



Phosphorus
in Soils
and Plants
Symposium

*Towards a sustainable
phosphorus utilization in
agroecosystems*



abstracts



**Theme 5 - Impact of phosphorus
on environmental quality and on
biodiversity
Oral presentation**



On the prediction of phosphorus fluxes in the Santa Lucía basin under different land use and management practices using SWAT model

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Several actions have been carried out in the Santa Lucia River basin (1.343.300 ha) in order to reduce the impact of anthropogenic pressure and improve water quality. Environmental models may be used as supportive tools when assessing the effect of local actions at a basin scale. To have a better understanding of which is the best combination of strategies and management guidelines that may result in an improvement of water quality, a SWAT model was built in the Santa Lucia River basin for the 1983-2019 period. In this context, the objective of this work is to present the progress made in the development of the model and to describe the scenarios in which phosphorus fluxes can be predicted with the implemented tool. Local data was collected and used as an input for the model: DEM, cartographic and physicochemical representative soil data and 2015 land use map, crop rotation sequences, fertilization dates and doses, point source discharges. Climatological forcing was built with 41 rainfall stations and one agro climatological station. Eight flow gauges were used to calibrate and validate the model using sequential uncertainty fitting algorithm (SUFI-2). The model performance was evaluated using Nash-Sutcliffe efficiency (NSE) and Kling-Gupta efficiency (KGE), obtaining values between 0.65 and 0.82 and between 0.68-0.87 respectively. This tool can predict phosphorus fluxes between soil and water for various scenarios such as subsuperficial phosphate fertilization, vegetative mining, buffer zones, land use changes, downstream dilution effects of reservoirs, which will support decision making in water and soil resources planning in Uruguay.

