

4R NUTRIENT STEWARDSHIP

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 four “rights” are necessary for sustainable plant nutrition management. The assessment of any planned nutrient management practice must consider the economic, social, and environmental effects to determine whether or not it is a “right” practice for that system.

4R Universal Scientific Principles

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.

RIGHT SOURCE

Ensure a balanced supply of essential nutrients, considering both naturally available sources and the characteristics of specific products in plant available forms. Specifically – consider nutrient supply in plant available forms, ensure nutrient suits soil properties, and recognize the synergisms among elements.

RIGHT RATE

Assess and make decisions based on soil nutrient supply and plant demand. Specifically – appropriately assess soil nutrient supply (including those from organic sources and existing soil levels), assess plant demand, and predict fertilizer use efficiency.

RIGHT TIME

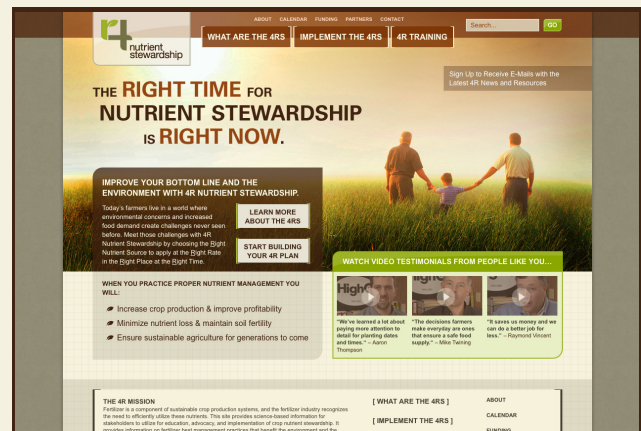
Assess and make decisions based on the dynamics of crop uptake, soil supply, nutrient loss risks, and field operation logistics. Specifically – assess the timing of crop uptake, assess the dynamics of the soil’s nutrient supply, recognize weather factors, and consider logistics.

RIGHT PLACE

Address root-soil dynamics and nutrient movement, and manage spatial variability within the field to meet site-specific crop needs and limit potential losses from the field. Specifically – recognize root – soil dynamics, manage spatial variability issues, consider the tillage system, and limit potential off-field transport.

To help identify opportunities to improve fertilizer efficiency and prevent nutrient movement from each field, ask:

Was the RIGHT FERTILIZER SOURCE given to the crop at the RIGHT RATE, RIGHT TIME, and in the RIGHT PLACE?



The new www.nutrientstewardship.com website promotes the 4R philosophy, an innovative and science-based approach that offers enhanced environmental protection, increased production, increased farmer profitability, and improved sustainability.

Learn more about 4R nutrient stewardship at www.nutrientstewardship.com.

The United States Department of Agriculture Natural Resource Conservation Service (USDA NRCS) has been undertaking Conservation Effectiveness Assessment Program (CEAP) studies in major watersheds throughout the United States. Key findings indicate **that suites of best management practices work better than single practices**, and that there is a need to **increase the complete and consistent use of nutrient management**, defined as using strategies that address proper **rate, form, timing, and placement**.