



Algae blooms from high concentrations of phosphorus contribute to depleting a waterway of oxygen, thus killing fish and damaging other aquatic resources. *Click the image for more information about it.*

Gypsum Helps Curb Runoff of Soil Phosphorus

By [Luis Pons](#)
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Gypsum was the best performer in an Agricultural Research Service ([ARS](#)) study examining the ability of soil additives to curb runoff of phosphorus from farm fields into the nation's waters.

In research led by agronomist [David Brauer](#) of the ARS [Dale Bumpers Small Farms Research Center](#) in Booneville, Ark., the soft, widely distributed mineral was the only one of the three soil amendments tested that reduced soluble soil phosphorus in a field containing more than 10 times the amount normally found in soils.

The study was done by Brauer, animal scientist [Glen Aiken](#) of the ARS [Forage-Animal Production Research Unit](#) in Lexington, Ky., soil scientist [Daniel Pote](#) of the Booneville center, and colleagues. The researchers examined how well gypsum, alum and ground-up wastepaper kept phosphorus from leaching from farmland. Testing was done near Kurten, Texas, on land that has received manure applications from dairy and egg-laying operations for more than 40 years.

Excessive use of manures and other fertilizers can significantly increase phosphorus amounts in the soil. A valuable crop nutrient, phosphorus can run off and damage waterways by promoting accelerated growth of algae and plants in streams and lakes. This can deplete oxygen levels in water bodies and adversely impact living aquatic resources.

The researchers amended the soil annually for three years. They found that applying 5,000 pounds of gypsum per acre was most effective in reducing soil-test values for phosphorus. According to Brauer, reductions in dissolved reactive phosphorus seemed to be dependent on continual applications of gypsum.

Commonly found in sedimentary environments, gypsum is also a by-product of coal-burning operations.

Brauer explained that gypsum curtails the amount of phosphorus loss by promoting the binding together of soil particles, thus reducing phosphorus carried along with sediment. He added that applying wastepaper product containing aluminum, the active ingredient in alum, can effectively curb phosphorus, but the large amounts necessary can be impractical.

This work has been described in the [Journal of Environmental Quality](#).

ARS is the [U.S. Department of Agriculture](#)'s chief scientific research agency.

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