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GROUNDWATER RESIDENCE TIME BASED ON $^3\text{H}/^3\text{He}$ DETERMINATIONS AND AGRICULTURAL POLLUTANTS IN THE PAMPEANO AQUIFER (ARGENTINA): ORGANOCHLORIDE COMPOUNDS AND NITROGEN ISOTOPES

The agriculture represents the main activity in Argentina with an intensive use of agrochemicals. Among them, nitrates and organochlorine pesticides, highly persistent, were used since 1945, but nowadays are forbidden. Particularly endosulfan was the last organochlorine banned (July 2012). Agrochemical transport and fate are influenced by many processes, including volatilization, runoff, absorption, biochemical decomposition and leaching, with the potential contamination of groundwater. The aim of this work is to establish the relationship among organochlorine pesticides, nitrate and groundwater residence time, in the Pampeano aquifer at the southeast of the Province of Buenos Aires, Argentina. Groundwater samples were taken from four groups of nested piezometers in different locations: Vivotatá, INTA, San Manuel, Lobería. Each group included concrete isolation wells to 12m, 24m and 48m. The highest pesticide concentrations were found at deepest layers with a predominance of endosulfans and coincident with residence times of about 50 years. At shallow depth ($^3\text{H}/^3\text{He}$ apparent age, 12-20 years) the occurrence of pesticides and nitrates was more related to interactive effects of agricultural practices, and local geologic features through local flow systems, being endosulfans the main organochlorine pesticide group found in all wells.

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