

GLOBAL PARTNERSHIP ON NUTRIENT MANAGEMENT

BMP Case Study

Overview

Name: Impacts of Manure Management Practices on Stream Microbial Loading into Conesus Lake, NY

Location/Terrain: Conesus Lake, NY, USA

Crop(s): Dairy and row crops

Nutrient(s): Nitrate, total phosphorus (P) and total suspended solids

Rationale: During the summer, nonevent conditions in streams indicate that the levels of total Coliform, Escherichia coli (E. coli), and Enterococcus peak in the streams.



Issue(s) of Concern/Challenges:

The levels of bacteria during nonevent conditions in streams is higher due to poor manure practices at farms near the watersheds. The fecal contaminants leaving farms and being transported to the Conesus Lake is causing an increase of microbial contamination. The amount of E. coli in the Graywood Gully has exceeded the 235 CFU/ 100 mL EPA Designated Bathing Beach Standard (EPA-DBBS).

Practice Description:

Structural and cultural BMPs aimed at controlling nutrient and animal waste water pollution were implemented based on soil testing, evaluation of the P index and common agricultural management practices. The BMPs included: gully plugs, installation of subsurface drainage tiles, construction of a standpipe and watering source for heifer pastures, fencing of cattle to prevent them from entering the stream, roof water separation allowing for clean water to stay clean and be safely discharged away from contaminated barnyard areas, and the elimination of winter, summer, and early fall spreading of manure. Water samples to examine nutrient loading were taken using two different methodologies: weekly manual grab samples and automated hydro-meteorological event samples. All streams in the study were monitored continuously for five annual cycles.

Practice Objectives:

Improve both the nutrient and microbial characteristics of the runoff from farms to Conesus Lake.

Outcomes:

Over a five year study period, there was a major decrease in bacterial loading during nonevent conditions at Graywood Gully. Nonevent flow was generally lower in the summer and higher in the spring. The E. coli, Enterococcus and total coliform levels in these streams were usually seasonal. The bacterial levels were highest in numbers from June to September, with peak amounts in August. The use of BMPs, such as manure management practices, helped significantly decrease the E. coli levels. At times, the Graywood Gully continued to be a major contributor to E. coli; however, it is thought to be a cause of surrounding wildlife.

Significance:

The use of BMPs contributed to the decrease in E. coli and other bacterial levels during nonevent conditions.



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/References5.pdf.