THE GLOMALIN-REATIVE SOIL PROTEIN UNDER ECOLOGICAL CITRUS MANAGEMENT

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Abstract:

Agricultural management practices may change the amount of soil glomalin-reactive soil protein produced by arbuscular mycorrhizal fungi. Soil tillage disturbance can speed up organic matter decomposition, disrupt fungal mycelium and also reduce glomalin production. The aim of this study was to assess concentrations of Total and Easily Extractable fractions of Bradford-reactive soil protein (BSRP and EE-BSRP) in two systems; one under conventional practices and other under ecological transition to organic farming. The study was performed in citrus orchards located around Mogi Guaçu city, São Paulo state. Soil samples were collected at the 10, 20, 30 and 40 cm depths and properly packed and carried to laboratory. In order to carry out the EE-BSRP extraction, 1.0 g of soil and 8 mL of 20 mM sodium citrate pH 7.0 were autoclaved for 30 minutes at 121 °C. For the BSRP extraction, 1.0 g of soil and 8 mL of 50 mM sodium citrate pH 8.0 were subjected to 4 cycles of 1-hour autoclaving. The amount of protein in the supernatant was measured with the Bradford method with bovine serum albumin as a standard curve. Data were submitted to ANOVA. Treatment means were separated by t test ($P < 0.05$) while depths means were separated by Tukey test ($p < 0.05$). The ecological transition management system showed higher values of EE-BSRP fractions than the conventional management at the first three depths. There was no difference about BSRP fractions between the treatments until 20 cm depth. The highest concentration of BSRP was observed at 30 cm in the ecological transition treatment (11.46 mg g^{-1}). At a depth of 40 cm, the conventional system showed the highest protein means (11.41 mg g^{-1}). The ecological transition showed a similar amount of EE-BSRP fractions at the all soil depths, whereas the conventional system reached the best concentration only at the deepest layer. The same tendency was also observed in the BSRP fractions. Other authors have reported decrease of BSRP and EE-BSRP with soil depth. It is possible that high doses of chemical may have caused negative impacts on the symbiont fungi in soil surface. Practices applied in the ecological transition treatment have been promoting production of Bradford-reactive soil protein at all depths assessed. This may contribute to larger C inputs in soil and, therefore, to more sustainable agriculture.

Keywords: alternative management, BSRP, citrus, EE-BSRP

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