



Soil macrofauna in agroecosystems under no-till systems in Northern of Paraná, Brazil

Marie L. C. Bartz¹, Amarildo Pasini¹, George G. Brown⁴

¹ Universidade Estadual de Londrina, Departamento de Agronomia, Rodovia Celso Garcia Cid, PR 445 Km 480, Caixa Postal 6001, CEP 86051-990, Londrina - PR, Brazil bartzmarie@gmail.com

² Empresa Brasileira de Pesquisa Agropecuária - Floresta, Estrada da Ribeira, Km 111, Caixa Postal 319, CEP 83411-000, Colombo-PR, Brazil

Agricultural areas under the no-till system using trash provide favorable conditions for the growth and development of communities of soil organisms. However, for this to occur, the system must obey its assumptions without reservation, which prescribe, among other factors, that the soil should not be turned and should be covered at all times, and crop rotations and green fertilization should be used. This study aimed to evaluate the diversity of taxonomic groups from the soil macrofauna in agroecosystems under the no-till system. The study was conducted in the cities of Rolândia and Arapongas - PR, Brazil, in three areas: 1) native Subtropical Ombrophilous forest; 2) no-till system, characterized by a history of 35 years of crop rotations and permanent soil cover; 3) subsoiled no-till, characterized by a history of over 20 years of crop successions, in which the soil cover was not maintained, and subsoiling operations were performed every two or three years. In all areas the soil was classified as Typic Acrudox (Dystroferic Red Latosol). Nine samplings were performed in each area during the dry period (winter), using the TSBF (Tropical Soil Biology and Fertility) methodology, which consists in removing 25 × 25 cm monoliths from the 0-10 and 10-20 cm layers. The organisms were manually screened and preserved in 70% alcohol (arthropods) and 4% formaldehyde (earthworms), and were then counted and classified into taxonomic groups. A total of 16 taxonomic groups were found, belonging to the classes Insecta, Arachnida, Oligochaeta, Crustacea, and Mollusca. Fourteen groups were identified in the forest. Of these, those with the highest population density (PD) were the Isoptera (with 47.0% of total PD), Hymenoptera (40.5%), and Coleoptera and Araneae (2.0%). Eleven groups were found in the subsoiled no-till, those with the highest PD values were the Hymenoptera (85.0% of total PD), Coleoptera and Oligochaeta (3.0%), and Mollusca (1.0%). In the no-till system, however, 9 groups were identified. The groups with the highest PD values were the Hymenoptera (35.0%), Mollusca (23.5%), and Chilopoda (8.0%). Although the no-till system is considered the most sustainable type of management, since it has a smaller impact on the soil and makes more resources available for the soil biota, in this case it did not provide higher biological diversity when compared with a lesser-quality no-till system (subsoiled no-till). However, the same system demonstrated to provide greater balance among the groups found, while the subsoiled no-till practically showed the dominance of a single group, Hymenoptera. It is important to highlight that this evaluation corresponds to the dry period only, and that more evaluations are required during the rainy period to allow a better understanding of results.

Financial support: Agrisus Foundation