

SWAT model analysis for confirming the effects of crop growth on the suspended sediment concentration from a settling basin catchment on Ishigaki island

*Yang Cao¹, Shin-ichi Onodera¹, Mitsuyo Saito², Hide Omae³, Yoshiko Iizumi³

1. Graduate School of Integrate Arts and Sciences, Hiroshima University, 2. Graduate School of Environmental and life Science, Okayama University, 3. Tropical Agriculture Research Front (TARF), Japan International Research Center for Agricultural Sciences (JIRCAS)

Crop growth has a significant effect on soil erosion in small watersheds. Exploring the characteristics and occurrences of soil erosion in small watersheds assists in our understanding of the water and material cycles in agricultural areas. The small catchment on the tropical island of Ishigaki, Japan, was chosen as the research area. The effects of sugarcane growth at different stages on the suspended sediment concentration in the basin from January 2017 to July 2018 were analyzed based on the Soil and Water Assessment Tool (SWAT) model. This study will explore the possible driving factors of these phenomena. The results show that the suspended sediment concentration in the basin reached its highest value on a rainy day near the sugarcane planting period because of the soil relaxation caused by tillage and cultivation. At the end of the sugarcane growth period, the sediment concentration was not at a high level when the rainfall reached 150 mm, because of the effective protection of the soil by sugarcane. The simulated sediment concentration of precipitation per mm showed that the simulated sediment concentration was at its highest during the crop planting period, followed by the period of bare land, and at the lowest during the crop growth period.

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