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Ground Water Quality in the Guarani Aquifer Recharge Zone of São Paulo State, Brazil

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The region of Ribeirão Preto located in São Paulo State, is an agriculturally important and highly mechanized sugarcane producing area. In addition serves as a recharge area for the largest reserve in the world of fresh water the Guarany aquifer. This aquifer provides water to hundreds of cities, as well as rural communities in the region. Embrapa Environmental Division has conducted research in this region since 2004 in the Espraiado watershed, located over the recharge area. Ground water samples were collected from seven wells located inside the watershed and residues of pesticide analysis of atrazine, tebuthiuron, diuron and hexazinone were made. These pesticides were chosen due to their intense use and potential to contaminate ground water.

The extraction of the water samples were made with solid phase extraction using estirene-divylbenzene cartridge (Supelco). After sample preparation, the extracts were injected in a high performance liquid chromatography (HPLC), using reversed-phase column, C-18, mobile phase methanol/water 50:50, v/v, detection and quantification at 247 and 230 nm. The following validation parameters were obtained: limit of detection of method 0.01; 0.007; 0.008 and 0.01 μg L^{-1}; limit of quantification of method 0.03; 0.02; 0.01 and 0.03 μg L^{-1} for tebuthiuron, hexazinone, atrazine and diuron, respectivelly; linear range from limit of quantification of instrument to 300 μg L^{-1} ($r^2 \geq 0.998$); recoveries from 70-115%; intermediary precision (%RSD) < 18%.
The method showed to be efficient and reliable for herbicides in ground water. Results showed that determination of residues of herbicides were below detection limits in ground water wells samples.

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