Geophysical Research Abstracts
Vol. 20, EGU2018-769-2, 2018
EGU General Assembly 2018

Decrease the Water Footprint using precision agriculture: a comparison between conventional and conservative agriculture

Eros Borsato, Paolo Tarolli, Luigi Sartori, and Francesco Marinello

Department of Land, Environment, Agriculture and Forestry, University of Padova, Legnaro (PD), Italy
(eros.borsato@phd.unipd.it; paolo.tarolli@unipd.it; luigi.sartori@unipd.it; francesco.marinello@unipd.it)

Agriculture makes competition on the freshwater use and affects negatively its availability, worsened by climate change and pollution. The challenge to reduce the water use has to deal with the improvement of water use efficiency and the abatement of pollution. This is possible considering a sustainable water consumption. Indeed, agricultural processes are the main responsible of the global water footprint. Since there are no many studies of water footprint on the operative phases of soil preparation, this study aims to understand how agricultural practices and a sustainable crop management can reduce the water usage and the water pollution. For this reason, the effect of conservation tillage system on water footprint has been studied in a three years defined crops rotation of maize, soybeans, wheat, and canola. The case study is located in the Veneto plain in Italy. A spatial variability analysis and the adoption of precision agriculture technologies were tested. Water footprint was examined using climate data, soil texture analysis, crop coefficients and each chemical input applied to each treatment during crop cycles. Results highlight that the water footprint between traditional and conservative tillage systems is significantly different. Minimum tillage combines positively the advantage of the water footprint reduction and a good yield. Precision agriculture affects mostly the grey water footprint, reducing operational inputs, such as pesticides and fertilizers consume. On the other hand, precision agriculture led to an increasing crop yield on average comparing the same techniques managed with uniform rate application. The study shows a reduction of water footprint within precision agriculture, especially in conservative tillage in comparison with the conventional tillage. These conservative techniques, combined with the precision agriculture, minimize the wastage and save input, avoiding environmental dispersion, and reducing its impact.