

Earthworm density and biomass in various land use systems in Northern Paraná State, Brazil**

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Soil alterations, such as oscillations in temperature, moisture, and organic matter contents, mainly resulting from agricultural activities, can impact earthworm abundance. The objective of this paper was to evaluate earthworm density and biomass in various land use systems in Northern Paraná State, Brazil. The study was conducted in Rolândia and Arapongas municipalities, in five areas: 1) no-till (36 yr) – NT; 2) subsoiled no-till – SNT (every 3 yr); 3) pasture – P (> 30 yr); 4) coffee plantation – C (> 30 yr); and 5) native forest – NF. Soils of the area were Oxisols: Rhodic Hapludox in NT, SNT, C and NF and a transition between Rhodic Hapludox and Rhodic Kandiudox in P. Nine samples were taken in each area over a one-year period (march 2008 to march 2009) every three months, using the TSBF (Tropical Soil Biology and Fertility) methodology (hand sorting of 25 × 25 cm monoliths from the 0-20 cm layer of soil). The earthworms were removed from the soil and preserved in 4% formaldehyde, and then counted (ind. m⁻²) and weighed (g m⁻²). The mean density in the year was higher in P (105 ind m⁻²), followed by NF, NT and SNT with 15, 13 and 12 ind. m⁻², respectively. Lowest mean density (4 ind. m⁻²) was found in C. Mean biomass followed the same order: P>NF>NT>SNT>C, with 7.15, 1.07, 0.21, 0.09 and 0.03 g m⁻² in each area, respectively. In the five samples dates (mar/08, jun/08, set/08, dec/08 and mar/09) highest densities and biomasses were observed in sep/08, in the end of the dry season, in P, C, SNT and NF. In NT, highest values for density and biomass were observed in mar/08, and then decreasing over the sampling period. All areas showed a large decrease in density and biomass in dec/08 and mar/09 which was attributed to climatic conditions during the study period which affected both, the water balance and soil moisture, determining factors for the survival and reproduction of earthworms. **Financed by Capes (scholarship for the first author) and Fundação Agrisus (divulagation of the results)