

Effects of sugarcane growth on hydrological elements and sediment yield

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In this work, the effects of sugarcane growth on main hydrological elements and sediment yield were investigated using SWAT model and monitoring data. The growth of sugarcane was controlled by setting tillage and fertilization information in the model. Calibration and validation of the model showed that the reasonable runoff and sediment simulation results were obtained. The results showed that with the growth of sugarcane, the dense roots and branches effectively regulated the runoff during the period of abundant precipitation. Compared with the year 2017 at the initial stage of sugarcane growth, evapotranspiration at the later stage of sugarcane growth in 2018 was lower because of low soil moisture. Reduced evapotranspiration has also led to a significant increase in water yield in the sugarcane region in 2018. In addition, the growth of sugarcane contributed to the reduction of sediment yield in the small basin, with the average sediment yield in sugarcane regions dropping by about 58% in 2018 compared with 2017. The research methods and results proposed in this paper can be used for reference for agricultural management in other small watersheds with abundant rainfall.

Keywords: SWAT model, small catchment, sugarcane, sediment, evapotranspiration