

The basics of manure testing

Manure testing is an important component of a nutrient management program. However, based on a 1997 survey conducted by the University of Pennsylvania in south-central Pennsylvania, 77% of the 994 responding farms reported “none” to manure nutrient testing. A Wisconsin study of 1179 dairy and beef operations concluded that although producers recognize the nutrient value of manure, few were attempting to credit manure nutrients. Even fewer were doing so in an accurate manner. There appears to be a manure sampling and testing void in nutrient management programs.

There are several advantages to manure testing. They include saving on fertilizer costs, refining application rates to meet crop requirements, demonstrating a commitment to protecting surface and groundwater quality, and serving as a data source for long-term farm plans. Because there can be discrepancies between book standards and measured farm data, it would be in the best interest of the farm owner to have manure nutrient values that are appropriate for the individual operation.

The objective of manure sampling is similar to that of testing forages and total mixed rations; collect a sample that represents the average composition, in this case, the manure source. The basic guideline is to collect multiple samples, mix them together to make a composite sample, and send it to the lab for analysis. Sample collection methods need to be adapted to the kind of manure storage and the application equipment. The greater the potential for variability in manure composition, the more individual samples that need to be mixed to form a composite. If some pattern in the composition of the manure is obvious, i.e. some manure is more liquid than others, separate composite samples may be best.

For liquid manure, sample agitated manure before application. It appears that 3 to 5 samples from well-agitated liquid manure are adequate to make a representative composite sample for testing total nitrogen, phosphorus and potassium. The first time a new manure storage is sampled, a sequence of composite samples from start to finish with separate analyses can provide information on any variation in the storage. It can also determine how well the agitation is really working. This information can be used to plan future applications on sampling.

For solid manure, it can take 10 to 40 small grab samples from a pile or bedded pack to make one composite sample. If piles have substantially different amounts of bedding, better information can be obtained by taking a separate composite from each pile or pack. After the collection of individual samples, mix the grab samples together and remove a composite sample for analysis. Approximately one quart of sample should be adequate.

Check with the laboratory to find out what kind of container to use, any preservation methods, and sample delivery information. Generally, laboratories prefer receiving samples in plastic containers with wide mouths and screw-top lids. Plastic bags are not recommended. Containers should be filled no more than two thirds full to allow room for gases produced by fermenting manure. The Penn State Agricultural Analytical Services has two manure testing packages. Manure test 1 costs \$28 and includes analyses for percent solids, total nitrogen, phosphorus, potassium and ammonium-nitrogen. This is the most frequent requested package. Manure test 2 is the same as 1 with additional analyses including calcium, magnesium, sulfur, sodium, copper, zinc, manganese, iron and aluminum. This package is most useful when information about metal application,

especially copper and zinc, is needed. The cost of this package is \$42. Carbon analysis is available with either package for an additional \$9.50. More information on testing services can be obtained by visiting the web site at <http://www.aasl.psu.edu/Smanure.html> or the nutrient management web site at <http://nutrient.psu.edu> under dairy, manure.