

Agrochemical use in argentine farming and its impact on water. Legal implications

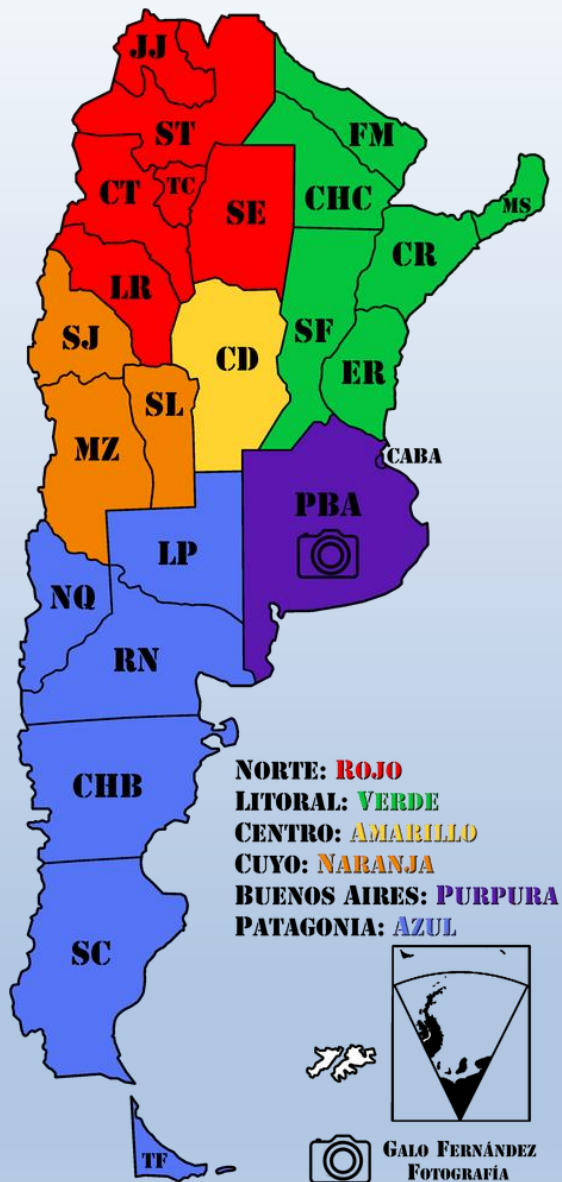


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AGROCHEMICAL REGULATIONS PROVINCE OF BUENOS AIRES



**COUNTRYSIDE AREA, LUJAN,
BUENOS AIRES PROVINCE, ARGENTINA**





BILL OF LAW N° 2963 (2016-2017)

IT FORBIDDES:

- Air spraying and application of agrochemicals in an area of 2000 meters AND
- Ground application in an area of 1000 meters from:



Urban zones.

Industrial parks.

Sports buildings.

Private neighbourhoods and households.

Touristic areas and protected natural areas.

River, streams and wetlands coasts.



BILL OF LAW N° E 133 (2016-2017)

A minimum distance between 100 meters and 500 meters for the agrochemical ground and air spraying respectively in:

- Schools.
- Hospitals.
- Churches.
- Residential areas.
- Retirement homes.
- Urban, peri-urban, and recreation zones.
- Public parks and buildings.

FINAL CONSIDERATIONS



**COUNTRYSIDE AREA, LUJAN, PROVINCE OF BUENOS AIRES,
ARGENTINA**

ENVIRONMENTAL AND HEALTH IMPACTS

DIRECT:

- Bills of law: Contact and inhalation of agrochemicals in short distances from households and utilities.

INDIRECT:

- Researchers: Find herbicides in rivers and streams affecting water quality.



Environmental fate of glyphosate and aminomethylphosphonic acid in surface waters and soil of agricultural basins

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HIGHLIGHTS

- We measured glyphosate and AMPA concentrations in soil, surface water and sediment.
- Glyphosate and AMPA are present in soils under agricultural activity.
- Glyphosate is more frequent in particulate matter and sediment than in water.
- The surface run-off cause the movement of soil particles with glyphosate adsorbed.
- Glyphosate is accumulated in the bottom sediment and is biodegraded to AMPA.

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ABSTRACT

Argentinian agricultural production is fundamentally based on a technological package that combines no-till and glyphosate in the cultivation of transgenic crops. Transgenic crops (soybean, maize and cotton) occupy 23 million hectares. This means that glyphosate is the most employed herbicide in the country, where 180–200 million liters are applied every year.

The aim of this work is to study the environmental fate of glyphosate and its major degradation product, aminomethylphosphonic acid (AMPA), in surface water and soil of agricultural basins. Sixteen agricultural sites and forty-four streams in the agricultural basins were sampled three times during 2012. The samples were analyzed by UPLC-MS/MS ESI(+/-).

In cultivated soils, glyphosate was detected in concentrations between 35 and 1502 $\mu\text{g kg}^{-1}$, while AMPA concentration ranged from 299 to 2256 $\mu\text{g kg}^{-1}$. In the surface water studied, the presence of glyphosate and AMPA was detected in about 15% and 12% of the samples analyzed, respectively. In suspended particulate matter, glyphosate was found in 67% while AMPA was present in 20% of the samples. In streams sediment glyphosate and AMPA were also detected in 66% and 88.5% of the samples respectively.

This study is, to our knowledge, the first dealing with glyphosate fate in agricultural soils in Argentina. In the present study, it was demonstrated that glyphosate and AMPA are present in soils under agricultural activity. It was also found that in stream samples the presence of glyphosate and AMPA is relatively more frequent in suspended particulate matter and sediment than in water.

Presence of pesticides in surface water from four sub-basins in Argentina

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HIGHLIGHTS

- We measured pesticides concentrations in surface waters of Argentina.
- Atrazine is the most ubiquitous contaminant in the four basins studied.
- The surface run-off cause the movement of soil particles with pesticides adsorbed.

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ABSTRACT

Argentina has 31 million hectares given over to agriculture comprising 2.2% of the world's total area under cultivation (Stock Exchange of Rosario, Argentina). Despite the intensity of this agricultural activity, data on pesticide pollution in surface water are rather scarce. In this sense, the aim of this work is to determine the presence of pesticides in surface water of four agricultural sub-basins of Argentine. An environmental monitoring was carried out to determine the impact of twenty-nine pesticides used in agricultural activities on the surface water quality of agricultural areas within the San Vicente, Azul, Buenos Aires southeast and Mista stream sub-basins.

The samples were analyzed by solid-phase extraction (SPE) using OASIS HLB 60 mg cartridges and ultra-high-pressure liquid chromatography coupled to tandem mass spectrometry (UHPLC/MSMS) that provided good analytical quality parameters.

The southeast of Buenos Aires was the site with the highest frequency of pesticides detection, followed by Azul and San Vicente microbasins. The most detected pesticides, considering all surface water samples, were atrazine, tebuconazole and diethyltoluamide with maximum concentration levels of 1.4, 0.035, and 0.701 $\mu\text{g L}^{-1}$, respectively. The results obtained for all basins studied show the presence of residual pesticides in surface waters according the different agricultural activities developed.



THE ROLE OF:



JURISPRUDENCE



*Criminal
sanctions?*

VALID LAW



*National Food
Code*



Agrochemical's law

THANK YOU
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