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Manures can be valuable sources of plant nutrients if they are tested to determine their nutrient content and applied to soils according to recommended fertilizer rates. Fertilizer recommendations should be based on soil fertility test, soil type, crop to be grown and yield goal, and past crop management.

Average amounts of nitrogen (N), phosphorus (P), and potassium (K) for chicken, beef, dairy, hog, horse, and sheep manures are provided in "Livestock Manure Management" (Bulletin MM-2) and other publications. Using these average nutrient contents for N-P-K in manure to estimate the amounts of nutrients added "per ton" or "per 1,000 gallons" applied is better than applying manure blindly with little regard to the nutrients being applied.

However, to achieve the most efficient utilization and greatest economical benefit of manure nutrients, you should test your manure to determine how many pounds of nutrients each ton or 1,000 gallons of manure can provide. Refer to MM-2 to estimate the amount of plant available $N\text{-}P_2O_5\text{-}K_2O$ in your manure. Obtain the fertilizer recommendations for each field based on a soil fertility test. Then determine the quantity of manure that can be applied to each field, as recommended by the Generally Accepted Agricultural and Management Practices adopted under the MI Right To Farm Act.

Sampling Livestock Manures

The most important part of testing manures (or soils) is getting a representative sample. For liquid manures, agitate or mix the manure in the pit, lagoon, slurry store, or other storage structure before taking samples. If complete mixing is not possible, combine samples taken from 10-15 different areas within the storage pit or sample at 10-15 different times during the removal of manure.

Mix these composites and fill a clean one pint plastic bottle about 3/4 full. Before sealing the bottle with its lid, squeeze the bottle to remove some of the excess air. This allows room for gas expansion during shipment without excess pressure building up.

For solid manures, take samples from 10-15 different locations of the manure stack or pile or take samples from 10-15 loads of manure when removing and applying manures in the field. Mix thoroughly and place about one pint or one pound of the composite manure sample into a clean, heavy duty plastic bag and seal. (Refer to NCR Exten. Pub. #567 for additional suggestions for collecting manure samples.)

For either a liquid or solid manure, refrigerate the sample overnight or longer and send it to one of the laboratories listed on the back.

These labs prefer UPS shipping early in the week. Use boxes with adequate packing to protect the sample container during handling. NO GLASS BOTTLES SHOULD BE USED! Each lab will provide sample bottles upon request and an information sheet that can be filled out and sent back with the manure samples. One lab suggests enclosing this sheet in a separate plastic bag which is a good idea.

Manure Analysis Results

Nutrient concentrations will normally be reported in lbs per 1000 gallons for liquid manures and lbs per wet ton for solid manure. Each of the laboratories listed below can provide ammonium-N (NH_4-N) analysis in addition to total N values. If your manure handling system includes aerobic treatment of manures during storage (e.g., use of aerators on a liquid manure basin), you should also request a nitrate-N (NO_3-N) analysis as well. (Without aeration, you can assume that NO_3-N concentrations make up 5% or less of the total N).

All NH_4-N and NO_3-N in manure is considered readily available for plants to use, while only a portion of the organic N (estimated by difference between total N minus the NH_4-H and NO_3-N) is released or mineralized for plants. With total N and NH_4-N analysis values, total N available for plant use can then be estimated by utilizing the "worksheet" in Bulletin MM-3.

This "worksheet" can also be used to calculate the amounts of P_20_5 and K_20 added by manure applications. Apply manure at rates recommended by the Right To Farm GAAMP, i.e., rates that match available manure nutrient additions with fertilizer recommendations based on soil fertility test information, the crop to be grown, and a realistic yield goal.

Lab Name and Address	Telephone	Lab Analysis Requested*	Cost
A & L Great Lakes Laboratories, Inc. 3505 Conestoga Dr. Ft. Wayne, IN 46808	219-483-4759	Basic Test M4	$45.00
Brookside Farms Lab. Assoc. Inc. Contact: Dennings & Associates, Inc. 7879 Upton Road Elsie, MI 48831	517-862-5615	Z001 & Z105	$39.00
Edgio Laboratories, Inc. 2121 E. Washington Blvd. Fort Wayne, IN 46803	219-424-1622	Basic Manure Test Package	$40.00
Research-Extension Analytical Lab Hayden Hall, Gerlaugh Dr. O.A.R.D.C. Wooster, OH 44691	216-263-3760	Standard Livestock Manure Test	$25.00
Soil & Forage Analysis Lab University of Wisconsin-Extension 8396 Yellowstone Drive Marshfield, WI 54449-8401	715-387-2523	Standard Manure Test plus NH_4-N Test	$27.50

*By requesting the indicated lab analysis, the manure analysis will provide percent moisture, total N, NH_4-N, P, and K, which is the basic information needed. In only specialized situations will analysis for additional nutrients provide useful information.

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