GLOBAL PARTNERSHIP ON NUTRIENT MANAGEMENT
BMP Case Study

Overview

Name: Management of Agricultural Practices Results in Declines of Filamentous Algae in the Lake Littoral

Location/Terrain: Conesus Lake, NY, USA

Crop(s): Soybeans, livestock and cover crops

Nutrient(s): Nitrogen and phosphorus

Rationale: Decrease algae in lake littoral

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Issue(s) of Concern/Challenges:

The amount of littoral algae in freshwater ecosystems is increasing because of nutrient enrichment, specifically from agricultural practices. The nutrients in runoff water increase the biomass and productivity of the algae, which can lead to anoxic water conditions and anaerobic bacteria.

Practice Description:

Agricultural best management practices (BMPs) were developed in three of the six sub-watersheds of Conesus Lake that are affected by littoral algae from 2001-2007. BMP Site 1 implemented a variety of management practices, including: fertilizer reduction, cover crops, contour strips, reduction in fall and winter manure spreading, various grass filters from runoff from bunker storage of silage and milk house wastes and livestock fenced from the creek and pond. BMP Site 2 had two major efforts: construction of three water and sediment control basins and strip cropping designed to retain soils on the watershed. BMP Site 3 installed rotational grazing pens and water troughs; cattle were fenced out of the creek and cultural management practices (i.e., changes in crop rotations, tillage practices) were implemented as fallow land, wheat and an alfalfa grass mix were converted to soybean production acreage. These evaluations determined which sub-watersheds were able to have the greatest decrease in amount of filamentous algae.

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Practice Objectives:

The objective is to determine a new way to manage the growing problem of littoral algae growth in the river mouths of the Great Lakes.

Outcomes:

In the BMP sites Cottonwood Gully, Graywood Gully and Sand Point Gully, the percent cover of algae during the Post-BMP period (2004-2007) was statistically lower than the Pre-BMP baseline (2001-2003) for 72.7% of the time, or eight of eleven years (Fig. 3D-F). The remaining sub-watersheds in Conesus Lake include Sutton Point Gully, North Gully, Long Point Gully and Long Point Cove. These sub-watersheds implemented few or no BMPs throughout the study. As a result, the Post-BMP period (2004-2007) percent cover was lower than the Pre-BMP baseline (2001-2003) only 25% of the time, or only three of twelve years (Fig. 3A-C). Therefore, algal growth decreased more when a variety of BMPs were present in the sub-watersheds.

Significance:

With the use of agricultural BMPs, nutrient runoff can be decreased. These practices can effectively reduce the growth of littoral zone filamentous algae.

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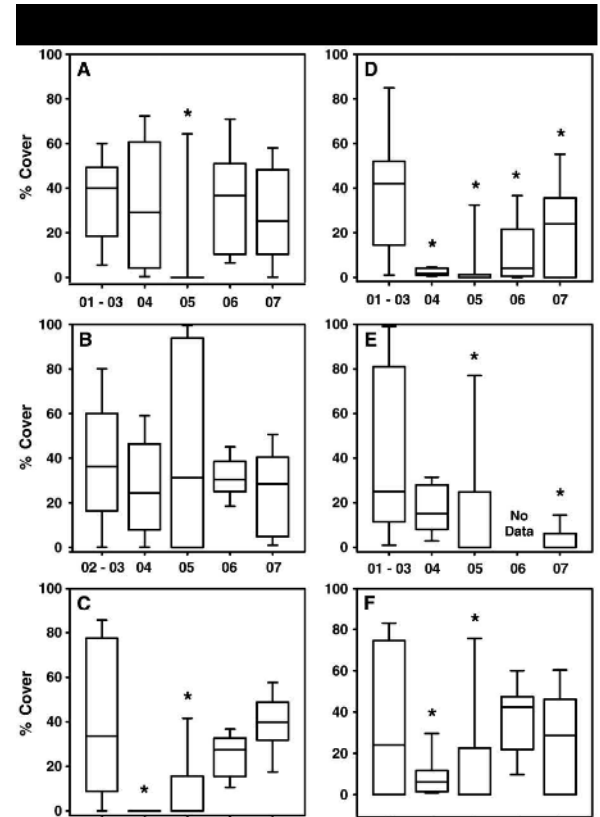
For more information, please contact Chuck Chaitovitz at chuck.chaitovitz@getf.org or visit www.gpa.unep.org/index.php/global-partnership-on-nutrient-management.

References:

For the full list of references, visit www.GlobalWaterChallenge.org/References1.pdf.