewater (WWW) application to agricultural soil adjacent to a winery in the Yarra Valley, Victoria has resulted in measurable increases in soil carbon. While the wastewater itself contains organic matter, the increases detected are unlikely to be solely from the added carbon from the water. Our study has identified some changes in physicochemical properties and microbial communities in the soil treated with WWW. Solid State 13C NMR has been used to evaluate the nature of the soil organic matter where subtle differences in the nature of the soil organic matter could be detected down the soil profile. Ongoing work will be presented with a view to understanding how long term WWW management might affect soil carbon levels. The study results indicate that soil carbon levels can be modified through appropriate management practices that influence soil biological properties as well as physicochemical properties. An understanding of the biological factors in relation to soil carbon sequestration presents a significant future research challenge.