Commercial Nutrient Handler Calculation Review

What does a fertilizer label tell you?

Fertilizer bag reads: 15-10-10

This is the percent N-P-K by WEIGHT. If you have a liquid fertilizer you need to know how much it weighs per gallon to be able to figure out how much fertilizer you are applying.

(Actually, the analysis 15-10-10 is the percent N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O by weight, but the test will not require you to convert between the oxide forms of P and K and elemental P and K. For all of the following examples we will SAY P and K but in reality we are calculating P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O)

Sample Questions

1. You have a 70lb bag of 0-46-0 fertilizer. This bag will supply how many lbs of:
   a. N ?
   b. P ?
   c. K ?

2. You have a 50 gallon tank of 10-15-10. Each gallon weighs 11 lbs. This tank will supply how many lbs of:
   a. N ?
   b. P ?
   c. K ?

3. You have a 40 lb bag of 10-10-10. This bag will supply how many lbs of:
   a. N ?
   b. P ?
   c. K ?
4. When we calculate the amount of fertilizer needed to supply a certain amount of N, P, or K we need to know:

1. How much N, P or K is needed per unit area (1,000 square feet, acre, etc.)
2. The analysis of the fertilizer (percent N, P, and K)
3. How much fertilizer do we need per unit area? Divide #1 by the percentage given in #2. Note that 10% would be 0.10 !
4. How much area we need to fertilize.

Take this example: you are told you need to apply 2 lbs of N per 1,000 square feet, that the fertilizer you have available is a 30-0-0, and that you are going to fertilize 150,000 square feet. The easiest way to calculate this:

Step 1. How much N do we need? We need 2 lbs per 1,000 square feet
Step 2. What is the fertilizer analysis? It is a 30-0-0, which means it is 30% N by weight (or 0.30)
Step 3. How much fertilizer do we need per 1,000 square feet? Divide 2 by 0.30 (30%), which gives you 6.66 lbs of fertilizer per 1,000 square feet.
Step 4. How much area are we fertilizing? We have a total of 150,000 square feet, which means that we multiply by 6.66 lbs by 150, giving a final answer of 1,000 lbs of fertilizer.

Sample Questions

1. You need to apply 2 lbs of N per 1,000 square feet. You have a 15-10-10 fertilizer available, and the total area to be fertilized is 3 acres. How much fertilizer will you need? (Given: an acre is 43,560 square feet)
2. You need to apply 60 lbs of N, 50 lbs of P₂O₅, and 65 lbs of K₂O per acre. If DAP fertilizer (which is 18-46-0) is used to supply the phosphorus recommendation, how many lbs per acre of urea (which is 46-0-0) will be needed to meet the nitrogen recommendation? How much potassium oxide (0-0-60) will be needed to meet the K requirement?
3. A fertilizer spreader has an application width of 7 feet. A 100-foot long area is used for calibration of a 25-5-3 fertilizer. If 5 lbs of fertilizer is collected from this calibrations area, what is the rate of potassium that is being applied per acre with this fertilizer? (Given: an acre is 43,560 square feet)
4. An organic material that contains 4% total nitrogen is applied to the soil at a rate of 60 pounds per 1,000 square feet. The nitrogen recommendation is 4 pounds of available nitrogen per 1,000 square feet. If it is assumed that 60% of the nitrogen in the organic material (i.e. manure) will mineralize to available nitrogen for this crop, how many pounds per 1,000 square feet of ammonium sulfate (which is 21-0-0) should be applied to meet the nitrogen recommendation?