

Glyphosate and AMPA residues evaluation in waters and sediments of hydric resources in a rice production area in Colombia

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INTRODUCTION

In Colombia, the herbicide Roundup®, which active ingredient is the isopropyl amine salt of the glyphosate, in the protection of rice fields is used. In the town of Saldaña and other towns from the Tolima department, Colombia, is located the irrigate district “Usosaldaña”, that use like source of water the Magdalena river, the main river in Colombia. After, the waste water of district “Usosaldaña” drain at Magdalena river again.

OBJECTIVES

The main goal was to find out glyphosate residues and AMPA (aminomethyl phosphonic acid), the major glyphosate transformation product, in water and sediments of streams which receive effluents from rice production

MATERIALS AND METHODS

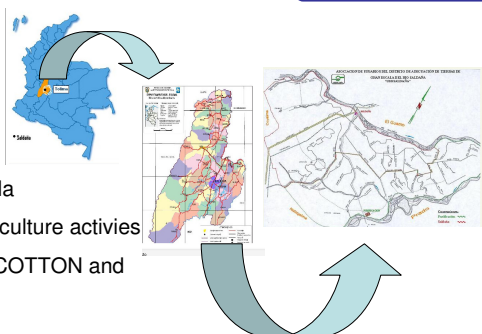


Figure 1. Study Area: irrigate district “Usosaldaña”, Tolima - Colombia

RESULTS

In that area, 14.200 Ha, are dedicated to the rice production, but the other area is used for agriculture activities like cotton, sorghum and corn mainly. Those streams are used for recreational and fishing activities by the population who live around it, and all rice crops drain to their.

Waters. In superficial waters, the concentration of glyphosate and AMPA were below de Limit Detection, 10 ug/l, which indicate that that those compounds would be degraded or sorbed in another environmental compartments.

Sediments. For the sediments, were find concentrations for six samples between **0,187 mg/kg and 0,504 mg/kg for glyphosate** and between **0,176 mg/kg and 0,183 mg/kg for AMPA** in three samples, and the only way to reach sediments is the runoff of the soils cultivated,

REFERENCES

- [1] IBAÑEZ, M., POZO, O., SANCHO, J.V., LOPEZ, F. y HERNANDEZ, F., J.Chromatogr. A. **2005**, 1081, 145-155
[2] APHA, *Standard Methods for analysis of water and wastewater*, 2005, 21 ed

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This work was carried out in 13 superficial hydric resources which received all runoff of the basin of irrigate district “Usosaldaña”, in february of 2009 (Figure 1). The water and sediments were taken, and maintained refrigerated until the analysis. Using like reference the EPA method for glyphosate and AMPA, those compounds were analyzed by LC-FL with post-column derivatization with OPA-ME. In the cases of waters, were analyzed using the method 6651 Standard Methods, 2005 [2] and the sediments analysis made following the extraction procedure used by Ibañez, et al [1], where the glyphosate and AMPA are extracted with a solution of KOH, after that neutralized and analyzed. The method was validated. The Figure 2 shown the chromatograms of one calibration curve in soil extract, because was evidenciaded the matrix effect.

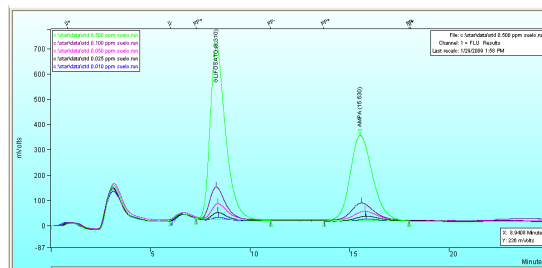


Figure 2 Chromatograms of one calibration curve in soil extract.

CONCLUSION

- ❖ We can inferred that the sediments are a sink for glyphosate and AMPA that is used in this area, and could be re-mobilized and transported along the streams.
- ❖ This study shown that the glyphosate is not only sorbed onto the soils, but also can be in the runoff and reach superficial streams.