



## **Impact of pesticides on the groundwater resources in intensive irrigated areas of Argentina and Chile**

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The use of pesticides in irrigated agriculture in South America has been increased in the last twenty years. Pesticides contribute to increase the crop yields, but in South America little attention has been paid up to now to its environmental impact. Herbicides represent the main class of pesticides, which could affect contamination of the water resources, but also insecticides and fungicides show high potential to affect the water quality. Among these substances, triazines are the most frequently detected, especially atrazine and simazine. Several studies show that atrazine can cause serious environmental problems. The aim of this research is to analyse the risk of groundwater pollution by selected pesticides using the simulation model PESTAN (EPA) for selected experimental areas in Argentina and Chile. The results show that sorption, which depends on the content of organic carbon in the soil, has the greatest influence on the migration of pesticides in the unsaturated zone and therefore the highest impact on the groundwater. The seepage rate on the other hand, has a smaller influence. Dispersion, half-life time (persistence), and water solubility are of minor importance. The results are used as input data for the groundwater simulation model Visual MODFLOW to investigate the long-time impact of the actual pesticide application practises on the groundwater at the catchment scale. The results of the simulations show that there is a high potential for the contamination of the groundwater resources by leaching of pesticides, especially atrazine, related to the actual management practises.