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Estimated Water Savings Potential of Florida-Friendly Landscaping Activities[1]

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Introduction

The Florida-Friendly Landscaping™ (FFL) program promotes a number of environmentally friendly landscaping practices intended to protect natural resources. These practices implement the nine basic principles of FFL that, taken individually or collectively, reduce landscape maintenance and resource requirements. These nine principles are:

1. right plant, right place;
2. water efficiently;
3. fertilize appropriately;
4. mulch;
5. attract wildlife;
6. manage yard pests responsibly;
7. recycle;
8. reduce stormwater runoff; and
9. protect the waterfront (UF/IFAS 2015).

The FFL program for residential landscapes—Florida Yards and Neighborhoods (FYN)—provides education on how to design, install, and maintain low-impact landscapes. By passing an evaluation conducted by an FYN Extension Agent or a Master Gardener Yard Advisor, homes can be recognized as Florida-Friendly, an honors program that acknowledges homeowners' efforts to conserve water and protect water quality and other natural resources. However, any homeowner can independently adopt the practices, provided they comply with homeowner association (HOA) requirements or restrictive covenants. Homeowners can gradually adopt FFL practices or focus on one, such as the second principle, "water efficiently." Watering efficiently can reduce water bills and can help conserve Florida's limited water resources.

Figure 1. Any homeowner can independently adopt the Florida-Friendly Landscaping practices as long as they are consistent with HOA requirements and other restrictions.
Credit: Michael Gutierrez, UF/IFAS

This Ask IFAS publication is intended for homeowners, FYN Extension Agents or Master Gardener Yard Advisors who conduct irrigation evaluations, irrigation professionals, and the general public. The objective is to provide information on the potential water savings from implementing one or more practices of the FFL program's second principle, "water efficiently."

FFL Evaluation Checklist

The FFL evaluation is based on a checklist of landscape practices. The checklist consists of required practices and optional practices (UF/IFAS 2024). Optional practices are assigned point values. In order to be recognized as Florida-Friendly, a homeowner must follow all applicable mandatory practices and collect a certain number of points from the optional practices. The listed practices for watering efficiently are given below. The first two practices are required, and the remaining practices are optional. Many of the practices apply only to landscapes that use in-ground automatic irrigation systems.

Required

- A functioning automatic rainfall shutoff device is maintained on in-ground systems, and a rain gauge is used to track rainfall amounts.

- Irrigation system is calibrated to apply 1/2" to 3/4" of water per application.
- Spray and rotor heads are installed on separate zones.

Optional

- For a landscape that does not use an irrigation system, the landscape is designed and maintained to exist on rainfall and minimal hand watering once plants are established.
- Not more than 50 percent of the irrigation system (by area) is high-volume. (High-volume irrigation has a flow rate of 0.5 gallons per minute or higher. In most cases, spray sprinklers, rotor sprinklers, and bubblers are considered high-volume [SJRWMD 2015].)
- Turfgrass and landscape plants are irrigated only as needed (in compliance with any existing watering restrictions).
- Irrigation systems are operated manually as opposed to running automatically.
- A smart controller (evapotranspiration, soil moisture sensor, or similar) is installed and operational. (Evapotranspiration controllers use weather data to schedule when and for how long irrigation should occur, and soil moisture sensors bypass scheduled irrigation events when the soil has enough stored water. Both types of smart controllers are used with in-ground automatic irrigation systems. Additional information on smart controllers can be found in EDIS document *Smart Irrigation Controllers: What Makes an Irrigation Controller Smart?* https://edis.ifas.ufl.edu/publication/AE442).
- Separate irrigation zones for turf and landscape plants are maintained.
- Microirrigation, also known as drip irrigation or low-volume irrigation, is installed and maintained in plant and flower beds.
- The in-ground automatic irrigation system is maintained seasonally to adjust spray patterns and repair clogs and leaks.

Water Savings Potential

To help predict the impact of implementing some of the water conservation measures listed on the FFL checklist, as well as other conservation measures, a table of estimated water savings has been developed (Table 1). Homeowners can select from Table 1 which FFL activities are the best fit for their landscape and can also use the table to see which FFL activities have the most conservation potential.

The water savings is compared to a baseline case of typical irrigation behavior. Savings are in units of gallons per 1,000 square feet of irrigated landscape per year (gal/1,000 sq ft/yr). Typical suburban residential homes in Florida may have a total lot size of about 10,000 sq ft (about 0.2 acres) and landscaped area of about 5,000 sq ft (about 0.1 acres). The water savings given in Table 1 are usually not additive (i.e., cumulative). For example, calibrating the sprinkler to deliver ½" of water and calibrating the sprinkler system to replace 60% of evapotranspiration (FFL activities 2 and 3 in Table 1) are both ways to adjust the sprinkler system, and the savings are not additive. Reducing irrigation in the summers and winters (FFL activities 10 and 11 in Table 1) would be cumulative because the activities are independent.

Baseline case: A homeowner irrigates their turfgrass according to UF/IFAS recommendations (Table 5 in Dukes et al. 2024) twice per week with 100% evapotranspiration (ET) replacement and an irrigation rate of 1.0 in/hr. His annual baseline irrigation is 31,787 gal/1,000 sq ft of turfgrass.

Rationale: Based on Table 5 in Dukes et al. (2024), the average monthly irrigation is 29.4 min/event in central Florida. With a rate of 1.0 in/hr and 2 events/wk, the irrigation depth is 51.0 in/yr, or 31,767 gal/1,000 sq ft/yr.

Note: The baseline may be higher or lower than what some homeowners typically use. In southwest Florida, Haley and Dukes (2012) observed that the control group of homes irrigated 2.5 in/month (18,849 gal/1,000 sq ft/yr). In central Florida, Haley et al. (2007) observed that the control group of homes irrigated 5.9 in/month (43,882 gal/1,000 sq ft/yr). Therefore, a homeowner who does not follow the UF/IFAS recommended irrigation schedule may be irrigating significantly more or less than 31,767 gal per 1,000 sq ft. Additionally, geographic location may influence irrigation use. Using the same IFAS recommendations of Table 5 in Dukes et al. (2024),the baseline irrigation is 23,015 gal/1,000 sq ft in north Florida (28% lower than in central Florida) and 35,765 gal/1,000 sq ft/yr in south Florida (13% higher than in central Florida).

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Table 1. Florida-Friendly Landscape activities that can result in water savings.

FFL Activity	Water Savings (gal/1,000 sq ft/yr)	Approximate cost ($)	Documentation
Install expanding disk interrupt rain sensor	2,541	200	Rationale: Meeks et al. (2012) found that using rain sensors resulted in an 8% irrigation savings for a two days/week irrigation schedule. Cárdenas-Lailhacar et al. (2010) observed a 13%–24% irrigation savings using a rain sensor during dry conditions. In an earlier study, Cárdenas-Lailhacar et al. (2008b) observed irrigation savings of 3%–44% depending on the rain sensor type and setpoint. Calculation: A conservative estimate of irrigation savings is 8%: (0.08)(31,767) = 2,541
Calibrate sprinkler system to deliver ½" or ¾" water instead of 1"	7,942–15,884	240[1]	Rationale: Trenholm and Unruh (2012) recommend 0.5–0.75 in/irrigation event. Calculation: By using 0.75 in/event, there is a 25% savings as compared to the baseline; and by using 0.5 in/event, there is a 50% savings: (0.25)(31,767) = 7,942; (0.50)(31,767) = 15,884
Use UF/IFAS recommendations and calibrate sprinkler system to replace 60% ET instead of 100%	12,707	240[2]	Rationale: Dukes and Cardenas (2024b) note that a 60% ET replacement schedule is generally adequate to maintain turf, although some supplemental hand watering may be necessary during warm months. Calculation: By replacing only 60% of water, 40% will be saved: (0.40)(31,767) = 12,707
Install soil moisture sensor or evapotranspiration controller	11,118–22,872	500	Rationale: Several studies have demonstrated the water savings potential of soil moisture sensor (SMS) or evapotranspiration (ET) controller. When using an ET controller and rain sensor, Rutland and Dukes (2012) observed a 41% irrigation reduction under wet conditions, and Davis et al. (2009) found a 43% reduction under dry conditions. In an SMS study in Gainesville, Florida, Cárdenas-Lailhacar et al. (2010) observed irrigation savings of 72% during wet conditions and of 35% (first half of 2006) to 54% (second half of 2006) during dry conditions. SMSs and ET controllers tend to reduce irrigation by 35%–72%. Calculation: (0.35)(31,767) = 11,118; (0.72)(31,767) = 22,872
Convert turfgrass area to landscaped bed with micro irrigation	15,569–31,767	750	Rationale: Klein et al. (2023) recommend that ornamental plants be irrigated only as needed once established. This recommendation is based on studies of ornamentals grown in Florida (Scheiber et al. 2008; Wiese et al. 2009). Alternatively, Haley et al. (2007) reported that mixed turf and ornamental landscapes that used micro irrigation in landscaped beds irrigated 74 mm/month over the entire landscape, which is equal to 55 mm/month (16,198 gal/1,000 sq ft/yr) for the ornamentals, as compared to 105 mm/month for irrigation with sprinklers only. Calculation: (31,767-16,198) = 15,569

Convert spray head nozzles to multi-stream, multi-trajectory (MSMT) nozzles	2,859	296[3]	Rationale: MSMT nozzles apply water more evenly and have lower application rates (˜0.5 inches/hr). Southern Nevada Water Authority and Eugene Water and Electricity Board (Sovocool et al. 2013; Petersen 2012) have both observed an improvement in distribution uniformity that could translate to a 9% savings based on the Irrigation Association's scheduling multiplier. Calculation: (31,767)(9%) = 2,859
Install pressure compensating heads	2,224	272[4]	Rationale: At a higher pressure, a spray head will apply a greater rate. By reducing pressure from 50 to 30 psi, the flowrate could be decreased by approximately 7%.[5] Calculation assumes that 60 psi is the minimum municipal pressure maintained for fire protection, 50 psi is a reasonable on-site pressure, and 30 psi is the sprinkler manufacturer's recommended operating pressure. Calculation: (31,767)(7%) = 2,224
Reduce irrigation from 3 days/week to 2 days/week	10,483	0	Rationale: Reduction from 3 days/week to 2 days/week yields an annual 33% savings. Calculation: (31,767)(33%) = 10,483
Reduce irrigation from 7 days/week to 2 days/week	22,555	0	Rationale: Reduction from 7 days/week to 2 days/week yields an annual 71% savings. Calculation: (31,767)(71%) = 22,555
Reduce irrigation frequency during the winter (Skip a Week)	8,259	0	Rationale: During the period between daylight savings (approximately November–March), irrigation would be skipped every other week. During the weeks the irrigation system would run, irrigation would be reduced from two times per week to one time per week. Irrigation savings would be achieved through 9 weeks of no irrigation and 9 weeks of 50% reduction in irrigation. Total annual irrigation reduction would be 26%. Calculation: (31,767)(26%) = 8,259
Reduce irrigation frequency during the summer	5,718	0	Rationale: The summer months typically have sufficient rainfall to provide the majority of the turfgrass's water requirements. Summer (June, July, and August) savings could be approximated by the savings obtained using a soil moisture sensor. In an SMS study in Gainesville, Florida, Cárdenas-Lailhacar et al. (2010) observed irrigation savings of 72% during wet conditions. Calculation: (31,767 gal/year)(3 summer months/12 per year)(72%) = 5,718

[1] Based on a four-hour irrigation contractor service call at $60/hr

[2] Based on a four-hour irrigation contractor service call at $60/hr

[3] Based on 8 nozzles per 1,000 sq ft area at $7/nozzle and a four-hour irrigation contractor service call at $60/hr

[4] Based on 8 pressure regulating spray heads per 1,000 sq ft area at $4/spray head and a four-hour irrigation contractor service call at $60/hr

[5] Reduction based on Toro Precision Series with arcs Q, H, and F and with radii of 5, 8, 10, 12, and 15 ft.

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