Fertilizer Injection Simplified

1. (Nitrogen) Lbs. fertilizer needed $= \dfrac{\text{(desired ppm N) (gal. in stock tank) (proportioner ratio)}}{\text{(\% N in fertilizer) (1200)}}$

2. (Potassium) Lbs. fertilizer needed $= \dfrac{\text{(desired ppm K) (gal. in stock tank) (proportioner ratio)}}{\text{(\% } K_2O \text{ in fertilizer) (1000)}}$

3. (Nitrogen) Final ppm N $= \dfrac{\text{(\% N in fertilizer) (lb. fertilizer) 1200}}{\text{(gal. in stock tank) (proportioner ratio)}}$

4. (Potassium) Final ppm K $= \dfrac{\text{(\% } K_2O \text{ in fertilizer) (lb. fertilizer) 1000}}{\text{(gal. in stock tank) (proportioner ratio)}}$

A. Lbs. KNO_3 needed $= \dfrac{\text{(200 ppmK) (50 gal.) (100)}}{\text{(44\%) (1000)}} = 22.7$ or 23 lb. KNO_3

B. ppm N $= \dfrac{\text{(13\%) (23 lb.) (1200)}}{\text{(50 gal.) (100)}} = 72$ ppm N

C. Lbs. NH_4NO_3 needed $= \dfrac{\text{(128 ppm N) (50 gal.) (100)}}{\text{(33\%) (1200)}} = 16$ lb. NH_4NO_3

This month, Michigan State University's Dr. Royal Heins helps take some of the work out of greenhouse fertilizer calculations.

The following combinations will give 200 ppm nitrogen and potassium when placed in a 50 gallon stock tank with a 1:100 fertilizer injector.

Combination	Ammonium nitrate	Potassium nitrate	Calcium nitrate	Potassium chloride
1	25 lb.	—	—	17 lb.
2	16 lb.	23 lb.	—	—
3	22 lb.	11 lb.	—	8 lb.
4	—	23 lb.	33 lb.	—

VO.2 1 (3)

Figuring out how much fertilizer to add to a stock tank for a particular feeding program *can* be a real mathematical chore. But it doesn't have to be.

1 & 2 Formulas 1 and 2 are easy techniques for calculating how much fertilizer to add when the desired final nutrient concentration is known.

3 & 4 When mixing nitrogen and potassium fertilizers together (e.g. potassium nitrate and ammonium nitrate) one must first calculate the quantity of potassium fertilizer needed. Next the remaining amount of nitrogen fertilizer needed must be calculated. Formulas 3 and 4 allow the calculation of a final ppm concentration when a known amount of fertilizer is added to the tank.

An example: a 200 ppm nitrogen/200 ppm potassium feed is required. The sources are potassium nitrate (13-0-44) and ammonium nitrate (33-0-0). The injector has a proportioner ratio of 1:100, and the stock tank holds 50 gallons.

A. Since N and P fertilizers are being mixed, formula 2 would be employed first. See example A.

B. Next, the nitrogen contribution of the 23 pounds of KNO_3 would have to be calculated. This requires formula 3, as shown in example B.

C. The 72 ppm is subtracted from the required 200 ppm. Another 128 ppm of nitrogen is needed from the ammonium nitrate, requiring the use of formula 1. This is shown in example C.