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Evaluation of phosphorus and nitrogen balances as an indicator for the impact of agriculture on environment: A comparison of a case study from Poland and Mississippi US

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ABSTRACT

The objective of this research was to quantify the changes of nitrogen (N) and phosphorus (P) balances in Poland and Mississippi (MS), USA. Nutrient balances were calculated as difference between input and output in the agricultural system according to Organisation for Economic Cooperation and Development (OECD) methodology. A positive nutrient balance means that a potential environmental problem may result from that nutrient; a negative nutrient balance means there is a potential yield loss. The N and P soil surface balances for Poland and MS were calculated for the year 1998 through 2008. The results showed that both MS and Poland had positive N and P balances, indicating that there was a surplus of N and P. The average balance for N was 48 kg·ha⁻¹ in Poland and 102 kg·ha⁻¹ in MS. For P, it was 3 kg·ha⁻¹ in Poland and 19 kg P kg·ha⁻¹ in MS per cultivated area. This research demonstrated that the nutrient balance of N or P depended on the efficient use of each nutrient and type and source of fertilizer used. This research is significant for N and P fertilizer management and their impact on agriculture production and environment health.

KEYWORDS

Nitrogen; Phosphorus; Nutrient Efficiency; Nutrient Availability; Nutrient Budget

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