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Multi-scale modelling approach to assess hydrological impact of weed control practices in mediterranean vinegrowing catchment

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This work proposes a methodology to assist water resource managers to assess the hydrological impact of weed control practices in Mediterranean vinegrowing water resource catchment's. Weed control practices strongly affects soil surface and so runoff-infiltration partition. These practices are chosen by farmer at the field scale and have consequences at water resources scale. The methodology is based on an integrated approach aiming at carrying out a spatial representation of weed control practices and integrate it in a distributed hydrologic model. A multi-scale hydrological modelling approach is proposed : (i) a distributed physically based model is implemented on an elementary experimental catchment (Roujan catchment, 1km^2), (ii) the experimental catchment is used to simulate hydrological impacts of several practices combinations under different initials and groundwater conditions, (iii) these simulations allows to defined the production function parameters of a simplified model running on a larger catchment (Peyne catchment, 100 km^2). The representation of the practices is based on their classification according to their effect on the evolution of hydraulic conductivity of soil surface. The Peyne catchment is divided in about 1 km^2 surface hydrological units for which surface ratio practices are known using communal data. In this communication, we will show event scale results relating to calibration and simulations at elementary catchment scale, calibration and validation at larger catchment scale using equivalent parameters and hydrological impacts of weed control practices at the two scales. The catchment applied case is in the department of Hérault in southern France.