

Spring 2014, No. 3

SO MANY CHOICES - SELECTING THE RIGHT NUTRIENT SOURCE

The 4R principles of nutrient stewardship involve selecting the “Right Source” of nutrients to meet plant demands. This fundamental decision of nutrient source influences the process of choosing the Right Place, Right Time, and Right Rate for each field.

A misconception persists that using manufactured fertilizers means opposing the use of organic nutrient sources. Most agronomists agree that selecting the right source of nutrients begins with first considering the supply of on-farm nutrients and then supplementing them with commercial fertilizers.

Integrated Plant Nutrient Management is the term used by agronomists to describe the appropriate use of both fertilizer and organic sources of nutrients. Every farming operation will differ in its access to various nutrient sources and there is a range in specific crop requirements, but all farmers have the goal of maximum crop output and harvest quality from the right nutrient application.

Organic nutrient sources can include soil organic matter, a small portion of which decomposes and releases nutrients each year. Crop residues vary greatly in nutrient content, but can be a contributing nutrient source in many situations. Animal manures are commonly used as a valuable source of plant nutrients. Manures and composts can have a wide range in nutrient composition, so it is useful to have them chemically analyzed to assess their fertilizer-replacement value. Cover crops can also be a useful nutrient source. Legume cover crops have the benefit of providing extra nutrients by hosting N-fixing bacteria. Grass cover crops can capture and retain nutrients that might have otherwise leached past the root zone, then release their nutrients again as they decompose.

Many excellent commercial fertilizers can be used to deliver nutrients that are lacking for successful crop production. Commercial fertilizers are most commonly used as bulk blends of popular granular fertilizers; compound fertilizers, which are a mixture of multiple nutrients within a single fertilizer particle; fluid fertilizers, homogeneous clear liquids which can be blended with materials such as micronutrients, herbicides, and pesticides, or diluted for foliar application; and suspension fertilizers which use a suspending clay or gelling agent to keep small fertilizer particles from settling out of the liquid.

Additional considerations in selecting the Right Nutrient Source might include:

- The soil chemical and physical properties (such as avoiding nitrate application in flooded soil, or surface application of urea on high pH soils).
- Availability of fertilizer application equipment to get the nutrients delivered properly.
- Blends of multiple fertilizer materials must account for their chemical properties and compatibilities.
- Recognize sensitivities and secondary benefits of specific fertilizer materials (such as chloride additions that may be beneficial for small grains, but possibly detrimental for the yield and quality of other crops in excessive concentrations).

Selecting the Right Source of nutrients is too often overlooked due to tradition and the ease of doing the same thing every year. Remember that crop production is very complex and that successful farmers need to be both artists and scientists with an understanding of all the 4R's to meet their goals.

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Abbreviations: N = nitrogen.

Note: *Plant Nutrition TODAY* articles are available online at the IPNI website: www.ipni.net/pnt