

■ **Composted waste.** Use the same storage and sampling procedures recommended for stockpiled litter. Although nutrients are somewhat stabilized in these materials, leaching of mobile nutrients can occur during rains. Therefore, sample unprotected compost periodically to monitor changes.

### Submitting the sample

Submit samples, the appropriate fee and a completed *Waste Sample Information* form (form AD-9). Information forms are available online [select **Information Forms** from the Agronomic Division home page]. You can also pick them up at any Cooperative Extension office or from the Agronomic Division office.

Use permanent ink to fill out the form. For the most reliable estimate of nutrient availability, provide all the information requested, and select the correct waste identification code and application method from the choices listed. If the codes do not seem to apply to your material, then add a statement describing the waste in the **SAMPLE DESCRIPTION / COMMENTS** section.

Always put samples in the owner's name to facilitate information retrieval. It is best to ship samples via a private carrier to the division's physical address. Personal delivery is also acceptable. Do not ship waste samples via U.S. Mail. Do not put fees or information forms inside plastic bags containing waste material.

### Obtaining the report

Waste samples are usually processed within three days, depending on sample load. N.C. residents can access their reports online [select **Find Your Report** from the Agronomic

Division home page] and/or wait to receive reports through the mail. Mailed reports come with an explanatory cover sheet. These cover sheets are also available online [select **Publications** from the Agronomic Division home page].

NCDA&CS regional agronomists are available throughout the state to provide advice on sampling, interpreting report results and implementing recommendations. Names, county assignments and contact information are available online at [www.ncagr.gov/agronomi/rahome.htm](http://www.ncagr.gov/agronomi/rahome.htm).

## North Carolina Department of Agriculture and Consumer Services

Steve Troxler, Commissioner of Agriculture

### Agronomic Division Plant/Waste/Solution Section

Physical Address: 4300 Reedy Creek Road  
(DHL, FedEx, UPS) Raleigh, NC 27607-6465

Mailing Address: 1040 Mail Service Center  
(U.S. Postal Service) Raleigh, NC 27699-1040

Phone: (919) 733-2655

Web site: [www.ncagr.gov/agronomi/](http://www.ncagr.gov/agronomi/)

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## Sampling for Waste Analysis



The Agronomic Division analyzes agricultural, municipal and industrial wastes for plant nutrient concentrations and chemical properties pertinent to their agronomic use. Waste is often land-applied to provide nutrients for forage, field or forest crops and to improve soil physical properties. At agronomic rates, these applications are both agriculturally beneficial and environmentally safe.

Owners of waste products have the responsibility to use them in environmentally safe ways. Nutrients taken up by plants or retained in the soil do not pose a threat to water resources. Environmental impact is most likely to occur when wastes are applied 1) at excessive rates, 2) at times when crop demand is low or 3) on slopes vulnerable to excess surface movement of water. Complete information on nutrient management regulations is available from the N.C. Department of Environment and Natural Resources.

Waste analysis provides data on fertilizer value, pH, potential hazards and lime equivalency, if applicable. This information enables farmers to 1) save money by reducing use of commercial fertilizer and liming materials, 2) use agronomic application rates that minimize movement of nutrients into surface and ground water and 3) prevent buildup of toxic levels of heavy metals in the soil.

## How and when to collect samples

The value of waste analysis depends on the quality and timing of the sample. Ideally, you should take samples as close to the time of application as possible, especially for wastes that are not protected from rainfall.

In most cases, guidelines for sampling major sources of waste are clearly established. However, when information on sampling is insufficient, use a common-sense approach. In all cases, the sample must truly represent the bulk of the waste material for test results to provide valid recommendations for use.

## Sampling liquid wastes

Always place liquid-waste samples in plastic containers since glass and galvanized metal can cause contamination. Use a one-pint container, filled about three-fourths full, and securely capped. Label the container with your name and the identifier that you assigned to the sample when you entered it on the *Waste Sample Information* form. Refrigerate samples if they are held for more than a day before shipping.

■ **Lagoon liquid.** Premixing the lagoon is ideal but not essential. If the lagoon is a two-stage system, draw samples from the lagoon that will be pumped. Do not include floating debris and scum in the samples.

Take subsamples from 10 to 12 sites around the lagoon. A 10-foot rod with a 1-pint container attached to the end serves as a good sampling device. Collect samples at least 6 feet from the edge of the lagoon to a depth of about 1 foot. Shallower samples from an anaerobic lagoon are not acceptable because oxygen transfer near the surface can alter the chemistry

of the solution. After collecting subsamples, mix them thoroughly in a plastic container (such as a bucket) and submit 1 pint of the mixture to the laboratory.

■ **Liquid slurry.** Premixing the slurry in a pit or storage basin prior to sampling is ideal. Collect subsamples from 10 to 12 areas of the pit and from different depths. Mix the subsamples thoroughly in a plastic container.

An 8- to 10-foot section of 1/2- to 3/4-inch pipe can be used to collect samples. Insert the pipe into the pit, and press a thumb over the end to create an air lock. Remove the pipe from the waste, place it over the sampling container and release the air lock.

Do not rinse the sample into the container because this will dilute the results. However, if you plan to add water to the waste prior to application, then adding the proportionate amount of water to the sample is appropriate.

## Sampling solid wastes

Solid waste analysis includes an assessment of moisture content. This information makes it possible for nutrient concentrations to be converted to a wet basis after analysis. As a result, it is very important that the sample submitted represent the average moisture of the waste product.

Use a shovel or a specially designed pipe to take slices or cores to a uniform depth. Put a 1-pint sample in a plastic container, such as a heavy-duty, zippered, plastic bag. Refrigerate samples that will not be shipped immediately.

■ **In-house solid waste.** The concentration of nutrients in poultry litter varies widely—both from house to house and within each house. Often, waste from a single house will be

collected for application. In such cases, sample the waste from each house separately.

Collect waste cores or slices from 10 to 12 locations in each house. Cores or slices should extend from the top to the bottom of the accumulated waste. Take samples around waterers, feeders and brooders in proportion to the space these areas occupy in the house.

Combine all subsamples in a plastic container, and mix thoroughly. Submit 1 pint of this mixture as your sample.

■ **Below-house solid waste.** In a high-rise system, manure accumulates below the cage area. Under a properly managed system, the manure is fairly uniform in moisture and appearance. However, if some areas of manure differ in appearance, take samples in proportion to the size and number of these areas. For example, if 10 percent of the manure differs from the bulk of the pile, then take 10 percent of the total sample from those areas. Otherwise, sample randomly throughout the entire waste accumulation area.

■ **Stockpiled litter.** Always collect 10 to 12 subsamples to a depth of at least 18 inches. Ideally, stored litter has an impervious surface beneath it and a cover over it. Uncovered waste develops a weathered exterior that will not accurately represent the majority of the material because rainfall moves water-soluble nutrients through the pile. If the litter is unprotected and used over an extended period, take new samples before each application.

■ **Surface-scraped manure.** Surface-scraped and piled materials are similar to stockpiled litter. They need protection from the weather. Follow the same procedures when collecting samples.