

# LOUISIANA HOME LAWN SERIES

A guide to maintaining a healthy Louisiana lawn

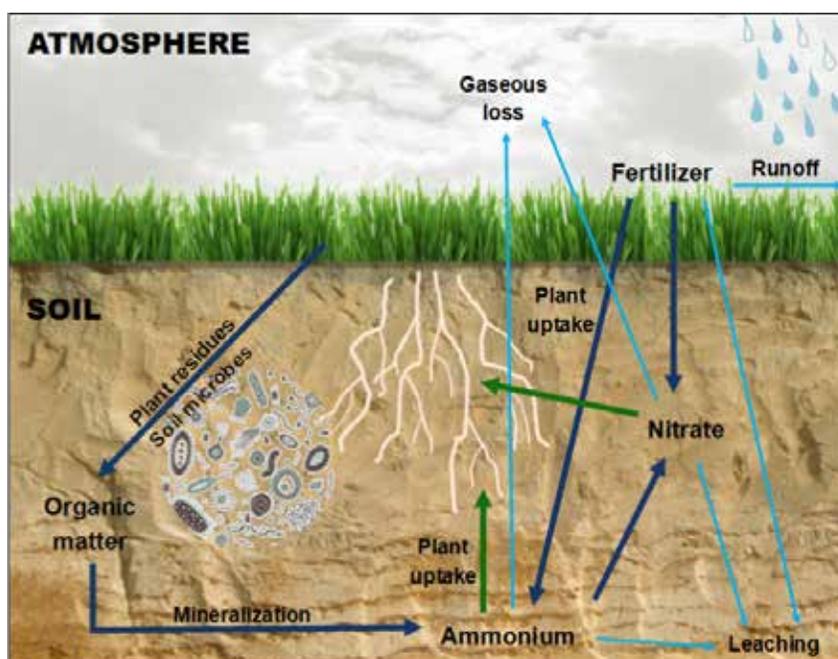


## Nitrogen

Nitrogen (N) is one of the most applied macronutrients because turfgrasses require it in the highest amount. Nitrogen not only affects the way your turfgrass looks but how it grows and recovers. Sufficient nitrogen levels allow the turfgrass to form a dense, lush, green groundcover. Insufficient nitrogen can result in stunted turfgrass growth and leaf yellowing. However, overapplying nitrogen can lead to excessive growth, fertilizer burn, greater severity of some diseases, and environmental issues with offsite movement into surface and subsurface waters. Therefore, understanding a few basics about nitrogen can help you develop a sound fertilizer plan for your lawn.

**Nitrogen plant uptake:** Nitrogen is available in the soil in two forms for plant uptake, nitrate ( $\text{NO}_3$ ) and ammonium ( $\text{NH}_4$ ). The majority of nitrogen in the soil is contained in organic matter, or decomposed plant and animal residues. Through the process of mineralization, soil microbes break down and transform organic matter into readily available forms of nitrogen for plant uptake. Environmental factors such as temperature and moisture affect microbial activity and, therefore, nitrogen availability. Another factor is the type of organic material. Organic matter nitrogen content and how easily organic matter can be decomposed determine how much nitrogen the organic matter in the soil provides for plant growth. Application of supplemental inorganic or organic nitrogen fertilizers can add nitrogen to the soil for plant uptake.

**Nitrogen losses:** To be good environmental stewards, it is important to reduce offsite nitrogen losses from your lawn. Therefore, it is important to understand nitrogen can have many forms and be extremely mobile in the environment under certain conditions. Nitrogen can be lost from a turf area through several modes. Nitrogen can be lost through leaching, surface runoff, and as a gas. Leaching occurs when water moves nitrogen downward through the soil profile, where it is unavailable to plant roots for uptake. Surface runoff occurs when the soil becomes saturated from precipitation or irrigation and excess water is drained laterally. These draining waters can carry away substances such as dissolved fertilizer. The last potential avenue for nitrogen losses involves gaseous losses through denitrification and volatilization. Denitrification is more common on saturated soils. Volatilization occurs more readily for ammonium and urea-based fertilizers, on high-pH soils and when fertilizer is not watered into the soil following application.





**Enhanced turfgrass color**

Proper nitrogen fertility of turfgrass:

- Increases shoot growth.
- Increases density.
- Increases rooting.
- Enhances color.
- Increases tolerances to drought as well as to cold and warm temperatures.
- Increases recuperation from injury or wear.

**Nitrogen deficiency:** A common visual symptom of deficient nitrogen in turfgrass is yellowing leaves, particularly on older leaves. However, nitrogen is not the only essential nutrient or stress that can lead to leaves yellowing, so testing the soil is important. Even though a test does not analyze for available nitrogen, a soil test can indicate the availability of other essential nutrients. Also check to make sure diseases or insects are not causing leaf yellowing.

A better way to determine if supplemental nitrogen needs to be applied is through observation of turfgrass growth. Deficient nitrogen will lead to less aggressive turfgrass growth that is stunted and less dense during the growing season.

**When to apply:** Nitrogen fertilizer should be applied only when the turfgrass is actively growing. It is best to apply in spring when the turfgrass is fully out of dormancy and has been mowed several times. Beware of applying nitrogen in the fall. Late-season nitrogen applications to warm-season turfgrass can extend turfgrass color, but these applications could make a turfgrass more susceptible to winter damage or lead to greater environmental losses of nitrogen.

January	February	March	April	May	June	July	August	September	October	November	December
Turfgrass dormant		Turfgrass active growth season							Turfgrass dormant		

**Fertilizer sources:** Listed are some common sources of nitrogen. Release of nitrogen can vary depending on the type of nitrogen fertilizer source applied and the environmental conditions at the time of application. Read the manufacturer's label for specific information before purchasing or applying any fertilizer.

Source	Release	Burn potential
Ammonium nitrate	Quick	High
Ammonium sulfate	Quick	High
Diammonium phosphate	Quick	High
Monoammonium phosphate	Quick	High
Calcium nitrate	Quick	High
Potassium nitrate	Quick	Moderate
Urea	Quick	Low
Sulfur-coated urea	Slow	Moderate
Polymer-coated urea	Slow	Low
Natural products	Varies	Varies

## How to calculate nitrogen fertilizer

Proper calculation can be advantageous in regards to cost, turfgrass health and environmental sustainability. Below is a basic calculation for solid (dry) fertilizers.

## Calculation Requirements

1. The area of your lawn in square feet (ft<sup>2</sup>) that will be fertilized.
2. The rate of the nitrogen, in pounds of nitrogen per 1,000 ft<sup>2</sup>, that you will be applying.
3. The fertilizer analysis on the fertilizer bag (N-P-K).

## Nitrogen Rates for Home Lawns

Turfgrass species	N Rate (per 1000 ft <sup>2</sup> per year)
Bermudagrass	Up to 3 pounds
Centipedegrass	Up to 2 pounds
St. Augustinegrass	Up to 3 pounds
Zoysiagrass	Up to 2 pounds

## Calculating Fertilizer

**Step 1.** Multiply the total square footage (ft<sup>2</sup>) of your lawn area by the appropriate rate of nitrogen. This calculation will result in the amount in pounds (lbs.) of nitrogen that is required to fertilize to the entire lawn area. For example:

$$5,000 \text{ ft}^2 \text{ lawn area} \times \frac{1 \text{ lb. nitrogen}}{1,000 \text{ ft}^2} = 5 \text{ lbs. of nitrogen (solution A)}$$

**Step 2.** Divide the amount in pounds (lbs.) of nitrogen required to fertilize the entire lawn area (solution A) by the percent of nitrogen contained in the fertilizer as labeled on the bag. Remember to put the percentage of nitrogen into decimal form (ex: 20 percent = 0.20). This calculation will result in the amount (pounds) of fertilizer required to fertilize the entire lawn area. For example:

$$5 \text{ lbs. of nitrogen} \div 0.20 = 25 \text{ lbs. of fertilizer}$$

## Tips for Applying Fertilizer

1. Apply nitrogen fertilizer only when the turfgrass is actively growing
2. Quick-release nitrogen fertilizers are more readily available for turfgrass uptake but can lead to flushes of growth; whereas slow-release nitrogen fertilizers provide nitrogen over time for more sustained growth.
3. Apply irrigation after fertilizer applications to increase plant uptake and reduce fertilizer burn. Be careful not to irrigate to the point of runoff or leaching.
4. Do not to apply nitrogen fertilizer if intense rainfall is forecast.
5. Urea should not be applied during summer temperatures because of high volatility.
6. Do not allow fertilizer application into open waters or non-permeable surfaces where fertilizer can move into sewer systems.
7. Never apply more than 0.5 lbs. N per 1,000 square feet at one application.
8. Properly calibrate application equipment. To learn how to calibrate equipment view the following extension publications: Pub. 3624-MMM Louisiana Home Lawn Series – Backpack Sprayer Calibration, Pub. 3624-NNN Louisiana Home Lawn Series – Boom Sprayer Calibration, Pub. 3624-OOO Louisiana Home Lawn Series – Drop Sprayer Calibration.

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