

KEEP PHOSPHORUS IN YOUR FIELD

THE ISSUE



An aerial photo of a Lake Erie algal bloom on August 19, 2011.
Source: www.glerl.noaa.gov/res/Centers/HABS/western_lake_erie

Historically, commercial fertilizer phosphorus was considered immobile on or in the soil. However, new data suggests fertilizer phosphorus left on the surface when followed by heavy rainfall can also be a major source of phosphorus loading. Research suggests current agricultural practices within the Western Lake Erie Basin contribute to the growing algal crisis, with more than 50 percent of the phosphorus load potentially attributed to agriculture.

There is no single practice to solve the problem. Each farm has different circumstances such as soil type, surface drainage, tile drainage, soil test levels, and tillage programs, which can be modified to make a difference. Farmers can play a critical role in reducing the algal blooms in Lake Erie and we all need to do our part.

SUGGESTED PRACTICES TO REDUCE PHOSPHORUS TRANSPORTATION INTO LAKE ERIE

- Inject or incorporate phosphorus when ever possible.
- For low-lying fields that are prone to flooding, delay application to just before planting, and either incorporate, band-place, or inject.
- Avoid spreading phosphorus near tile stand pipes or surface drains.
- Utilize cover crops to improve soil health and increase water holding capacity thereby reducing surface run-off.
- Include starter phosphorus or row fertilizer phosphorus where ever practical.
- Schedule phosphorus broadcast applications when shallow tillage is possible for conventional/reduced tillage programs.
- Schedule phosphorus applications for no-till programs as close to crop utilization as practical.
- Do not schedule phosphorus applications just prior to heavy rainfall.
- Do not schedule phosphorus applications when soils are frozen during mid-winter.
- Do not schedule phosphorus applications when soils are snow covered.
- Soil test to determine nutrient requirements for the next crop.
- Keep fertilizer phosphorus out of ditches, streams and waterways while making application.
- Consider all nutrient sources available to the crop when deciding on how much to apply.

THE ACTION

4R nutrient stewardship provides a framework to achieve cropping system goals – increased production, increased farmer profitability, and enhanced environmental protection. To achieve those goals the 4Rs utilize fertilizer best management practices that address the Right Nutrient Source, at the Right Rate, the Right Time, and in the Right Place. The 4R nutrient stewardship principles are the same globally, but how they are used locally varies depending on field and site specific characteristics such as soil, cropping system, management techniques and climate. **The following describes the principles generally, and their specific application to lake-friendly P management.**

RIGHT SOURCE: Ensure a balanced supply of each of the essential nutrients in plant available forms, utilizing all available sources. **Specifically, choose sources of P that can be placed in the soil.**

RIGHT RATE: Assess and make decisions based on soil nutrient supply and plant demand. **Specifically, soil test and determine the P rate appropriate to the crop.**

RIGHT TIME: Assess and make decisions based on the dynamics of crop uptake, soil supply, loss risks, and field operation logistics. **Specifically, avoid applying over snow or frozen soil during mid-winter, and consider replacing fall applications with spring applications where possible.**

RIGHT PLACE: Place nutrients where they are accessible to crops, addressing root-soil dynamics, and managing spatial variability within the field. **Specifically, place P in the soil for each crop, in ways that attain the goals of conservation tillage.**