CALCULATING A COMPOST APPLICATION RATE BASED ON FERTILIZER NEEDS

1) First, you need a fertilizer recommendation based on a soil test. For more information on soil sampling, see CSU factsheet 0.500. For more information on selecting a laboratory, see CSU factsheet 0.520. These factsheets are available at: http://www.ext.colostate.edu/pubs/crops/pubcrop.html#soil

2) Fertilizer recommendations are typically made as lbs N, P_2O_5, or K_2O per acre. Be sure to use the corresponding analysis from your compost test report. Convert these figures to lbs/ton by multiplying % by 20.

3) Since compost is like a slow-release fertilizer, we assume only 20% of the N in the compost will be plant-available the first year after it is applied. For phosphorus, we assume 40%. For potassium, we assume 60%. These are rough estimates of availability. Multiply your compost analysis by these availability factors.

4) Then step-by-step, calculate your N, P_2O_5, and K_2O needs by dividing the lbs/acre required by the lbs/ton in the compost. The result will be in tons of compost to apply per acre.

Example:
The soils lab recommends 100 lbs N/acre and 40 lbs P_2O_5/acre.
The compost results show 1.7% N, 1.3% P_2O_5, and 1.5% K_2O.
How much compost should you apply?

First, convert compost results to lbs/ton.

1.7% N x 20 = 34 lbs N/ton
1.3% P_2O_5 x 20 = 26 lbs P_2O_5/ton
1.5% K_2O x 20 = 30 lbs K_2O/ton

Then, correct for availability.

34 lbs N/ton x 0.20 = 7 lbs available N/ton
26 lbs P_2O_5/ton x 0.40 = 10 lbs available P_2O_5/ton
30 lbs K_2O/ton x 0.60 = 18 lbs available K_2O/ton

Finally, divide the fertilizer recommendations by the available nutrients.

$$\frac{\text{100 lbs N/acre}}{\text{7 lb av. N/ton}} = \text{14 tons/acre}$$

$$\frac{\text{40 lbs } P_2O_5\text{/acre}}{\text{10 lb av. } P_2O_5\text{/ton}} = \text{4 tons/acre}$$