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Manure Testing: What to Request?

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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 (P_2O_5), potassium (K_2O), 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 (P_2O_5 and K_2O) 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*.

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Manure Sample Submission Form

<p>Client information: Name: _____ Address: _____ _____ _____ Phone: _____ Account: _____ E-mail: _____ Fax: _____</p>	<p>Analysis results to be communicated to:</p> <p><input type="checkbox"/> Mail address <input type="checkbox"/> Fax number <input type="checkbox"/> e-mail address</p> <p>If sent to e-mail address, would you like a:</p> <p><input type="checkbox"/> pdf file <input type="checkbox"/> txt file <input type="checkbox"/> xls file</p>	<p>Sample names: _____ _____ _____</p> <p>Sample collection date: _____</p> <p>Send copy to: _____ _____ _____</p>
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<p style="text-align: center;">Tests Desired</p> <p><input type="checkbox"/> Nebraska Minimum (Total N, NH₄-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>Report Information</p>	
<p>Units:</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>Moisture:</p> <p><input type="checkbox"/> As received or wet basis <input type="checkbox"/> Dry matter basis</p>	<p>Nutrient availability:</p> <p><input type="checkbox"/> 1st year availability only <input type="checkbox"/> Additional years</p> <p>Estimate application rate on a:</p> <p><input type="checkbox"/> Nitrogen basis <input type="checkbox"/> Phosphorus basis</p> <p>Application rate units:</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;">Ammonium-N factors</p> <p>Time of application</p> <p><input type="checkbox"/> Fall <input type="checkbox"/> Winter <input type="checkbox"/> Spring <input type="checkbox"/> Summer</p> <p>Manure incorporation</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>Sidedress application</p> <p><input type="checkbox"/> Incorporated as applied <input type="checkbox"/> Sprinkler irrigated</p>	<p style="text-align: center;">Organic-N factors</p> <p>Type of manure</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>Species</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;">Past year applications</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>Rate applied (if known): _____</p> <p>Notes: _____ _____ _____ _____ _____</p>
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