

How should results be reported?

Manure test results should be reported “as is” because that is the way manure will be land applied. If results are on a dry-matter basis, values can be multiplied by the manure dry-matter percentage (expressed as a decimal) to obtain the equivalent wet weight.

Example:

If total N = 2 percent dry basis and the sample is 60 percent dry matter, then $N = 2 \times 0.6 = 1.2$ percent wet basis.

Also, the nutrient content of the manure should be in the same units used in calibrating the land application equipment. That is:

Pounds per ton for solid manure

Pounds per 1,000 gallons for slurry manure

Phosphorus should be reported as P_2O_5 because this is the value used in fertilizer application planning. If results are in elemental P, $P \times 2.29 = P_2O_5$

Potassium should be reported as K_2O because this is the value used in fertilizer application planning. If results are in elemental K, $K \times 1.20 = K_2O$

How can manure analyses be used?

Using the NDSU Extension Service publication NM-1306, “North Dakota CAFO Operators Record Book,” the crop-available proportion of manure nutrients can be estimated. The manure nutrient analyses, combined with soil tests and crop nutrient requirements, can be used to determine the proper application rate for manure.

Conversion factors

If results are given in percent, parts per million (ppm) or milligrams per liter (mg/L), the following conversion factors can be used to get results in more usable forms:

Percent $\times 20 =$ pounds per ton

Percent $\times 83 =$ pounds per 1,000 gallons

Percent $\times 2,266 =$ pounds per acre-inch

ppm or mg/L $\times 0.002 =$ pounds per ton

ppm or mg/L $\times 0.0083 =$

pounds per 1,000 gallons

ppm or mg/L $\times 0.2266 =$ pounds per acre-inch

Need more assistance?

If you have questions about manure analysis or labs that conduct the tests, please contact your local Extension office.

You also can contact

Ron Wiederholt at (701) 652-2951 or
Teresa Dvorak at (701) 483-2348, ext. 108.

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For more information on this and other topics, see: www.ag.ndsu.edu

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Manure Sampling for Nutrient Management Planning

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Why sample manure?

Compared with commercial fertilizer, which has a guaranteed analysis, manure is highly variable in composition and nutrient availability.

Manure nutrient values depend on many things, including animal type, size, diet, bedding, weather, manure handling and storage systems.

Sampling and laboratory testing provides actual manure nutrient information that a crop producer needs to plan for maximum crop yields and minimal manure nutrient impact to the environment.

How should manure be sampled?

Separate samples should be taken from each manure storage site that represents a different animal type, size, age, diet, management practice, type of storage structure or other factor that could affect nutrient values.

Sampling solid manure

Collect 10 to 15 quart-sized subsamples using a spade or shovel from various locations and depths in the pile. Avoid sampling the dry top crust or other parts of the stockpile that may not be representative. Mix subsamples thoroughly in a bucket. Collect 1 to 2 pints and place in a reclosable plastic bag or plastic bottle with a lid.

Sampling liquid manure

Hog and dairy manure often is collected and stored as slurry. After the slurry has been agitated, usually two to four hours, a good sample can be taken. Five to six subsamples can be dipped from the storage structure or dipped from spreader tank loads and placed in a plastic bucket. A composite sample of 1 to 2 pints should be poured into a **plastic** sample bottle and sealed with a lid. Leave about 1 inch of air space in the bottle for expansion and gas production.

If the top area of the storage is accessible, as in the case of a pit under a slotted floor, a composite sample may be obtained without agitation. Extend a length of ½- or ¾-inch-diameter PVC pipe vertically down into the manure. Seal the upper end of the pipe with your hand, withdraw the length of pipe and empty the contents into a plastic sample bucket. Collect six or eight of these

Sampling from liquid storage areas can be dangerous.

You run the risk of falling into the manure or becoming overwhelmed by manure gases.

Let someone know when you will be working around manure storage units and take measures to insure good ventilation.

subsamples and deposit in a bucket. From the bucket, collect 1 to 2 pints in a plastic bottle with a lid. This method is not as accurate as sampling agitated slurry, but it allows sampling before land application begins.

How should manure samples be handled?

Contacting the lab before taking samples is best because each lab may have its own preferences for sample size, packaging and delivery. Some labs will furnish sample containers and mailers free of charge.

Manure constantly is changing in physical, chemical and biological characteristics. Samples should be placed on ice, in a cooler, when gathered during warm weather and delivered to the lab as soon as possible. If possible, freeze samples immediately after collection. Send samples early in the week to avoid weekend layovers.

What manure analyses are needed?

Total nitrogen (N), inorganic N, phosphorus as P_2O_5 and potassium as K_2O .

Total salts may be useful if salts are a problem in the soil to which manure is to be applied.