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## Reducing Nutrient Pollution: Hopeful Signs

Some researchers expect the Conservation Reserve Program (CRP) and the Conservation Compliance Program to reduce soil erosion in the United States by over two-thirds (Brown). Yet, several years into the implementation of these programs, the U.S. Geological Survey (USGS) reports that nutrients from agriculture dwarf all other sources of nutrient pollution (Puckett).

To effectively address remaining nutrient run-off and leaching problems, research and incentive programs need to support farmers' efforts to credit livestock waste and other farm-produced nutrients in their fertilizer decisions.

### Potential for more efficient nutrient use

Farmers can often reduce their commercial nitrogen applications by 24 to 40 percent with improved crediting of farm-produced nitrogen (Babcock and Blackmer, Shortle et al., Trachtenberg and Ogg). Farm-produced nutrients include phosphorus and nitrogen in livestock waste, and nitrogen fixed by the previous year's legume crops. These nutrients need to be credited by measuring or estimating amounts present in the field and adjusting commercial fertilizer applications to meet the crop's needs.

Soil tests, best done in the late spring in humid regions, can help properly credit nutrients from manure and nitrogen fixation (Babcock and Blackmer, Shortle et al.). The 36 percent of farmers in Pennsylvania who have used the late spring soil test reduced fertilizer use by 40 percent (Shortle et al.). Other methods for making fertilizer decisions, still used in many states, estimate crop

nutrient needs based on yield goals, and estimate nutrients in the soil from livestock waste and previous legume crops. Using the latter methods for crediting nitrogen in the soil would lead to nitrogen fertilizer savings of 24 to 33 percent of nitrogen fertilizer used in the United States in 1990 (Trachtenberg and Ogg).

### The Need for Better Crediting Methods

The late spring soil test was developed only in the past decade. Because it takes three to five years to adapt new technologies for making nutrient recommendations to local soils and climates, many states still have not adopted this

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or other methods of making nutrient recommendations for use by their farmers.

Adaptive research in several states and new research funded by the Cooperative State Research Service, the Agricultural Research Service, and the Environmental Protection Agency aim to improve nutrient crediting estimates for many soils and climates (Trachtenberg and Ogg). Development and use of these new crediting technologies in regions beyond Pennsylvania will allow farmers to capture the potential savings without reducing yields (Shortle et al.)

### Environmental and economic benefits of improved nutrient crediting

Nitrogen fertilizer use beyond recommended amounts may be considered "excess," and it is this excess that often leaches into groundwater or seeps back to the surface to pollute surface water.

Nationally, some 86 percent of the nitrogen excess, beyond the recommended amounts identified in the Trachtenberg and Ogg nutrient balances, results from commercial fertilizer applications, while only 14 percent of the nitrogen excess results from farm-produced nutrients. Cutting the excess commercial fertilizer applications will save farmers several hundred million dollars per year.

Some of the largest efficiency gains from improved nutrient crediting will occur on livestock farms, which produce more than enough nitrogen to meet their own crops' needs. Due to insufficient crediting, these livestock farms spend \$150 million on unneeded commercial nitrogen (Trachtenberg and Ogg).

### Realizing the potential efficiencies in nutrient use

Cost sharing for nutrient recommendations is available through two relatively new U.S. Department of Agriculture programs: (a) the Water Quality Incentives Program (WQIP) and (b) the Integrated Crop Management (ICM) Program. However, the programs have provided very little money, as yet, to farmers. The Water Quality Incentives Program is limited to only a few pilot watersheds. And it seems better suited for more expensive practices, such as barnyard waste containment and storage structures, than for the

lower-cost nutrient recommendations applicable over wide regions.

The Integrated Crop Management (ICM) Program, unfortunately, has been tied to implementation of more complex and costly pesticide recommendations. Program rules require that both nutrient and pesticide problems be addressed under the ICM plan (although recent administrative changes may allow flexibility, in some cases, for plans to focus on nutrient problems). Nutrient recommendations cost under 50¢ per acre (Shortle et al.), and nutrient services are widely available. In contrast, pesticide recommendations generally cost more than ten times that amount and require a much more sophisticated, less readily available service. Therefore, government efforts to expedite use of nutrient recommendations should not be tied to pesticide recommendations. A 100 percent cost share on nutrient recommendations on two-thirds of U.S. corn acres would cost only \$20 million per year.

### Building on past successes

Adding a national nutrient management initiative, such as a revised Integrated Crop Management Program, would complement Conservation Compliance, CRP programs, and research underway to improve nutrient crediting, and would help achieve substantial reductions in our most pervasive remaining pollution problems. A very large portion of sediment and nutrient problems can be remedied by continuing to rely on options which both benefit farmers economically and avoid taxpayer burden. ■

### ■ For more information

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*The views expressed here are those of the author and do not purport to represent EPA policy.*

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