

Crop Production

Manure on fields offers loads of benefits

By NATALIE RECTOR



MANURE is being hauled onto fields at a rapid pace this spring. It's both a necessary and expensive task, but there is a silver lining. The nitrogen, phosphorus, potassium and micronutrients all come along for the ride. Take a manure sample before it goes to the field to find out how much value there is in your specific situation.

Key Points

- Manure benefits include nitrogen, phosphorus and potassium.
- Spread manure into the root zone where it can be retained for crop uptake.
- Pre-side-dress nitrate-soil tests tell you what you have and what you need.

Nitrogen can be lost as quickly as it can be retained. Retaining it for the coming crop can save \$40, \$50 or even \$60 per acre at today's nitrogen prices.

Add in the other nutrients, and manure quickly commands the respect of purchased fertilizer.

From a management standpoint, nitrogen and phosphorus are the critical nutrients demanding attention. Begin with current soil tests and direct manure nutrients to the fields testing lowest in phosphorus.

Second, apply manure on fields to be planted with high-nitrogen-demand crops, such as corn and sugarbeets.

Third, apply manure as if it were

purchased fertilizer: Know the nutrient content (fertilizer analysis), spread evenly, calibrate for desired nutrient values and keep records.

Get it into the root zone

Some other principles relate to both manure and purchased nitrogen fertilizer. If left on the surface of dry soil during warm temperatures, the ammonium portion of the manure or the fertilizer will volatilize into the air, being lost for crop production. If applied on wet, saturated soils, it will denitrify, also being lost into the air.

The goal is to spread manure into the root zone where it can be retained for crop uptake.

Some people believe that all the nitrogen from surface-applied manure volatilizes to the air and is lost. This is not the case. The ammonium fraction of nitrogen manure can volatilize, but manure also has an organic fraction that does not.

Under hot, dry conditions during the summer, when manure is applied with no incorporation, virtually all of the ammonium fraction is lost. When injected, it will be retained, but it is hard to estimate how much is still left in the spring.

When manure is surface-applied during cold temperatures, not all of the ammonium is lost into the air.

In the spring, if surface-applied when cool and the soils are damp, little ammonium is lost in the air. The same surface-applied application in the spring under warm temperatures (greater than 50 degrees F) and on dry soils can result in losses.

Of all the above scenarios, only the ammonium fraction of nitrogen in the manure is being considered. Manure also contains organic nitrogen, which is broken down over several years; a percentage being available the first year.

Consider the difference

Typical dairy manure from a lactating herd, applied at 6,000 gallons per acre, may contain about 150 pounds of plant-available nitrogen if injected or incorporated within one day of application. The exact same manure could be broadcast for a week under warming conditions and lose up to 75% of the potential nitrogen just by lack of incorporation. That brings down the plant-available nitrogen credit to only 35 pounds per acre.

The difference between 150 pounds and 35 pounds of nitrogen is \$46 of lost nitrogen from your crop and your pocketbook.

All manures have a unique nitrogen test and percentage in the ammonium fraction, so go by manure samples, not the examples listed above.

Pre-side-dress soil tests a must

A pre-side-dress nitrate soil test is an excellent tool to be sure sufficient nitrogen is available for the coming season. Plan now to take them at side-dress time to ensure good crop yields and proper management of manure nutrients.

For more information, visit the Michigan State University Extension site at www.rootzone.msu.edu.

Rector is an MSU Extension educator.

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