Geophysical Research Abstracts
Vol. 16, EGU2014-3440, 2014
EGU General Assembly 2014

Modeling Soil Sodicity Problems under Dryland and Irrigated Conditions: Case Studies in Argentina and Colombia

Ildefonso Pla-Sentís
Universitat de Lleida, Medi Ambient i Ciencies del Sol, Lleida, Spain (ipla@macs.udl.cat, +(34) 973702613)

Salt-affected soils, both saline and sodic, my develop both under dryland and irrigated conditions, affecting negatively the physical and chemical soil properties, the crop production and the animal and human health.Among the development processes of salt-affected soils, the processes of sodification have been generally received less attention and is less understood than the development of saline soils. Although in both of them, hydrological processes are involved in their development, in the case of sodic soils we have to consider some additional chemical and physicochemical reactions, making more difficult their modeling and prediction. In this contribution we present two case studies: one related to the development of sodic soils in the lowlands of the Argentina Pampas, under dryland conditions and sub-humid temperate climate, with pastures for cattle production; the other deals with the development of sodic soils in the Colombia Cauca Valley, under irrigated conditions and tropical sub-humid climate, in lands used for sugarcane cropping dedicated to sugar and ethanol production. In both cases the development of sodicity in the surface soil is mainly related to the effects of the composition and level of groundwater, affected in the case of Argentina Pampas by the off-site changes in dryland use and management in the upper zones and by the drainage conditions in the lowlands, and in the case of the Cauca Valley, by the on-site irrigation and drainage management in lands with sugarcane. There is shown how the model SALSODIMAR, developed by the main author, based on the balance of water and soluble componentes of both the irrigation water and groundwater under different water and land management conditions, may be adapted for the diagnosis and prediction of both problems, and for the selection of alternatives for their management and amelioration.