[Effect of Rainfall Intensity on the Content of Nitrogen and Phosphorus Components in Plateau Areas: A Case Study of the Fengyu River Watershed]

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Abstract

The runoff formed by rainfall carrying various land surface materials into rivers and lakes is an important factor leading to a change in water quality, and the characteristics of nitrogen and phosphorus output of rivers under different rainfall intensities are different. This study explores the impact of rainfall intensity on the water quality of the Fengyu River Watershed in the plateau agricultural region, based on the water quality monitoring data of the export section of the Fengyu River Watershed from 2011 to 2013, combined with local rainfall monitoring. The effects of four rainfall intensities (light rain, moderate rain, heavy rain, and torrential rain) on the content of different nitrogen and phosphorus components in water were analyzed. The results show that the rainfall intensity has a significant effect on the nitrogen and phosphorus emissions of the Fengyu River Watershed. The average nitrogen and phosphorus concentrations of all components are lower in light rain (<10 mm) and moderate rain (10-25 mm), and higher in heavy rain (25-50 mm) and torrential rain (50-100 mm). The percentage of NH_4^+-N (57.14%-76.85%) to TN is larger than that of PN (23.15%-42.86%), and the percentage of TDP (22.73%-28.00%) to TP is smaller than that of PP (72.00%-77.27%). The nitrogen concentration of different forms is:TN > NH_4^+-N > PN; the phosphorus concentration of different forms is:TP > PP > TDP.

Keywords: nitrogen and phosphorus forms; non-point source pollution; plateau agricultural area; rainfall intensity; small watershed.