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Organic dairy farming is characterized by grazing cows in contrast to Danish conventional farms where the majority of cows are kept indoors. Cattle trampling reduces the finer macroporosity in the top 5-10 cm of the soil. This causes a low infiltration capacity at the soil surface, giving a higher probability of macropore flow from the surface. Rapid water movement through macropores bypasses the soil matrix, reducing nitrate leaching. We investigated how three years of cattle trampling in organic grass-clover fields could influence the risk of nitrate leaching in the autumn. The experimental part of this study was situated in Denmark on a loamy sand within a long-term organic dairy crop rotation trial. Experimental plots were irrigated with a concentrated solution of potassium bromide (18.5 mm for an hour). The amount of bromide in the soil water was determined at five depths (0.1, 0.3, 0.4, 0.75 and 1.0 m) 24 h after irrigation. Macropores larger than 1 mm were recorded on horizontal surfaces (0.70 m^2) at the same depths. Earthworm density and biomass were registered. Bromide concentration in soil was significantly larger with the grazing regime than with the cutting regime below 0.3 m depth to at least 1 m. We observed equivalent macropore densities between the two treatments, both at 0.1 and at 0.3 m depth. The dry bulk density measured at 10 cm depth was significantly larger in the plots with the grazing regime than with the cutting regime, indicating a reduction of the porosity at this depth for the plots subjected to cattle trampling. No epigeic species were present. Cattle trampling affected mainly endogeic earthworms. Deep-burrowing species (anecic) were the least sensitive to cattle trampling. The deeper infiltration of water in soil when subjected to cattle trampling indicated that preferential flow through large macropores occurred, and that rain water may bypass the soil matrix under similar or more extreme conditions than this experiment. We expect such hydraulic functioning to reduce the risk of leaching of soil water nitrate.