

Step 1: Getting a Manure Sample

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Introduction

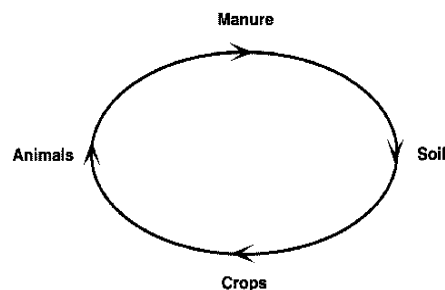
On farms that have livestock, including dairy and beef cattle and sheep, livestock manure is usually the most important nutrient source for growing crops. Manure contains major plant nutrients like:

- Nitrogen (N),
- Phosphorus (P) and
- Potassium (K),

and nutrients required by plants in much smaller amounts, such as

- Boron (B),
- Copper (CU),
- Manganese (Mn) and
- Zinc (Zn).

Nutrient management on dairy and livestock farms is complicated, with nutrients moving among all parts of the farm:



Manure Cycle on the Farm

The first step in managing these nutrients is getting a manure sample, and having it analyzed for nutrient content. This fact sheet describes procedures for sampling solid and liquid manures.

When and Where to Sample

A good manure sample lets you calculate the amount of nutrients applied to a field. The nutrient content of manure changes significantly during handling and storage, so you want to obtain a sample near the site of application. For spring applications of solid manure, sample when the stack thaws. Liquid manure should be agitated before sampling (as discussed later), so sampling will need to be done near the time of application.

Solid manures should be sampled out of stacks, because this represents what is actually applied. There are large differences between manure taken fresh from the barn and that stacked for several months. If you have both new stacks and stacks that have overwintered, sample them separately. Remember the main goal: to get a representative sample — a sample that approximates what is applied in the field.

Sampling Solid Manure

The equipment you'll need for sampling solid manure is a:

- Five-gallon plastic bucket,
- Narrow spade or shovel, and
- One-quart or one-gallon plastic freezer bag.

Take six to eight samples from different places in the stack. If the manure is too soft to walk on, either place a plank on the stack or circle the stack, taking samples. Make sure to dig through the crust before taking a sample. The crust is much lower in nutrients than the interior of the stack.

Solid manure can also be sampled out of the spreader box (some people find this easier). Simply take small samples from five to 10 loads, collecting them in the large bucket. After taking enough samples, mix well and take a composite sample to be analyzed. It is important to keep the manure in the bucket cool during the collection period. If it warms up, it will turn organic N to ammonium and nitrate.

With either of the methods described above, place the 5 to ten samples in the bucket as they are collected, and mix them thoroughly. Turn the plastic freezer bag inside out over your hand, and use it as a glove to sample from the bucket. (It is neater than shoveling into the bag, believe me.) Squeeze the air out of the bag, and seal it.

Keep the sample in a cooler. If it will be days or weeks before it travels to the lab for analysis, freeze it.

Sampling Liquid Manure

With many recently built concrete or earthen liquid manure storages, most or all of the manure from the farm is put in one place. The trick with sampling a liquid manure system is to get a representative sample, since solids and liquids will quickly separate in storage. For this reason, samples should be taken after the manure is thoroughly agitated.

There are several ways to get a sample of liquid manure:

- From the pit, #1: Some people use a can or bucket on a rope, which is thrown into the manure storage. The sample is collected as the bucket is "pulled to shore." This is a messy method, and the manure must be agitated (since only the top of the storage is sampled).
- From the pit, #2: Probes made from two PVC pipes, with one fitted tightly inside the other, can also be used. Each pipe has holes drilled into it, and by turning the outside pipe the holes can be aligned (allowing manure in) and then closed (to keep sample). Samples are taken from several locations and mixed in a five-gallon plastic bucket.
- During loading: This is probably the simplest method. If it is possible to slow pump speed during loading, you can easily take a sample in a one- to two-gallon bucket at the end of the load pipe. If this is not possible, use a small pail or can to "dip" a sample out of the spreader. With either method, take a small sample from every fifth or 10th load, and mix these in the five-gallon bucket.

- During spreading: This is also a simple method, and truly measures the nutrient content of manure as it reaches the field. Place three to six buckets or trays at several locations in the field, spread, and correct the container contents in a five-gallon bucket. This is messy but effective.

With all of these methods for sampling liquid manures, the final sample (taken from the five-gallon bucket) should be poured into a jar and frozen until it is sent in for analysis. Fill the jar 2/3 to 3/4 full, to allow for expansion.

Conclusion

Take manure samples regularly, at least once per year. If you make major changes in rations, bedding, handling or storage, get a new analysis. Remember, the analysis is only as good as the sample.

For more information on water quality concerns, contact your county Extension office.

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