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ENH860

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IFAS Extension

Fertilization and Irrigation Needs for Florida Lawns and Landscapes[1]

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Many Floridians take pride in having a well maintained lawn and landscape that enhances the beauty of their homes. Maintained landscapes contribute much to a home and a neighborhood. Following proper maintenance practices is critical for the benefit of the lawns and landscapes and also for the viability of Florida's water resources.

Florida has abundant surface-water resources—rivers, streams, springs, lakes, and oceanfronts. In addition, the below-ground aquifer in many parts of the state is close to the soil surface. These factors all contribute to the potential for nonpoint-source pollution, which occurs when fertilizers and chemicals are moved by rain or irrigation water into water resources.

How lawns and landscapes are fertilized and irrigated can have a direct impact on the natural environment, so it is imperative that both landscape maintenance professionals and homeowners adopt the environmentally friendly approaches that are outlined in this publication.

Florida Friendly Landscaping™ Best Management Practices (BMPs) for management of commercial and residential lawns and landscapes were developed by scientists with the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS). These BMPs assist homeowners and professionals in making management choices that will help sustain lawns and landscapes in Florida without impairing Florida's priceless water resources.

Establishment of Lawns and Landscapes

Fertility and irrigation needs of lawns and landscapes differ during their establishment phase from the needs of mature plants. During establishment, plants are less able to support themselves and generally require more water to become self sufficient. The water and fertilizer needed during establishment also vary due to season of the year and location, but some general guidelines are as follows.

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Lawns

Irrigation. Florida lawns are most commonly established by sodding. In this method, the entire lawn area is covered with a thin layer of above-ground grass leaves and stems and a short below-ground root system. Because sod lacks a developed root system, sodded lawns require frequent, short waterings to help them survive and become established 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 the roots to grower deeper into the soil. To ensure that roots in sod do not die from lack of water following planting, irrigate two to three times daily for brief periods (about 5 to 10 minutes each time). During this establishment phase, only irrigate the sod enough to wet the top few inches of soil. It will generally take about 7 to 10 days for the roots to "peg" down so that they are firm in the soil, depending on season of the year, temperature, soil type, and other factors.

Once roots are pegged down approximately 1/2 inch to 1 inch into the soil, reduce irrigation to once a day to supply approximately 1/4 inch of water daily. After seven to 10 days on this regime, reduce irrigation frequency to every other day to apply approximately 1/2 inch in each irrigation event. Irrigate every other day for about 7 to 10 days, by which time roots should be growing down through the soil, and the sod should not pull up if tugged on.

By this time, three to four weeks after sodding, the grass should be able to thrive on an irrigation schedule for an established lawn. However, in the summer months, under drought conditions, an extended period of more frequent watering may be required to ensure that the lawn establishes, particularly if watering restrictions limit irrigation of established lawns to once a week.

Fertility. Do not fertilize a newly planted lawn for about 60 days after sodding. The short root system of the grass during this period of establishment means the grass has little ability to absorb nutrients. As a result, fertilizing during this period may lead to increased nutrient leaching past the roots through the soil. Additionally, because sod is generally fertilized prior to harvest at the sod farm, the sod will not typically require additional fertilizer during the establishment period. If the sod appears to lack sufficient nutrients (yellow coloration and spindly growth), apply fertilizer no sooner than 30 days after sodding. If possible, ask the sod grower or installer when the sod was last fertilized.

Before it is time to fertilize the newly established lawn, have a "soil test" done to determine what nutrients are readily available in the soil for plant uptake. In most areas of Florida, with the exception of the Panhandle, phosphorus is available in the soil in quantities that are sufficient for lawngrasses, so applications of phosphorus may not be needed in many lawns in Florida or may be needed only in small quantities.

Look for a fertilizer with at least some of the first number (which represents the nitrogen content of the fertilizer) in a slow-release form. Slow-release is usually denoted as "controlled release," "coated," "polymer coated," or "sulfur coated." Slow-release nitrogen will help the grass to take up the nitrogen over a longer period of time.

Apply the fertilizer at a rate of no more than 1 pound of nitrogen per 1,000 square feet of lawn. For more information on how to calculate that amount, refer to EDIS Publication ENH 962, Figuring Out Fertilizer for the Home Lawn, http://edis.ifas.ufl.edu/EP221. After the first fertilization, follow the UF/IFAS guidelines for annual lawn fertilization for your grass species and your location. These rates can also be found in the above publication. There is often a tendency to over fertilize lawns, but for both the health of the grass and the health of Florida's water environment, it is important that these guidelines be followed.

Landscape

Irrigation. Several months are required for a shrub planted from a 3-gallon nursery container to adjust to its new landscape surroundings. Specifically, roots must grow from the artificial confines of the container into the surrounding landscape soil. Roots grow in response to the soil conditions at the site and will spread out and sometimes down into a more natural position. This

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root growth and redistribution takes about 6-12 months in most parts of Florida. For shrubs to remain reasonably healthy during this establishment period, irrigation is required. Cutting this period short could result in stressed plants and plant death unless regular rainfall occurs. Once shrubs are established, they should survive on rainfall alone except during times of extended drought or if planted in situations which might cause them to dry out, such as full sun, deep sand soil, etc.

Shrubs planted from 3-gallon containers can be established in landscape soil with as little as one gallon of irrigation water applied every eight days in north Florida and every four days in south Florida (Table 2).

More frequent irrigation (e.g. every four days in north Florida and every two days in south Florida) has been shown to result in more vigorous plant growth. However, applying a volume of water greater than one gallon per irrigation event does not increase survival or growth. Light, frequent applications are much more efficient and effective than applying large volumes less frequently. Applications of large volumes of water will not compensate for infrequent 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

Fertility. Slow-release (or 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. Adding 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 root condition will injure the plant and could kill it.

Bedding plants should be fertilized prior to planting or at planting time. Incorporate 12-4-12 or a similar analysis fertilizer uniformly throughout the soil at the rate of 1 pound per 100 square feet of bed area. Slow-release fertilizers are ideal for establishing bedding plants.

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Table 1. Irrigation Scheduling for Recently Planted Trees.

Notes on Irrigation:
1.) Delete daily irrigation when planting in winter. Irrigation frequency can be reduced slightly (e.g. 2-3 times each week instead of every other day) when planting hardened-off, field-grown trees that were root-pruned during production. Establishment takes 3 (hardiness zones 10-11) to 4 (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 2-3 gallons per inch trunk caliper to the root ball. Apply the water in a manner so all water soaks into the root ball. Do not irrigate if root ball is already wet/saturated on the scheduled irrigation day.
4.) Trees take much longer to establish than 3-4 months per inch trunk caliper. Irrigate in drought the following summer.

Table 2. Irrigation Schedule for Establishing Shrubs in Well Drained Soil. (Irrigation schedule is based on shrubs planted from 3-gallon, smooth-side plastic containers.)

Location	Irrigation Schedule for Vigor	Irrigation schedule for Survival
North Florida	Every 2-4 days	Every 8 days
Central Florida	Every 2-4 days	Every 8 days
South Florida	Every 2 days	Every 4 days

Established Lawns and Landscapes

Lawns

Irrigation. Lawns should be irrigated when a substantial portion of the lawn shows signs of wilt. These signs include the following:

- 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, location, time of year, temperatures, and any particular micro-environmental effects, such as shade. If rain is forecast within the next 24 hours, delay irrigation.

Different types of soils will require different watering frequencies. Many Florida soils are sandy and hold 1 inch of water in the top 12 inches of soil. Since most roots are in the top 4-6 inches of soil, 1/2 - 3/4 inch of water will wet that area and below to encourage deeper rooting. Some lawns may be growing on compacted or fill soil, which may require more frequent watering with smaller amounts each time to reduce runoff. Soils with greater amounts of organic matter or clay may require less frequent watering. Regardless of soil type, however, light, frequent watering of mature turf is inefficient and encourages shallow root systems. Conversely, excessive irrigation, which keeps the root system saturated with water, is also harmful to the lawn.

A simple watering schedule would apply 1/2 to 3/4 inch of water when turfgrass shows symptoms of water deficit as discussed earlier. Once this amount of water has been applied, do not apply any more until drought symptoms are again noticeable. 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. 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.

Be sure to always comply with watering restrictions from local authorities or Water Management Districts.

Fertility. Fertility needs for lawngrasses vary due to homeowner preference, grass species, and location. The following table is a guide for fertilization needs based on species and location. The application rates are based on pounds of nitrogen per 1,000 square feet of lawn. For more information on how to apply this amount properly, refer to EDIS

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Publication ENH 962, Figuring Out Fertilizer for the Home Lawn, http://edis.ifas.ufl.edu/EP221.Choice of a fertilizer should be based on results of a soil test to determine whether the soil needs phosphorus (P).

Table 3. Fertilization Guidelines for Established Turfgrass Lawns.

Species/Location	Nitrogen Recommendations (lbs 1000 ft^{-2} yr^{-1})[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

[1]Because homeowner preferences for lawn quality and maintenance level will vary, 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.
[2]These recommendations assume that grass clippings are left on the lawn.

Landscape

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 remain 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 N-containing fertilizers to apply per 1,000 square feet of bed area is presented in Table 4. To prevent increased fertilizer costs and unintended loss of nutrients from landscapes, fertilizer should only be applied to targeted areas.

Table 4. Fertilization Rates for Established Landscape Plants.

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

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 - 2:1. However, 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 (quick-release) fertilizers should be applied at no more than 1/2 pound N/1000 ft per application. Application rates of slow-release fertilizers depend on release rates of the product.

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Palms have different nutritional requirements than other landscape plants. When palms are an important feature of the landscape, areas within 30 feet of palms should be fertilized with a 4-1-6-2 (N - P_2O_5 - K_2O - Mg) ratio fertilizer. (An 8-2-12-4 is an example of a fertilizer utilizing this ratio). N, K_2O and Mg 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 (N) given above for basic, moderate and high levels of maintenance. Because palms are highly prone to several potentially fatal micronutriet deficiencies, any fertilizer applied to a palm should contain 1-2% Fe and Mn, as well as trace amounts of Zn, Cu, and B to prevent these deficiencies.