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Manure testing: what to request?

Charles Shapiro, Charles Wortmann and Richard Deloughery

Manure testing is necessary to make optimum use of manure while protecting water resources. The Manure Sample Submission Form requests information required for reliable interpretation of the results.

Tests desired
The tests most frequently needed to optimize nutrient management are total and ammonium nitrogen (N), phosphorus (P₂O₅), potassium (K₂O), pH, soluble salts, sodium, and dry matter content.

Nitrogen. Manure contains both organic and inorganic forms of nitrogen. Ammonium-N is the primary inorganic form in manure and is readily available to crops. Nitrate-N is usually too small to affect management decisions, unless the manure is composted.

Organic N is determined as the difference between total N and inorganic N. Organic N becomes plant available as manure decomposes, with 20 to 50% of organic N available to the first crop after application. Much of the remaining organic N becomes available in subsequent years.

Phosphorus. Most, about 75%, manure P (about 75%) is in inorganic forms. P analysis allows calculation of the most economical manure rates while avoiding over-application of P with severe consequences to surface waters.

Other tests. Tests for potassium, sulfur, zinc, and other nutrients may be useful. When manure is applied to meet N or P needs, other nutrients are generally adequate for soils in Nebraska. If liquid manure is applied to a crop through sprinkler irrigation, test for soluble salts or electrical conductivity to avoid leaf burning. Electrical conductivity is useful in managing anaerobic lagoons.

Report information

Units. Specify if the results should be reported in pounds of nutrient per ton (spreader), per 1000 gallons (tanks or umbilical cord), or per acre-inch (irrigation). This depends on your method of application. Phosphorus and potassium K should be reported in the oxide form (P₂O₅ and K₂O) so its fertilizer value is easy to calculate.

Moisture. Reporting the results on an “as is” or “wet” basis allows a producer to determine the nutrient application rate use the results without adjusting for water
content additional moisture calculation.

**Nutrient availability.** Laboratories can estimate the amount of nutrients available in the first year, and the amount of manure N available during following years. This is especially important for solid manures.

**Application basis.** Manure is often applied on a “nitrogen basis”, to supply enough N to meet crop needs. When soil test P is excessive, manure may be applied a producer may want to apply manure on a “P basis”, that is at a rate sufficient to match P removal by the crop.

**Estimation of crop available N**

The information requested is used to estimate crop available N from manure. Select the appropriate ammonium-N loss factor for the time of manure application, and days until incorporation to enable an estimate of ammonium-N loss to the atmosphere. Indicate the type of manure and species as these affect are major determinants of organic-N availability. If manure applied in the past is similar to the current sample, give information on Past Year Applications and the Rate applied to estimate the amount of organic N available to this year’s crop from the previously applied manure.

Suggestions on how to interpret a manure analysis are given in the NebGuide G97-1335-A Determining Crop Available Nutrients from Manure (http://www.ianr.unl.edu/pubs/wastemgt/g1335.htm).

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### Manure Sample Submission Form

**Client information:**
Name: ____________________
Address: ________________
____________________________________
____________________________________
Phone: ________________
Account: ________________
E-mail: ____________________
Fax: ________________

**Analysis results to be communicated to:**
- Q Mail address
- Q Fax number
- Q e-mail address

If sent to e-mail address, would you like a:
- Q pdf file
- Q txt file
- Q wks file

**Sample names:**

**Sample collection date:**

Send copy to: ________________

**Tests Desired**
- Q Nebraska Minimum (Total N, NH₃-N, Organic-N, P, K, moisture)
- Q Standard lab analysis
- Q pH, salts, sodium
- Q _____________
- Q _____________
Contact your lab for their ‘options’.

**Report Information**

**Units:**
- Q lbs/ton
- Q lbs/1000 gallons
- Q lbs/acre inch
- Q ppm or %

**Moisture:**
- Q As received or wet basis
- Q Dry matter basis

**Nutrient availability:**
- Q 1st year availability only
- Q Additional years

**Estimate application rate on a:**
- Q Nitrogen basis
- Q Phosphorus basis

**Application rate units:**
- Q Tons/acre
- Q 1,000 gallons/acre
- Q Inches/acre

**For the Estimate of Crop Available Nitrogen**

**Ammonium-N factors**
- Q Fall
- Q Winter
- Q Spring
- Q Summer

**Time of Application**
- Q Immediately
- Q One day later
- Q Two days later
- Q Three days later
- Q Four to seven days later
- Q Not incorporated

**Manure incorporation**
- Q Sprinkler irrigated

**Organic-N factors**
- Q Solid
- Q Solids with litter or bedding
- Q Composted solids
- Q Stored liquid
- Q Fresh, daily scrape

**Type of manure**
- Q Dairy
- Q Beef
- Q Swine
- Q Poultry - layer
- Q Poultry - broiler
- Q Turkey
- Q Other: ____________

**Species**

**Past Year Applications**
- Q Every year
- Q Every other year
- Q Every third year
- Q Every fourth year
- Q First time application

Rate applied (if known):

**Notes:**

This generic manure sample form is provided by UNL Cooperative Extension.