

The Right Time for Nutrient Stewardship is 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 reports have indicated that food production needs to double by 2050.

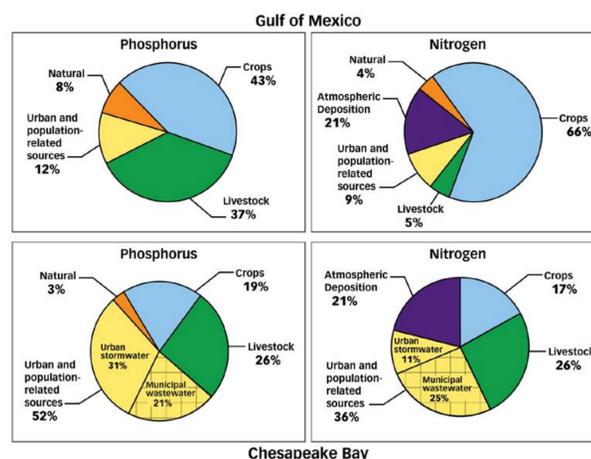
- Increased food production will be achieved by intensified crop production and not by an expanded arable land base
- Genetic and biotech seed industries have predicted yield increases of three to four percent per year
- To optimize the yields of advance seeds, fertilizer inputs must be optimized to provide the greatest potential for success.

Policy 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, state and local levels:

- EPA Assessments:
 - 14,000 nutrient related surface water impairment listings in 49 states
 - Over 47 % of streams contain medium to high levels of N and P
- USDA – NRCS
 - Conservation Effectiveness Assessment Program (CEAP) indicates 60-80% of cropland needs additional nutrient management to reduce N and P loss
 - Environmental groups and federal government applying pressure on states to develop additional regulations and nutrient reduction strategies

N and P Contributors to the Chesapeake Bay and the Mississippi River Basin



What are the 4Rs?

4R Nutrient Stewardship

The 4Rs provide a framework to achieve cropping system goals – increased production, increased farmer profitability, enhanced environmental protection and improved sustainability. To achieve those goals, the 4Rs incorporate the:

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

- The **Right Source** utilizes nutrients that are in – or easily converted to – compounds best used by target crops.
- The **Right Rate** utilizes nutrient applications that match supply with crop requirements.
- The **Right Time** utilizes practices to ensure nutrients are available when crop demand is high.
- The **Right Place** utilizes practices to locate nutrients where they can be effectively accessed by the crop.

NRCS and the 4Rs

CEAP Watershed Studies

The CEAP studies use a combination of surveys and modeling to determine the effects of implemented conservation practices. Reports have been released for the Upper Mississippi River Basin and the Chesapeake Bay using data from 2003 - 2006.

- A key finding shows the need to increase complete and consistent use of nutrient management, defined as using strategies that address proper rate, form, timing, and method of application
- Specifically, the model showed that suites of practices which include soil erosion control and nutrient management are required to simultaneously address soil erosion and nutrient loss.



Answering the Challenges

Improved Agricultural Productivity

- Optimizing nutrient management minimizes risks associated with fluctuations in prices of fertilizer and other inputs.
- 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.

Minimize Impact to the Environment

- 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 in the environment as pollution.



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

What Can You Do?

- Educate yourself
- Consider ways to expand your 4R practices
- Spread the word

