



Learn how to quantify nutrients in a fertilizer bag, decide how much to apply, and correctly spread the amount intended.

Organic Fertilizer Fact Sheet

Specific to granular applications

Why is this important? If fertilizers or pesticides are improperly applied, they can wash off a lawn or garden and directly reach lakes, rivers and the ocean where they can contaminate water. Excess nutrients create algae blooms that suck the oxygen out of the water which can kill wildlife, fish and plants. Excess pesticides can contaminate drinking water and produce negative health effects in humans and wildlife.

Best Practice - An initial Soil Test should precede a fertilizer application and then repeated at 3 year intervals thereafter, unless monitoring deficiencies. Only apply lime if **pH test** indicates it is necessary.

Nitrogen Sources – Fundamental Differences

It is here that we determine whether or not a fertilizer has an organic or synthetic source of nitrogen.

- Some common synthetic nitrogen sources are urea, potassium nitrate, ammonium nitrate.
- Some common organic sources of nitrogen are corn, soy, feather meal, alfalfa, compost, among others (grains or animal byproducts.)

Synthetic nitrogen sources are mostly water soluble and work quickly— on contact with soil moisture. There are some sources that have been reacted in such a way that they become less soluble.

- These water-soluble sources begin to work in 48 hours, most of the nitrogen release is 7 to 10 days after application, and most of the fertilizer is gone roughly 4 to 6 weeks after application.

Organic nitrogen is different. Plant material cannot use nitrogen in the organic form—only in the inorganic forms-nitrate (NO_3^-) or ammonium (NH_4^+). Moisture has little to do with the breakdown—bacterial organisms breakdown and convert the organic N to inorganic in the processes of mineralization and nitrification which require a healthy biomass. **This type of Nitrogen is referred to as Water Insoluble Nitrogen (WIN) This is a winning component of an organic program!**



Nitrogen (N) is used in the largest amount by turfgrass, followed by Potassium (K) and then Phosphorus (P.)

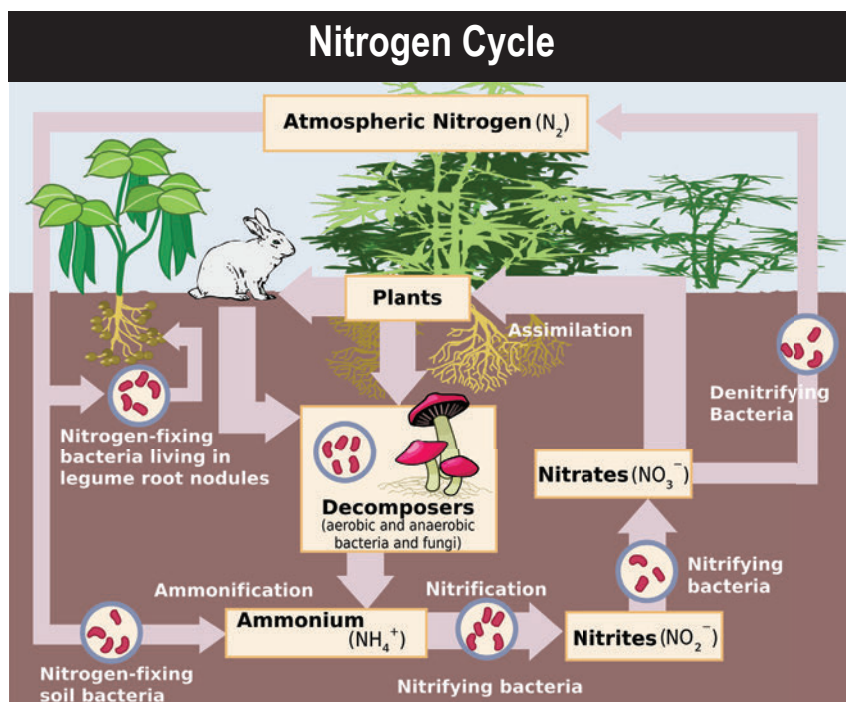
Some of the associations with nutrients and turf grass include:

N - blade growth, reproduction, chlorophyll

P - rooting

K - stress resistance

A soil test determines how much, if any, P or K are needed. It is the assumption that grass will use some nitrogen. **The rate of applied nitrogen will be determined more by expectations as opposed to a soil test.**



Credit: US EPA

Potassium will be available naturally in the soil and increased by adding fertilizer, if needed. **Unless deficient, established lawn and turf should be able to grow with no additional input of phosphorus.**

Reading a Fertilizer Label – Key components

A RATIO is the relative quantities of the nutrients present in the fertilizer. This provides little information about the amount of nutrients in the bag. It is a representation of the relationship between the amounts of N, P, & K.

AN ANALYSIS refers to the percentage by weight of the individual fertilizer nutrients.

EXAMPLE 8-2-6 ORGANIC GRANULAR FERTILIZER BLEND

RATIO: 4-1-3

Analysis:

8%	Nitrogen (N)	expressed on elemental basis
2%	Phosphorus (P)	expressed as P_2O_5 (phosphoric acid)
6%	Potassium (K)	expressed as K_2O (potash)

Step 1: To determine weight of nutrients in a 100 lb. bag, multiply x 100

Step 2: To determine weight of nutrients in a 50 lb. bag, divide answer from Step 1 by 2

Note: P_2O_5 contains 44% Phosphorus
 K_2O contains 83% Potassium

This means that:

For every 1% P (P_2O_5) on the label there is only .22 lbs actual P in the 50 lb. bag

For every 1% K (K_2O) on the label there is only .42 lbs actual K in the 50 lb. bag



Fertilizer Calculations

- It is important to do the right mathematics so that you know how much actual nitrogen and other nutrients are being applied to a given area during the growing season.
- Calculate, don't guess, the area of lawn!

Using the 8-2-6 example: Desired application rate $\frac{3}{4}$ lb N/ 1000 ft.²

A. 8% N = .08

$$.08 \times 100 = 8$$

C. $50/4 = 12.5$ lbs fertilizer to deliver 1 lb N/ 1000 ft.²

$$12.5 \text{ lbs} \times .75 = 9.4 \text{ lbs fertilizer to deliver } \frac{3}{4} \text{ lb N/ 1000 ft.}^2$$

B. 8 lbs N in 100 lbs fertilizer

4 lbs N in 50 lb bag

D. If the lawn is 7,500 ft.² and we want to apply $\frac{3}{4}$ lb N/ 1000 ft.²

$$7.5 \times 9.4 = 70.5 \text{ lbs fertilizer needed}$$

Spreader Calibration (As important as calculations)

Self-calibration of delivery equipment (spreaders) is usually necessary with most organic fertilizers. As opposed to conventional fertilizers, organic fertilizers are made up of a variety of particle sizes that do not lend themselves to the uniformity of spreader settings.

Follow this process for Self-calibration:

1. Measure out 1000 ft.²
2. Calculate the weight of fertilizer necessary to deliver the desired nitrogen/1000 ft.²
3. Put that amount of fertilizer in the spreader
4. Set the spreader setting in the middle
5. Walk the designated area

If there is no fertilizer left in the spreader, you have the right setting.

If you finished and still have fertilizer left in the spreader, you need to open it up wider.

If you delivered all of the fertilizer before covering the area, you need to close the spreader.

Turf Expectations

The quality of grass which you are growing, determined by the use of the turf and the desire of the client. As applied nitrogen levels increase through the application of fertilizers, turf quality and density improve. There is a direct relationship between applied nitrogen and the quality and density of the turf system.



Low level of expectations is met by low nitrogen input and low cost

High level of expectations is met by higher levels of applied nitrogen, and thus higher cost which in turn translates to meeting the higher expectations

Low level of expectations is not bad and high level of expectations is not necessarily good. It is the right expectation for any individual situation. Many times grass is not the appropriate plant or a high level of management might not be appropriate. Realistic expectations should be set based not only on the desired quality of the turf grass system but on environmental concerns as well.

Recommendation Levels	Nitrogen Application	Anticipated Outcomes
Low level	0-1 lb/ 1000 ft. ² /year	Lawn with part of the system inclusive of other species (weeds) or sensitive environments
Moderate level	2/lb/ 1000 ft. ² /year	Lawn managed to 10%-15% weed threshold, yet still aesthetically pleasing
High level	3 lb/ 1000 ft. ² /year	Lawns and turf managed to 5% or less weed threshold, including sports turf and other high profile areas

It should be anticipated that after a transition period, actual applied nitrogen can be reduced. The system will begin to pick up some of the load allowing for a reduction over time.

Recommended rates of application, timing, and procedure

Based on the use of a granular, natural and organic fertilizer

- Soil tests must be taken prior to application and repeated once every three years
- No fertilizer application within 15 feet of waterways
- No fertilizer application to frozen ground or impervious surfaces. Legally, if fertilizer is applied to an impervious surface by accident, it must be cleaned up and applied to the turf or returned to the labeled container
- No fertilizer applications between November 1 and April 1
- Maximum annual input of actual nitrogen should be no more than 3 lbs/ 1000 ft.²/year
- A single fertilizer application should not exceed .75 lbs N/ 1000 ft.²
- A minimum of 75% to 85% of the fertilizer should be WIN (water insoluble nitrogen)
- No fertilizer containing phosphorus can be applied unless a soil test indicates a deficiency
- When phosphorus is applied, a single application may not exceed .25 lbs P/1000 ft.² with an annual maximum input of .5lb/ 1000 ft.²

Co-authored by Chip Osborne and Bernadette Giblin. Edited by Jenna Messier.

© CT NOFA 2014



NOFA Organic land Care Program, 126 Derby Avenue, Derby, CT 06418
OrganicLandCare.net info@OrganicLandCare.net or call 203-308-2584

The NOFA Organic Land Care Program is a program of **ctnofa**
*NOFA: the Northeast Organic Farming Association Local and Organic Since 1982