



# Manure Testing

Economic and environmental conditions encourage livestock producers to consider manure as a resource, rather than a waste product. By properly recycling these nutrients, a producer can reduce an operation's reliance on energy-intensive commercial fertilizer for high-yield crops. Manure that is properly managed by accurate testing and applied properly presents little hazard to surface or ground water and improves soil health. Good nutrient management includes efficient handling, proper storage, proper land application, and accurate testing. Proper management allows the operator to determine the land area required to accept manure at a set rate that provides adequate nutrients for plants and minimizes losses to the environment.

**Manure analysis is essential in determining manure's value as a resource for field crops. Nutrient content is highly variable. Manure sample results provide a benchmark nutrient levels used in manure management plans.**



*“Providing value to our customers through on-time quality testing with friendly service”*

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## How do I get a manure sample?

The first step in sampling manure is to obtain a container suitable for the sample. The container selected should be rinsed out, reasonably clean, and suitable for mailing. Most manure samples are carried through the regular postal system. The amount of manure that should be collected depends somewhat on the tests being run. However, a routine manure analysis, as described above, usually can be accomplished with a one-pint volume of sample. Contact MVTL Laboratories if you have questions about the container and amount of sample to collect. **MVTL Laboratories provides manure sampling supplies.**

**Solid Manure.** Solid manure may be collected and mailed in freezer bags if the manure is dry enough, otherwise use a bottle. When sampling solid manure, observe the pile and take as many samples as necessary to represent the variability you observe. Most piles will require a minimum of 20 samples. Mix the samples to make a single composite sample to mail to the laboratory.

**Liquid Manure.** Liquid or slurry manure should be agitated to obtain a representative sample. A good procedure is to sample every fourth or fifth load of manure as it is taken from storage. The samples can then be mixed for a single composite sample. Lab results for manure sampled in this manner will not be available as the manure is spread, but can be used as a guide for the next spreading activity.

**Lagoon.** The liquid layers of lagoons are quite uniform horizontally, but vary with depth. Sample the liquid from the depth of the pump intake. Lagoons need to be agitated (mixed/stirred) before pumping. Take samples after agitation. Much of the pumping equipment allows sampling while the pump is operating. This gives a more representative composite sample. Avoid floating or surface debris when taking the sample.

## When should I collect the sample, and how should it be handled?

Efforts should be made to minimize the elapsed time between sample collection and its arrival at the laboratory. Samples should not be allowed to remain in conditions of extreme heat, such as the trunk of a car or cab of a truck in the summer. Gases generated by bacteria in the sample can burst the sample container under these conditions. Sample bottles should have lids tightly closed and secured with tape. They should be mailed in a cardboard box large enough to allow packing material to be placed around the bottle. This will minimize the effects of rough handling in the postal system. Samples should be collected so that they can be mailed to the laboratory without being in the postal system over a weekend. Call MVTL Laboratories to coordinate delivery of your sample.



*Photo courtesy of USDA NRCS*



## What analyses should be run on the manure sample?

Generally, the nutrients, nitrogen, phosphorus and potassium (N, P and K) are of most interest in using manure as fertilizer. It is useful also to know the level of ammonia nitrogen, which makes up part of the total nitrogen in manure. Nitrogen is present in the inorganic (ammonia) form and the organic form. Inorganic forms of nitrogen are readily volatilized to the atmosphere and may have large losses unless the manure is incorporated or injected into the soil. MVTL manure reports provide an estimate of 1st year availability of nitrogen, phosphorous, and potassium based on application and incorporation methods.

## What is an acceptable time period between lab analyses and manure spreading?

In general, samples and analyses should be obtained as close to the spreading activity as reasonably possible. However, nutrient levels in manure storage structures do not change rapidly, and an elapsed time of 2 to 3 weeks is not likely to be critical. Seasonal changes do occur, however, and a manure analysis obtained in the spring should not be used for a fall application.

### To determine manure nutrient availability you need to answer several questions:

1. When will the manure be applied?
2. What is the target crop for manure nutrient utilization?
3. How will the manure be applied?
4. What type of manure is being applied?

## Manure Test Results

Total nitrogen, phosphorous and potassium are reported in percent and micro-nutrients are reported as parts per million on an as received basis. Total nutrient values are reported in lbs./1000 gallons and pounds/ton. Phosphorous is reported as P<sub>2</sub>O<sub>5</sub> and potassium as K<sub>2</sub>O.

### Conversion Factors

To switch from	Multiply by	To get
mg/l	1.0	ppm
ppm	0.0001	percent
ppm	0.00834	lb/1000 gal
ppm	0.002	lb/ton
ppm	0.2265	lb/acre-inch
lb/1000 gal	0.012	percent
lb/ton	0.05	percent
percent	83.4	lb/1000 gal
percent	20	lb/ton
percent	10,000	ppm
percent	2,265	lb/acre-inch
ton	2000	lb.
acre-inch	27,200	gallons
P (elemental)	2.29	P <sub>2</sub> O <sub>5</sub>
K (elemental)	1.2	K <sub>2</sub> O



Photo courtesy of USDA NRCS



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## MVTL Manure Analysis Testing

Manure nutrient content can be quite variable due to storage, environmental, animal feeding conditions, and animal species. Samples should be taken each year for several years to establish the value of nitrogen and other nutrients. To efficiently use fertilizer nutrients in manure, nutrient levels must be determined by laboratory analysis. Primary manure nutrients are nitrogen, phosphorus, and potassium.

MVTL provides a wide range of manure testing options which include:

1. Total nitrogen
2. Ammonia and ammonium nitrogen
3. Phosphorus (P or P<sub>2</sub>O<sub>5</sub>)
4. Potassium (K or K<sub>2</sub>O)
5. Moisture content (or dry matter)
6. pH
7. Soluble Salts
8. Cations (Ca, Mg, Na)
9. Micronutrients (S, Zn, Fe, Cu, Mn)

## Manure Lab Certifications

MVTL Laboratories is certified through the Manure Testing Laboratory Certification Program. This program administered through the Minnesota Department of Agriculture, assists laboratories in ensuring the accuracy and credibility of manure test results, promotes voluntary adoption of manure testing practices, and use of test results in nutrient management planning. These goals are accomplished through standardized manure analysis methods; laboratory proficiency testing; information and technical assistance provided to laboratories, educators and private industry; and promotion of manure testing and nutrient management planning services provided by laboratories, dealers, consultants, applicators and others.



**Check us out on the Web:**  
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