

Dissolved triazines in watersheds under sugarcane cultivation

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Sugarcane is an important extensive crop in north western of Argentina. Chemical weed control have been increasing over the last years. The typical period of this practice takes place from October to December, at beginning of rainy season. Atrazine and ametryn are the main herbicides used, they have moderate to high potential mobility in soils, which is a potential source of contamination for nearby streams. The aim of this study was to quantify both atrazine and ametryn contamination levels in two streams of the southeast of Tucuman (Argentina) under sugarcane production. This area has a subtropical climate, and a monsoon rainfall regime with an annual average of 700 mm. Five sampling points of Mista and Saladillo streams were monitored from September to April, during three growing season. In each growing season, four sampling moments were defined: M1) Before the herbicides application; M2) Beginning of the rainy season and during the chemical weed control period; M3) High accumulated rainfall; M4) End of the rainy season. Water samples were taken and stored in polypropylene bottles at -20°C until analysis. Samples were analyzed by ultra performance liquid chromatography (Waters[®] ACQUITY[®] UPLC) coupled to a mass spectrometer (MS/MS Quattro Premier XE Waters).

Atrazine was quantified in all samples and the highest concentrations were found in M2 ($0.03\text{--}3.07\ \mu\text{g L}^{-1}$). For the others sampling moments, atrazine concentrations were ranged from 0.003 to $0.2\ \mu\text{g L}^{-1}$. Ametryn was detected in the 90% of the samples. Ametryn concentrations in M2 varied from 0.004 to $0.32\ \mu\text{g L}^{-1}$, and in the rest sampling moments were less than $0.11\ \mu\text{g L}^{-1}$.

Both herbicides were highly detected in the study area. Although atrazine is authorized for other crops in the area, ametryn is only authorized for sugarcane, the largest cultivation in the area.