



## Water balance and soil losses in an irrigated catchment under conservation tillage in Southern Spain

Patricia Cid (1), Luciano Mateos (1), Encarnación V. Taguas (2), and Helena Gómez-Macpherson (1)

(1) Instituto de Agricultura Sostenible, CSIC, Córdoba, Spain (ag1main1@uco.es), (2) Universidad de Córdoba, Spain (ir2tarue@uco.es)

Conservation tillage based on permanent beds with crop-residue retention and controlled traffic has been recently introduced in irrigated annual crops in Southern Spain as one way to improve water infiltration, reduce soil losses, and save energy. The water balance and soil losses in water runoff have been monitored during 4 years in a 28-ha catchment within a production farm where this kind of soil conservation practice was established in 2004 for a maize-cotton-wheat rotation. The catchment average slope is 6 %. Soils are Typic Calcixerupt and Typic Haploxerert. The water balance components that were measured include: applied irrigation water, rainfall, and runoff. Runoff was measured at the outlet of the catchment by means of a hydrological station that consisted of long-throated flume, ultrasonic water level sensor, automatic water sampler, data logger and transmission system, weather station, and ancillary equipment. We present here results from three hydrological seasons (October to September): 2009-10, 2010-11, and 2011-12. The first season the catchment was grown with wheat, thus the irrigation depth was small (25 mm); rainfall above average, 1103 mm; and the runoff coefficient was 26 %. In the season 2010-11, the catchment was grown with cotton, the irrigation depth was 503 mm, rainfall was 999 mm, and the seasonal runoff coefficient was 7 %. The last season, the crop was maize, rainfall was below average (368 mm), irrigation 590 mm, and the runoff coefficient as the previous year, 7 %. Soil losses were very small: 0.05, 1.26, and 1.33 t per ha and year, the first, second, and third monitored seasons, respectively. A simple water balance model allowed simulating evapotranspiration, deep percolation and runoff. The Curve Number for the catchment was calibrated using the balance model.