WHAT ARE THE 4Rs?

4R nutrient stewardship provides a framework to achieve cropping system goals — increased production, increased farmer profitability, enhanced environmental protection and improved sustainability. To achieve those goals, the 4R's incorporate the:

RIGHT FERTILIZER SOURCE *at the*
RIGHT RATE, *at the*
RIGHT TIME *and in the*
RIGHT PLACE.

Properly managed fertilizers support cropping systems that provide economic, social and environmental benefits. On the other hand, poorly managed nutrient applications can decrease profitability and increase nutrient losses, potentially degrading water and air.

4R nutrient stewardship requires the implementation of best management practices (BMPs) that optimize the efficiency of fertilizer use. The goal of fertilizer BMPs is to match nutrient supply with crop requirements and to minimize nutrient losses. Selection of BMPs varies by location, and those chosen for a given farm are dependent on local soil and climatic conditions, crop, management conditions and other site specific factors.

Other agronomic and conservation practices, such as no-till farming and the use of cover crops, play a valuable role in supporting 4R nutrient stewardship. As a result, fertilizer BMPs are most effective when applied with other agronomic and conservation practices.

HOW YOU CAN PUT 4R NUTRIENT STEWARDSHIP TO WORK FOR YOU!

To utilize the 4Rs to achieve your cropping system goals, apply the **Right Source** of fertilizers that are in — or are easily converted to — compounds best used by the target crop. Apply the **Right Rate** of fertilizer to match nutrient supply with crop requirements. Apply fertilizer at the **Right Time** so nutrients will be available when crop demand is high. Apply or maintain fertilizer in the **Right Place** where the crop can access the nutrients most effectively. Applying these general practices will minimize nutrient transport from fields and maximize crop uptake and utilization.

- **EDUCATE YOURSELF**
- **CONSIDER WAYS TO EXPAND YOUR 4R PRACTICES**
- **SPREAD THE WORD!**

Visit **www.nutrientstewardship.com**

Information in this brochure was developed utilizing materials available from The Fertilizer Institute, the International Plant Nutrition Institute, and the Canadian Fertilizer Institute.

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4R nutrient stewardship

The Right Time
for Nutrient Stewardship
IS RIGHT
NOW

The Fertilizer Institute
Nourish, Replenish, Grow

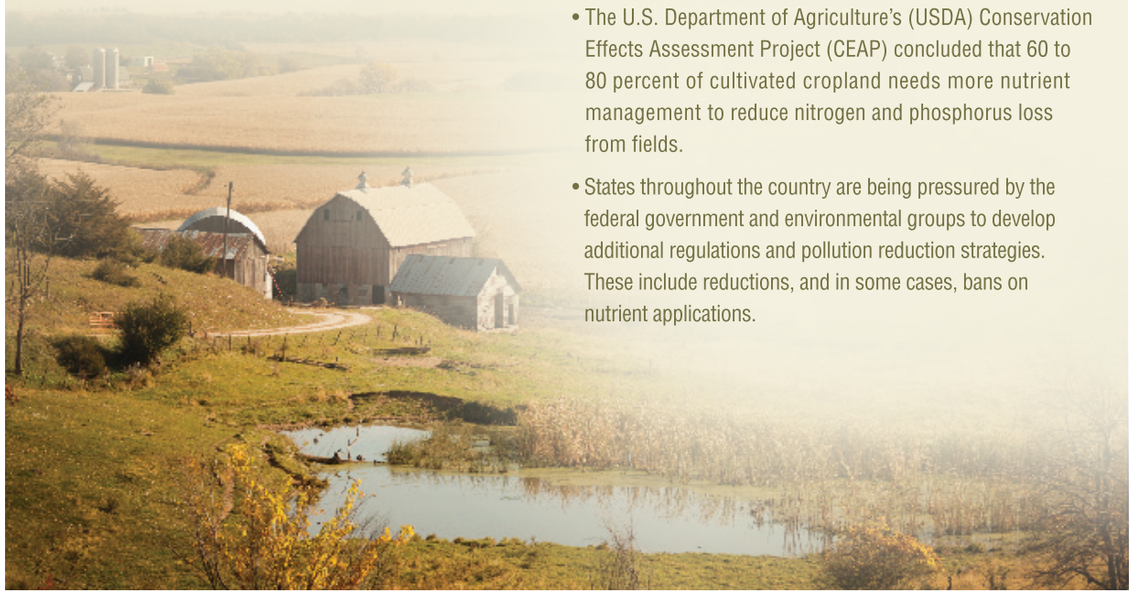
4R NUTRIENT STEWARDSHIP

WHY USE THE 4Rs RIGHT NOW?

AGRICULTURE IS FACING CHALLENGES

POPULATION PRESSURES

According to the United Nations, the global population will increase by more than two billion people in the next 40 years, and many reports have indicated that food production needs to double by 2050. Industry experts agree that increased food production will be achieved by intensified crop production and not by an expanded arable land base. Genetic and biotech seed industries have predicted yield increases of three to four percent per year. However, to optimize the yields of advanced seeds, fertilizer inputs must be optimized to provide the greatest potential for success.



REGULATORY PRESSURES

Pressure to limit the use of fertilizers is increasing. Legislative, regulatory and non-government activities, including legal action pertaining to nutrients in the environment, are taking place on national, regional, state and local levels:

- Assessments by the Environmental Protection Agency have assigned agriculture responsibility for 44 percent of the nitrogen and phosphorus being delivered to the Chesapeake Bay.
- The National Academy of Sciences cite nitrogen-based fertilizer application and animal feeding operation runoff as a large majority of the nutrient inputs within the Mississippi River Basin and Northern Gulf of Mexico watershed.
- The U.S. Department of Agriculture's (USDA) Conservation Effects Assessment Project (CEAP) concluded that 60 to 80 percent of cultivated cropland needs more nutrient management to reduce nitrogen and phosphorus loss from fields.
- States throughout the country are being pressured by the federal government and environmental groups to develop additional regulations and pollution reduction strategies. These include reductions, and in some cases, bans on nutrient applications.

ANSWERING THE CHALLENGE WITH 4R NUTRIENT STEWARDSHIP

4R nutrient stewardship can help
IMPROVE AGRICULTURAL PRODUCTIVITY:

- Optimizing nutrient management is simply good business in dealing with fluctuations in prices of fertilizers and other inputs, as well as in prices of crops sold.
- Higher crop yields are well documented with better crop and soil management.
- Improved fertilizer efficiency increases the quantity produced per acre for each unit of nutrient applied, without sacrificing yield potential.

4R nutrient stewardship can help
MINIMIZE IMPACT TO THE ENVIRONMENT:

- Adopting nutrient stewardship contributes to the preservation of natural ecosystems by growing more on less land.
- Retaining nutrients within a field's boundaries and in the crop rooting zone greatly reduces the amount that is not utilized by plants and thereby escapes into the environment as pollution.