

Effect of surface state of paddy fields on pollutant load outflow during a non-irrigation period

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ABSTRACT

The purposes of this study are to clarify the effect of the state of the surface of paddy fields on outflow loading during a rainy event in a non-irrigation period and to propose an effective management method to reduce outflow of pollutant loading. We chose four types of paddy fields according to the state of the surface in order to investigate the difference in runoff. Water samples were collected from surface and culvert outflow in each paddy field during two rain events. From surveys of these two events, an L-Q model was developed. Then, we evaluated the pollutant loading during a non-irrigation period (2004.09.01–2005.04.30, 242 days) using the model. Cumulative loadings of SS, T-N, PN, T-P and PP were compared with unit loading in an irrigation period. As a result, unit loading in a non-irrigation period is about 25–51% and 24–89% of the irrigation period unit loading for T-N (45.7 kg/ha) and T-P (8.72 kg/ha), respectively. This result clearly indicated that runoff loading during a non-irrigation period cannot be ignored. From the discharged loading according to the surface state, many pollutants discharged from a Type C paddy field which spread straws after a harvest during a non-irrigation period.

Keywords: Non-point sources pollution; Non-irrigation period; Paddy field; pollutant load; Paddy field management

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