



UConn Home & Garden Education Center

FERTILIZING WITH MANURE AND COMPOST

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Manure and compost are sources of plant nutrients and organic matter. Proper manure and compost applications can increase plant yield and quality, improve soil quality, increase the ability of soil to hold water and improve plant resilience to drought. However, improper manure and compost applications can cause environmental pollution.

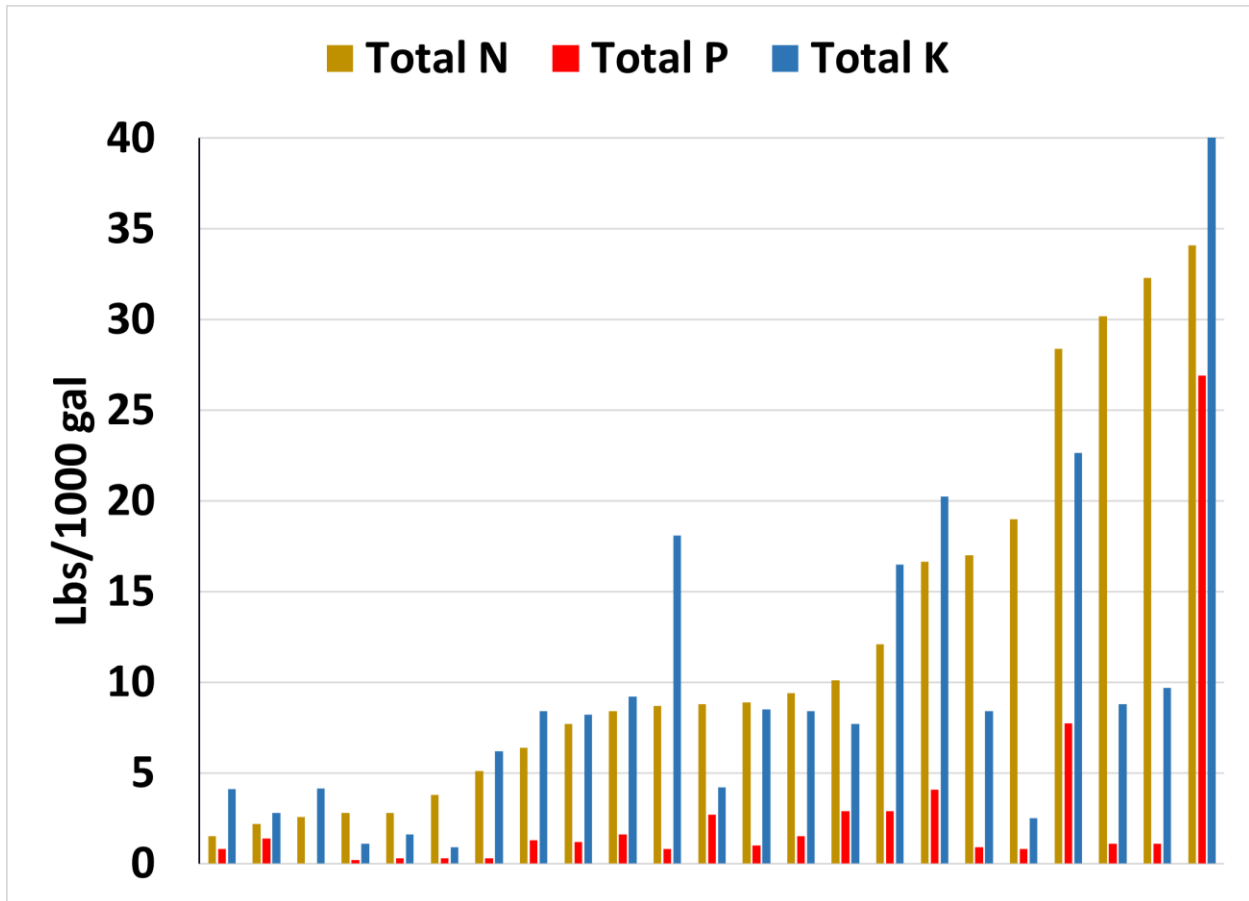
Manure and compost provide many essential nutrients for plants, such as nitrogen, phosphorus, potassium, magnesium, sulfur, etc. Nutrients concentrations in manure and compost vary. For example, the accompanying graph shows the great variability in total nitrogen (N), total phosphorus (P), and total potassium (K) concentrations in 23 dairy manure samples. This illustrates the importance of testing your manure and compost for nutrient concentrations to determine the right application rate for your soil and your plants, if the products that you purchase do not have such information. Not knowing the nutrient content of manure can lead to under or over applications of nutrients. Remember that the amount of manure and compost application should be based on your crop need and soil test. Soils with high to excessive levels of nutrients, especially nitrogen and phosphorus, are not a good choice for manure and compost applications because the nutrients in manure are less likely to benefit crops and more likely to be lost to from the fields and become pollutant to the environment.

Farmers may want to test their manure for nutrients to determine application rates. Sampling fresh manure for lab testing is tricky. Before you take samples, you should contact the laboratory that you intend to send samples to for their instructions. The laboratory will inform you of specific containers they prefer, number of samples they need for analyzing nutrients that you request, and the shipping instruction. Unfortunately, the UConn Soil Nutrient Analysis Lab does not have the ability to test manure or compost. The UMaine and Penn State labs along with some private labs can do so.

Home gardeners who purchase bagged manure or composts from retail stores may find a nutrient analysis on the bags. If not, one suggestion is to apply about an inch of the material on your garden beds, incorporate it into the top 4 to 6 inches of soil, wait about a month and then send in a soil sample to the UConn soil lab. You can find out if any pH or nutrient modifications are necessary before planting.

Manure and compost normally have unbalanced nutrients compared with your plants' needs. This unbalance refers to more phosphorus than nitrogen being available in manure compared

with crop needs. For example, if you apply manure to meet nitrogen needs of your plants, you likely are overapplying phosphorus, the number one inland freshwater pollutant in Connecticut. If you apply manure to meet the phosphorus needs of your plants, you likely do not provide sufficient nitrogen for your plants and may need to make up the difference using a nitrogen containing fertilizer. If you apply manure or compost to meet nitrogen needs, you should test your soil phosphorus concentrations annually because this practice can cause build up of phosphorus in your soil. For agricultural crops, 10 ppm (20 pounds/acre) measured using modified Morgan (which the UConn soil lab uses) is sufficient for your crops. Your plants are unlikely to benefit from additional phosphorus from either compost or manure applications.



Raw manure contains nitrogen in both inorganic and organic forms. The inorganic forms of nitrogen can be immediately available for plants, but if the raw manure is applied on soil surface, much of the inorganic nitrogen is lost to the atmosphere within a few days. The loss can be greater and faster in warm, dry, and windy conditions. So, incorporating manure immediately, if not, within two days after application with a harrow or disc or pitchfork, or irrigation immediately after application during dry seasons, can reduce nitrogen loss. However, with manures that are high in organic forms of nitrogen but low in inorganic forms of nitrogen, such as beef solid manure and horse manure, incorporation is unnecessary for the purpose of reducing nitrogen loss.

The organic forms of nitrogen will be released gradually during the crop growing season to feed the plants. It is worth pointing out that horse manure or manures with lots of woody bedding may temporarily reduce nitrogen availability after application. This is because soil microorganisms must use nitrogen in the soil in order to decompose horse manure that has high carbon and nitrogen compared with the needs by soil microorganisms. The soil nitrogen that is consumed by soil microorganisms becomes unavailable for plants, until these microorganisms die and the decomposition of their body residue releases the nitrogen.

If you have been applying manure or compost to your field or gardens for several years, organic matter accumulated in the soil may be able to provide sufficient nutrients for your plants. To avoid over application, it is important to test your soil organic matter content, potential available nitrogen, along with other plant essential nutrients.

Raw manure and improperly composted manure products may not be a good choice for salad and root crops that are eaten raw because of food safety concerns. According to U.S. Food and Drug Administration, raw manure may contain foodborne pathogens, such as *E. coli* O157:H7 and *Salmonella*. If contaminated manure is applied to crops that are consumed raw, the pathogens may be transferred to human. Visit the UConn Soil Nutrient Analysis website (www.soiltest.cahn.uconn.edu) and check out their fact sheet entitled: Compost-Compost-Tea-Manure-Food-Safety-Implications.

For questions on using manure or compost in the garden or for testing information, feel free to contact the UConn Soil Lab at (860) 486-4271. For all your other gardening questions, contact the UConn Home & Garden Education at (877) 486-6271 or www.homegarden.cahn.uconn.edu or your local Cooperative Extension Center.