

GLOBAL PARTNERSHIP ON NUTRIENT MANAGEMENT

BMP Case Study

Overview

Name: Winter Application of Manure on an Agricultural Watershed and its Impact on Downstream Nutrient Fluxes

Location/Terrain: Conesus Lake, NY, USA

Crop(s): Dairy cows and row crops including corn and beans

Nutrient(s): Total phosphorus (TP), soluble reactive phosphorus (SRP), total Kjeldahl nitrogen (TKN) and nitrate (NO₃)

Rationale: Nutrient and soil loss from watersheds

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Issue(s) of Concern/Challenges:

The application of manure during the winter season can have negative effects. It is the least desirable time to use manure because of pollution and nutrient utilization. Also, when applied near watersheds, it can increase the loss of nutrients and soil to downstream aquatic systems.

Practice Description:

In order to reduce the loss of nutrients, agricultural best management practices (BMPs) were implemented in the Graywood Gully sub-watershed. Specifically, the timing of manure spreading was altered. Spreading of manure in the Graywood Gully took place during the fall and winter. The spreading was halted during winter months during the study.

Practice Objectives:

Application of manure during the winter reduces the loss of nutrients and soil from watersheds.

Outcomes:

In the Graywood Gully sub-watershed, the implementation of the BMP (i.e.: winter manure application) impacted the dissolved and particulate fractions in the water. There were significant decreases in the winter concentrations of the dissolved and particulate fractions. The amount of TP, SRP and TKN was reduced in stream water by 50% or more by the first winter (2003-2004) after the BMP implementations. There were much slower decreases in concentrations until 2006-2007. One year after implementation, the NO₃ levels decreased by 24.1%. It decreased about 20% per year to about 67% in 2005-2006. After that, there

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was no significant decrease in NO₃ to 2006-2007 (Fig. 3).

Significance:

The use of BMPs made for a significant decrease in the loss of nutrients in the stream water.

Data/Graphs:

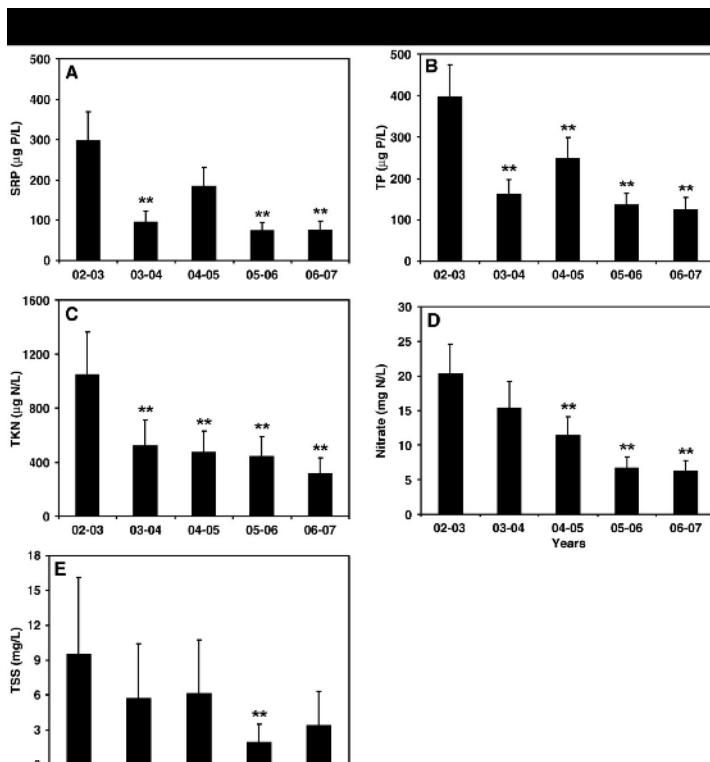


Fig. 3. Average event and nonevent winter marginal mean concentration (±S.E.) of soluble reactive phosphorus (SRP) (A), total phosphorus (TP) (B), total Kjeldahl nitrogen (TKN) (C), Nitrate (NO₃) (D), and total suspended solids (TSS) (E). ** Significantly different from 2002-03 (p < 0.05, Bonferroni post-hoc test).



For more information, please contact Chuck Chaitovitz at chuck.chaitovitz@gef.org or visit www.gpa.unep.org/index.php/global-partnership-on-nutrient-management.

References:

For the full list of references, visit www.GlobalWaterChallenge.org/References3.pdf.