

# How compost delivers nitrogen to the soil

Because it is the microbial community in soil that provides nutrients for plant growth, it is important to “feed” the soil only what the microbes can utilize efficiently and productively. Plants break down the nitrogen in the compost slowly and steadily as the health of the soil generally improves.

**As an example**, if a homeowner added the recommended rate of one inch of compost per square foot over 1,000 square feet a year (approximately one ton of compost) that would deliver about 20 lbs of nitrogen to the soil.

However, not all the 20 pounds of nitrogen is available to the plants because they need to break it down to ammonium or nitrate nitrogen, which is the only form of nitrogen plants can consume.

**The first year** 10% or two pounds of the nitrogen in this ton of compost is available to the plants.

**The second year** 3-5% or approximately one pound (of the original 20) is available to the plants.

**In the third year** only 1-3% of nitrogen or one half pound is available.

Thus only 3 to 3 ½ pounds of the original 20 pounds of N is available over a three-year period. The rest is lost, mostly to the atmosphere.

Therefore, when a gardener applies city compost at the rate of one ton (or 1 inch per 1,000 square feet) year after year, the compost is providing 3 pounds of nitrogen per 1,000 square feet, which is what most plants need to thrive and produce vegetables and flowers abundantly.

Our area soils in western South Dakota are generally understood to have between 1.5 and 3% organic matter. The ideal soil is usually determined to have between 5-6% organic matter. Yearly applications of approximately one inch of compost, incorporated approximately 6-8 inches deep (the root layer of the soil) in the fall will steadily improve the percentage of organic matter in the soil. You will see the health of the soil, the vigor of the plants, the improved ability of the soil to hold moisture and the reduced need for additional fertilizer and/or pesticide/herbicide use.

The fine screened (3/8”) compost can also be used as a ½ to 1” top dressing on flower and vegetable gardens.

All persons wanting to use compost to improve soil in home gardens are encouraged first to obtain a soil test of all areas that will receive compost. (The test kits are available at the Pennington County Extension Office, tel. 394-2188 for a modest fee. Soil samples will be sent to South Dakota State University for analysis.)