



Manufacturing a Fertilizer

Many details and considerations must be made when calculating a guaranteed analysis and developing a label for a manufactured fertilizer product.

The first step is to determine the nitrogen (N), phosphorous (P), and potassium (K) percentages for the guaranteed analysis of the fertilizer product. An example of this process is below.

Example:

You are manufacturing a proprietary blend by mixing 500 pounds of 20-0-5 granular fertilizer into 500 gallons of water (sometimes called “melting fertilizer”).

- 20 lbs. Nitrogen (N), 0 lbs. Phosphorus (P), and 5 lbs. Potassium (K) are in 100 lbs. of the fertilizer product.
- Fertilizer total weight is **500 lbs.** (5 units of 100 lbs. of fertilizer.)
- Total Nitrogen is 20 lbs. (N x 5 units) = **100 lbs. N**
- Total Phosphorus is **0 lbs.** (zero in the granular fertilizer.)
- Total Potassium is 5 lbs. (K x 5 units) = **25 lbs. K**
- 1 gallon of water weighs 8.3 lbs.
- Water total weight is 500 gallons x 8.3 lbs. = **4,150 lbs.**
- Total batch weight is 4,150 lbs. of water + 500 lbs. of fertilizer = **4,650 lbs. total batch weight**

To Determine % Guaranteed Analysis of Fertilizer:

Formula: fertilizer weight / total batch weight x 100* = % by weight of nutrient

100 lbs. N / 4,650 lbs. batch = 0.0215 x 100 = 2.2% Nitrogen

0 lbs. P / 4,650 lbs. batch = 0.00 x 100 = 0% Phosphorus

25 lbs. K / 4,650 lbs. batch = 0.0054 x 100 = 0.5% Potassium

*The number 100 is a constant used to convert the concentration to a percentage (%) value.

Guaranteed analysis of batch = 2.2 – 0 – 0.5 (N – P – K)

Fertilizer manufacturers are required to develop a product label containing specific information. The following information must be present on the label in order for it to be in compliance:

Packaged Fertilizer Label:	Bulk Fertilizer Label:
<ul style="list-style-type: none"> Name and address of the manufacturer or distributor Product name Fertilizer grade (primary nutrients N, P K) Guaranteed analysis Net weight of fertilizer in the package Use directions and relevant hazard caution statements 	<ul style="list-style-type: none"> Name and address of the manufacturer or distributor Name and address of recipient Date of delivery Product name, if any Fertilizer grade (primary nutrients N, P, K) Guaranteed analysis Net weight of each lot or load

Example Fertilizer Labels:

Package:

Business Name 101 Street Address City, WI, 50000 (123) 456-7890	Special Lawn Blend 2.2 – 0 – 0.5 <i>Guaranteed Analysis</i> Total Nitrogen (N)..... 2.2% 0.5% Urea Nitrogen Total Phosphorus (P)... 0.0% Total Potassium (K).....0.5% Derived from urea and muriate of potash
Use Directions: Turf: Apply at a rate of 2 gallons per 1,000 sq. ft.	
Net weight 40 lbs.	

Bulk label statement for each delivery:

Business Name 101 Street Address City, WI, 50000 (414) 234-4321	Special Lawn Blend 2.2 – 0 – 0.5 <i>Guaranteed Analysis</i> Total Nitrogen (N)..... 2.2% 0.5% Urea Nitrogen Total Phosphorus (P)... 0.0% Total Potassium (K).....0.5% Derived from urea and muriate of potash
Customer: John Smith 123 Oak Street Town, WI 54123	Use directions as applicable
Date of delivery: June 1, 2022	
Net weight 40 lbs.	