



Fertilization and Irrigation Needs for Florida Lawns and Landscapes¹

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There are approximately four million acres of residential and commercial lawns in Florida. Florida is not only surrounded by surface water, but is also home to many miles of rivers, streams, springs, lakes, and karst areas. In addition, the water table in many parts of the state is close to the soil surface. All of these conditions lead to the potential for environmental impairment of ground and surface waters from agricultural and urban horticultural activities. This has led to development of Best Management Practices (BMPs) for many agricultural industries, including commercial and residential turfgrass and landscapes. How we fertilize and irrigate our lawns and landscapes can have a direct impact on our environment, so it is imperative that the green industry and homeowners alike adopt environmentally friendly landscape maintenance practices.

Establishment of Lawns and Landscapes

Fertility and irrigation needs of recently established lawn and landscape plants differ from those of mature lawn and landscape plants. During establishment, plants are less able to support themselves and generally require more fertilizer and

water. The water and fertilizer needed vary according to season and location in the state, but some general guidelines can be followed:

Lawns

Irrigation

Florida lawns are generally established by sod, sprigs, or plugs. These lawns will require frequent, short waterings to develop a root system following planting. The objective in watering during establishment is to keep the root system alive until it starts to root down and then to encourage deep rooting. To ensure that roots don't die from lack of water following planting, irrigate a few times during the day until roots have pegged down into the soil. This will generally take five to ten days. Only irrigate enough to wet the top few inches of soil for this period (five to fifteen minutes per zone). After roots are pegged down, reduce irrigation gradually over the next two weeks to two to three times weekly. In the summer months, under drought conditions, daily irrigation may be necessary for this period.

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Fertility

Begin fertilizing newly planted lawns about two weeks after planting. Apply a complete (N-P-K) turf-type, slow-release nitrogen fertilizer (e.g., 16-4-8 or 15-4-15) to provide 1/2 pound of actual nitrogen per 1000 square feet. Do this every two to three weeks until the lawn has completely filled in, and then follow fertility regimes as recommended for your grass species. Time for establishment will vary depending on planting method, but most lawns should be considered established two to three months after planting. If you are planting centipedegrass, only apply fertilizer once during establishment.

Look for the words *slow-release* or *controlled-release* on the fertilizer labels. Nitrogen in this type of fertilizer will not burn or wash away as readily as quick-release nitrogen sources. Don't be fooled by the word *organic*. Some organic fertilizers are water-soluble and can leach as quickly as inorganic fertilizers.

Landscape

Irrigation

Research shows that, unlike established plants, recently transplanted trees and shrubs survive best and establish most quickly with light, frequent irrigation. Irrigation scheduling depends on the region of the state. To ensure the survival of trees planted in spring or summer, provide two irrigations each week in north Florida or three irrigations each week in south Florida during the first few months after planting (Table 1). Daily irrigation provides the quickest establishment. Following the initial few months of frequent irrigation, provide weekly irrigation until plants are fully established. At each irrigation, apply about two to three gallons of water per inch trunk diameter (e.g. four to six gallons for a two-inch tree) over the root ball. Never add irrigation if the root ball is saturated.

Shrubs planted during the warm part of the year should be watered every day for the first few weeks after planting. Gradually decrease the frequency of irrigation to every other day and then to every third day until shrubs have established (Table 2). Shrubs planted in cooler seasons can be watered less often.

Bedding plants should be watered immediately after planting and daily until they have become established.

Fertility

Controlled-release fertilizer can be applied on top of the root ball and backfill soil or on top of the mulch at planting. There is no need to mix it with the backfill soil or place it at the bottom of the planting hole. Under most circumstances, mulch will not prevent fertilizer from reaching the tree roots. Slow release fertilizer at planting has not been associated with improved survival but can increase growth rate in some situations. Adding soluble fertilizer to a newly installed plant could burn roots if too much is applied. This will injure the plant and could kill it.

Bedding plants should be fertilized before planting or at planting time. Incorporate 12-4-12 or a similar analysis fertilizer uniformly throughout the soil at the rate of one pound per 100 square feet of bed area. Controlled fertilizers are ideal for establishing bedding plants.

Established Lawns and Landscapes

Lawns

Irrigation

Lawns should be irrigated when approximately 50% of the lawn shows signs of wilt. These signs include:

- Leaf blades are folded in half lengthwise in an attempt to conserve water.
- The grass takes on a blue-gray tint.
- Footprints or tire tracks remain visible on the grass long after being made.
- The length of time needed between irrigations will vary depending upon grass species, soil characteristics, your location in the state, time of year, temperatures, and any particular micro-environmental effects such as shade. If rain is forecast in the next two days, delay irrigation.

Table 1. Irrigation Scheduling for Recently Planted Trees

Size of nursery stock	Irrigation Schedule for Vigor ^{1,3}	Irrigation Schedule for Survival ^{2,3,4}
< 2 inch caliper	Daily for 2 weeks; every other day for 2 months; weekly until established.	Twice weekly for 2-3 months
2-4 inch caliper	Daily for 1 month; every other day for 3 months; weekly until established.	Twice weekly for 3-4 months
> 4 inch caliper	Daily for 6 weeks; every other day for 5 months; weekly until established.	Twice weekly for 4-5 months

¹ Delete daily irrigation when planting in winter. Irrigation frequency can be reduced slightly (e.g. two to three times each week instead of every other day) when planting hardened-off, field-grown trees that were root-pruned during production. Establishment takes three (hardiness zones 10-11) to four (hardiness zones 8-9) months per inch trunk caliper.

² Irrigation frequency can be reduced slightly (e.g. to once or twice each week) when planting hardened-off, field-grown trees that were root-pruned during production.

³ At each irrigation, apply two to three gallons per inch trunk caliper to the root ball. Apply it in a manner so that all water soaks into the root ball. Do not water if root ball is wet/saturated on the irrigation day.

⁴ Trees take much longer to establish than three to four months per inch trunk caliper when under-irrigated. Be prepared to irrigate the following summer.

Table 2. Irrigation Scheduling for Recently Planted Shrubs

Plant size (container size)	Time to establish	Amount of irrigation to apply
1 gallon	3 to 6 months	1 quart
3 gallon	6 to 12 months	2 quarts
7 gallon	1 to 2 years	1 gallon

Florida soils are typically sandy and hold one inch of water in the top 12 inches of soil. Since most roots are in the top four to six inches of soil, 3/4 inch of water will wet that area and below to encourage deeper rooting. **Light, frequent watering is inefficient and encourages shallow root systems. Excessive irrigation, which keeps the root system saturated with water, is also harmful to the lawn.**

A simple watering schedule would apply 3/4 inch of water when turfgrass shows water deficit symptoms as discussed earlier. Once this 3/4 inch of water is applied, do not apply any more until drought symptoms are again noticeable. With no rainfall, two to three waterings per week in the summer and one every 10 to 14 days in the winter are adequate. If

rainfall occurs, irrigation should be suspended until visible drought symptoms appear.

The best time for lawn irrigation is in the early morning hours. Watering during the day wastes water due to excessive evaporation and can scald the lawn when temperatures are high. Watering in late afternoon or late morning may be detrimental if it extends the time the lawn is naturally wet from dew. This extended wet period can accelerate disease occurrence.

Fertility

Fertility needs for lawngrasses vary due to homeowner preference, species, season, and location within the state. Guidelines for fertilization needs by

species and location are presented in Table 3. The ranges of rates follow homeowner preference for a low, medium, or high maintenance lawn.

Landscapes

Irrigation

Many established drought tolerant landscape trees and shrubs require little or no irrigation, provided roots are not obstructed by compacted soil, foundations, or other obstacles in the soil. Trees and shrubs often require supplemental irrigation to remain healthy in landscapes where roots are confined to a small area. Plants such as azaleas and other shallow rooted shrubs that lack drought tolerance may require irrigation during extended drought periods to look their best.

After establishment, bedding plants should be watered on an “as-needed” basis. Frequency of irrigation will depend on soil type, exposure to sunlight, kind of bedding plant, and season of the year.

Fertility

Fertilization may be justified when faster growth is desired or when plants exhibit nutrient deficiencies. Bedding plants receiving water-soluble fertilizers may need monthly fertilizations to keep them in continuous bloom. When it has been determined that fertilization is necessary, most established landscape plants should be fertilized at rates within the ranges listed in table 4. The number of pounds per year of various nitrogen-containing fertilizers to apply per 1000 feet of bed area is presented in table 5.

Phosphorus content of the fertilizer should be 0 - 2% P_2O_5 . Historically, the ratio of nitrogen (N) to potassium (K_2O) for landscape plants has been in the range of 1:1 to 2:1. Due to the prevalence of magnesium (Mg) deficiency on certain landscape plants in many parts of the state, up to 2.5 pounds Mg/1000 ft/year may be applied to address this problem. Micronutrients can be applied at specified rates and timing to achieve fertilization objectives.

Water-soluble fertilizers should be applied at no more than 1/2 pound of actual nitrogen per 1000

square feet. Application rates of controlled-release fertilizers depend on release rates of the product.

Palms have different nutritional requirements than other landscape plants. When palms are important, landscaped areas within 30 feet of large established palms should be fertilized with a 4-1-6-2 Mg (N - P_2O_5 - K_2O - Mg) ratio fertilizer (An 8-2-12-4 Mg is an example of a fertilizer using this ratio). Nitrogen, potassium and magnesium should have equivalent percentages of each nutrient in controlled release form. Using a fertilizer with a ratio other than that specified may induce or accentuate nutrient deficiencies in palms. Fertilization rates may be based on the rates for nitrogen given in table 4 for basic, moderate and high levels of maintenance. Because palms are highly prone to several potentially fatal micronutrient deficiencies, any fertilizer applied to them should contain 1-2% iron (Fe) and manganese (Mn), plus trace amounts of zinc (Zn), copper (Cu), and boron (B) to prevent these deficiencies.

Table 3. Fertilization Guidelines for Established Turfgrass Lawns

Species/Location	Nitrogen Recommendations (lbs/1000 ft ² /yr) ^{1,2}
Bahiagrass- North	2-3
Bahiagrass- Central	2-4
Bahiagrass- South	2-4
Bermudagrass- North	3-5
Bermudagrass- Central	4-6
Bermudagrass- South	5-7
Centipedegrass- North	1-2
Centipedegrass- Central	2-3
Centipedegrass- South	2-3
St. Augustinegrass- North	2-4
St. Augustinegrass- Central	2-5
St. Augustinegrass- South	4-6
Zoysiagrass- North	3-5
Zoysiagrass- Central	3-6
Zoysiagrass- South	4-6
<p>¹ Homeowner preferences for lawn quality and maintenance level will vary, therefore we recommend a range of fertility rates for each grass and location. Additionally, effects within a localized region (i.e., micro-environmental influences such as shade, drought, soil conditions, and irrigation) will necessitate that a range of fertility rates be used.</p> <p>² These recommendations assume that grass clippings are recycled.</p>	

Table 4. Fertilization Rates for Established Landscape Plants

Level of Maintenance	Amount of Nitrogen Fertilizer
Basic	0-2 lbs N/1000 ft ² /year
Moderate	2-4 lbs N/1000 ft ² /year
High	4-6 lbs N/1000 ft ² /year

Table 5. Number of Pounds of Fertilizer (per 1000 ft²/yr) to use for fertilizer containing various percentages of N at 7 Rates.

% N in Analysis	Rate (lbs N/1000ft ² /yr)						
	0.5	1	2	3	4	5	6
6	8	17	33	50	67	83	100
7	7	14	29	43	57	71	86
8	6	12	25	38	50	63	75
9	6	11	22	33	44	56	67
10	5	10	20	30	40	50	60
11	5	9	18	27	36	45	55
12	4	8	17	25	33	42	50
13	4	8	15	23	31	39	46
14	4	7	14	21	29	36	43
15	3	7	13	20	27	33	40
16	3	6	13	19	25	31	38
17	3	6	12	18	24	29	35
18	3	6	11	17	22	28	33
19	3	5	11	16	21	26	32
20	2	5	10	15	20	25	30
33	1	3	6	9	12	15	18
39	1	3	5	8	10	13	15
46	1	2	4	7	9	11	13