

What should you test for in your compost feedstocks?

What should you test for in compost?

Here are some suggestions for feedstocks:

If you are using a new feedstock, it is useful to test for the following:

1. C:N ratio (the ratio of total carbon to total nitrogen)
2. Moisture content (how much water the material contains--%)
3. Ash content (how much non-organic material the feedstock contains-%)
4. Total nitrogen (usually expressed on a dry weight or wet weight basis)
5. pH (the acidity or alkalinity of the feedstock; should be between 5-9)
6. Bulk density (the weight per unit volume; usually expressed as lbs./cubic yards)
7. Particle size (the size of the particles in the feedstock; usually expressed in inches or centimeters).

You can have a state Soil Testing Lab or a commercial lab analyze carbon, nitrogen, moisture content, pH and ash content. You can then calculate the C:N ratio from the total C (%) and total N (%) values. If they don't do total C, you can estimate the %C from the ash content using the equation described in the "Art and Science of Composting" booklet.

You measure bulk density yourself by filling a 5-gallon bucket with the feedstock and then weighing it on a scale. The bulk density would be the weight (lbs) per 5 gallons (the volume). You can then convert gallons to cubic yards using a conversion factor of 40.

You can estimate particle size visually by inspecting the feedstock. If it is a manure or fine material, the particle size will be less than 0.5". If it is a yard waste, it might have twigs or stems close to 3" long. If it has a mixture of different particles, try to get an average particle size of the whole feedstock.

Here are some suggestions for finished compost:

1. C:N ratio
2. total nitrogen
3. total carbon or organic matter
4. plant available nitrogen (nitrate and ammonium) concentrations
5. pH
6. electrical conductivity or soluble salts
7. biological stability (using some measure of microbial respiration; e.g. Solvita Compost Maturity test)
8. moisture content
9. bulk density
10. presence of non-desirable materials (glass, plastics, "trash")

11. essential plant nutrients (phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S), boron (B), iron (Fe), manganese (Mn), copper (Cu), zinc (Zn)
12. presence of “heavy metals” (lead (Pb), chromium (Cr), cadmium (Cd), nickel (Ni)
13. phytotoxicity (toxic to plants; usually done with a seed germination test)

It is important to get a full fertility (organic matter, nutrients, pH, soluble salts) profile of your compost, particularly if you're making compost for the first time or changing feedstocks. Labs will either analyze total amounts of nutrients or “plant available” forms. You should ask them what type of tests they offer. If you want to know the amounts of plant available nutrients only, request that they do a “saturated paste or media” extract of the compost. This test will give you amounts of nutrients that are most soluble in water. If you only ask for total nutrients, in most cases, you can't assume that the total amounts of nutrients present will be available for crop uptake. In fact, very little of the total nitrogen is available to crop (usually less than 10% of the total) in the first growing season.

You can provide this information to potential customers if you are selling the compost. If you're using it on your own farm, you will know how the compost might affect your crops' growth. For most of the chemical analysis (organic matter, nutrients, pH), you can request these tests from a state or commercial soil and plant analysis lab. There are labs that specialize in testing compost (e.g. Woods End Research Labs), and they will provide you with an interpretation of the results oriented toward compost use. Most soil testing labs don't offer tests of biological stability or phytotoxicity. Labs that specialize in testing compost will offer those types of analyses. The US Composting Council has a list of approved compost testing labs that is part of their Seal of Testing Assurance (STA) program.