

#3: Fertilize Appropriately

PREVENT POLLUTION AND MAXIMIZE PLANT HEALTH

All plants need nutrients for growth. They must obtain these nutrients from the soil or other medium in which they're growing. Gardeners can also provide supplemental nutrients to plants by applying fertilizers in the form of composted organic material, packaged fertilizer, or a specific mineral such as iron.

Plants have varying nutrient needs, depending on the species, the age of the plant, and its location. It's not always necessary to fertilize your plants or lawn, but if you choose to fertilize, it's important that you do so properly. This section will help you correctly choose and apply the right type of fertilizer.

Too much fertilizer can weaken a plant, promote disease, and invite pests, in addition to wasting money and harming the environment. It also means more pruning and mowing. So consider your plants' needs carefully before applying any fertilizer, and always follow label directions when using fertilizer.

FERTILIZER COMPONENTS

Most fertilizers available for use in the home landscape or garden are blends of several elements mixed together to achieve a specific formulation of plant nutrients.

MACRONUTRIENTS

Macronutrients are nutrients required by plants in relatively large amounts for optimum plant growth. The three main nutrients contained in fertilizers are nitrogen (N), phosphorus (P), and potassium (K), represented by three numbers that appear on the bag. A complete fertilizer will contain all three of the major plant nutrients. Other macronutrients include calcium (Ca), magnesium (Mg), and sulfur (S).

MICRONUTRIENTS

Micronutrients are nutrients most plants need in small quantities and are sometimes referred to as trace elements or minor elements. These nutrients—which include boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), and zinc (Zn)—are often available in sufficient quantities in the soil, but are also present in many fertilizers. Micronutrients are also sold as individual nutrients.

ARE FERTILIZERS NEEDED?

Before you use fertilizer, you should always determine if it's really needed. Keep in mind that certain plants are more prone to specific kinds of nutrient deficiencies (for example, ixora and palms tend to run low on manganese).

VISUAL SIGNS

Your plants will indicate when they lack certain nutrients—you just have to know what to look for. Plant nutrient deficiency symptoms are often symmetrical (for

example, yellowing areas that appear to be mirror images on a plant leaf), whereas pathogenic (e.g., fungal or bacterial) problems tend to appear more randomly on the plant. Remember that many nutrient deficiencies look similar. Any time you're not certain of what ails a plant, take a sample into your county Extension office for help.

SOIL TESTING

A soil test can help you understand what nutrients are present in your soil. This is important for deciding what nutrients, if any, you should add. Your county Extension office can help you with this. For more information about testing your soil, see page 7.

PREVENTING POLLUTION

Fertilizer is a powerful tool that can help plants thrive—if used appropriately. If applied incorrectly, it can not only harm plants, but also the environment. To prevent water pollution from nutrient leaching and runoff, always follow these steps when fertilizing your lawn or landscape.

IN GENERAL

- **Follow UF/IFAS** recommendations. Ideal rates, application timings, and formulas are different for different plants.
- **Choose slow-release products.** Look for fertilizers with slow-release nutrients. They should include potassium and little or no phosphorus.
- **Keep fertilizer off hard surfaces.** If fertilizer gets spilled on a hard surface (like a driveway), sweep it up and dispose of it. Fertilizers can wash into storm drains and from there into a nearby water body.



Do not rinse fertilizer into storm drains.

- **If you spill fertilizer on the lawn, collect whatever you can.** It might be tempting to just water extra fertilizer into the lawn, but the excess nutrients will leach (seep downwards) through the soil and into the groundwater.



Sweep up fertilizer spills on the lawn.

- **Never fertilize within 10 feet of any water body.** Designate a 10-foot maintenance-free zone between your landscape and the riparian zone.



Never apply fertilizer within 10 feet of any water body.

- **Don't fertilize before a heavy rain.** If rain is forecast in the next twenty-four hours, hold off on applying fertilizer. Rain can wash fertilizer off lawns or cause it to leach into groundwater, contributing to pollution.
- **Know your water source.** If you use reclaimed/recycled water for irrigation, keep in mind that it can contain

nutrients, including nitrogen, and adjust the amount you fertilize accordingly.

FOR LAWNS

- **Apply fertilizer only when grass is actively growing.** Many Florida turfgrasses go dormant or slow their growth in cooler seasons. Water it in with $\frac{1}{4}$ inch of water or less.
- **Use a broadcast spreader with a deflector shield.** Don't use a drop spreader, which can damage the coatings on slow-release fertilizers, rendering them quick-release.



A deflector shield directs fertilizer away from your maintenance-free zone.

- **Avoid using "weed and feed" products.** These contain herbicides and fertilizer together.
 - These products can injure some trees and shrubs. Tree and shrub root systems can extend far beyond the canopy drip line, intermingling with turf.
 - Pesticides should be applied only to affected areas, rather than broadcast over the entire yard as occurs with a weed and feed product.
 - The appropriate timing is often different, with pre-emergent herbicides applied far earlier than fertilizer. This almost ensures that one or the other is ineffective, if not harmful.
- **Apply an iron source instead of a nitrogen fertilizer.** To green the lawn without increasing growth in the summer, use chelated iron or iron sulfate.

SELECTING A FERTILIZER

A wide range of fertilizers is available for gardeners. You can select from different combinations of nutrients that come in a variety of forms. The key to selecting a fertilizer is understanding what nutrients your plants need.

INORGANIC FERTILIZERS

Inorganic fertilizers are materials that are mined or synthesized from non-living materials. Many inorganic fertilizers contain nutrients that are immediately available to plants. Others are formulated to allow nutrients to be released

over a period of time. If you use an inorganic fertilizer in your landscape, choose one with some or all of the nutrients in slow- or controlled-release form, so that the plants will be able to take up the fertilizer as it is gradually released.

ORGANIC FERTILIZERS

Organic fertilizers are materials that are derived from plants and animals; one of the most common forms is manure. Animal manure can come from chickens, cows, pigs, sheep, horses, or rabbits and should always be composted before use in vegetable gardens to reduce risk to food safety. (Keep in mind that these products often contain high levels of phosphorus, which has been shown to cause water pollution, and should be applied carefully.) Never use cat or dog manure or human waste—there is a greater risk of these sources transmitting disease. Homemade compost (typically made of kitchen scraps and/or yard waste) is another excellent source of organic matter for garden soils. It usually contains small amounts of nitrogen and potassium, but very little phosphorus. Both composted manure and compost also contain micronutrients.

Most of the nutrients in composted manure and compost are available more slowly than those in most inorganic fertilizers. The quick availability of nutrients, especially nitrogen, in inorganic fertilizers is very important in vegetable growing. If you're growing vegetables, you may want to supplement any organic fertilizer you apply with some inorganic fertilizer for quick feeding.

READING THE LABEL

When selecting a fertilizer, look at the three numbers on the bag. They will read something like 15-0-15 or

GUARANTEED ANALYSIS	
Total Nitrogen (N).....	35.0%
35% Urea Nitrogen*	
Soluble Potash (K ₂ O).....	5.00%
Boron (B).....	0.03%
Copper (Cu).....	0.05%
Iron (Fe).....	5.00%
0.10% Water Soluble Iron (Fe)	
Manganese (Mn).....	0.05%
Molybdenum (Mo).....	0.0006%
Zinc (Zn).....	0.05%
Derived from: Polymer-coated Urea, Urea, Muriate of Potash, Sodium Borate, Copper Oxide, Ferric Oxide, Ferrous Sulfate, Manganese Oxide, Molybdic Oxide and Zinc Oxide.	
* Contains 15% slowly available Nitrogen from coated Urea.	
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Always check the N-P-K ratio and quantity of slow-release nitrogen.

16-2-8. The first number represents the percentage of nitrogen in the bag, the second refers to phosphorus, and the third number is the amount of potassium. For example, a 50-pound bag of 16-2-8 is 16 percent nitrogen (8 pounds total); 2 percent phosphorus (1 pound total); and 8 percent potassium (4 pounds total). The remaining weight is usually comprised of inert ingredients. Nitrogen and phosphorus cause the most problems with regard to water pollution.

SLOW- & CONTROLLED-RELEASE FERTILIZERS

Slow- and controlled-release fertilizers provide nutrients to plant roots over an extended period of time. This allows you to fertilize less frequently—and to prevent nutrients from leaving your landscape and entering waterways, contributing to harmful algal blooms and other water quality problems.

In Florida, any fertilizer that is labeled “slow-release” or “controlled-release” must contain 15 percent or more slow- or controlled-release nitrogen. The label will indicate the percentage of slow- or controlled-release nutrients in the fertilizer, and it's a good idea to look for a fertilizer with higher amounts of slow-release nitrogen.

Slow- or controlled-release fertilizers can be applied to your lawn, bedding plants, trees, and any other plants that need nutrients.

FERTILIZING LANDSCAPE PLANTS

If you're happy with the color and appearance of your landscape plants (shrubs, flowers, trees, etc.), you don't need to fertilize them. Many established plants don't need fertilizer, and many trees will thrive without it. Remember that fertilizer applied to turf will reach the roots of plants nearby, so if you fertilize your lawn, your plants may already be getting all the nutrients they need.

Even when plants show signs of nutrient deficiencies, keep in mind that fertilizer might not help—these plants may not be suited for their location or their roots may be damaged in some way. Consider removing high-maintenance plants from your landscape and substituting lower-maintenance choices.

PALMS & CYCADS

Palms and cycads have more complex nutritional requirements than other landscape plants. The ideal fertilizer for palms and cycads has an analysis of 8-2-12-4 Mg; all of its



Palms have special nutritional needs.

N, K, and Mg should be in slow- or controlled-release form. Since palms are prone to several potentially fatal micronutrient deficiencies, this fertilizer should also contain 1–2 percent iron (Fe) and manganese (Mn), plus trace amounts of zinc (Zn), copper (Cu), and boron (B). Using fertilizers with ratios other than the one given may cause or intensify nutrient deficiencies.

FERTILIZING THE LAWN

A properly maintained lawn filters stormwater runoff, reduces air temperatures, and helps prevent pollution and stabilize soil. Grass that receives appropriate levels of fertilizer—not too little and not too much—might also require fewer cultural or chemical controls for weeds, insects, and diseases, since it grows more vigorously and is strong and healthy.

On the other hand, fertilizing incorrectly can aggravate pest problems, stimulate excessive growth, and require

frequent watering. In addition, when too much nitrogen fertilizer is used on lawns, it can leach through the ground, past the root zones of grass, plants, and trees, and into the aquifer, where almost all of the freshwater used in Florida comes from. It can also be washed off by rainfall directly into surface water or stormwater systems.

How much fertilizer should I apply to a lawn?

No matter what kind of grass you have or where in the state you live, you should not apply more fertilizer than the rate listed on the label. If using a quick release product, apply only up to 0.5 pound of nitrogen per 1,000 square feet.

How much fertilizer that translates to depends on the percentage of nitrogen in your fertilizer and the size of your landscape. To calculate how much fertilizer to apply to your lawn, use the following table.

TABLE 1A.

Recommended application rates for turfgrass fertilizers to Florida lawns: 30% or more slow-release nitrogen.

In the table below, match the size of your lawn to the percentage of nitrogen (N) in your fertilizer to find the amount of fertilizer you need to apply. If you have a bahiagrass lawn, apply this amount of fertilizer about twice a year no matter where you live in the state. For centipedegrass, apply about once a year in North Florida and once or twice a year in Central and South Florida. For St. Augustinegrass or zoysiagrass, apply about two or three times a year in North and Central Florida and three or four times a year in South Florida. UF/IFAS recommends soil testing for phosphorus content before any P fertilizer is applied.

	6% N	10% N	12% N	15% N	16% N	23% N	27% N
1,000 ft ²	16.5 lbs	10 lbs	8.5 lbs	6.5 lbs	6 lbs	4.5 lbs	4 lbs
1,100 ft ²	18.5 lbs	11 lbs	9.5 lbs	7 lbs	7 lbs	5 lbs	4 lbs
1,200 ft ²	20 lbs	12 lbs	10.5 lbs	8 lbs	7.5 lbs	5 lbs	4.5 lbs
1,300 ft ²	22 lbs	13 lbs	11.5 lbs	8.5 lbs	8 lbs	5.5 lbs	5 lbs
1,400 ft ²	23.5 lbs	14 lbs	12.5 lbs	9 lbs	9 lbs	6 lbs	5 lbs
1,500 ft ²	25 lbs	15 lbs	13.5 lbs	10 lbs	9.5 lbs	6.5 lbs	5.5 lbs
2,000 ft ²	33.5 lbs	20 lbs	17 lbs	13 lbs	12 lbs	9 lbs	8 lbs
2,500 ft ²	41.5 lbs	25 lbs	21 lbs	16.5 lbs	15.5 lbs	11 lbs	9.5 lbs
3,000 ft ²	50 lbs	30 lbs	25.5 lbs	19.5 lbs	18 lbs	13 lbs	12 lbs
3,500 ft ²	58 lbs	35 lbs	30 lbs	23 lbs	21.5 lbs	15.5 lbs	13.5 lbs
4,000 ft ²	66 lbs	40 lbs	34 lbs	26 lbs	24 lbs	18 lbs	16 lbs
4,500 ft ²	74 lbs	45 lbs	38 lbs	29.5 lbs	27.5 lbs	20 lbs	17.5 lbs
5,000 ft ²	82 lbs	50 lbs	42.5 lbs	33 lbs	31 lbs	22 lbs	19 lbs

*These recommendations assume use of a properly calibrated spreader. See www.yourfloridalawn.ifas.ufl.edu for instructions on calibrating your spreader.