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Pollutants dynamics in a rice field catchment during storms in the growing and non-growing seasons

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We compared the behavior of pollutants such as total nitrogen (TN), total phosphorous (TP), chemical oxygen demand (COD) and suspended solid (SS) in runoff from a Korean rice field catchment during storm events between growing and non-growing seasons. The study catchment has a size of 21.9 ha and its water source is river. Fertilizers were applied at rates of 91 N kg ha^{-1} and 18 P kg ha^{-1} as basal and top dressings. The rice fields are shallowly (3-10 cm) flooded during most of the growing season, and therefore runoff water always flows during the growing season but flows only during storms in the non-growing season. TN concentrations in runoff water decreased with discharge irrespective of the season, whereas TP, COD and SS concentrations increased with discharge. Event mean concentrations (EMCs) of pollutants in runoff water from the catchment during the non-growing season were 2 to 3 times higher than those during the growing season. This may be because flooded water in the growing season greatly reduces transport of pollutant associated with soil erosion. The results suggest that the rice field catchment may act as a sink of some pollutants during growing season but as a source of all pollutants during non-growing season.

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