

11-2007

## Manure Testing: What to Request?

Charles A. Shapiro

*University of Nebraska-Lincoln*, [cshapiro1@unl.edu](mailto:cshapiro1@unl.edu)

Charles S. Wortmann

*University of Nebraska-Lincoln*, [cwortmann2@unl.edu](mailto:cwortmann2@unl.edu)

Follow this and additional works at: <https://digitalcommons.unl.edu/biosysengfacpub>



Part of the [Bioresource and Agricultural Engineering Commons](#), and the [Civil and Environmental Engineering Commons](#)

---

Shapiro, Charles A. and Wortmann, Charles S., "Manure Testing: What to Request?" (2007). *Biological Systems Engineering: Papers and Publications*. 338.

<https://digitalcommons.unl.edu/biosysengfacpub/338>

This Article is brought to you for free and open access by the Biological Systems Engineering at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Biological Systems Engineering: Papers and Publications by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

## Manure Testing: What to Request?

Charles A. Shapiro, Extension Soils Specialist  
Charles S. Wortmann, Nutrient Management Specialist

Manure testing is necessary to make optimum use of manure while protecting water resources. This publication is a guide to providing information on a *Manure Sample Submission Form* for reliable interpretation of results.

### Tests Desired

The tests most frequently needed to optimize nutrient management are total and ammonium nitrogen ( $\text{NH}_4\text{-N}$ ), phosphorus ( $\text{P}_2\text{O}_5$ ), potassium ( $\text{K}_2\text{O}$ ), 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 concentration is usually too small to affect management decisions, unless the manure is composted.

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

**Phosphorus.** Most manure phosphorus (about 75 percent) is in inorganic forms. Phosphorus analysis allows calculation of the most economical manure rates while avoiding over-application of phosphorus that can have severe consequences to surface waters.

**Other tests.** Tests for potassium, sulfur, zinc, and other nutrients may be useful. When manure is applied to meet nitrogen or phosphorus 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 determine a management plan for avoiding leaf burning. For more information see EC778, *Application of Liquid Animal Manures Using Center Pivot Irrigation*. Information on soluble salt content or electrical conductivity is useful in managing anaerobic lagoons as “purple lagoons” associated with EC values of less than 6

mmhos/cm. When the surface of a lagoon has a purple color, the microbial processes are functioning well and the odor is less.

### Report Information

**Units.** Specify if the results should be reported in pounds of nutrient per ton (spreader), per 1,000 gallons (tanks or umbilical cord), or per acre-inch (irrigation). This depends on your application method. Phosphorus and potassium should be reported in the oxide form ( $\text{P}_2\text{O}_5$  and  $\text{K}_2\text{O}$ ) so their 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 without adjusting for water content.

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

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

### Estimating Crop Available Nitrogen

The information requested is used to estimate the amount of nitrogen available to the crop from manure. Select the appropriate ammonium-N 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 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 nitrogen available to this year’s crop from the previously applied manure.

Suggestions on how to interpret a manure analysis are given in NebGuide G1335, *Determining Crop Available Nutrients from Manure*.

## Area Laboratories

### Agvise Laboratories

902 13th St. N  
P.O. Box 187  
Benson, MN 56215  
(320) 843-4109  
*agvise@polarcomm.com*  
*www.agvise.com*

### A&L Heartland Labs, Inc.

111 Linn Street  
P.O. Box 455  
Atlantic, IA 50022  
(712) 243-6933  
(800) 434-0109  
*smckee@allabs.com*  
*www.allabs.com*

### Midwest Laboratories

13611 "B" St.  
Omaha, NE 68144  
(402) 334-7770  
*jpt1@midwestlabs.com*  
*www.midwestlabs.com*

### Olsen's Agricultural Laboratory

210 E. First St.  
P.O. Box 370  
McCook, NE 69001  
(308) 345-3670  
*info@olsenlab.com*  
*www.olsenlab.com*

### Platte Valley Laboratories

P.O. Box 807  
914 Hwy. 30  
Gibbon, NE 68840  
(308) 468-5975  
*info@soillab.com*  
*www.soillab.com*

### Servi-Tech Laboratories

1602 Park West Drive  
P.O. Box 169  
Hastings, NE 68902  
(402) 463-3522  
(800) 557-7509  
*kristeno@servitechlabs.com*  
*www.servitechlabs.com*

### University of Nebraska

Soil and Plant Analysis Lab  
153 Keim Hall  
P.O. Box 830916  
Lincoln, NE 68583-0916  
(402) 472-1571  
*spal@unl.edu*  
*www.agronomy.unl.edu/spal*

### Ward Laboratories

4007 Cherry Ave.  
P.O. Box 788  
Kearney, NE 68848  
(308) 234-2418  
(800) 887-7645  
*rayward@wardlab.com*  
*www.wardlab.com*

### Acknowledgment

The authors would like to acknowledge the work of Richard L. Deloughery, former Water Quality Extension Educator, who was a coauthor of the previous edition of this publication.

### Disclaimer

Reference to commercial products or trade names is made with the understanding that no discrimination is intended of those not mentioned and no endorsement by University of Nebraska–Lincoln Extension is implied for those mentioned.

UNL Extension publications are available online at <http://extension.unl.edu/publications>.

### Index: Waste Management Livestock Waste Systems

Issued November 2007

Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture.

University of Nebraska–Lincoln Extension educational programs abide with the nondiscrimination policies of the University of Nebraska–Lincoln and the United States Department of Agriculture.

## Manure Sample Submission Form

<p><b>Client information:</b>                  Name: _____                  Address: _____                  _____                  _____                  Phone: _____                  Account: _____                  E-mail: _____                  Fax: _____</p>	<p><b>Analysis results to be communicated to:</b></p> <p><input type="checkbox"/> Mail address  <input type="checkbox"/> Fax number  <input type="checkbox"/> e-mail address</p> <p><b>If sent to e-mail address, would you like a:</b></p> <p><input type="checkbox"/> pdf file  <input type="checkbox"/> txt file  <input type="checkbox"/> xls file</p>	<p><b>Sample names:</b>                  _____                  _____                  _____</p> <p><b>Sample collection date:</b>                  _____</p> <p><b>Send copy to:</b> _____                  _____                  _____</p>
---	--	---

<p style="text-align: center;"><b>Tests Desired</b></p> <p><input type="checkbox"/> Nebraska Minimum                  (Total N, NH<sub>4</sub>-N, Organic-N, P, K, moisture)  <input type="checkbox"/> Standard lab analysis  <input type="checkbox"/> pH, soluble salts, sodium  <input type="checkbox"/> _____  <input type="checkbox"/> _____  <input type="checkbox"/> _____                  Contact your lab for its options.</p>	<p style="text-align: center;"><b>Report Information</b></p>	
<p><b>Units:</b></p> <p><input type="checkbox"/> lbs/ton  <input type="checkbox"/> lbs/1,000 gallons  <input type="checkbox"/> lbs/acre inch  <input type="checkbox"/> ppm or %</p> <p><b>Moisture:</b></p> <p><input type="checkbox"/> As received or wet basis  <input type="checkbox"/> Dry matter basis</p>	<p><b>Nutrient availability:</b></p> <p><input type="checkbox"/> 1st year availability only  <input type="checkbox"/> Additional years</p> <p><b>Estimate application rate on a:</b></p> <p><input type="checkbox"/> Nitrogen basis  <input type="checkbox"/> Phosphorus basis</p> <p><b>Application rate units:</b></p> <p><input type="checkbox"/> Tons/acre  <input type="checkbox"/> 1,000 gallons/acre  <input type="checkbox"/> Inches/acre</p>	

### For the Estimate of Crop Available Nitrogen

<p style="text-align: center;"><b>Ammonium-N factors</b></p> <p><b>Time of application</b></p> <p><input type="checkbox"/> Fall  <input type="checkbox"/> Winter  <input type="checkbox"/> Spring  <input type="checkbox"/> Summer</p> <p><b>Manure incorporation</b></p> <p><input type="checkbox"/> Immediately  <input type="checkbox"/> One day later  <input type="checkbox"/> Two days later  <input type="checkbox"/> Three days later  <input type="checkbox"/> Four to seven days later  <input type="checkbox"/> Not incorporated</p> <p><b>Sidedress application</b></p> <p><input type="checkbox"/> Incorporated as applied  <input type="checkbox"/> Sprinkler irrigated</p>	<p style="text-align: center;"><b>Organic-N factors</b></p> <p><b>Type of manure</b></p> <p><input type="checkbox"/> Solid  <input type="checkbox"/> Solids with litter or bedding  <input type="checkbox"/> Composted solids  <input type="checkbox"/> Stored liquid  <input type="checkbox"/> Fresh, daily scrape</p> <p><b>Species</b></p> <p><input type="checkbox"/> Dairy  <input type="checkbox"/> Beef  <input type="checkbox"/> Swine  <input type="checkbox"/> Poultry – layer  <input type="checkbox"/> Poultry – broiler  <input type="checkbox"/> Turkey  <input type="checkbox"/> Other: _____</p>	<p style="text-align: center;"><b>Past year applications</b></p> <p><input type="checkbox"/> Every year  <input type="checkbox"/> Every other year  <input type="checkbox"/> Every third year  <input type="checkbox"/> Every fourth year  <input type="checkbox"/> First time application</p> <p><b>Rate applied (if known):</b>                  _____</p> <p><b>Notes:</b> _____                  _____                  _____                  _____                  _____</p>
---	--	---