

# Understanding Your Fertilizer Bag

### A COMPLETE GUIDE

Developing a better understanding of the fertilizers you buy and apply can help make a big difference in how you do business. That's why we've put together this Complete Guide to Understanding Your Fertilizer Bag.

In this book, you'll learn valuable information on:

- Reading a fertilizer label
- Determining the amount of nitrogen in your blend
- Understanding how much of the nitrogen in your blend is a slow-release source
- Increasing fertilizer longevity and reducing filler
- A new way to look at your fertilizer investment
- Enhanced efficiency fertilizer (EEF) technologies
- Which EEF products may be right for your operation

Read through this guide and you'll discover what so many other professionals already know: **There Is a Better Way to Fertilize.**™



# Understanding Your Fertilizer Label

There are plenty of good fertilizers, so how should you go about choosing one? It all starts with knowing how to read a fertilizer label. All fertilizer packaging is required to clearly display a label with the brand, grade, guaranteed analysis, name and address of the manufacturer, and the bag's net weight. Some bags contain additional information, such as the size of the granules or size guide number (SGN).

#### 1. Brand

This can be an actual fertilizer brand name (XCU<sup>®</sup> slow-release fertilizer), a generic name (urea), or another name or number under which the fertilizer is registered.

#### 2. Grade (Analysis)

The grade is displayed as three bold numbers separated by hyphens on a fertilizer bag, representing the *product's percentages* of nitrogen (N), phosphorus (P) and potassium (K) by weight.

**First Number:** Nitrogen content. The example bag contains 27% nitrogen.

**Second Number:** The phosphorus level, expressed as phosphate  $(P_2O_5)$ . The example bag contains 0% phosphorus.

**Third Number:** Represents potassium, expressed as potash (K<sub>2</sub>0). The example bag contains 5% potassium.

#### **3.** Guaranteed Analysis

This shows all nutrients being claimed and, in some cases, the form of nutrients.

### Derived from Statement The actual source materials of nutrients.

#### 5. Directions for Use

Following this information carefully will produce the best results.

6. Supplier, Manufacturer, Registrant or Guarantor The company responsible for the product's state registration.

### 7. Net Weight

Measured in pounds (lbs).

#### 8. Enhanced Efficiency Fertilizer (EEF) Explanation

Percentage and source of enhanced efficiency nutrient, controlled-release, slow-release, stabilized, etc. Required if EEF claims are made.

### 9. Metal Disclosure

Required on the west coast.

#### 10. SGN (Size Guide Number) Describes the average granule diameter in millimeters times 100. A 250 SGN is 2.5 mm in average particle diameter.

#### 11. Batch Number

### 12. EPA Establishment Number

Required if the product contains a pesticide; the EPA registration number will also appear.



### REQUIRED INFORMATION | — ADDITIONAL INFORMATION

# Determining the Pounds of Nitrogen in a Blend

Nitrogen (N) is the leading source of nutrition to maintain healthy turfgrass growth. You can find out how much N is in a bag by looking at the grade (analysis), which represents the percentage of the N-P-K components in a fertilizer blend. The analysis shown below is comprised of 27% N, with no phosphorus (P) and 5% potassium (K). It's important to understand how those percentages translate to pounds as it relates to application and coverage.

### Percentages to Pounds

Say you purchased a 50-pound fertilizer bag with the grade (analysis) below — how many pounds of N do you think are in the bag? *It's not 27 — that's the percentage*.



To find the pounds of N in the bag, multiply the total weight of the bag by the percentage listed on the grade (analysis). Using the 27-0-5, here's your calculation:

Total Bag Weight (lbs.) % of N in the Bag 50 × 0.27= 13.5 lbs. of N

Based on this example, if you are using the application rate of one pound of N per 1,000 sq. ft., you can quickly determine that one bag covers 13,500 sq. ft.

This formula can also be used to figure out the pounds of any component in your grade (analysis). Knowing how to calculate the exact weight of each component makes it easier to figure out how many bags of a particular fertilizer you need to buy to meet your application requirements.

### Do the Math

Run this calculation on different analyses to compare blends and determine which is best for your operation.

Total Bag Weight (lbs.)		% of N in the Bag		Lbs. of N	
	×		=		
	×		=		
	×		=		
	×		=		
	×		=		
	×		=		
	×		=		
	×		=		

# How Much of that Nitrogen is an EEF Technology?

Now that you know how much N is in your bag, let's find out how much of it is a controlled-release, slow-release or stabilized nitrogen source. (See pages 14 and 15 for more information on these technologies.) This will help you determine if you're gaining the full advantages of EEFs.

### Calculating the Percentages

On bags of blended fertilizer, there will be a **Derived from Statement** that is part of the **Guaranteed Analysis**. Here, you will find a percentage and source for the enhanced efficiency nutrient (controlled-release, slow-release, stabilized) claimed in the bag.

This percentage is also often misunderstood.

Looking at the example below, you might think that 16.2% of your total N is slow-release. The number actually reflects that 16.2% of the 27% N listed on the grade (analysis) is derived from a slow-release source.



### **GUARANTEED ANALYSIS**

Derived from: Urea, Polymer Coated Sulfur Coated Urea and Sulfate of Potash. 16.2% Slow-Release Nitrogen from Polymer Coated Sulfur Coated Urea. To calculate what percentage of the total N is slow-release, divide the percentage of slow-release nitrogen by the total N.



60% is a relatively high percentage of slow-release or controlled-release N. You should be looking at a minimum of 50% to gain more of the advantages EEF technologies can provide.

### The Business Side of EEFs

A higher percentage of EEFs in a blend increases the longevity of the product. Extended longevities lead to fewer fertilizer applications, which saves time and money. Plus, with fewer applications you can:

- Optimize and reallocate your labor
- Reduce the number of bags you buy, handle and store
- Decrease fuel and equipment upkeep expenses
- Minimize hardscape cleanup

• Lower operational and material in-use costs

# Reducing Filler Increases Value

If you're buying blended fertilizer based on bag cost alone, you should consider other factors that contribute to a better cost-in-use. Some cheap blends can contain up to 50% filler, which adds little to no nutritional value. Replacing filler with more nutrition can decrease the amount of fertilizer needed to cover the same ground. And that can add up to peracre cost advantages.

Here are three fertilizer bags with a range of analyses. The lowest grade (analysis) contains up to 50% filler, but it's also the cheapest. Does that mean it's the right investment? Take a look and compare.



NOTE: Pricing data and product availability are for representative purposes only, and do not constitute an offer.



24-0-12

50% EEF | 0.5 Fe

### \$16.50 Per Bag

Applying 1 lb. N: **4.2 lbs. / 1,000 sq. ft.** 50 lbs. cover 12,019 sq. ft.

\$1.37 / 1,000 sq. ft. 200 ACRES

**\$11,962.50** 725 BAGS



### 32-0-16

50% EEF | 0.5 Fe

\$19.20 Per Bag

Applying 1 lb. N: **3.1 lbs. / 1,000 sq. ft.** 

> 50 lbs. cover 16,000 sq. ft.

\$1.20 / 1,000 sq. ft. 200 ACRES

**\$10,464.00** 545 BAGS

### **The Choice Is Clear**

Bags that replace filler with more nutrition may cost more, but you'll need fewer over the course of a year to maintain healthy turfgrass. With higher percentages of EEF technology in the bag, more of the N you pay for contributes to the health of the plant. These higher percentages also mean less filler in a 50-pound bag. *In fact, the 32-0-16 bag illustrated above has no filler at all.* 

# The Daily Cost of Your Fertilizer Choice

Here's another way to look at the value of EEFs. Have you ever thought about what it costs — per day — to maintain a green, healthy color on an acre of turfgrass? *That's your cost per day of green.* 

If you're taking care of large areas, like university campuses, golf courses or municipal properties, then this new way to calculate your fertilizer investment could unlock a number of advantages for your operation.

### Increased Longevity, Increased Savings

Longevity is the length of time a defined percentage of nutrients are released or remain available to the plant. Extended nutrient delivery, through higher percentages of EEF technology, plays a key role in lowering your cost per day of green. To find yours, simply multiply bags per acre by cost per bag, then divide that total by your longevity.

The chart below shows the percentage of N released, and the longevity of that release. The chart on page 11 shows how a cost per day of green can change when more EEF technology is introduced to the same 28-0-16 blend.



28-0-16 Blend   30%, 50% or 70% EEF Technology (Variable N Rates and Bags per Acre)								
% Urea : % EEF	*N Rate (Ibs. of N per 1,000 sq. ft.)	Bags per Acre	x	Cost per Bag	÷	Longevity (80% Release + 14 Days)**	=	Cost per Acre per Day of Green
70:30	0.8	2.5	х	\$19.65	÷	35	=	\$1.40
50:50	1.2	3.7	Х	\$21.60	÷	60	=	\$1.34
30:70	1.4	4.4	х	\$23.55	÷	79	=	\$1.30

NOTE: This is only an example. Pricing data, application and coverage rates are for representative purposes only. \*Nitrogen rates vary based on the expected longevity of release. \*\*Expected additional plant response after nutritional release.

### Do the Math

*Although a ten-cent difference in your cost per day figure may seem minor, when you add it up, your savings can be significant.* Let's say you have 80 acres. You end up saving \$8 a day with the better blend. Over the course of a 220-day season, those savings grow to \$1,760. And if you're in a warm-weather climate with a 300-day season, you end up saving \$2,400.





\$8 × 220 Days= **\$1,760** 

# \$8 × 300 Days= **\$2,400**

On top of those cost savings — and the time you save through fewer applications — you are also applying a more effective N source. So, your turfgrass is healthier and is receiving more of the N you paid for.

# Calculating Application Rates

In order to deliver your desired rate of N to the turfgrass you manage, you need to know how much fertilizer to apply. This is a critical step toward achieving efficient nutrient management, and there's a simple calculation to help get you there.

Since turf fertilizers are usually applied based on N rate, you'll need two pieces of information:

- 1. Desired N rate
- 2. Percentage of the fertilizer that is made up of N

With the example analysis 25-0-10, use this equation to calculate the amount of fertilizer you need for every 1,000 square feet:

#### Desired N Rate ÷ %N of Fertilizer in Decimal Form = Amount Needed (NOTE: 25 is the %N, and it needs to be converted to a decimal: 0.25. When %N is less than 10, go over two decimal places: 8% = 0.08, not 0.8) Desired %N of Fertilizer Fertilizer per Example 1: N Rate in Decimal Form 1,000 sq. ft. **Analysis:** 25-0-10 $1.0 \div 0.25 =$ **4.0** lbs Rate: 1 lb. N per 1,000 sq. ft. Here's another example. For the 3/4 lb. N, break it down to its decimal point: 0.75. Desired %N of Fertilizer Fertilizer per Example 2: N Rate in Decimal Form 1,000 sq. ft. **Analysis:** 22-0-8 **Analysis:** 22-0-8 **Rate:** <sup>3</sup>/<sub>4</sub> lb. N per 1,000 sq. ft. **0.75** ÷ **0.22** = 3.4 lbs.

NOTE: This is only an example. Application and coverage rates are for representative purposes only.

### Yearly Nitrogen Requirements for Turfgrass

Species differ in the amount of N that is needed for optimum turfgrass performance. The pounds in the chart below represent how much N is needed for an entire year.

Grass Type	Lbs. of N per 1,000 sq. ft.	Grass Type	Lbs. of N per 1,000 sq. ft.	
Bentgrass	2-4 lbs.	Kentucky Bluegrass	2-4 lbs.	
Bermudagrass, Common	2-6 lbs.	Perennial Ryegrass	2-4 lbs.	
Bermudagrass, Hybrid	4-6 lbs.	Tall Fescue	2-6 lbs.	
Centipedegrass	1-2 lbs.	Fine Fescue	1-3 lbs.	
St. Augustinegrass	4-6 lbs.	Zoysiagrass	2-3 lbs.	

### Fertilizer Application Rate Based on Percent Nitrogen

The amount of product you have to apply varies depending on the percentage of N in the bag. Like examples 1 and 2 on page 12, the chart below is based on applying 1 lb. of N per 1,000 square feet.

%N of Fertilizer	Fertilizer per 1,000 sq. ft.	%N of Fertilizer	Fertilizer per 1,000 sq. ft.	%N of Fertilizer	Fertilizer per 1,000 sq. ft.
10%	10.0 lbs.	23%	4.3 lbs.	36%	2.8 lbs.
11%	9.1 lbs.	24%	4.2 lbs.	37%	2.7 lbs.
12%	8.3 lbs.	25%	4.0 lbs.	38%	2.6 lbs.
13%	7.7 lbs.	26%	3.8 lbs.	<b>39</b> %	2.6 lbs.
14%	7.1 lbs.	27%	3.7 lbs.	40%	2.5 lbs.
15%	6.7 lbs.	28%	3.6 lbs.	41%	2.4 lbs.
16%	6.3 lbs.	<b>29</b> %	3.4 lbs.	42%	2.4 lbs.
17%	5.9 lbs.	30%	3.3 lbs.	43%	2.4 lbs.
18%	5.6 lbs.	31%	3.2 lbs.	44%	2.3 lbs.
19%	5.3 lbs.	32%	3.1 lbs.	45%	2.2 lbs.
20%	5.0 lbs.	33%	3.0 lbs.	46%	2.2 lbs.
21%	4.8 lbs.	34%	2.9 lbs.		
22%	4.5 lbs.	35%	2.9 lbs.		

**NOTE:** Desired N Rate / %N of Fertilizer in Decimal Form = Amount Needed

# Apply Your Knowledge

The benefits available with EEF technologies can change the way you do business. And now you know how to find them on a fertilizer bag and put them to use.

Remember that EEFs are a component in the blend. Work with your distributor to ensure you are getting the grade (analysis) and percentages that are best for you. Bags should contain at least 50% EEFs—that's the minimum amount you'll need to start seeing advantages.

### Increased Longevity, Increased Savings

EEFs are amended into three different technologies: controlled-release, slow-release and stabilized nitrogen. Each provides more efficient nutrient delivery, which extends a fertilizer's longevity and turfgrass response.



#### Amended urea:

- Regulates the release of nutrition
- Allows for efficient nutrient uptake
- Gives you more control of your nutrition programs
- Helps to reduce potential N losses to the environment

#### Efficient nutrient delivery means:

- Less flush growth, less unscheduled mowing
- Fewer clippings to handle
- Less turfgrass stress and more tolerance to insect pressure, weeds and diseases because the feast famine cycle is minimized
- More N uptake by the plant
- Healthy, consistent turfgrass growth
- Minimized potential for volatilization, denitrification and leaching
- Reduced N use up to 40%



# Extended longevities can mean fewer applications, which helps:

• Optimize labor by freeing up crews to do other tasks

Stabilized Nitrogen

- Save time
- Provide more flexibility in fertilizer programs
- Reduce the number of bags to buy, handle and store

### **Put EEFs to Work for Your Business**

Take control of what's in your fertilizer blend. Ask for these leading brands from Koch Turf & Ornamental when consulting with your local distributor or connect with our team at **KochTurf.com/FindaSalesRep.** 

### **CONTROLLED-RELEASE FERTILIZER**

#### Controlled-Release Fertilizer (Polymer Coated)

products protect N inside a durable coating. This polyurethane polymer precisely meters nutrient release based primarily on temperature, making it available when the plant can use it.



Longevity up to 45-180 days

### **SLOW-RELEASE FERTILIZER**

**Polymer-Coated Sulfur-Coated Urea (PCSCU)** fertilizers are economical, medium longevity fertilizers that rely on a dual coating of both polymer and sulfur to control release.

**Reacted Technology** fertilizers store N in a chain that requires microbial activity for release. Release rate is related to chain length, making N available to the turfgrass over a long period of time without additional applications.



Longevity up to 10 weeks





Longevity up to 22 weeks

Longevity up to 16 weeks

### STABILIZED NITROGEN FERTILIZER

**Stabilized Nitrogen** contains urease inhibitors that temporarily prevent naturally occurring urease from breaking down urea, and/or nitrification inhibitors that slow the conversion of ammonium to nitrate. Loss by volatilization is reduced, and fertilizer remains in the positively charged ammonium form longer, interacting with the soil, enhancing availability for plant uptake.



Longevity up to 12 weeks



# Add Up the Advantages

Start looking beyond the price tag and find out for yourself how buying a better fertilizer can lower your total investment. Plug your current grade (analysis) into our calculator, and then compare it to a blend containing more nutrition with EEF technology.

# Try out our calculator today at **KochTurf.com/WhatsInTheBag**.

- 1. Input your analysis and adjust the percentage of nutrition in the bag.
- 2. Create a new analysis.
- 3. Compare the results.

#### CALCULATE AND COMPARE

Adjust the percentage of nutrition in the bag, create a new analysis and compare the results.





TURF & ORNAMENTAL

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