

The Value of Manure Testing

Jack Legg, CCA-ON
 Agri-Food Laboratories

Many producers, when calculating nutrient credits from manure application, will use published average values for their particular livestock class. Although these numbers are readily available through OMAFRA or from agricultural testing laboratories, average values are just that; an average. The actual databank of test results is very wide ranging, so much so that by merely picking an average value a producer may in fact be crediting too much or not enough.

There have been cases where growers were assuming a rate of phosphorus after multiple years of application, and after several years a soil test has shown much less available phosphorus than expected. For example, in 2009 the Agri-Food Laboratories databank of manure analysis shows that the average content of liquid sow manure is 0.06% P and 0.11% K, however the range of test values for P is 0.01% to 0.18%. The average values for solid dairy manure are 0.09% P and 0.25% K, with a range of P from 0.03% to 0.21%, and K from 0.07% to 1.20%.

The table below shows the difference in available P205 and K20 expected for these differing values.

Liquid Sow Manure	Low P%	High P%	Avg. P%
Test Results	0.01	0.18	0.06
Available P205 (lbs/1000 gal)	0.9	16.5	5.5
	Low K%	High K%	Avg. K%
Test Results	0.09	0.25	0.11
Available K20 (lbs/1000 gal)	3.2	27	11.9
Solid Dairy Manure	Low P%	High P%	Avg. P%
Test Results	0.03	0.21	0.09
Available P205 (lbs/ton)	0.5	3.8	1.6
	Low K%	High K%	Avg. K%
Test Results	0.07	1.2	0.25
Available K20 (lbs/ton)	1.5	26	5.4

To put the table into context, a producer applying liquid sow manure at 8000 gallons per acre, using these average values, is applying 44 lbs P205 and 95 lbs K20. However, if a manure test showed he had nutrients values at either end of the range, the actual lbs/ac could be as low as 7 lbs P205 and 26 lbs K20; or as high as 132 lbs P205 and 216 lbs K20. Although it is unlikely that any manure would test exactly at either end of the high-low range for both P and K, the example does show how extreme the differences can be when multiplied by a large application volume.

There are many factors that can influence the nutrient composition of manure, but the most predominate factor depends on the feeding program. Using feed ingredients such as phytase can lower the phosphorus content in manure. Different feed practices and ration formulations from farm to farm will definitely contribute to different manure test results, even between the same livestock type. Other factors that contribute to the different concentrations of manure nutrients are storage type (covered vs. open), different bedding materials included in the manure, and the dry matter content.

Although the nutrient content varies from farm to farm, once a producer has established their manure nutrient values with laboratory analysis, testing need not be done in subsequent years providing the feeding and storage facilities do not change. Testing manure every three years will be adequate to monitor variations in the nutrient profile. An investment of less than \$40 per manure sample every three years (< \$15 per year) that allows more accurate accounting of tens of thousands of dollars of nutrients, is a sound management decision.

Further benefits to knowing the nutrient content of each farm's manure include:

Calculation of land mass required to spread.

- If the manure test shows lower than expected nutrients, more volume per acre can be spread, perhaps reducing the land base required.
- This may in turn reduce hauling distances and the associated costs.

Reduction of commercial fertilizer

- If more nutrients are available than expected, commercial fertilizer rates can be reduced accordingly.
- Placing a dollar value on per ton or per 1000 gallon volume of manure.
- Knowing the dollar value enables the calculation of economical hauling distances.
- Where manure is traded or sold, the dollar value of the product can influence the negotiated rate.

As with any sample for testing, it is important that it be representative. Although it is difficult to make any large volume of solid or liquid manure homogenous, it is possible to extract a sample that is representative to the whole volume. See the article Manure Sampling Procedures for further information.