UF | IFAS Extension
UNIVERSITY of FLORIDA

# Florida-Friendly Landscaping™
# Handbook for Home Landscapes

Florida-Friendly Landscaping™ PROGRAM

Florida-Friendly Landscaping™ Handbook for Home Landscapes

This publication was funded in part by FDEP with a Section 319 Nonpoint Source Management Program Grant from the U.S. Environmental Protection Agency.

# Table of Contents

# What Are Florida Friendly Landscapes?

Florida-Friendly Landscapes protect Florida's unique natural resources by conserving water, reducing waste and pollution, creating wildlife habitat, and preventing erosion. Any landscape can be Florida-Friendly if it is designed and cared for according to the nine Florida-Friendly Landscaping™ principles, which encourage individual expression of landscape beauty.

In 2009, the Florida Legislature found "that the use of Florida-Friendly landscaping and other water use and pollution prevention measures to conserve or protect the state's water resources serves a compelling public interest and that the participation of homeowners' associations and local governments is essential to the state's efforts in water conservation and water quality protection and restoration." Florida Yards and Neighborhoods is the residential program of the Florida-Friendly Landscaping™ Program. Make your landscape a Florida-Friendly Landscape—do your part to create a more sustainable Florida!

# Creating Your Florida Friendly Landscape

Florida is a popular place to live because of its appealing climate, unique beauty, and great quality of life. However, gardening here can be tough! Florida soils are typically sandy, summers are hot, and insects are abundant. As a gardener, you know how hard it can be to keep your plants alive, your lawn green, and your flowers blooming.

That's where the Florida-Friendly Landscaping™ Handbook for Home Landscapes program can help. It makes creating and maintaining a quality landscape both easier and more Florida-Friendly through numerous helpful concepts, tools, and techniques.

Our tips on cost-saving, efficient landscapes will help you reduce water, fertilizer, and pesticide use. Plus, a FloridaFriendly Landscape can be designed to suit your tastes, community, and lifestyle. Whether you're establishing a new landscape or making changes to an existing one, this book will guide you through the process.

In the past, many people desiring to improve the sustainability of their landscapes found that archaic association rules and deed restrictions prevented them from managing their yard in a responsible manner. In 2009, the Florida Legislature found "that the use of Floridafriendly landscaping and other water use and pollution prevention measures to conserve or protect the state's water resources serves a compelling public interest and that the participation of homeowners' associations and local governments is essential to the state's efforts in water conservation and water quality protection and restoration." Per 373.185 and other Florida Statutes:

- "A deed restriction or covenant may not prohibit or be en forced so as to prohibit any property owner from implementing Florida-friendly landscaping on his or her land or create any requirement or limitation in conflict with any provision of part II of this chapter or a water shortage order, other order, consumptive use permit, or rule adopted or issued pursuant to part II of this chapter;" and

- "A local government ordinance may not prohibit or be en forced so as to prohibit any property owner from implementing Florida-friendly landscaping on his or her land."

# #1: Right Plant, Right Place

## Enjoy Healthier Plants And Reduce Work  By Using Plants Suited To Your Landscape Conditions

Achieving a natural, healthy balance in your landscape starts with putting the right plant in the right place. This encompasses far more than simply putting sun-loving plants in your yard's sunny spots—you also need to consider things like maintenance and water needs. Matching plants to conditions in your landscape can help them thrive, once established, with little or no irrigation and few or no fertilizers and pesticides.

The secret to successful landscape design is thorough planning. Remember that once you have a plan, you don't have to do all the work at once—you can implement it one area at a time. Read this chapter to get an idea of the factors you should take into account when planning your new landscape or renovating an existing one, and use the worksheet at the end of the chapter to design a customized landscape plan that is sure to work for you.

# Landscape Design

Florida-Friendly Landscape design combines art and science to create functional, attractive, and ecologically sound surroundings that complement a home or other structure. The main idea when placing plants in your landscape is not to waste time, energy, and money caring for a plant that is not adapted to the spot where it's planted. But Florida-Friendly Landscaping™ guidelines need not restrict your choices of color, texture, and style.

## Form follows function

In a landscape, plants fulfill multiple roles. For example, landscape designers often recommend grouping plants into masses to unify the design of plant beds. Groups of plants are visually pleasing, but this design technique provides environmental benefits as well. Trees planted in groups provide more atmospheric cooling than the same number of evenly spaced, isolated trees and are much better protected in high winds. In addition, trees planted in combination with appropriate shrubs and groundcovers form effective windbreaks and wildlife habitat.

## Plant matchmaking

Turf and landscape plants have different water, fertilizer, and maintenance needs. All it takes is one misplaced shrub to disrupt mowing and irrigation patterns. To conserve water and make maintenance easier, group plants in beds according to water requirements.

## Color in the landscape

One way to design your landscape is by choosing two or three colors that complement each other, and repeating the color combination throughout the landscaped area. You'll create a scene that's visually attractive, and the repetition of color will draw the eye through the planting. However you design your landscape, don't forget to take into consideration what times of year different plants bloom or display leaf, fruit or bark color.

## Wet vs. Dry

Many drought-tolerant plants thrive on elevated dry spots or in windy areas, but can quickly succumb to root diseases and pest problems if planted in areas that tend to stay wet. Drought-tolerant plants do well in exposed areas and along the unshaded southern or western walls of buildings, but you should place plants adapted to wet soils in low spots, along waterways, and in areas with poor drainage.

## Wind-wise plantings

Florida winter winds tend to blow from the north or northwest. A solid fence or a row of evergreens situated on the north side of a house forms a barrier against cold winter winds, which can dry and damage plants. In the summer, winds typically originate in the south, so to allow breezes to cool outdoor living spaces in the warm months, keep tall barriers away from the southern edge of your landscape. Since Florida is frequently in the path of hurricanes, choose trees that are known for their sturdiness in high winds.

## Made in the shade

Position trees and shrubs strategically to naturally cool or heat your home. Plant deciduous shade trees on the south, east, and west sides of a house to cast shade in summer and allow warming in winter.

Tree shade can reduce air conditioning costs significantly. An air-conditioning system's outdoor compressor/condenser unit uses less energy when it is shaded from direct sun during the day—but be careful not to block the unit's airflow. If the warm discharge air cannot escape, the intake air temperature rises, causing the unit to operate less efficiently.

## The lowdown on grass

Healthy lawns clean and cool the air by absorbing carbon dioxide, releasing oxygen, and collecting dust and dirt. They filter stormwater runoff and reduce erosion, glare, and noise. But the many benefits of grass are only realized when it's cared for and used properly. Turfgrass thrives in sunny areas, but most types do not grow well in dense shade. In shady spots, plant shade-tolerant groundcovers instead of turf.

For a more thorough overview of the artistic elements of landscape design, visit http://gardeningsolutions.ifas.ufl.edu or consult a reputable landscape designer or professional landscape architect.

## Urban landscape biodiversity

Biodiversity is the key indicator of the health of an ecosystem. Healthy ecosystems clean our water, purify our air, maintain our soil, regulate the climate, recycle nutrients, and provide us with food.

Generally, human activities may negatively impact biodiversity. But we can focus on improving and increasing biodiversity by the efficient planning and management of resources in the urban environment.

Homeowners can create more biodiversity in their yards by following the nine FFL Principles while planting a variety of species and using an abundance of plants. Yards that attract many different insects and animals most likely have a good variety of trait functions.

Shade your A/C unit from direct sun, but do not block the airflow.

# Soil Know-How

In much of Florida, "soil" and "sand" are synonymous. Where sandy soils predominate, water and nutrients move downward quickly. As a result, Florida soils usually dry out rapidly and are not compatible with plants having high water and nutritional needs. Sandy soils are also more likely to allow pollutants to leach into groundwater and waterways.

In certain parts of the state, the sandy soil has a hardpan (a dense layer of largely impervious soil) under it, causing water to stand for long periods instead of draining away. Other exceptions to the quick-draining sandy soils situation occur:
- In the Keys there is really no soil at all—it is rock.
- In parts of the Panhandle the soil is reddish clay.

## Soil health

Though it may seem to be simple, lifeless dirt, healthy soil is immensely active with a thriving ecosystem. Soil health refers to the combined physical, chemical, and biological characteristics that affect the soil's ability to support plants and cycle water and nutrients. Promoting soil health means supporting a diverse community of organisms from bacteria and fungi to earthworms, nematodes, and plants. Organic matter plays a key part in soil health because it builds soil structure, promotes water retention, and infiltration. The active ecosystem allows the soil to break down organisms that die and recycle nutrients back to the soil and plants. Management of soil health is a long-term process. However, building soil health will produce longterm benefits to the plants in your landscape and the environment.

## Improving soil

For best results growing flowers or vegetables, you may need to amend the planting bed frequently by addingamendments (e.g., composted manures, biosolids, or yard waste) from a lawn and garden store or a local composting facility. Organic matter retains moisture, provides nutrients, and attracts beneficial organisms like earthworms. When selecting organic matter, choose materials that are decomposed to the point of containing few or no recognizable source materials – in yard waste, that would mean you wouldn't see any leaves or sticks.

The easiest way to add organic matter to an empty planting bed is to put down a layer 2–3 inches thick, then mix it into the soil using a tiller, shovel, or digging fork. In established planting areas, such as a rose bed, add organic matter such as mulch around plantings each spring, before the rainy season.


Soil amendments keep garden soil robust and healthy.

## Compacted soil

Many new homes are built on a raised platform of compacted "fill dirt" imported during the construction process. Such compacted soils don't absorb water readily and restrict the healthy root growth of plants. If you have a landscape that has compacted soil, loosen and amend the soil with organic matter as you add planting beds.

## Hardpan

Some soils have a sub-layer of hardpan, limestone, rock, or shell, which limits root penetration, essentially establishing a barrier to plant roots. Where possible, examine your soil to a depth of about 18 inches before making final plant selections.

## Soil PH

Soil pH is the measure of acidity or alkalinity and can have a big effect on the health of your plants—essential plant nutrients like iron and manganese become more or less available depending on the pH of the soil. Soil testing will help you determine the pH of your site. In general, coastal areas are usually alkaline (high pH), while inland areas are usually acidic (low pH).

Although many plants tolerate a wide pH range, they do best when planted in the right soil. Plant reference guides often provide pH information along with other plant requirements. Raising soil pH is easy, but lowering it is harder to do and is only a temporary condition.

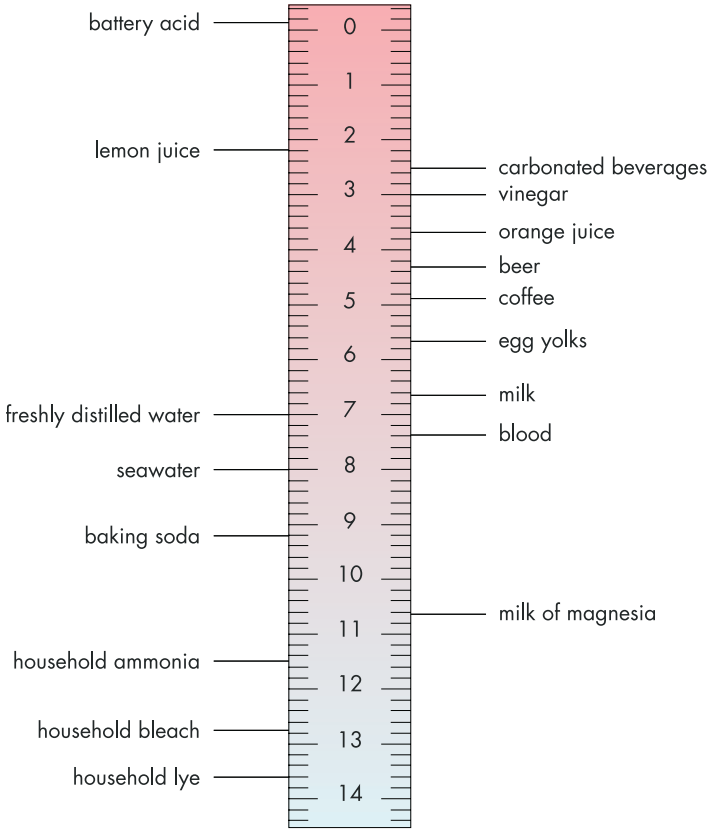
Concrete, stucco, brick, mortar, plaster, and other building materials are strongly alkaline. These materials dissolve into surrounding soil, drastically changing the pH over time. For this reason, azaleas (Rhododendron), flowering dogwoods (Cornus), ixora (Ixora coccinea), and other acid-loving plants should not be planted near the concrete foundation of a home or along sidewalks.

## Soil Testing

Whether you're deciding what to plant or just doing some troubleshooting, you should get your soil tested. A soil test can tell you some of the nutrients your soil contains or the pH of your soil. For a specific area, like a planting bed, you can take just one sample; for a large area (like a lawn), you should take samples from multiple locations to get an average reading. County Extension offices can test your soil for a small fee or provide you with a kit to send a soil sample to the University of Florida/IFAS Extension Soil Testing Laboratory. Detailed directions come with the kit. You'll get the results within a few weeks, helping you make smart plant and fertilizer choices.

UF/IFAS County Extension Offices:
https://sfyl.ifas.ufl.edu/find-your-local-office/

UF/IFAS Soil Testing Laboratory:
http://soilslab.ifas.ufl.edu




The pH scale measures acidity and alkalinity of substances.

Plant alkaline-loving plants by concrete, brick, or other building materials.

# Plant Selection

The plants you choose determine how much maintenance your landscape will require and also how long it will last. There are countless varieties of plants that can work in a Florida-Friendly Landscape. Select plants from the UF/IFAS Florida-Friendly Plant List (see https://ffl.ifas.ufl.edu/plants/), or consult your county Extension office.

Use these steps as a guide to selecting the right plants for the right places in your Florida-Friendly yard:

### Choose low-maintenance plants suited to your site.

Once these plants are established in the right location, most require little, if any, supplemental water, fertilizer, or pesticides.

### Welcome wildlife and pollinators.

Provide flowering and fruiting plants to bring birds, butterflies, and other pollinators into your yard. Florida is a stopover or second home for many migrating and wintering butterflies and birds, so cater to these colorful, winged creatures. (See the FFL Butterfly Gardens app here: https://ffl.ifas.ufl.edu/butterflies/ and our FFL Florida Bee Gardens app here: https://ffl.ifas.ufl.edu/bees/)

### Plant for impact.

If you do choose high-maintenance plants, group them together for greater visual impact and easier care.

### Eliminate invasive plants.

Invasive non-native plants can spread from landscapes into natural areas where they can aggressively out-compete native plants, contributing to habitat loss. Learn to identify problematic plants (https://assessment.ifas.ufl.edu/) and dispose of them carefully. And never plant them!

### Buy quality plants.

Choose the healthiest plants you can find. Slip plants out of pots to inspect roots. Diseased roots are brown to black and often have a sour or rotting odor. Roots growing in a circle inside the pot indicate a rootbound plant—a plant that has been left in the pot too long. Purchase a different plant, if possible.

### Consider size.

Most plants are not full-grown when purchased (smaller plants will often establish faster and grow as quickly as larger plants). Make sure you know how large a plant will grow before purchasing it, and consider buying dwarf species for smaller spaces to reduce pruning needs and overcrowding. Always give plants

Healthy roots are white and earthy-smelling.

Circling roots can shorten the life of trees.

enough room to grow to full size. Think ahead—don't plant trees that grow large beneath power lines, close to your house, or in other potentially hazardous sites. If your home features solar panels, be sure any trees you plant will not block them.

### Aim for diversity.

Create a mosaic of trees, shrubs, groundcovers, native grasses, and wildflowers. Monocultures—large expanses of the same plant species—are prone to disease and insect infestation and aren't as sustainable as a diverse plant community.

### Keep grass useful.

Plan turf areas to be functional and design them for easy maintenance. Define planting bed edges and shapes to make mowing easy.

### Cope with a slope.

Use groundcovers on slopes where grass is difficult to maintain.

### Don't use quick fixes.

Don't be fooled by the quick-fix appeal of fast-growing plants. Such plants require frequent pruning and more water. Also, fast growth yields lots of lush, green shoots, which can attract certain pests. Slow-growing plants may take longer to fill in your landscape, but they'll ultimately last longer and create less work.

### Consider wind tolerance.

Certain tree species are less wind-tolerant than others, meaning they are more likely to be damaged or blow over in a hurricane or other severe weather. Look for sturdy trees to place in your landscape. Check http://hort.ifas.ufl.edu/treesandhurricanes/ for information about specific species.

### Think of upkeep.

Do not overlook maintenance needs when designing your landscape. Maintenance includes proper watering, fertilizing, composting, pruning, mowing, mulching, and pest management. The more carefully you plan your landscape, the less you will have to worry about maintenance. Newly installed plants need frequent water, but it's possible to maintain an established landscape with minimal amounts of pesticide, fertilizers, and supplemental water.

For more information about choosing plants, use the plant list that is available on the FFL web site https://ffl.ifas.ufl.edu/plants/, contact your county Extension office, or visit http://gardeningsolutions.ifas.ufl.edu.

Always consider a plant's mature size when you purchase it.

Mature plants need more room than immature plantings.

# Invasive Plants

Below is a list of some of the most problematic invasive exotic plants. The State of Florida prohibits their planting. If you have any of these plants in your landscape, remove them to prevent their further spread.

Air potato
(Dioscorea bulbifera)

Australian pine
(Casuarina spp.)

Brazilian pepper
(Schinus terebinthifolius)

Chinese tallow
(Sapium sebiferum)

Melaleuca
(Melaleuca quinquenervia)

Old World climbing fern (Lygodium microphyllum)

Tropical soda apple
(Solanum viarum)

Water hyacinth
(Eichhornia crassipes)

For information about invasive plants, contact your county's UF/IFAS Extension office or visit the assessment web site: https://assessment.ifas.ufl.edu/.

# Do You Need Salt-Tolerant Plants?

Many Floridians live near the coast, where the air, groundwater, and soil can be salty and capable of severely damaging, deforming, or killing plants. But there are many plants with varying degrees of salt tolerance. Choose salt--tolerant plants if you live on or near an estuary or a salt marsh, or within one-eighth of a mile of the ocean. Use the UF/IFAS Florida-Friendly Plant List, available on the FFL web site, to help you choose salt-tolerant plants for your landscape.

# Know Your Zone

How well your plants perform depends in large part on choosing the right plants for your climate. The U.S. Department of Agriculture has designated eleven hardiness zones to guide gardeners; each zone indicates the average lowest temperatures of an area. Figure out your USDA plant hardiness zone for guidance in what will survive your winters.


# Is It Safe To Dig?

Before you dig in your yard, it's important that you get your underground utilities marked. Hitting utilities while digging can cause tremendous damage, interrupting your electric, telephone, cable television, water, sewer, and gas service—it can even cause injury or loss of life.
All you have to do is dial 811 at least two business days before you want to dig. Your utility companies will locate any underground utilities in your landscape for free. If you don't follow this procedure and underground lines are damaged, you could be fined.

For more information, visit https://www.sunshine811.com/.

# Plant Sorting: To Keep Or Not To Keep

If you're renovating your landscape, it's wise to keep some of the plants you already have. In an established landscape, retaining trees, shrubs, perennials, and other plants will save you money—and it also preserves established wildlife habitat. If you are dealing with new home construction, leaving plants in place will help reduce erosion. The trick is knowing which plants to keep. Follow these simple guidelines to sift through your botanical choices:

### Maintain plants for best health.

Keep healthy plants that show good form and are growing in appropriate locations. Consider just pruning healthy, overgrown shrubs.

### Discard or thin tightly spaced plants.

Over time, tight spacing fosters insect and disease problems and stresses plants. Overcrowding can also cause leggy growth from plants competing for sunlight and nutrients. It's best to get rid of plants that are grouped too closely together.

### Evaluate your existing trees.

Select trees that are healthy, are long-lived, and plan for diversity in the trees you keep. Some examples are live oak (Quercus virginiana), mahogany (Sweitenia mahogany), and sabal palm (Sabal palmetto). Consider removing trees that are short-lived, like cherry laurel (Prunus caroliniana); prone to decay, such as mature laurel oak (Quercus laurifolia); or weak-wooded, such as pine (Pinus).

### Save clusters of trees and the plants growing beneath them.

Trees growing in groups or shady forests often grow very tall and narrow. If the site is cleared, an isolated tree becomes vulnerable to wind damage and could snap or fall over during a windstorm or hurricane. For this reason, it is best to leave trees in clusters. The cluster should include the trees along with any groundcovers or native shrubs growing beneath them. This trio of trees, shrubs, and groundcovers buffers wind and maintains habitat for wildlife.

Plant trees in clusters to protect from wind damage.

### Remove unsuitable plants.

These include unhealthy plants, invasive plants, and plants that require constant care to survive. Plants with these characteristics are usually more trouble than they're worth.

### Move plants located too close to walls.

They block air currents and prevent access for home maintenance.

### Relocate plantings out from under eaves.

They often prove problematic, as they may not receive adequate rainfall or may be damaged by the force of rainwater dropping from the roof.

Once you know which plants you intend to keep, ensure that roots are not damaged through construction activities or soil compaction, which can damage or kill a plant. Avoid driving over the roots of plants, especially trees, with heavy vehicles; digging into the root zone area; and mounding soil against the base of plants. To protect trees during construction, construct barricades at the edge of the canopy drip line. Even though this does not protect the entire root system, it will improve your trees' odds of survival.

Trees particularly sensitive to soil compaction include sweetgum (Liquidambar), dogwood (Cornus spp.), sassafras (Sassafras spp.), tupelo (Nyssa spp.), pine (Pinus spp.), white oak (Quercus alba), laurel oak (Quercus laurifolia) and most nut trees, such as black walnut (Juglans nigra), hickory (Carya spp.), and pecan (Carya illinoinensis).

Move plants that block air currents or interfere with home maintenance.

# Planting Trees

Begin your landscape renovation by putting walkways, irrigation systems, or patios into place first; then plant trees. Because trees are a more permanent addition to the landscape, careful site selection and proper planting techniques are essential.

### Look up.
Find a new planting site if there is a wire, security light, or building nearby that could interfere with the tree as it grows.

### Dig a wide, shallow hole.
Dig a hole that is one and one-half to three times the width of the root ball (the roots and soil attached to the plant when you remove it from its pot).

### Examine the root system.
If the root ball contains circling roots or shows signs of being pot-bound, shave off the outer inch of the root ball with a sharp spade.

### Find the point where the topmost root emerges from the trunk.
This point is called the trunk flare, root flare, or root crown and should be 2 inches above the soil surface.

### Slide the tree into the planting hole and position it carefully.
Place the trunk flare slightly above the surface of the landscape soil and begin to fill the hole with the excavated soil, making sure the tree is straight as you go. As you add the soil, slice a shovel down into it twenty to thirty times, all around the tree. Compress the soil to stabilize the tree.

### Add plenty of water to the root ball and planting hole.
Make sure the root ball and surrounding soil are thoroughly moistened. Add more soil around the root ball if needed.

### Cover the backfill soil with mulch.
Apply mulch to a minimum 8-foot diameter circle around the tree, with a gap of 12 to 18 inches between the trunk and the mulch.

### Stake the tree, if necessary.
Staking holds the root ball firmly in the soil. Top-heavy trees might require staking, especially if they're located in a windy location.

### Water trees frequently so roots fully establish.
Light, frequent irrigation fosters the quickest establishment for trees (see "Establishing Trees" on page 21 for more information). Following the initial few months of frequent irrigation, water weekly until plants are fully established.

For more information about planting trees, visit http://gardeningsolutions.ifas.ufl.edu.

Shave off the outer inch of the root ball

The trunk flare should be two inches above the soil surface.

Cover with mulch.

## Trees Can Help

Not sure where to start with a new landscape? Plant trees. Establishing a tree canopy is a great way to begin your Florida-Friendly yard. Trees not only provide shade and wildlife habitat, they also help to reduce stormwater runoff. Trees significantly increase the value of a home and lot. According to the American Forestry Association, trees have other significant monetary benefits. Each year, a single tree provides $73 worth of air conditioning savings, $75 worth of erosion control, $75 worth of wildlife shelter, and $50 worth of air pollution reduction. Compounding this annual total of $273 for 50 years at 5 percent interest results in a tree value of $57,151. The overall benefits far outweigh the initial cost and maintenance of each tree.

## Where Are Tree Roots?

A tree resembles a wine glass placed on a dinner plate. Consider the base of the wine glass as the lowest part of the trunk where major roots flare outward. The dinner plate represents the rest of the root system, which extends far beyond the drip line—up to three times the canopy's diameter, depending on the species. Vertically speaking, most tree roots are located in the top two feet of soil, where oxygen is most available.

# Choosing A Turfgrass

Grass is a good choice for areas with high recreational use, for erosion control, or for use in a swale (an open channel with gently sloping sides that collects and slows the flow of rainwater). When planning a grass area, carefully consider which type of turfgrass is best for your site conditions and your desired maintenance level. (For example, bermudagrass and seashore paspalum are not usually recommended for home lawns because of their high maintenance requirements. For more information about them, visit http://hort.ufl.edu/yourfloridalawn/.) Groundcovers may be more successful and practical in low-traffic areas, heavily shaded spots (such as under trees), or on steep slopes where grass is difficult to maintain. Keep these factors in mind when choosing a turfgrass:

### Drought tolerance.

St. Augustinegrass will not thrive in some sites without supplemental irrigation in dry times. Bahiagrass will survive without supplemental irrigation by going into drought-induced dormancy, but may not form a lawn as dense as other grasses. Centipedegrass and zoysiagrass need slightly less water than St. Augustinegrass but do require supplemental irrigation to remain green and healthy during dry periods.

### Shade tolerance.

Most turfgrasses grown in Florida are sun-loving, but some will grow in areas with partial shade. Dwarf St. Augustinegrass cultivars such as 'Captiva', 'Delmar', and 'Seville' are best for shaded areas and can tolerate as few as five to six hours of sunlight daily. 'Floratam' has the lowest shade tolerance and does best where it will receive seven to eight hours of sunlight per day.

### Wear tolerance.

This term describes how well a turf species will stand up to repeated traffic, either human or vehicular. Most zoysiagrasses have relatively high wear tolerance.

### Salt tolerance.

This is mainly a concern for lawns in coastal areas, where salt spray from the ocean or use of reclaimed/recycled water may expose the grass to higher concentrations of salt. St. Augustinegrass and zoysiagrasses are the better choices for these areas, although they may sustain injury with high levels of salinity. Bahiagrass and centipedegrass have relatively poor salt tolerance.

### Fertility requirements.

A lawn that needs more fertilizer costs a homeowner more time, money, and effort. Centipedegrass and bahiagrass have relatively low fertility requirements, while zoysiagrass and some cultivars of St. Augustinegrass need more fertilizer and consequently more water and pest control. When choosing a turfgrass type, consider the time and money you are willing to spend on maintenance.

### Climatic conditions.

Florida's climate varies greatly from north to south. It's important to research which species and cultivars are best suited to your region of the state and your soil type. Consulting your county Extension office is always a good idea.

### Leaf texture.

Leaf texture describes the width and coarseness of the grass blades. Although often preferred, the fine-textured leaf blades have higher maintenance requirements.

### Pest & disease problems.

Each species and cultivar of turfgrass is prone to certain insect pests and fungal or bacterial pathogens. St. Augustinegrass often suffers from chinch bugs, while zoysiagrass is prone to hunting billbugs and brown patch disease. Know which pests and diseases your chosen grass is most prone to, and be aware of what your control options are.

For more information about selecting a turfgrass for your landscape, visit http://gardeningsolutions.ifas.ufl.edu.

Sun-loving turf cultivars will not thrive in shady conditions.

Shade-loving shrubs are a better choice for underneath trees.

# Turfgass Selector




| | Bahiagrass | Centipede Grass | St. Augustinegrass | Zoysiagrass |
|---|---|---|---|---|
| **Area Adapted To** | Statewide | N. Fla. And Panhandle (Except For 'Hammock') | Statewide | Statewide |
| **Mowing Height (Inches)** | 3–4 | 1.5–2.5 | 3.5–4 (2–2.5 For Dwarf Cultivars) | 1.5–2.5 |
| **Soil** | Acid, Sandy | Acid, Sandy, Or Clay | Wide Range | Wide Range |
| **Leaf Texture** | Coarse–Medium | Medium | Coarse–Medium | Fine–Medium |
| **Drought Tolerance** | Excellent | Medium | Fair | Medium |
| **Salt Tolerance** | Poor | Poor | Good | Good |
| **Shade Tolerance** | Poor | Fair | Good (Cultivar-Dependent) | Good (Cultivar-Dependent) |
| **Wear Tolerance** | Poor | Poor | Poor | Good–Excellent |
| **Nematode Tolerance** | Very Good | Poor | Good | Depends On Cultivar |
| **Maintenance Levels** | Low | Low | Medium | Medium |

# Choosing A Landscape Maintenance Service

If you lack the time, desire, or ability to tackle your own landscape work, you may decide to hire a professional landscape maintenance company. Ensure employees have obtained a certificate of completion in the Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries (GI-BMPs), a joint program of the Florida Department of Environmental Protection and UF/IFAS. This training is mandatory for all commercial fertilizer applicators who must have a license from the Department of Agriculture and Consumer Services (FDACS) (482.1562, F.S.. For identification purposes their photograph will be on the license).
Ask potential hires if they follow these Florida-Friendly practices:

### Pest Control

- Monitor for pests instead of routinely treating areas.
- Use the least toxic methods of managing pests.
- Apply pesticides only with your approval.

### Fertilizer

- Apply fertilizer only if plants show signs of nutrient deficiencies, and follow UF/IFAS recommendations and BMPs.
- Use slow-release fertilizers.
- Avoid fertilizers containing weed killer or insecticide.
- Sweep fertilizer from sidewalks and driveways.

### Lawn Care

- Mow turf areas only as needed, according to seasonal growth.
- Mow no more than one-third the height of the grass blades per mowing, using a reel, rotary, or mulching mower.
- Mow turf to University of Florida-recommended height for your species and cultivar (see chart on page 16).
- Maintain sharp mower blades at all times.
- Leave grass clippings on the lawn and use yard waste as mulch or compost.

### Irrigation

By law, automatic irrigation systems must have a functioning rain sensor or other device to bypass irrigation if adequate moisture is present. Licensed contractors are required by law to install, repair, or replace these control devices if they are not installed and working properly before doing any other work on an irrigation system.

- Inspect and test rain shut-off devices and other components and zones in the irrigation system regularly.
- Make regular minor adjustments and repairs to irrigation systems such as head cleaning and replacement, filter cleaning, small leak repair, and minor timer adjustments.

### Yard Waste

- Don't sweep or blow yard waste into storm drains.
- Replenish all mulched areas regularly to maintain a 2- to 3-inch layer using pine bark, pine needles, melaleuca, eucalyptus, or other Florida-Friendly materials.

For more information on selecting a landscape maintenance service, please visit http://ffl.ifas.ufl.edu.

# Qualifications To Look For

Landscape maintenance professionals can take many kinds of trainings and display many different certifications—but there are only a few that UF/IFAS recommends. Ask if any of a landscape maintenance company's employees have any of the following licenses or certifications:

- Florida-Friendly Green Industry Best Management Practices (Florida Department of Environmental Protection and UF/IFAS)
- International Society of Arboriculture (ISA) certification
- Florida Irrigation Society (FIS) or Irrigation Association (IA) certification
- Florida Certified Horticulture Professional (FCHP) certification from the Florida Nursery, Growers, and Landscape Association
- Limited Commercial Landscape Maintenance Certification (Florida Department of Agriculture and Consumer Services)
- Pesticide Applicator License (FDACS)

# Landscape Planning Worksheet

This worksheet can be used for both new and established landscapes. By following these steps, you're almost guaranteed a thriving, low-maintenance landscape suitable to your climate and needs.

## 1. Decide why you want to landscape.

Most homeowners think of landscaping as a way to add beauty to their home or to improve the resale value. Other reasons to landscape are more specific, such as enhancing or screening a view, creating a microclimate, or attracting wildlife to a yard. You may need a play area for your children, or perhaps you'd like to entertain family and friends outdoors. Your passion may be raising vegetables or simply savoring a lovely view.

How will you use your landscape? (A typical landscape has multiple uses.)

## 2. Obtain a soil analysis.

Soil plays a big part in any landscape project, influencing what plants will thrive in your yard. Determine the soil's texture (sandy to clay), and have it tested to determine the pH—the level of acidity or alkalinity. This information will help you decide which plants are best suited to the conditions of your yard. Read more about soil starting on page 6.

Type of soil in your landscape: _____

pH: _____

Any exceptions? (For example, maybe the place where you want to put a planting bed has more acidic soil than other areas in the landscape.)

## 3. Inventory your landscape.

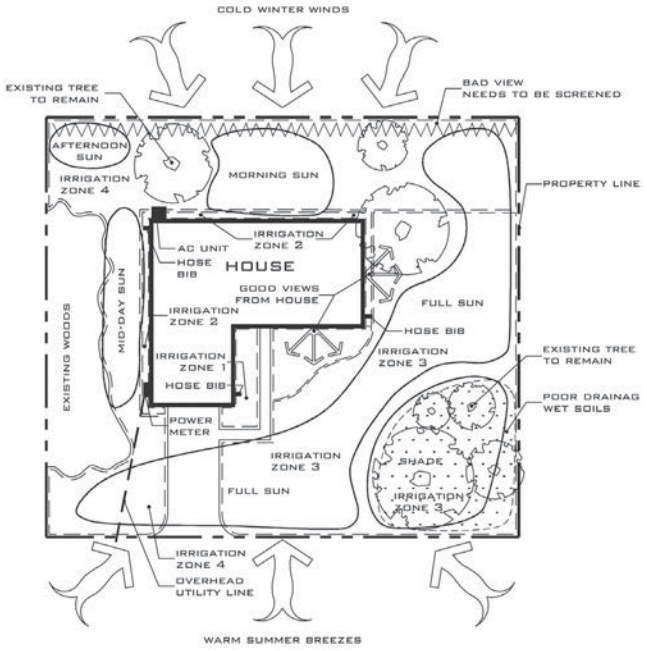
Walk around your property, noting conditions that make your yard unique. Does your site call for plants that are tolerant of cold, wind, full sun, shade, drought, occasional flooding, or salt spray? Also take note of the locations of more permanent features, including utilities, hardscapes like the driveway, and water sources such as hoses.

What kinds of conditions does your landscape have?

## 4. Draw a site analysis.

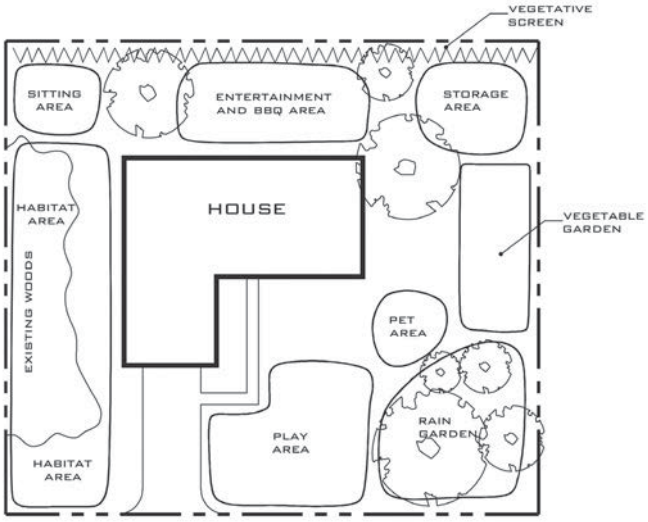
Don't be nervous—you don't have to be an artist to tackle this step! Round up the tools you'll need: a pencil, ruler, and graph paper. (Computer software programs that can help you with landscape planning are also commercially available.) Don't worry too much about getting the scale just right. If you have the survey completed for your home purchase, photocopy it—it'll be really helpful at this stage.

On the graph paper or template, create your diagram using the information you gathered in steps 2 and 3. Draw your house and pencil in existing trees, shrubs, and other plants you want to keep. If you have an existing irrigation system, be sure to note its location and coverage. See the sample site analysis below for guidance.




## 5. Draw an activity map.

On another piece of graph paper, sketch your house again and where various activities will take place (refer to your answers for step 1). Make sure to consider views: Is there a spot you can see from indoors that you want to enhance with plants that attract birds or butterflies? Is there scenery you would like to hide? See the sample activity diagram below for guidance.




Sample Activity Diagram

## 6. Create a landscape plan.

Your landscape plan will be guided by the site analysis and activity map discussed in steps 4 and 5. Based on these other two diagrams, determine the types of plants you want in different locations. Don't worry about choosing specific plants yet—just draw in where you want trees, shrubs, groundcovers, flowering plants, and turf.

Now that you have a plan, you can choose plants suited for the conditions in your landscape, using the Florida-Friendly Plant List, which can be found online at https://ffl.ifas.ufl.edu/plants.

# NOTES

# #2: Water Efficiently

## Reduce Water Bills, Pest Problems, And Maintenance Needs

Florida's freshwater is considered a limited resource, and it requires an individual effort to conserve it. In the urban landscape, irrigation water is supplied either from potable drinking water, reclaimed (purple pipe), or underground well water sources. Regardless of the supply available, proper irrigation management is critical to protecting our drinking water supplies and reducing the negative impacts on our natural resources.
By using the latest advancements in efficient water-saving technologies and the adoption of recommended best management practices, residents can easily maintain good plant health and reduce pest problems and maintenance needs.

Both over- or under-watering are unsustainable practices that often waste water and are detrimental to plant health and survival. For example, underwatering reduces plant drought tolerance and decrease the plant's ability to establish and sustain growth. Overwatering does more than increase your water bill; it can deplete water supplies and make plants more prone to disease and pests.

By learning to efficiently apply water, you can reduce water bills, decrease plant problems, and lower maintenance requirements. For example, overwater can accelerate plant growth, which leads to increased mowing and pruning of overgrown plants. The more you water your lawn, the faster it grows and the more it needs to be mowed. It's also more likely to develop fungal problems that require treatment with pesticides.

Finally, inefficient watering practices can lead to water quality issues related to leaching and runoff. Leaching is a natural function of water moving downward through the soil. Leaching can occur very quickly in sandy soils, moving nutrients to the groundwater which may lead to contamination. Irrigation spray that contacts or puddles on hard surfaces can move nutrients via stormwater runoff. For example, a prolonged irrigation event can flush chemicals and yard debris away from the lawn and landscape into stormwater drains.

# Water Restrictions

Florida's five water management districts (WMDs) are agencies of the state that manage and protect our water resources on a regional basis. The irrigation restrictions issued by your WMD and that may be implemented by your local government—in most areas, they're in effect year-round—should be followed exactly or even exceeded, as they exist to ensure that there's enough water for everyone.

Restrictions usually limit automatic watering with a sprinkler or irrigation system to certain times on certain days of the week. These times and days may be different depending on your house number, neighborhood, or side of the street. Water restrictions in your area may also be called "irrigation schedules." Water restrictions apply to everyone and every water source in a WMD. (Water use requirements may be different with reclaimed/ recycled water.)

Even if it is your assigned day to irrigate, that doesn't mean you should irrigate. Scheduled watering can waste money and water. Don't let the calendar tell you when to water—look to your plants for telltale signs of water stress and turn on your irrigation system manually instead of allowing the automatic controller to run on a set schedule. For information about setting your irrigation controller, visit http://ffl.ifas.ufl.edu.

# Water Management Districts

Florida is divided into five water management districts. Figure out what water management district you live in, and follow the water restrictions for your area.

Northwest Florida Water Management District:
https://www.nwfwater.com
(850) 539-5999

St. Johns River Water Management District:
https://www.sjrwmd.com
(386) 329-4500 or (800) 451-7106

Southwest Florida Water Management District:
https://www.swfwmd.state.fl.us
(352) 796-7211 or (800) 423-1476

South Florida Water Management District:
http://www.sfwmd.gov
(561) 686-8800 or (800) 432-2045

Suwannee River Water Management District:
http://www.srwmd.state.fl.us
(386) 362-1001 or (800) 226-1066

# Water-Wise Advice

**1. Choose the right plant for the right place**
All plants must get the right amount of sun, water, and nutrients to thrive—even natives.

- Select plants suited to your area.
- Place plants in the landscape where site conditions match their needs.
- Group plants with similar water needs together.

**2. Water thoughtfully**
A drop here and a drop there can add up to a lot of water.

- Always follow any water restrictions in your area.
- Water early in the morning.
- Irrigate plants and grass only when they start to wilt, as allowed by water restrictions.
- Once landscape plants are established, water only as needed.

**3. Handwater when possible**
Handwatering is usually allowed during water restrictions because it uses less water than an automatic irrigation system.

- Use a watering can, pail, or hose with an automatic shutoff nozzle.
- Handwater potted plants, shrubs, trees, vegetables, and flower beds.
- Check if your water management district limits handwatering.

Perform regular irrigation system maintenance.

**4. Perform regular irrigation system maintenance An irrigation system is only as efficient as it's maintained to be.**

- Check for and repair leaks.
- Unclog and replace broken heads.
- Point heads at plants, not driveways and sidewalks.
- Prune plants that interfere with irrigation systems.

Handwater whenever possible.

A rain barrel can save excess rainwater water for dry times.

**5. Calibrate irrigation system**
Even an efficient irrigation system can waste water if it's left on for too long. The ideal amount of water to apply to a lawn is 1/2 - 3/4 inch. See page 19 for information on how to calibrate your system.

**6. Make a rain barrel**
Rain barrels capture rainwater that flows off your roof. They're easy and inexpensive to make. Instead of watering your plants with water you're paying for, you're using free water!

**7. Use microirrigation**
Drip or micro-spray irrigation systems apply water directly to the roots of plants, where it's needed, and lose minimal water to evaporation or wind drift.

**8. Mulch plants**
Mulch helps keep moisture in the soil around your plants. Choose from many different kinds of mulch and apply two to three inches around trees, shrubs, flowers, and vegetables.

**9. Mow correctly**
How you mow your lawn can have a big impact on how much water it needs. Raise your mowing deck to promote a healthy root system, which will make your grass more drought tolerant.

**10. Be a weather watcher**
Rain is irrigation, too. Use it to your advantage—it's free!

- Don't water your landscape if it's rained in the past 24 hours or if rain is forecast in the next 24 hours.
- Purchase a rain gauge to track how much rain your plants are getting.
- Install a rain shut-off device or soil moisture sensor to override your irrigation system when it's raining.

## Calibrating Irrigation Systems

Follow these steps to determine how much water your irrigation system is applying:

- Set out 5 to 10 flat-bottomed, straight-sided cans (all of equal size). Containers that are 3 to 6 inches in diameter, such as cat food or tuna cans, work best for this.
- If you have an in-ground system, place the containers in one zone at a time, scattering the cans randomly throughout the zone. You'll need to repeat this procedure in each zone.
- If you use a hose-end sprinkler to water your turf, place the containers in a straight line from the sprinkler to the edge of the watering pattern. Space the containers evenly.
- If you have a drip irrigation system, place the cans under emitters.
- Turn on sprinklers for 15 minutes.
- Use a ruler to measure the depth of water in each container. The more precise your measurement, the better your calibration will be. Measurement to the nearest 1/8 inch should be adequate.
- Find the average depth of water collected in the containers by adding up the depths and dividing by the number of containers.
- To determine the irrigation rate in inches per hour, multiply the average depth of water times four (since you ran the water for 15 minutes).
- Check your system yearly to make sure it's working properly.

# Microirrigation

Microirrigation systems deliver small volumes of water directly to the root zone through low-flow emitters, such as micro-spray jets, micro-bubblers, or drip tubes. Microirrigation can be a great way to water your plants more efficiently. It can be installed under shrubs and trees, in planting beds, and in containers, but should be avoided in lawns.

- Drip or micro-spray fittings can clog; you may need to filter the water source. Inspect fittings regularly and clean them when necessary. Insects, rodents, and enthusiastic hoeing can damage drip tape or tubing.
- If you already have an irrigation system, your options for converting to microirrigation may be limited. But sometimes low-pressure emitters, such as microbubblers, can be adapted to existing sprinkler heads. This may require a pressure regulator at the source to reduce water pressure.
- Although microirrigation equipment releases small amounts of water, overwatering is still possible if the system is left on for too long.

## Soaker Hoses

While plants are becoming established in your yard, you may want a temporary watering system—it's convenient and usually worth the effort. Temporary watering systems could be a soaker hose or just a garden hose attached to a sprinkler.

Unlike regular garden hoses, soaker hoses seep or leak water along their entire length, delivering it to the soil around the plants. Lay the hose on top of the soil, or bury it slightly in the soil or mulch. Landscape staple pins work great for holding the hose in place. If you decide to use a soaker hose or other temporary watering system, purchase a battery-powered timer to hook up to the spigot. The timer will help you make sure you don't leave the water running longer than it needs to.

Use the soaker hose until your plants are established, and then install or use a more permanent irrigation system if needed. Soaker hoses aren't recommended for long-term use because they distribute water inefficiently.

Drip tubing.

Micro-bubbler.

Micro-spray.

# Smart Irrigation Controllers

Smart controllers such as soil moisture sensor controllers or weather-based controllers, sometimes called evapotranspiration (ET) controllers, are devices that control irrigation to meet plant needs. They schedule irrigation events or inhibit irrigation in response to soil moisture or weather conditions.

Any person who purchases and installs an automatic landscape irrigation system must properly install, maintain, and operate technology that inhibits or interrupts operation of the system during periods of sufficient moisture. This technology includes rain sensors and soil moisture sensors.

A licensed contractor who installs or performs work on an automatic landscape irrigation system must test for the correct operation of each inhibiting or interrupting device or switch on that system. If such devices or switches are not installed in the system or are not in proper operating condition, the contractor must install new ones or repair the existing ones and confirm that each device or switch is in proper operating condition before completing other work on the system.

These smart irrigation controllers, conserve water, save you money, and reduce wear on your irrigation system. They can also help prevent turf disease and other problems caused by excess moisture. Make sure yours is working properly, or replace or repair it if needed.

Soil moisture sensor.
*Photo courtesy of Bernardo Cardenas*

Rain sensors.

# Establishing Plants

Remember to water your new plants thoroughly when establishing them. In North and Central Florida, you'll need to irrigate 3-gallon plants two to three times per week. In South Florida, irrigate three to four times per week. For each watering, apply 3 liters (about 0.8 gallons) of water. Irrigate your new plants until they're established, which usually takes 15 to 20 weeks. You may need to handwater plants to comply with local water restrictions. Once your plants are established, water on an as-needed basis, continuing to comply with the irrigation schedule mandated by your water management district.

# Establishing Trees

Newly planted trees need regular irrigation to rapidly grow the roots necessary for proper establishment. For trees planted in spring or summer, water two to three times per week. After the first few months, provide weekly irrigation until plants are fully established. Irrigations should be 2 to 3 gallons of water per inch trunk diameter. For example, a 2-inch tree should be watered with 4 to 6 gallons each irrigation. Again, handwatering may be the only way you can follow this schedule and still comply with water restrictions.

# Drought-Tolerant Lawns

All turfgrasses need water to remain green, whether it comes from rainfall or supplemental irrigation. Drought tolerant grasses will go into dormancy during dry periods, growing more slowly or turning brown until conditions are favorable for growth. When enough soil moisture returns, these grasses can usually recover from droughtinduced dormancy, rather than dying. Bahiagrass and centipedegrass are more drought tolerant than zoysiagrass and St. Augustinegrass, but for all grass types, proper watering and mowing practices will encourage the grass to develop deep roots that aid recovery from drought stress. In other words, you can make your lawn more drought tolerant no matter what kind of grass you have.

When rainfall is inadequate, grasses will require supplemental irrigation to remain green. But you can train your lawn to use less water by following these easy steps:

- **Mow your lawn at the highest recommended setting** for your grass type (see page 13), and don't remove more than one-third of the grass blade at each mowing. Mowing high results in deeper roots, which is important in developing drought tolerance and minimizing irrigation requirements.
- **Adjust irrigation times and applications** by season, weatherconditions, and your region of the state. Don't irrigate until you see signs of wilt, making sure to comply with water restrictions.
- **Water infrequently and deeply.** This will train the grass roots to grow deep. Make sure you don't overwater—just fill the root zone with 1/2 - 3/4 inch per application.
- **Spot-treat pest problems only as needed.** Chemicals applied inappropriatly can cause damage and stress to the grass, which can increase its need for water.

For more information on caring for your lawn, see http://gardeningsolutions.ifas.ufl.edu.

Keep mower blades sharp and clean.

Let your lawn tell you when to water.


LESCO

# #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.

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. This section will help you correctly choose and apply the right type of 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 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 potassium and 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 often display a yellowing that appears to follow a distinct distributional pattern on a leaf or among leaves on a shoot, whereas pathogenic (e.g., fungal or bacterial) problems tend to appear more randomly on the plant. Turf nutrient deficiencies also display distinct characteristics, for instance iron deficiency appears first in the tips of the leaf blade and nitrogen displays a

## If there is something wrong with your lawn. Use this chart to help identify nutritional deficiencies that may be causing the problem. For an accurate diagnosis and recommendation, contact your local county Extension office.

| Elements | Deficiency symptoms | Comments |
|---|---|---|
| **Nitrogen** | Symptoms appear first, and are most severe, on the oldest leaves as a uniform light green or yellow coloration. As the deficiency progresses, the entire plant quickly becomes light green in color and growth rate declines sharply. | Nitrogen deficiency is associated with sandy soils with low organic matter. A deficiency can also occur in soils exposed to high leaching conditions from heavy rainfall or excessive irrigation.<br>Be sure to apply the appropriate amount of nitrogen as recommended by UF/IFAS turfgrass scientists. Applying incorrect amounts can lead to a weak stand of turf (too little), disease problems or potential nonpoint source pollution (too much). |
| **Iron** | Yellowing between the veins in new leaves (interveinal chlorosis), then spreading to older leaves as deficiency worsens. | Occurs commonly in alkaline soil plants with root problems caused by mechanical injury, root rot diseases, or nematodes may also exhibit iron deficiency symptoms. |

yellowing of the entire leaf blade. 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.

## Selecting A Fertilizer

A wide range of fertilizers are 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.

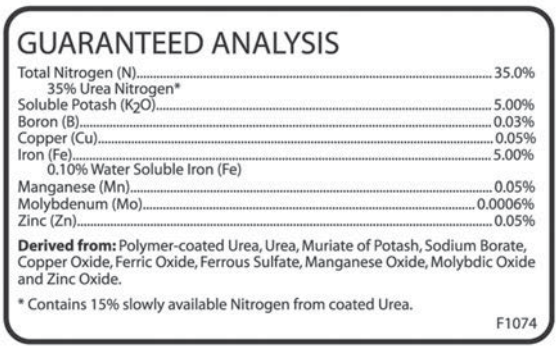
### Organic Fertilizers

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 released more slowly than those in some 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 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.


GUARANTEED ANALYSIS

Total Nitrogen (N) ..... 35.0%
35% Urea Nitrogen*
Soluble Potash ($K_2O$) ..... 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.

F1074

Always check the N-P-K ratio and quantity of slow-release nitrogen.

## Slow- & Controlled-Release Fertilizer

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.

According to UF/IFAS guidelines, any fertilizer that is labeled "slow-release" or "controlled-release" must contain 30 percent or more slowor 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 (30% to 50% or more) 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.

# 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 unless a soil test indicates a deficiency.
- **Keep fertilizer off hard surfaces.** If fertilizer gets spilled on a hard surface (like a driveway), sweep it up and disperse it over the lawn or return it to the bag. Fertilizers can wash into storm drains and from there into a nearby water body.
- **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 may leach (seep downwards) through the soil and into the groundwater.
- **Never fertilize within 10 feet of any water body.** Designate at least 10-foot low-maintenance zone between your landscape and the normal high water mark.
- **Avoid fertilizing before a significant rainfall (greater than 1 inch).** If significant rain is forecast, 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. Be sure that only vegetated areas are irrigated.

Do not rinse fertilizer into storm drains.

Sweep up fertilizer spills on the lawn.

## For Lawns

- **Apply fertilizer only when grass is actively growing.** Many Florida turfgrasses go dormant or slow their growth in response to cooler seasons and shorter days. Water it in with 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.
- **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 preemergent herbicides applied far earlier than fertilizer. This almost ensures that one or the other is ineffective, if not harmful.
- **For yellow turfgrass in summer, especially on alkaline soils, try liquid foliar applied chelated iron or iron sulfate before you consider applying a nitrogen fertilizer.** While both iron (Fe) and N deficiencies result in yellowing of turfgrass, they are distinctly different deficiencies. Applying iron will not correct a nitrogen deficiency, and nitrogen will not substitute for iron.

Avoid fertilizing within 10 feet of any water body.

A deflector shield directs fertilizer away from your maintenancefree zone.

# 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

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

Palms have special nutritional needs.

# 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 may 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. Fertilizers for Urban turf must be formulated and have application instructions in accordance with requirements and directions provided by Rule 5E-1.003, Florida Administrative Code, Labeling Requirements for Urban Turf Fertilizers. If using a quick release product, FDEP recommends that you apply only up to 0.7 pound of water soluble nitrogen per 1,000 square feet. However, some local fertilizer ordinances may stipulate no more than 0.5 lbs/1000 per application.

Do not exceed the annual nitrogen recommendations provided on the fertilizer label. A maximum of 1 lb. total (N) per 1000 sq. ft. may be applied at any one time, except as provided on the fertilizer label for certain products applied during spring and summer. In most of north Florida, do not apply before April 15th (Tax Day), or after mid-late September. This last application should minimize tender new growth and promote cold tolerance through the winter, such as with a fertilizer high in potassium which is the third number in the analysis.

If you live in an area where fertilization is prohibited from June through September, new "Enhanced Efficiency" fertilizers have been developed that may be effectively used to prevent nutrient deficiencies during this period of maximum growth. For those south of Ocala, apply a .5 or 1 pound per 1,000 square feet nitrogen application in late March or early April, and again in early October. In May, (look for a dry spell in the forecast) you may apply up to 2 pounds per 1,000 square feet of nitrogen if the label permits it, using a special slow release fertilizer of 65% or more slow release nitrogen.

### When should I apply fertilizer to a lawn?

The warmer parts of Florida have year-round growing seasons while other areas have semi-dormant or dormant lawns for parts of the year. Apply fertilizer only when grass is actively growing. As a general rule of thumb, in North Florida (north of Ocala) and the Panhandle, your last fertilizer application should be made in late September.

In Central Florida, your last application can be made in early October. You can tell when grass is showing dormancy because growth will slow significantly or the grass will turn brown.

Dormancy is caused by changes in both weather and length of day, so even in South Florida grass may go into some degree of dormancy. Consult your county UF/IFAS Extension office with questions about the best times to fertilize your lawn, and always comply with local fertilizer ordinances.

### How do I water-in fertilizer?

Most fertilizers need to be watered-in to move fertilizer just below the soil surface to grass roots. This process requires only about 1/4 inch of irrigation water. To find out how long it takes your sprinkler system to deliver this much water, read 'Calibrating Irrigation Systems' on page

Don't overwater, or you'll increase the potential to move fertilizer past the root zone and into groundwater.

Turfgrasses do not use fertilizer when they are dormant.

Apply fertilizer only when grass is growing actively.

## Follow these steps to fertilize your lawn.

### 1. Measure

Measure the areas of your yard to be fertilized in order to determine the total square footage. Divide your yard up into a series of rectangles and multiply the length times the width to determine the square footage of each area. Add them all together to get the total.

### 2. Research

Check fertilizer tables, local ordinances, and UF/IFAS recommendations, and fertilizer labels.

### 3. Weigh

Be sure to weigh out the correct amount of fertilizer and pour half into the spreader.

### 4. Apply

Apply fertilizer in N/S direction.

### 5. Reload

Reload with the second half of the fertilizer and apply in an E/W direction.

### 6. Clean up

Be sure to sweep up any spilled fertilizer on hard surfaces and apply to the grass.

## Fertilization Guidelines for Established Turfgrass Lawns in Three Regions* of Florida

Nitrogen recommendations (lbs N / 1000 $ft^2$ / year)**

| Species | North | Central | South |
|---|---|---|---|
| Bahia | 1-3 | 1-3 | 1-4 |
| Bermuda | 3-5 | 4-6 | 5-7 |
| Centipede | 0.4-2 | 0.4-3 | 0.4-3 |
| St. Augustine | 2-4 | 2-5 | 4-6 |
| Zoysia | 2-3 | 2-4 | 2.5-4.5 |

* North Florida is north of Ocala. Central Florida is defined as south of Ocala to a line extending from Vero Beach to Tampa. South Florida includes the remaining southern portion of the state.

** Suggested rates based on years of nitrate leaching and turf quality research.

# 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 1 lb of total nitrogen. 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. (N-0-K unless P is needed.)

| | 6% N | 10% N | 12% N | 15% N | 16% N | 23% N | 27% N |
|---|---|---|---|---|---|---|---|
| 1,000 ft2 | 16.5 lbs | 10 lbs | 8.5 lbs | 6.5 lbs | 6 lbs | 4.5 lbs | 4 lbs |
| 1,100 ft2 | 18.5 lbs | 11 lbs | 9.5 lbs | 7 lbs. | 7 lbs | 5 lbs | 4 lbs |
| 1,200 ft2 | 20 lbs | 12 lbs | 10.5 lbs | 8 lbs | 7.5 lbs | 5 lbs | 4.5 lbs |
| 1,300 ft2 | 22 lbs | 13 lbs | 11.5 lbs | 8.5 lbs | 8 lbs | 5.5 lbs | 5 lbs |
| 1,400 ft2 | 23.5 lbs | 14 lbs | 12.5 lbs | 9 lbs | 9 lbs | 6 lbs | 5 lbs |
| 1,500 ft2 | 25 lbs | 15 lbs | 13.5 lbs | 10 lbs | 9.5 lbs | 6.5 lbs | 5.5 lbs |
| 2,000 ft2 | 33.5 lbs | 20 lbs | 17 lbs | 13 lbs | 12 lbs | 9 lbs | 8 lbs |
| 2,500 ft2 | 41.5 lbs | 25 lbs | 21 lbs | 16.5 lbs | 15.5 lbs | 11 lbs | 9.5 lbs |
| 3,000 ft2 | 50 lbs | 30 lbs | 25.5 lbs | 19.5 lbs | 18 lbs | 13 lbs | 12 lbs |
| 3,500 ft2 | 58 lbs | 35 lbs | 30 lbs | 23 lbs | 21.5 lbs | 15.5 lbs | 13.5 lbs |
| 4,000 ft2 | 66 lbs | 40 lbs | 34 lbs | 26 lbs | 24 lbs | 18 lbs | 16 lbs |
| 4,500 ft2 | 74 lbs | 45 lbs | 38 lbs | 29.5 lbs | 27.5 lbs | 20 lbs | 17.5 lbs |
| 5,000 ft2 | 82 lbs | 50 lbs | 42.5 lbs | 33 lbs | 31 lbs | 22 lbs | 19 lbs |

# #4: Mulch

## Keep Moisture In The Soil, Help Control Weeds, And Reduce Stormwater Runoff

A mulch layer around trees, shrubs, and planted beds provides many benefits. In areas that are difficult to mow, irrigate, or otherwise maintain, use mulch to replace turf or groundcovers. Also, consider placing mulch in shady areas where many plants don't grow well.

# The Dirt On Mulch

Mulch is a wonderful addition to any landscape, because it:

- **Buffers soil temperature.** Mulch keeps soils and plant roots warmer in winter and cooler in summer.
- **Helps maintain soil moisture.** Mulch slows evaporation and reduces the water needs of plants.
- **Inhibits weed germination and growth.**
- **Adds beauty.** Mulch gives planting beds a neat and uniform appearance, and its color and texture can complement plantings.
- **Helps reduce soil erosion.**
- **Can improve soil.** Careful planning and management can help gradually build soil organic matter to sufficient levels. Adding new organic matter to soil every year (by spreading a thin layer of compost on top of grass) is perhaps the most effective way to improve and build soil organic matter in established lawns.
- **Can protect plants.** Mulch can help prevent certain plant diseases, and when placed around shrubs and trees (at least 12 to 18 inches from the trunk), it reduces the likelihood of damage from trimmers and mowers.

Properly applied mulch encourages moisture retention and accents the landscape.

# Choosing A Mulch

There are many factors to consider when selecting mulch for your landscape. Depending on your priorities, you could make a decision based on any or all of them:

- Cost
- Color
- Origins of the mulch
- Durability
- Nutrient content
- Texture/Appearance

All of the different kinds of mulch available in Florida have benefits and drawbacks. Cypress, melaleuca, and pine bark are the longest lasting types of mulch but don't offer plants many nutrients when they break down. Soil pH may be reduced by pine bark and pine straw, which would be excellent for acid-loving plants like azaleas, but not plants that require high-pH soil. Here's an overview of the most popular mulches:

**Pine bark** is a byproduct of the forest industry. It comes in ground and nugget forms, and has a rich brown color.

**Pine straw** (pine needles) comes from pine plantations, which produce paper and wood products, and is sold in bales. Unlike some mulches, pine needles are not likely to wash away, because they knit together.

**Fallen leaves** (including grass clippings) can be raked up for free in your landscape. This type of mulch is high in nutrients, but decomposes quickly.

**Melaleuca mulch** is made from the invasive exotic trees. The product is cured at a high temperature to kill seeds.
Mixed hardwood mulch is produced from scrap lumber, recycled pallets, or tree stems that are too small to be used for paper or wood production.

**Eucalyptus mulch** typically comes from plantations in South and Central Florida where the trees are grown specifically for mulch. They grow quickly, so this mulch is considered renewable.

**Utility mulch** is sold or given away for free by many utility companies. This mulch comes from trimming trees and other plants that get in the way of power lines, but it can come with weed seeds and other debris.

**Cypress mulch** is composed of both wood and bark. Cypress trees, which grow in Florida's forested wetlands, are often harvested for lumber used in fencing, flooring, furniture and other wood products. Cypress mulch is often made from the waste wood generated in the manufacture of these products, but it may also be produced from whole trees cut from wetlands. The Florida-Friendly Landscaping™ Program does not recommend the use of cypress mulch, as its origins may be difficult to determine.

**Gravel or pebbles** can be used for pathways or under the eaves of the house, but should not replace organic mulches in planting beds as they won't contribute to the soil's nutrient and organic content or water-holding capacity. If you choose to use these products in pathways, make sure to first install a woven ground cloth to keep them from sinking in sandy soils.

## How Much Mulch?

Purchasing mulch by the bag is convenient, but it can be costly. Buying mulch in bulk quantities can save you money. Bulk mulch is sold by the cubic yard; each cubic yard contains 27 cubic feet. Remember to apply 3 to 4 inches of mulch for a layer that will be 2 to 3 inches when settled. One cubic foot will cover 4 square feet to a depth of 3 inches.

## Colored Mulch

Colored mulch may be made of construction and demolition (C&D) materials. If this is so, it could potentially be contaminated with arsenic which can leach into the ground and harm plants, animals, and the humans that spread it. It is often difficult to determine it's origin. Some companies use C&D material because it is drier than fresh mulch and more readily absorbs the dye used to color it. While the dye is non-toxic, the wood may be and should be avoided due to its potential arsenic content. Look for mulch certified by the Mulch and Soil Council (MSC) which requires passing a chemical test for arsenic along with other industry standard guidelines.

## Guidelines For Using Mulch

Follow these tips when using mulch in your landscape:

- **Maintain a 2- to 3-inch layer** around established trees, shrubs, and bedding plants. Coarse materials, such as pine nuggets, may be applied to a depth of 4 inches, but don't allow mulch to accumulate to a greater depth. Adding more mulch can harm plants because mulch intercepts rain and irrigation meant for plants' root systems.

- **Do not mulch to the curb, sidewalk, or water's edge.** Organic mulches eventually degrade and release their nutrients. They may also wash away and get into storm drains or water bodies. This can be especially severe on sloped areas. A 3 to 4 foot buffer of turf or other dense ground cover is preferred on the downhill side of the mulched area. Coarse stones or gravel that will not wash away may also be used along impervious areas.

- **Avoid "volcano mulching."** When mulch is piled against the base of a tree, it holds moisture, encouraging rot in the trunk. Mulch piled against the trunks of young trees may also create habitat for rodents that chew the tender bark and can ultimately kill the trees.

- **Cover sides of the root ball with mulch.** Provide a 3-inch-deep layer of mulch around the tree. Generally, a 2 to 3 foot diameter circle of mulch per inch of tree trunk caliper will give adequate mulch area for newly planted trees. A thin (1 inch) layer of mulch can be placed over the root ball for aesthetic reasons, but deep layers on the root ball can prevent adequate irrigation and rain from reaching roots. Keep mulch about 12 to 18 inches from the trunk for any size of tree. Keep turf as far away from the trunk as possible with mulch or herbicides to aid tree establishment, to prevent mower damage to the trunk, and to prevent soil compaction.

- **Rake old mulch.** Some mulches can become matted, pre venting water and air from seeping through. Rake it to benefit plantings and refresh the mulch's appearance.

# #5: Attract Wildlife

## Bring Your Yard To Life By Providing Water, Food, And Shelter For Birds, Butterflies, And Other Creatures

Florida is a state renowned for its diverse and unique ecosystems. But rapid development, particularly in coastal areas, is continuing to destroy wildlife habitat. As our communities expand, we rightly lament the loss of native birds and other animals. But did you know there is much you can do to provide needed resources and create a safe haven for these displaced Floridians?

By following the simple tips in this chapter, your Florida-Friendly lawn and garden can become a sanctuary for wildlife, as well as part of a migratory passage between one wild space and another. Animals need to move from place to place, just like people. They have trouble traveling in heavily urban and suburban landscapes, but you can help them by joining your Florida-Friendly yard with others in the neighborhood to create a "natural corridor"—a safe, traversable route between woodlands, wetlands, or other wild areas.

Use a variety of plants in your yard's design to attract many different species of animals, from birds and butterflies to snakes and squirrels. Your home landscape will become a refuge for critters in need of shade, rest, food, and water. In return, your landscape will become a living, lovely part of Florida. Talk with your neighbors and community organizations about Florida-Friendly Landscaping™, and encourage others to make their yards as hospitable as yours.

## Tips

Try a few of these ideas to lure wildlife to your yard:

- **Provide food.** Select plants with seeds, fruit, foliage, or flowers that butterflies, birds, and other wildlife like to eat. Berries, fleshy fruits, nuts, and acorns are all treats for many animals.
- **Supply water.** Any water you provide will attract wildlife. You could have running water in the form of a natural feature, such as a pond, creek, or other body of fresh water, but a fountain or birdbath will also beckon wildlife. Empty and clean your birdbath every few days. Do not clean it with soap or bleach—just physically scrub all surfaces with a brush or scouring-type sponge. Change the water regularly to prevent mosquito breeding and bacterial contamination.
- **Leave snags.** Leave snags, which are the trunks of dead trees, in place if they do not create a hazard. Many birds use snags for perching, nesting, and feeding. Where homeowner's associations (HOA) are not an issue, brush piles also provide cover for wildlife and nesting resources for birds and some native bees.
- **Manage pets.** If you permit pets to harass or kill wildlife, you will only hinder any efforts you make toward attracting wildlife. This is especially true for cats allowed outdoors, so keep your cats inside.
- **Reduce insecticide use.** Each time you apply an insecticide to your landscape, you reduce insect populations, which form an important food source for birds. Some chemicals can also poison birds and other animals that feed on affected insects. Pesticides also kill many beneficial insects that deliver key services to your garden and surrounding landscape, such as lady beetles, green lacewings, bees, and parasitic wasps.
- **Reduce the amount of mowed lawn area.** Unmowed areas can contain more plant species than mowed areas, providing more potential food sources and habitat for wildlife. Reduce the mowed area around your house, especially in low-traffic areas, such as corners of the yard.
- **Increase vertical layering.** Plant a variety of plants in different sizes and heights to provide more cover and feeding opportunities for diverse species of wildlife.

Remember to plant for pollinators.

Firebush supplies food for birds and butterflies.

Snags have great appeal for various woodpeckers.

Layers of vegetation entice wildlife and add visual interest.

# Creature Comforts

To attract specific types of animals or insects to your yard, think about their needs.

## Bats

A small bat house in your yard can provide a roost for bats. An individual bat can eat thousands of insects in a night, and bats also serve as important pollinators for many flowering plants, including fruit trees. Bat houses aren't complex structures, and designs are easy to find in books and on the Internet. Your bat house should be tall, shallow, and hung at least twelve to fifteen feet above the ground on the south or southeast side of a tree, pole, or building. The site should be fairly open and easy for bats to see.

## Birds

Design planted areas that include a tree canopy, smaller understory trees and shrubs, grasses, and flowers. Allow grasses and flowers to go to seed on occasion—this is a real draw for birds.

## Butterflies

A combination of both larval (caterpillar) and nectar plants will attract a variety of butterflies to your yard. Nectar plants provide food for adult butterflies, while larval plants are food sources for the caterpillar stage. If you want to attract butterflies to your yard, expect a certain level of damage to certain plants from hungry caterpillars. See the plant list online at http://ffl.ifas.ufl.edu for help with choosing species that attract butterflies.

A bat house provides a roost for these nocturnal pollinators.

A Ruddy Daggerwing basks on Spanish Needle.

# #6: Manage Yard Pests Responsibly

## Create An Effective Defense Against Pests While Minimizing Your Impact On The Environment

Pest management in the home landscape once relied heavily on the use of chemicals. Today that is changing because of concerns for human health and environmental safety. Scientists now recommend using Integrated Pest Management (IPM), a strategy that helps gardeners prevent and manage pest problems with as few chemicals as possible. IPM emphasizes smart planning, proper maintenance, and natural or low-toxicity controls in ensuring plants stay healthy and resist insect infestations and disease infections.

# Avoiding Pest Problems

The way that you plant and maintain your yard either discourages pests or throws out the welcome mat for them. Follow these tips to prevent pests:

- **Think before you plant.** Plants in locations not suited to them may be stressed and thus more susceptible to pests.
- **Start early.** IPM begins at planting time, with the selection of plants that are pest-free or pest-resistant.
- **Keep your plants healthy.** Using appropriate amounts of water and fertilizer is the best defense against pests.
- **Conduct regular scouting.** Keep an eye on your yard's plants to detect pest problems early, before significant damage occurs.
- **Go easy on water and fertilizer.** Too much of either can cause excessive growth, making plants vulnerable to some insects and diseases. Encourage healthy growth by applying fertilizer and water only when they're needed and in moderate amounts.
- **Mow to the proper height and prune selectively.** Mowing grass too short and severely pruning trees and shrubs weakens them, potentially inviting problems.
- **Encourage beneficial insects.** Learn to recognize the insects in your garden that help manage pests and let them continue their good work! The pictures below are beneficial insects.

# Common Beneficial Insects

Lady beetle.

Big-eyed bug.

Parasitic fly.

Parasitic wasp.

Assassin bug.

Green lynx spider.

Green lacewing.

# Detecting Pest Problems

Frequently inspecting plants helps detect pest problems early. You can give plants the once-over anytime you water by hand, mow, or do other outdoor chores. Set aside a time twice or more each week to walk through your yard and look at plants. Some small insects complete their life cycles in one week, so a weekly wander through the yard may not be frequent enough.

Common plant pests in Florida include aphids, mealybugs, scales, whiteflies, thrips, plant-feeding mites, caterpillars, and chinch bugs. Often you will spot evidence of a pest's activity before you see the insect itself. If you see chewed or deformed leaves, sooty mold, many ants scurrying up and down plant stems, or discolored "trails" on leaves, you are likely to find a pest lurking somewhere.

Detecting small insects and mites can be difficult. One method that works well is to flick the leaves of small branches against a sheet of white paper. Use a 10-power (10X) magnifying glass to search for movement or evidence of pests. Chinch bugs can be detected in a lawn by visually inspecting the thatch layer or vacuuming the suspected infestation area with a fine mesh bag inserted into the vacuum hose to capture any insects.

Look on the branches and on both the upper- and undersides of leaves for pests that attach to the plant, such as scale insects and whitefly nymphs. Sooty mold fungus on leaves is a telltale clue to an infestation by what are known as piercingsucking insects (aphids are one example). These pests pierce the plant with sharp mouthparts and suck the sap. Some piercing-sucking insects excrete a sugary substance called honeydew, on which the black-colored sooty mold fungus grows. Sooty mold doesn't injure a plant directly, but it does block sunlight from leaves, reducing photosynthesis. Ants also signal the potential presence of pests, since they feed on honeydew and often protect the insects that produce it.

If you see plant damage but few pests, beneficial insects may already be working on your behalf. These may include lady beetles (commonly called ladybugs) and their larvae, lacewings and their larvae, assassin bugs, spiders, parasitic wasps, and parasitic flies (tachinid flies).

Tolerate some insect damage and leaf disease on plants. No one can maintain an insect- and disease-free landscape, and a

little damage will not hurt your plants. Remember, in order to have the "good guys," such as ladybugs, there must be some "bad guys," or pests, for them to feed on. If a pest problem persists, take a sample of the damaged plant and pest to your county Extension office for identification and suggestions on how to use IPM techniques.

## Treating Pest Problems

IPM is the best strategy for dealing with pest management, and it relies on the use of chemicals only as needed.

Check out these IPM techniques.

- **Remove affected leaves or plant parts.** When pests are heavily concentrated on a plant, you can often reduce or eliminate the problem by simply removing the affected leaves or stems.
- **Pick off insects by hand.** This easy step can often defeat in festations of large, slow-moving pests. Dispose of any captured insects so they do not return to feed again. Try one of these methods:
  - Drop pests into soapy water or isopropyl alcohol.
  - Place them in the freezer overnight (in a baggy or plastic container).
- **Look for beneficials.** If you see a pest outbreak, determine if it's being managed by natural enemies already present. Many beneficial insects prey on pests, and harming them will just help the pests.
- **Don't treat by default.** Plants with aesthetic damage don't necessarily need to be treated. Consider the amount of damage you're willing to accept. Remember that there will always be insects in any healthy landscape, so don't worry about minor damage.
- **Start with low-impact techniques**. Always try the safest alternatives first, such as handpicking insects or pruning affected parts of a plant. If pesticide use does become necessary, choose products that are the least harmful to people, pets, and wildlife. These products include insecticidal soap, horticultural oil, botanicals (e.g., pyrethrins and neem), microbials (e.g., spinosad and Bacillus thuringiensis), and entomopathogenic nematodes (small worms that kill insects).
- **Avoid using broad-spectrum insecticides.** They're not selective, meaning they also kill beneficials. Instead, choose targeted products, which are designed to harm only specific pests. For example, products that contain formulations of the bacterium Bacillus thuringiensis var. Kurstaki are used to manage caterpillars without affecting other organisms.
- **Spot-treat only.** Use pesticides to treat only the affected areas of a plant or lawn. Never use blanket applications to treat problems because it often exposes more beneficial organisms than pests to the pesticide and wastes time and money. This can result in more severe pest outbreaks or reliance on pesticide use.
- **Read and follow all label instructions.** Be careful and remember that the label is the law!
- **Apply pesticides during the cooler part of the day.** Heat combined with soaps, horticultural oils, and other pesticides can injure plants.
- **Use products only on recommended plants.** Always read the label to find out which plants a product can be applied on and which plants are sensitive to the product. If you're unsure about applying a product to a plant, test it on a small area of the plant first. Check for leaf burn in the tested area after one to two days. Phytotoxicity, or chemical injury, often looks like a burn on the edge of leaves.

For more information about specific yard pests, diagnosing pest problems, and controlling pests, visit http://ipm.ifas.ufl.edu.

Removing by hand and tolerating minor insect damage are responsible ways to manage pests.

# Common Landscape Pests And Their Management

Although thousands of insects are commonly found on landscape plants, only 10 insect groups are responsible for most insect problems. These are considered Key Pests. Below is a list of 10 common pests associated with lawn and garden damage.

Green peach aphids.

## 1. Aphids

Winged or wingless pear-shaped bodies may be green, yellow, black, red, or multi-colored. Typically found on new growth. Damaged leaves appear yellow, twisted, or distorted; ants (which nurture aphids) or sooty mold may also be present.

**Natural Enemies**

Lady beetle (ladybug) adults and larvae, lacewing larvae, syrphid fly larvae, parasitic wasps, and aphid midges..

**Other Controls**

Prune infested plant parts or forcefully spray them with water to dislodge the insects. Apply insecticidal soaps or horticultural oils.

Oleander caterpillar.

## 2. Caterpillars

These are the larvae of butterflies and moths. They chew on foliage, creating skeletonized, notched, or ragged leaves. Watch for greenish fecal pellets on leaves or below plants.

**Natural Enemies**

Wasps, predatory stink bugs, big-eyed bugs, birds, lizards.

**Other Controls**

Remove by hand (use tweezers to remove stinging caterpillars), apply Bacillus thuringiensis products (most effective when caterpillars are small).

Note: Most caterpillars only feed on specific host plants. Remember that if you want butterflies you will need to tolerate caterpillar feeding activity.

Southern chinch bugs.

## 3. Chinch Bugs

Southern chinch bugs feed primarily on St. Augustinegrass, often in stressed areas in full sun or near pavement. Adults are 1/5-inch long, black with white patches on wings. Young nymphs are smaller, reddish, and have a white stripe across their backs. Injured turf yellows and dies.

**Natural Enemies**

Big-eyed bugs, minute pirate bugs, earwigs, assassin bugs, fire ants, spiders, and a species of parasitic wasp.

**Other Controls**

Fertilize correctly. Maintain St. Augustinegrass at height of 3 inches in sun and 4 inches in shade. Spot-treat infestations with insecticides labeled for chinch bugs.

Striped mealybug.

## 4. Mealybugs

White, soft-bodied insects 1/16-to 1/8-inch long. Bodies and egg masses covered by powdery white wax. Attack leaves, twigs, and roots. Sooty mold or ants may also be present.

**Natural Enemies**

Lady beetles, lacewing larvae, minute pirate bugs, and parasitic wasps.

**Other Controls**

Spray with horticultural oil or insecticidal soap. If that fails, apply a systemic insecticide to the root system. Soil applied systemics may take several weeks to work.

Tawny mole cricket.

## 5. Mole Crickets

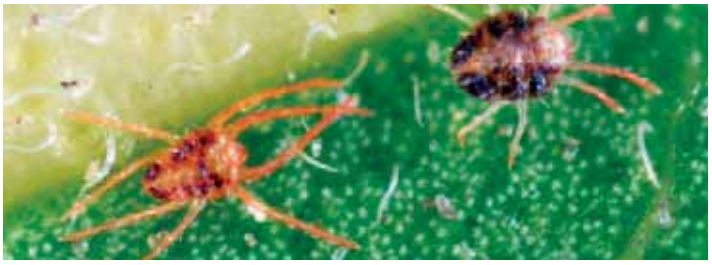
Velvety brown, 1.5 to 2 inches long, feed on turfgrass and vegetable roots. Flattened front legs adapted for burrowing. Mole crickets affect many grasses, but prefer bahiagrass and bermudagrass. Injured turf may be spongy and thinning, with 3/4 inch, round holes that are signs of tunneling. Infestation usually occurs in the same area each year. Test for infestation by flushing area with soapy water (1–2 tablespoons dishwashing soap in a gallon of water). Crickets will surface within 3–5 minutes if present.

**Natural Enemies**

Parasitic wasp, red-eyed fly, insect-pathogenic nematodes, and birds.

**Other Controls**

For chronic infestation, consider replacing urfgrass with a resistance cultivar or trees, shrubs, or groundcovers. If necessary, spot-treat infestations in May or June with insecticides labeled for mole cricket control. Night lights and wet soils attract mole cricket adults..



Texas citrus mites.

## 6. Plant-Feeding Mites

Tiny (1/32-inch) red, yellow, or green with oval bodies. Some spin loose webs on foliage.  Mites produce a new generation about every week in hot weather. Injuries to plants look like lightcolored dots, giving leaves a dull, gray-green, speckled appearance.

**Natural Enemies**

Lady beetles, predatory mites, and predatory gall midges.

**Other Controls**

Spray undersides of foliage with water, then alternate with soap and oils if necessary.

Green scales.

## 7. Scales Insects

Vary in size, shape, and color. Soft scales and armored scales are the most common. Soft scales produce honeydew (sugary secretion), which promotes sooty mold and attracts ants. The armored scale body is hidden under a waxy covering. Mature scales are stationary and feed on leaves, twigs, stems, and fruit. “Crawlers” (the immature, mobile stage) are the most vulnerable life stage and, therefore, easiest to control.

**Natural Enemies**

Lady beetles, parasitic wasps.

**Other Controls**

Scrape scales off plant tissue. See other controls for mealybugs.

Tropical sod webworm.

Citrus whitefly.

## 8. Sod Webworms

Gray-green caterpillars (3/4-inch) with brown spots on each segment. These lawn-damaging pests chew on grass blades, causing short, ragged patches in the lawn. They feed at night and hide by day. A soap flush may verify their presence.

**Natural Enemies**
Spiders and numerous other beneficials that live in lawns.

**Other Controls**
Apply products containing Bacillus thuringiensis var. Kurstaki.

Hollyhock thrips.

## 9. Thrips

Tiny (1/32-inch) larvae and winged adults scar leaves, buds, and flower petals by scraping plant tissue surfaces and consuming exuding sap. Injured plants may be dull gray with curling, distorted leaves or browning flowers.

**Natural Enemies**
Minute pirate bugs, predaceous thrips, predatory mites.

**Other Controls**
Apply horticultural oils and/or insecticidal soaps. Avoid spraying minute pirate bugs.

## 10. Whiteflies

Adults (1/10-inch) look like tiny white moths on plants. They take flight when leaves are disturbed. Eggs are on leaf undersides. Nymphs (the stage of whitefly that feeds on plants) are oval, flat, transparent-to-greenish in color, and may look like scales. They are stationary and located on undersides of leaves. Ants or sooty mold may be present.

**Natural Enemies**
Fungi (most effective in humid weather), parasitic wasps, lacewing larvae, lady beetles.

**Other Controls**
Spray with insecticidal soap. Follow with horticultural oils, if necessary. Be aware that several species are resistant to insecticides.

# Plant Diseases

Many organisms, including viruses, fungi, and bacteria, can cause diseases in plants. Diseases can be specific to certain plants, but identifying them can still be extremely difficult. Often, home gardeners mistake environmental or maintenance problems for diseases. For example, Spanish moss, lichens, and ball moss are not parasites that should be killed or removed; they are merely harmless plants. Another common misdiagnosis in coastal areas is mistaking saltwater damage for disease. Irrigating plants with salty well water can cause yellowing around the edges of leaves and leaf-drop starting from the bottom part of the plant's canopy.

When a plant does have a disease, the problem may be merely cosmetic rather than truly damaging to the plant. Examples are minor leaf spots or other damage to some select leaves. Such injury is no cause for alarm or treatment. There are serious diseases, however, that can damage or kill plants. Examples are mushroom root rot on landscape plants, bacterial wilt on vegetables, and take-all root rot on turf. Such diseases can seriously degrade a plant's appearance or limit its growth.

Because diseases are difficult to identify, do not assume a disease has caused abnormalities in a plant's appearance. Use a magnifying glass to look for insect pests that may be causing the damage. Also analyze maintenance practices for causes related to visible symptoms. If you still suspect a disease, contact your county Extension office for advice on how to collect and submit plant samples for disease diagnosis and recommendations on the least toxic methods of treatment.

Bacterial wilt.

# #7: Recycle

## Re-Use Your Yard Waste To Save Money And Enrich Your Soil

Landscape maintenance activities like mowing, pruning, and raking generate yard waste that you can compost or mulch, recycling valuable nutrients. It's easy to recycle yard waste.

# Mowing

- Mow turf areas only as needed, according to seasonal growth.
- Mow no more than one-third the height of the grass blades per mowing, using a reel, rotary, or mulching mower.
- Mow turf to University of Florida-recommended height for your species and cultivar (see chart on page 16).
- Maintain sharp mower blades at all times.
- Leave grass clippings on the lawn and use yard waste as mulch or compost.

# Pruning

Pruning is selectively removing parts of a plant to improve plant health, control growth, or enhance fruiting, flowering, or appearance. Prune shrubs and other small plants using one of three techniques: thinning, heading back, or hedging. Follow the steps below, and then shred the resulting cuttings to add to the compost pile or use as mulch. You can also toss the cuttings behind a shrub to decompose.

## Best Practices for Tree Pruning

Across the state of Florida, storms occur frequently. And all too often, these storms damage trees resulting in power outages, costly damage to structures, blocked roadways, and regrettably, sometimes human injuries and fatalities.

Trees lose large limbs when defects in the canopy cause branch attachments to fail. Sometimes limbs snap off, particularly if they are long and have had too much inner canopy removed, depriving them of needed girth and taper. Blow-overs can occur if roots have been restricted by planting in undersized areas, or where roots have been damaged, and soils compacted by vehicular traffic from autos, mowers and construction equipment.

We also see stability problems with trees that were planted with circling roots (pot-bound) and where extensive root cutting has occurred due to sidewalk and roadway repairs. Trunks can snap due to decay from mechanical damage also caused by mowers, vehicular strikes and poor pruning practices such as large flush cuts.

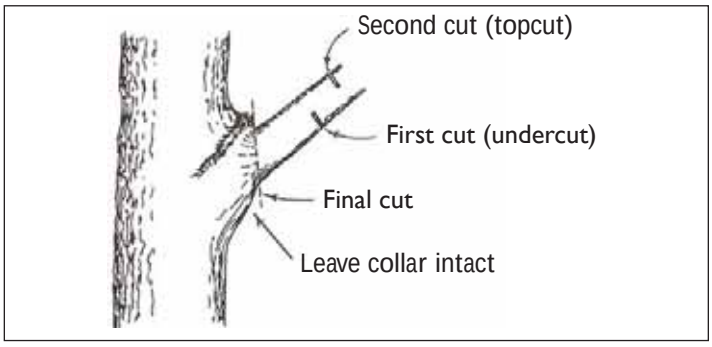
Many of these problems could be prevented if people would just use common sense and follow best practices when choosing the Right Tree for the Right Place, purchasing a quality tree, planting it in the right place and then maintaining it according to current best practices.

- Remove Severely Damaged and Potentially Hazardous Trees from Your Property. A certified arborist can assist you in making removal/remediation decisions.
- Have your Trees Pruned Properly.
- Remove Broken and Dead Limbs from the Canopy
- Always Make Good Cuts when pruning your own trees. There are two types of cuts: removal cuts and reduction cuts.

### Removal cuts

Removal cuts remove a smaller limb back to the trunk or back to another larger limb. Removal cuts are used when trimming low hanging branches back to the trunk or when thinning the canopy by removing a smaller limb back to a larger limb. The swelling where the smaller limb is attached to the trunk or to a larger limb is called a branch collar. Don't remove it. Rather, make the cut just outside the branch collar.

Doing so has two advantages: a smaller diameter cut is made, and trunk or branch wood is not exposed to decay organisms. Untrained persons frequently remove the branch collars and make many flush cuts. Large diameter flush cuts often never close over and are a portal for entry of decay organisms.

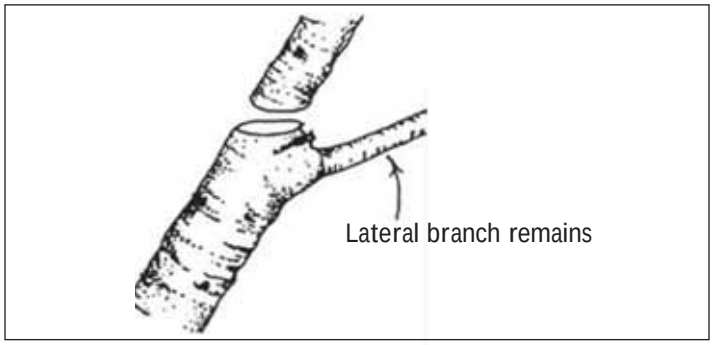


Removal Cut

When removing a limb that is larger than what you can support, consider making a three-step cut to avoid the limb tearing back to the trunk when it comes off the tree. See the diagram above for details.

### Reduction cuts

Remove a larger limb back to a smaller limb. Reduction cuts are used to shorten overly large or very long limbs back to a more appropriate size. This checks their growth and reduces strain on the crotch where they are attached.



Reduction Cut

Topped Tree

Reduction cuts can also be used to reduce the overall size of a tree that has gotten too large for the space it is growing in. Doing so is far better than topping a tree which involves making many indiscriminate large diameter, internodal stub cuts. Topping trees is a prohibited practice in many jurisdictions.

## Avoid Over-Elevating the Canopy

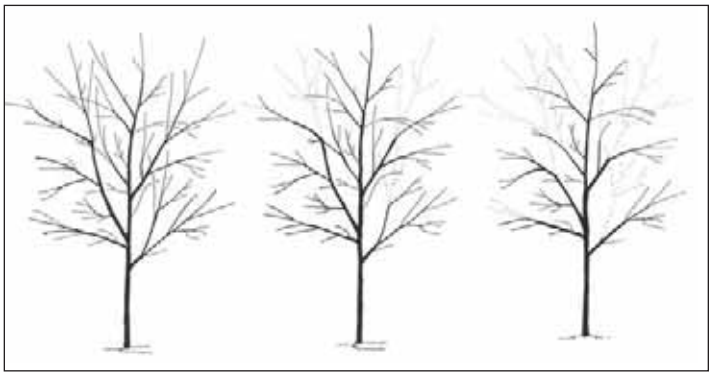
A useful rule of thumb to consider when deciding how high to elevate the canopy of a tree is as follows: when the pruning is complete, half of the foliage should remain in the lower 2/3rds of the tree and the other half in the upper 1/3rd of the tree.

Severely over-lifted tree

## Practice Structural Pruning

Research done at the University of Florida has shown that large and medium maturing trees are best trained to having a single dominant trunk.

Structural pruning involves choosing one dominant leader, frequently the one in the center of the tree that has the best potential for being trained to have a good branching pattern and making a series of reduction cuts made over time (3-5 years) to shorten and/or remove the undesirable competing leaders. See the illustration below: dots indicate branches removed. The result is a tree with a strong single trunk with 5-10 well spaced scaffold (lateral) branches.



Pruning for a strong single trunk

## Best Practices for Pruning Palms

If you have palm trees, you may be wondering about the proper way to prune them. Some palm trees don't need to be pruned, like our native cabbage palm—it automatically sheds its dead leaves.

If you have palms that aren't self-cleaning, you may choose to prune them periodically. Just use a pole saw to remove any brown fronds. Leave the green fronds alone, since they're the energy factory for the tree.

If you hire a tree service, don't let them climb with tree spikes, since these cause permanent damage to the trunk.

Severely overpruned palms


Don't remove any palm fronds between 9 and 3.

## Best Practices for Mangrove Pruning

Mangrove trees are an important part of Florida's diverse ecosystem and are integral to the coastal intertidal zones where they grow.

Mangrove forests in the tropics and subtropics are identifiable by their dense tangle of prop roots that help the trees handle the rise and fall of the tides. This dense tangle of roots acts as a net, holding and stabilizing shorelines. In addition, these roots provide shelter to the majority of all recreationally and commercially important fish species in Florida.

Their unique structure makes them able to withstand major storm forces like those from hurricanes. Mangroves are a keystone species providing essential services that act as the base for the entire estuarine community. Occasionally referred to as the "kidneys of the coast," mangroves are magnificent filters and maintain necessary water clarity for offshore corals and near shore seagrasses.

In fact, mangroves are so essential to the coastal ecosystem that laws have been passed to protect these trees. The 1996 Mangrove Trimming and Preservation Act prohibits trimming or alteration of mangroves on publicly owned lands and sets specific limits for trimming or removal of mangroves on private property. Depending on the site conditions, a permit may be needed to trim or remove dead or living parts of a mangrove tree. Contacting a certified mangrove trimmer will help you adhere to the law, or you can contact the Florida Department of Environmental Protection. Some counties and municipalities have received delegation of the state rule, allowing them to administer the rule on behalf of the FDEP.

## Hurricane Pruning

When it comes to pruning palm trees, less is usually better. You never want to overprune your palms by subjecting them to what's called "hurricane pruning" or "hurricane cutting," where all but a few fronds are cut off.

Palms are naturally able to withstand the high winds that hurricanes bring, so removing fronds isn't necessary. In fact, it can seriously damage the palm tree.

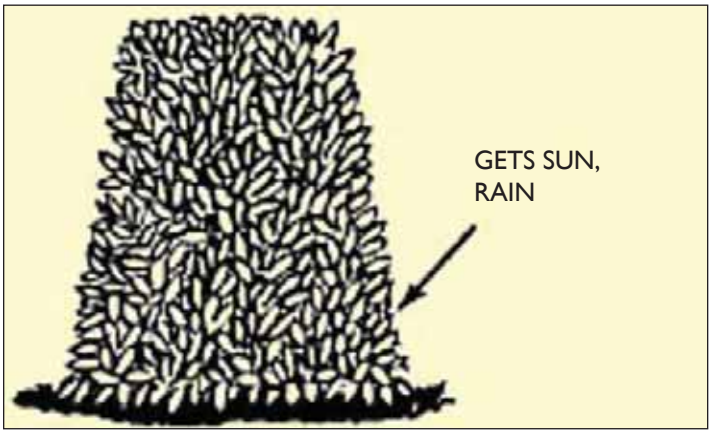
When pruning palms, only remove fronds that are completely brown and that hang below the 9 o'clock or 3 o'clock position. If you hire a professional, make your wishes clear by putting them in writing. Explain that you want your palms to have a rounded canopy, not a mohawk.

Always remember that the point of pruning is to remove only dead growth.

### Best Practices for Pruning Shrubs and Hedges

How to properly prune your hedge depends on the type of hedge that you have. Informal hedges consist of a row of closely planted shrubs which are allowed to develop into their natural shape. Annual pruning involves thinning and shaping just enough to maintain desired height and width using quality hand pruning shears.

Formal hedges have a hard outline of foliage from the top of the hedge to the ground. They should be clipped while the new growth is green. The most common mistake people make when trimming a hedge is cutting the plant into a sharply-edged box shape. It's important to trim a hedge so that the top is narrower than the bottom; this way, sunlight can reach all the plant's leaves. The bottom branches of "box-shaped" hedges usually thin out—and even die—from lack of sunlight. Prune flowering hedges after they've bloomed in order to avoid cutting off buds.




Leaving the bottom of the hedge wider than the top allows sunlight and rain to reach all of the plant.

### Renovating Shrubs

If you've seen older shrubs that look like giant stems of broccoli, then you've seen shrubs that are ready for renovation. Shrubs that aren't properly pruned over the years can become tall and leggy, bushy and oversized, or just plain ugly.

But renovating them is simple. In early spring, cut one third of limbs down to within a few inches of the soil. Over the next two years, remove another third each year completing the rejuvenation process over a three year period.

Renovation is a fairly aggressive practice and won't work with all shrubs, especially certain evergreens.

## Pruning Tools

A pair of quality shears will make pruning and shaping a breeze. Hand-pruning shears are good for small branches, but are no match for larger branches. Lopping shears have longer handles and are operated with both hands. Good quality loppers can slice through branches as thick as 1.5 inches. To see what thickness your loppers can handle, check the label.

Larger branches will require a saw. Look for a quality limb saw to make these cuts safely. Pole pruners allow you to reach small branches high in trees. Electric, gas engine, and rope-operated pole pruners are available. Hedge shears can be manual or powered and are useful when pruning small-leaved plants into formal shapes.

## Calling The Professionals

If you are unsure about proper tree pruning techniques, consider hiring an arborist—a specialist in the care of trees—to prune your trees. Look for someone who is certified by the International Society of Arboriculture (ISA). Certification indicates that the arborist has been trained through continuing education administered by the ISA.

To find an ISA-certified arborist in your area, check out the International Society of Arboriculture Florida Chapter's website, http://floridaisa.org, and search by ZIP code.

Pruning trees can be a technical, detailed, and dangerous process. Learn more about it online at https://edis.ifas.ufl.edu/entity/topic/tree_pruning

Hire a certified arborist if you are unsure about proper pruning techniques.

## Reduce Your Pruning Load

Keep pruning chores to a minimum:

- Select slow-growing plants
- Place plants far enough from walkways, driveways, or buildings to allow them to reach maturity without encountering obstructions that require pruning.
- Forget the clipped, formal look. Soft, flowing, natural lines are attractive and easy to maintain.

## Raking

Many new Floridians avoid having deciduous trees in their yards because they believe that fallen leaves require raking. But deciduous trees reduce energy costs by shading a house in summer and, after leaves fall, by allowing sunshine to heat a house in winter.

Rake up leaves and pine needles and use them as mulch or add them to your compost pile. Or permit leaves to remain under trees to form a self-mulching area. Leaves add nutrients to soil as they decompose. If aesthetics are an issue, plant shade-tolerant shrubs under trees to avoid raking. The shrubs will benefit from decomposing plant litter and help to hold leaves in place so they won't clutter the landscape.

### Composting

A common misconception about plant care is that all plants require fertilizer. Plants do need nutrients, but they might not need added fertilizer. That is because as organic matter decomposes, nutrients are released into the soil in a form that plants can utilize.

A great way to supply some of these key nutrients to plants while recycling yard waste is by adding compost, which you can make from yard and/or kitchen waste. As compost decomposes, it releases essential nutrients. Add generous amounts of composted material frequently to soil to help create the perfect medium for sustained plant health.

Adding compost to soil can:

- Improve soil structure, texture, and aeration.
- Increase the water-holding capacity of soil.
- Help loosen compacted soils.
- Promote soil fertility and stimulate root development.
- Create a favorable environment for microorganisms, earth worms, and insects that are nature's "soil builders."

Composting can be as simple as placing leaves, grass clippings, and small cuttings behind shrubs or in a hidden corner of the yard and letting nature take its course. Homemade or manufactured compost bins allow you to easily incorporate kitchen waste, such as vegetable and fruit scraps, eggshells, and coffee grounds. Numerous types of compost bins are commercially available, and many are attractive. Gardening magazines, catalogs, and garden centers are good sources for composting products. For more information about composting, visit https://edis.ifas.ufl.edu/publication/EP323

### Follow these tips for successful composting:

• Try using a bin. They're not necessary, but they help keep piles neat, retain heat and moisture, and prevent complaints from neighbors. The minimum recommended size is 1 cubic yard (3 feet square by 3 feet high).

• Decide when you want it. Composting can take as little as four to six weeks or as long as one to two years, depending on the size and type of material in the pile and the amount of attention you give it.

• Add water as you build the pile. Proper moisture is necessary for microorganisms to decompose the material. Covering the pile retains moisture and prevents the decomposing material from getting too soggy when it rains. You should not be able to squeeze water from the material produced at the bottom of the pile.

• Combine different materials in the pile, such as grass clippings and leaves, to achieve the right proportions of carbon and nitrogen for effective composting.

• Always bury kitchen waste inside the pile to discourage pests and to prevent odor from rotting fruit and vegetables. Never place meat, animal fat, or dairy products in a compost pile.

• Turn or stir the pile with a pitchfork or shovel on a weekly basis for faster composting. Stabbing the pile with a length of pipe or rake handle will also help aerate and mix the material.

Place your compost bin in a convenient location.

## What To Compost

Compost is both an easy way to reduce the amount of waste you send to the landfill and a cheap way to get nutrients for your garden. The key is to use twice the amount of brown to green materials (plus some air and moisture). Here are some items you can compost. All of them will decompose more quickly when added in smaller pieces.

### Green

- Grass clippings
- Weeds without seed heads
- Fruit and vegetable scraps
- Egg shells
- Plant trimmings
- Farm animal manure

### Brown

- Fallen leaves
- Twigs and fallen branches
- Wood chips and sawdust
- Tea bags
- Coffee grounds and filters
- Paper towels
- Pine needles
- Cotton dryer lint
- Cornstalks and corn cobs
- Shredded newspaper and cardboard

Never compost pet waste or animal fats like meat, grease, and cheese. They can create odor problems and attract pests. Never compost invasive plants.

# #8: Reduce Stormwater Runoff

## Infiltrate and Filter Rain Through Your Landscape to Protect Waterways and Replenish The Aquifer

Rain can wash exposed soil, plant material (grass, leaves), fertilizers, pesticides, and pet waste from pervious areas (lawns, landscape beds) and road dust, oil, and other debris from impervious areas (roads)—all of which then become a part of stormwater runoff. Ultimately, every yard and neighborhood is connected to water bodies. This connection may be immediate and obvious, like in a waterfront community, or gradual and unnoticed, through the flow to storm drains, ditches, streams, rivers, and estuaries. Either way, the decisions you make in your landscape directly influence the health of Florida's waters.

# How Water Works

No matter where you live in Florida, chances are there's a body of water nearby—a pond, lake, creek, river, or canal. In many places these surface waters are connected to Florida's groundwater through sinkholes, springs, drainage basins, and other pathways.

Groundwater comes from the aquifer, an underground cave system made of porous limestone. Groundwater is the source of most of the water we use in our daily lives, both inside our homes and outside in our yards.

Because Florida's groundwater is so close to the surface, the health of groundwater is directly connected to the health of our visible water bodies. The ways we maintain our landscapes can have a big impact on both groundwater and surface waters.

Pollutants can enter surface water bodies through stormwater runoff. Stormwater is rainfall that runs off roads, roofs, yards, and through gutters and into storm drains, retention ponds, and surface water bodies. As it flows to the nearest body of water, stormwater runoff can pick up pollutants from landscapes such as excess fertilizer, pesticides, and plant debris. Runoff that soaks into the ground can also carry these pollutants below ground. Once in the ground, if not filtered out, these pollutants can enter the ground water system or aquifer, where they may eventually return via springs or upwelling to surface waters such as lakes, streams, or wells.

The nitrogen and phosphorus present in fertilizers and decomposing plant materials may fuel the excessive growth of algae, which smothers natural vegetation, depletes oxygen, and kills fish. Nitrogen and phosphorus can also allow invasive weeds to flourish, changing Florida's natural plant communities. Untreated stormwater runoff carries pollutants that can eventually enter recreational water bodies and drinking water supplies, potentially damaging aquatic life and threatening human health. A healthy, properly maintained lawn and landscape can absorb and/or filter stormwater runoff in ways that protect Florida's waters. Following Florida-Friendly Landscaping™ guidelines will reduce pollution coming from the landscape.

Rain gardens filter stormwater runoff before it soaks into the ground.

# Keep It In The Ground

One of the basic concepts of a Florida-Friendly yard is that the rain that falls in your yard should soak into your yard. After all, rainfall is an excellent water source for your landscape, and reducing stormwater runoff will reduce impacts on waterways. Research has shown that the first inch or so of rain after a dry spell or "first flush" washes most of the pollutants from roads, parking lots, driveways, lawns. etc. This first flush dislodges and removes far more of the accumulated pollutants from these surfaces than rain that occurs later in a storm. If we can capture a small portion of runoff in our landscape and allow it to soak into the ground, we can keep pollutants from flowing into nearby lakes, ponds, and canals, and the water has a chance to be filtered before it reaches groundwater. It is not practical to retain runoff from all storm events on a site, particularly large storms that can cause flooding. Instead, the aim should be to keep the small, regular storm events from running off from your lot. Consider the following ways to reduce the amount of rainfall that runs off your yard. Keep in mind that you may need to get permission from your homeowners' association before adding any of these features.

## Disconnect Impervious Surfaces

This strategy involves redirecting runoff from impervious areas such as rooftops and pavement and flow paths, such as downspouts and gutters, on to pervious natural or landscaped areas. Disconnecting the continuous path of impervious surfaces gives the opportunity for stormwater to be filtered, treated, or infiltrated.

Paved areas can be graded so that they drain onto pervious area, such as landscaped or natural areas, rather than onto other impervious areas. This can increase the opportunity for infiltration and diminish the need for downstream treatment.

Keep in mind, rainwater or runoff should be directed away from buildings to prevent infiltration within 10 feet of foundations and footings. Downspouts should not direct runoff onto paved areas, driveways, or sidewalks for safety reasons, and the landscaped areas receiving roof water should be large enough to capture runoff from regular events and allow for it to infiltrate. Vegetated areas around downspout outlets may need stabilizing with rock or stone to dissipate the concentrated energy of flow at this point and to limit erosion.

## Rain Gardens

Rain gardens are an easy and attractive way to reduce the amount of stormwater runoff that leaves your landscape. These shallow areas are planted with grasses and other plants to filter water before letting it soak naturally into the ground. Water kept within a landscape this way returns to the aquifer, helping to replenish Florida's water supplies.

Rain gardens work best when they're placed where they can receive runoff regularly such as a low spot in the landscape or near a downspout. They're especially good for diverting runoff

from paved surfaces and can also be placed in turf areas. They can be any size or shape and can attract wildlife. It is important to make sure the rain garden can infiltrate the runoff it receives within about a day to prevent mosquito breeding.

Before constructing a rain garden, it is wise to do a simple percolation test to make sure water will be able to adequately infiltrate. First, dig a pit approximately one food deep. Second, take a cylinder, such as a coffee can with the bottom cut out, and push this a few inches into the bottom of the pit. You should have at least a foot of the cylinder above the bottom of the pit. Third, fill the cylinder do a depth of at least 12 inches deep and note the current time. If the cylinder is empty of water within 24 hours, then you have a good spot for creating a rain garden. If there is any water left in the cylinder after 24 hours, the soils may be compacted or too fine to dry out between storm events and you should consider another location.

## Some things to keep in mind when locating a rain garden

### DO:

- Place your rain garden at least 10 feet from the house to prevent water from infiltrating near footers or foundations.
- Choose an existing low spot in your yard if it normally drains quickly after a heavy rain. Test the percolation before constructing though
- Place your rain garden in full sun, away from trees to maximize evaporation of runoff
- Choose plants that thrive in wet conditions but are also drought tolerant for the times between rains.

### DON'T:

- Place your rain garden within 25 feet of a septic tank or well.
- Cut large tree roots to make room for your rain garden. This may severely damage the tree.
- Choose a site that has standing water. The purpose of a rain garden is to encourage infiltration.

### Downspouts

Take full advantage of the rain that comes off your roof by making sure that your downspouts deposit rainwater where it can be put to good use. Redirect downspouts into rain barrels, on to gardens and grassy areas— places where water can infiltrate the ground and be soaked up by plant roots - decreasing the amount of water that goes down storm drains. If your roof has rain gutters, aim the downspouts at a pervious surface so water can soak into soil. If the soil is compacted, you can improve drainage by periodically aerating it. To prevent water from pooling next to your home's foundation, extend downspouts further out into the yard and create a depressed area to collect stormwater for infiltration. See the "Rain Gardens" section of this chapter for more information about helping eliminate stormwater runoff in your landscape.

### Porous Surfaces

Whenever possible, use permeable pavers, gravel, turf block, mulch, pervious (permeable) concrete, or other porous materials for walkways, driveways, and patios. These materials allow rainwater to seep into the ground, helping to recharge groundwater and filter pollutants while also reducing the amount of runoff from your yard. In some cases, these porous materials may even cost less to install than concrete or asphalt.

Consider using mulch or other porous materials for walkways.

### Earth Shaping

Swales (small channels in the ground) and berms (raised earthen areas) can help capture or slow runoff that would otherwise rush from your yard, giving it time to soak into the ground. In a waterfront yard, use a berm-and swale combination, placed above the high-water line and parallel to the shoreline, to reduce stormwater runoff. Add a low-maintenance zone of native wetland plants to the swale to make your yard more waterfront friendly.

Always check with your local Florida Department of Environmental Protection office, other local governmental agencies, and your HOA before making any changes.

Swales encourage stormwater to soak into the ground.

Berms also help slow runoff.

## Rain Barrels & Cisterns

When it rains in Florida, it often pours. Wouldn't it be great if you could save some of that rain and use it on a dry day to water your plants? Rain barrels are a great way to reduce the amount of stormwater runoff while also conserving water.

Rain barrels can capture a significant amount of water and can have a tangible effect on your water bill—especially when two or more rain barrels are connected. Best of all, they're easy to find in stores and to make at home!

Installing a spigot on a rain barrel makes it easy to fill a watering can for hand watering plants. A rain barrel can also be hooked up to seep irrigation systems. Your rain barrel can (and should) be made mosquito-proof with a tight-fitting lid and mesh screen, and can be painted or hidden by foliage or a trellis to make it more attractive.

Contact your county Extension office to see if they offer workshops on how to make a rain barrel. The FFL Website also has a lot of information about buying or making rain barrels. Cisterns also catch rain but can hold hundreds or thousands of gallons and require more engineering than rain barrels. Keep in mind that your community or county may require a permit for cisterns.

Direct downspouts to porous areas, including rain gardens.

Cisterns can be located above or below ground.

## Trees Help Reduce Runoff

Trees are valued for the beauty and many other benefits they bring to our landscapes and neighborhoods. Trees are increasingly recognized for their importance in managing runoff. Their leaf canopies help reduce erosion caused by falling rain. They also provide surface area where rainwater lands and evaporates, reducing the total rainfall making it to the ground. Roots take up water and help create conditions in the soil that promote infiltration.

# NOTES

# #9: Protect the Waterfront

## Help Preserve Florida's Waterways, Plants, And Wildlife

Florida is covered with water. The state boasts over 10,000 miles of rivers and streams, about 7,800 lakes, more than 700 freshwater springs, and the second-longest coastline in the United States. Even if you do not reside on a waterfront, the land you live on is directly connected to a nearby water body. That's because no matter where you live, surface water that leaves your landscape as runoff (either due to rain or over-watering), together with any fertilizers and pesticides in that runoff, will eventually drain into a water body. The contributing drainage area is called a watershed.

All watersheds are ultimately connected to each other and to the underground aquifer that supplies most of Florida's drinking water. So what you do in your yard has further reaching consequences than you might imagine. If you live on the waterfront, the information in this chapter can help you create a landscape that is beautiful, functional, and environmentally sound. But you should consider the waterfront wherever you live.

# Maintaining Your Waterfront Property

Waterfront property owners should have firsthand knowledge of the special value that lakes, ponds, rivers, streams, and lagoons contribute to Florida's quality of life. Florida-Friendly waterfront living also involves unique challenges and responsibilities, some of which are outlined here.

## Shoreline Vegetation

The land along the fresh water's edge is called the riparian zone and is often a wetland. Some cities and counties require homeowners to establish a buffer zone to protect this area.

If there is no buffer zone along your waterfront, add Florida-Friendly, low-maintenance plantings to help reduce pesticide and fertilizer runoff from adjacent lawns and landscaped areas. Shoreline vegetation attracts native wildlife and reduces erosion. It can also help beautify your property, dissipate noise from passing boats and other watercraft, and protect your privacy.

For your freshwater shoreline, select native aquatic plants such as softstem bullrush, giant bullrush, common arrowhead, pickerelweed, and maidencane. Remove invasive exotic species like water hyacinth, purple loosestrife, hydrilla, and water chestnut.

UF/IFAS has recommended plant lists to help you choose plants for your fresh water or saline shoreline environments.

## Living Shorelines

Living shorelines can be cost-effective and used to restore saltmarsh and oyster reefs to protect coastal land from erosion while providing habitat and improving water quality.

A living shoreline is a management practice that controls erosion and protects, restores, or enhances the natural habitat of the shoreline.  It takes advantage of plants, stones, sand fill, and other organic materials to maintain the coastal processes.

## Seawalls And Rip Rap

While shoreline vegetation has benefits, many waterfront homes have man-made structures bordering the water instead of a riparian zone with plants. These structures can also help to minimize shoreline erosion. They include seawalls (sea-facing walls on a steeply sloped shoreline exposed to high wind and waves), rip rap (loose, large stones), and gabions (rectangular metal baskets filled with rock).

But these structures can cause other problems. Seawalls, for example, can cause erosion on adjoining properties. Consider inquiring into your city and county ordinances to determine whether removal of these structures is an option. When such structures are necessary, look for ways to encourage native vegetation in and along them, especially rip rap and gabions.

## Your Low Maintenance Zone

Whether you live on a natural or man-made water body, it's important to designate a "low maintenance zone" of at least 10 feet between your landscape and the riparian zone. This area helps to protect the water from runoff. Don't mow, fertilize, or apply pesticides in the l ow maintenance zone. Select plants that will do well without fertilization or irrigation after establishment.

## Other Maintenance Considerations

Don't let grass clippings and fallen tree leaves get washed into the water body; their high nutrient content can increase pollution. Also, pick up all pet wastes deposited in your landscape. Pet wastes contain not only lots of nutrients, but also harmful bacteria.

## Clearing And Construction

Waterfront property is often protected by local or state regulations. A permit may be required for activities as diverse as removing vegetation; extending a fence; building a structure; or developing walking, cycling, or vehicular paths. Before building anything on or clearing anything from your property, make sure you contact the Florida Department of Environmental Protection or your local city or county offices or departments related to land development, building, and planning.

A 10-foot-wide maintenance-free zone protects a water body from fertilizer and pesticide runoff.

Seawalls can help minimize shoreline erosion but may cause other problems.

Natural edges with native aquatic plants can help filter runoff before it enters the water body.

## Wetlands

Wetlands are transition ecosystems between land and water. Bogs, cypress domes, mangroves, swamps, wet prairies, and marshes are all types of wetlands. Some of these wetlands are enormous, like the Florida Everglades. Others may be small and contained entirely on one property.

Wetlands play a critical role in reducing flood damage by storing stormwater when it surges and releasing it slowly over time. Wetlands are invaluable in keeping water clean by acting as filters for pollutants, silt, and sediment. Fish, birds, and wildlife depend upon wetlands for food, nesting grounds, migratory stops, and shelter. Wetlands are also valuable to the Florida economy, as they support commercial fisheries and tourist-based wildlife watching.

## Springs

Florida has the largest concentration of freshwater springs in the world. Floridians and visitors enjoy the recreational opportunities afforded by many springs, including diving, snorkeling, tubing, and canoeing. Springs also serve as important habitats for many fragile plant and wildlife species, and are considered "windows into the aquifer," because the water they pump out comes from the underground source of most of Florida's drinking water. But like other water bodies, Florida springs are threatened by population growth, urban sprawl, groundwater withdrawals, and the use of fertilizers, pesticides, and other potential pollutants.

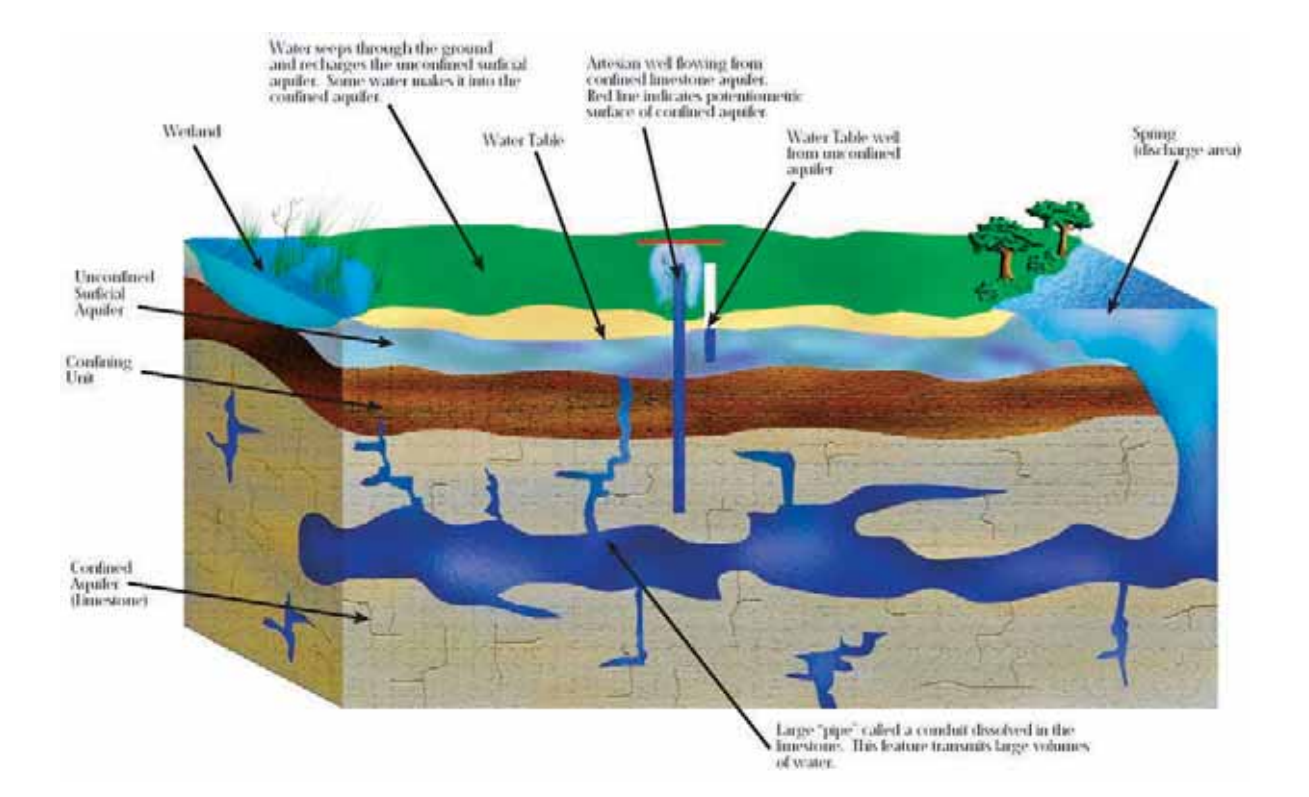
Excess nutrients cause algae and vegetation blooms in Florida springs.

## Stormwater Ponds And Canals

Many Floridians live near man-made water bodies called stormwater ponds and canals. These structures are created to prevent flooding, manage stormwater, and improve water quality in urban areas. Stormwater ponds and canals are just as important to protect as our natural water bodies because all of Florida's waterways are connected, and anything that enters a man-made water body could eventually enter our natural water system. Stormwater ponds and canals can be more than functional. With a little help from you, they can serve as a home for birds, fish, plants, and frogs and become a neighborhood amenity. Work with your neighborhood association or your neighbors to create an area that not only improves the environment, but also contributes to your quality of life. Just make sure you talk to your water management district before making any modifications, because you'll probably need to get a permit change. Consider these strategies to enhance stormwater ponds and canals:

- Plant flood-tolerant species that are known to help reduce contaminants in water.
- Plant a wide variety of plants to increase biodiversity and attract a wider range of wildlife and insects.
- Add landscaping to make it look like a natural wetland.
- Build boardwalks and trails so neighbors can enjoy plants and wildlife.
- Add varied water depths to an existing pond to create diverse habitats.

Stormwater management ponds can be beautiful and educational amenities.




Keeping stormwater onsite allows it to soak into the ground and recharge aquifers.

## Water At The Neighborhood Level

Whether you want to improve water quality in your neighborhood or just make the waterways in your area more attractive, if you're interested in doing more with waterfronts in your community, ask your neighborhood association about some of these things.

- Are Florida-Friendly Landscaping™ practices being used in neighborhood common areas?
- Have neighborhood canals, stormwater ponds, or other artificial water bodies been enhanced with aquatic plants? Are the plants appropriate for the site?
- Are swales and berms being used to help clean and filter runoff before it reaches water bodies?
- Are there dry basins in our neighborhood? If so, how are they being maintained? Can Florida-Friendly Landscaping ™ practices be implemented?
- Can water quality in stormwater ponds be improved to provide wildlife habitat and enhanced recreational opportunities?
- Are your pond's maintenance professionals certified through the UF/IFAS Healthy Ponds Certification Programs?

# Converting Your Yard to a Florida-Friendly Landscape

A Florida-Friendly Landscape is ecologically sound and cost effective. If you get the chance to design a landscape from scratch, you can go Florida-Friendly all at once. But sometimes it is not practical for a homeowner with an established landscape to make the changeover to a Florida-Friendly design immediately. Converting an established yard to a Florida-Friendly Landscape can be done most effectively in about three years and seven steps.

## Overview of the Step-By-Step

First, develop a master plan on paper. Second, install any patios, walkways, or decks (hardscapes). Heavy equipment and materials used in the construction of hardscapes should be used before planting to avoid crushing the plants. Third, prepare areas to plant trees. Trees should be planted before other plants because they require more time to reach a size that will provide shade and mulch (leaf litter). The final steps in the conversion involve working in small sections and installing plant beds and mulch in phases.

## The Florida-Friendly Master Plan

Whether you are designing a landscape from scratch or converting to a Florida-Friendly Landscape, create a Florida-Friendly Master Landscape Plan. This is a complete plan for your yard that includes all elements in precise locations and takes into account the nine Florida-Friendly Landscaping™ principles. To create the master plan, you may find it helpful to use the Landscape Planning Worksheet provided in this guide or a similar form. Conduct a site inventory and analysis to determine the opportunities and constraints of your yard. Pay attention to soil type, existing vegetation, shade patterns, drainage patterns, views, and utility locations. Homeowners should also consider their needs and wants.

Draw the master plan to scale, including property boundaries from a certified survey, the location of the house and any existing hardscape, and the location of any trees or plants to remain on site. Complete the master plan by adding all proposed plants, hardscapes, and specified construction materials. If applicable, check with your HOA before beginning the design process, and be sure to obtain final approval from the responsible committee. Use the nine FFL principles, design elements, and fundamentals of design described in this guide to create outdoor "rooms" by using pathways, hardscapes, and plants to divide and organize spaces. Also consider the following:

- Proportion: Keep the size of the plants proportional to the house and yard.
- Variety: Make the yard interesting by having variation in plant sizes (especially heights), color, texture, and shape.
- Composition: Group and arrange plants in overlapping masses based on the size, form, color, and growing requirements.
- Emphasis: Use dramatically different plants as focal points to attract attention.

## The Seven Steps

The seven-steps described below illustrate the phased process of converting a landscape, including the addition of new hardscape, trees, and Florida-Friendly plant material to a typical development landscape. If all steps are followed, the final product will be a Florida-Friendly Landscape created over a three-year period.

***1 -Develop a Master Plan***

Include some of the following elements in your Florida-Friendly Master Landscape Plan:

- Turf areas, plant beds, and mulch areas
- Entertainment and circulation areas such as pathways, decks, and patios
- Trees and shrubs (placed for energy efficiency and as screens/buffers for views)
- Plantings to screen A/C units & utilities
- Concealed work/trash area
- Wildlife habitat plantings
- Garden shed/compost bin
- Cisterns/rain barrels (located by downspouts)
- Rainwater collection areas (low spots or rain gardens)

***2 -Install hardscapes (Patios, walkways,decks pools etc.)***

Call before you dig. State law requires that you call the free Utility Locator Service at 811 at least two full business days before you dig. www.callsunshine.com

- Install all new hardscapes at the same time to save money by not destroying plants later.
- Use porous pavers, concrete or gravel, to allow stormwater drainage.
- Use durable materials and, whenever possible, use reclaimed, reprocessed, or recycled-content materials (EDIS pub 1110/EP374).
- Minimize the movement of trucks and equipment in the yard to avoid soil compaction.
- If using underground irrigation, install the system before installing plants.

***3 -Create New Tree Beds***
- Mark the edge of the new tree bed with a rope.
- Remove sod or other plant material and till to aerate soil in tree bed area.
- Put down a 2-3"-thick layer of Florida-Friendly mulch to protect the soil.

***4 -Install Trees***
- Choose healthy trees appropriate for your climate and conditions (wind, moisture, soil, etc.), and use proper installation techniques (http://hort.ifas.ufl.edu/woody/planting.shtml).
- Wind proof by grouping trees together and locate to provide selective shade. Call to locate underground utility lines before digging.
- Install any new trees located near proposed hardscape after the hardscape is installed (Step 2).

***5 -Prepare (Phase I) Plant Beds***
- Consult the master plan to decide where to install the first planted area. Your choice will be determined by your needs.
- Remember to leave clear access to the backyard if you do the front yard first.
- Use boundaries such as walkways, fences, or house corners to determine the extent of the planted area.

***6 -Install (Phase I) Plant Beds***
- Relocate existing plants as indicated on the master plan and space relocated and new plants accordingly.
- Use proper installation practices for planting.
- If you are not installing the plants, hire landscape contractors certified in Florida-Friendly Green Industry Best Management Practices (GI-BMPs).
- Mulch newly installed plants to control weeds and reduce runoff (EDIS pub FOR80/FRO79).
- Follow a UF/IFAS-recommended irrigation schedule until plants are established (EDIS pub ENH857/EP113) and then reduce irrigation as needed.

***7 -Repeat Steps 5&6 for additional phases of plant beds***
Additional phases of plant beds are determined by your needs. For Phase II , you may choose to plant the area that is contiguous to the Phase I plants, or you may decide to plant another area of the garden that is used often or for a different purpose.

Follow the procedures used in Phase I to prepare beds and install the Phase II plants. If a temporary irrigation system was used in Phase I, the system can be relocated to use in Phase II.

Remember the plants in Phase II will initially be smaller than the plants in Phase I, but they will quickly catch up and fill in the space.

You may want to choose less visible areas for the last phase(s). Again, follow the procedure used in previous phases I and II to prepare and install additional beds.

Remember the plants in later phases will be smaller than the plants in the earlier phases, but they will also quickly catch up. Maintain the yard with Florida-Friendly Landscaping™ principles described in *The Florida-Friendly Landscaping™ Handbook for Home Landscapes* and in this publication. If you are not maintaining the landscape, hire a landscape contractor who is certified in the GI-BMPs.

# Additional Resources

## For Additional Information

For references on the information contained in this book and links to additional resources on each of the nine Florida-Friendly Landscaping™ principles, including many articles on the EDIS website (Electronic Data Information Source of UF/IFAS Extension), go to http://ffl.ifas.ufl.edu and follow the link to the Florida-Friendly Landscaping™ Handbook for Home Landscapes. Contact your county's UF/IFAS Extension office and ask for the Florida Yards & Neighborhoods program. See https://sfyl.ifas.ufl.edu/find-your-local-office/ or check the government pages in your phone book to find your county's Extension office.

USEPA GREENSCAPES:
https://www.epa.gov/G3/green-streets-and-community-open-space

FDEP Nonpoint Source Management :
https://floridadep.gov/wra/319-tmdl-fund

Florida Department of Agriculture and Consumer Services, Pest Control:
https://www.fdacs.gov/Divisions-Offices/Agricultural-Environmental-Services

## About FYN

In 2008, the FYN Homeowner program, Florida Friendly Communities program, and the GI-BMP program were brought together under the umbrella of the Florida-Friendly Landscaping™ Program. All subprograms of the Florida-Friendly Landscaping™ Program are consistent in their messages and scientific recommendations. FDEP assists with grant funding and environmental oversight. Academic oversight is through the UF/IFAS faculty, Environmental Horticulture Department and Center for Landscape Conservation and Ecology (CLCE). Additional funding is provided through individual cities, counties, and water management districts.

- In the early 1990s, the FYN program began in 4 counties in the Sarasota and Tampa Bay areas in response to nutrient inputs from stormwater runoff being identified by the National Estuary programs as a leading cause of seagrass depletion. The Sarasota/Manatee area was working with the concept of a low impact Florida Yards program for individual homeowners. This idea merged with the Hillsborough/Pinellas Tampa Bay Neighborhoods program which was promoting low impact neighborhoods at about the same time with similar program content. The result was immediately recognized as a regional success and was quickly expanded with DEP grant support to 14 additional counties in the Indian River Lagoon, Northeast Florida and St. Marks/Wakulla River watersheds. By 1998, it became obvious that oversight and planning for the program needed to be centralized which led to establishing the statewide FYN office in Gainesville. Expansion and enhancement of the program has steadily continued with over 48 counties now providing some level of FFL programming activity.

- Shortly after the FYN homeowners program was established in southwest Florida, builders and developers were recognized as an audience that required special emphasis. New development in the planning stages provides an extraordinary opportunity to influence landscaping practices on a large scale. Once again, the Sarasota Bay area took the lead and established a pilot program to offer FYN assistance to this target group. As with the homeowners program, the builder and developer program was a success that expanded to a regional scale in southwest Florida and eventually became a statewide FFL element.

- The GI-BMPs are a science-based educational program developed in 2000 by UF/IFAS, DEP and industry, for Green Industry workers (lawn-care and landscape maintenance professionals). The GI-BMPs teach environmentally safe landscaping practices that help conserve and protect Florida's ground and surface waters. They can also save the Florida homeowner money, time, and effort; increase the beauty of the home landscape; and protect the health of your family, pets, and the environment. Later, the Florida legislature created laws recognizing the program. Florida Statute 482.1562 states that all commercial fertilizer applicators must have a license from the Florida Department of Agriculture and Consumer Services (FDACS). To get this license, each Green Industry worker must be trained in the GI-BMPs and receive a certificate of completion from the program.

### Photo Credits For This Handbook 2020

The Florida-Friendly Landscaping ™ Program is indebted to the following individuals and organizations for contributing photos and graphics to the production of this book.

Michelle Atkinson
Timothy Broschat
Philip Busey
Lyle Buss
James Castner
Paul Choate
Mark Clark
Wilbur Dankers
Jim DeValerio
Terry DelValle
Michael Dukes
Audrey Durr
Florida Geological Survey
Theresa Friday
Georgia Gelmis
Ed Gilman
Debbe Hooper
Bill Kern
Kenneth Langeland
Kathy Malone
H. Means
Esen Momol
Michael Orfanedes
Brian Niemann
Tallahassee Nursery
Linda Seals
Joe Sewards
Carrie Stevenson
Michael Thomas
Laurie Trenholm
Bryan Unruh
Ondine Wells
Tom Wichman

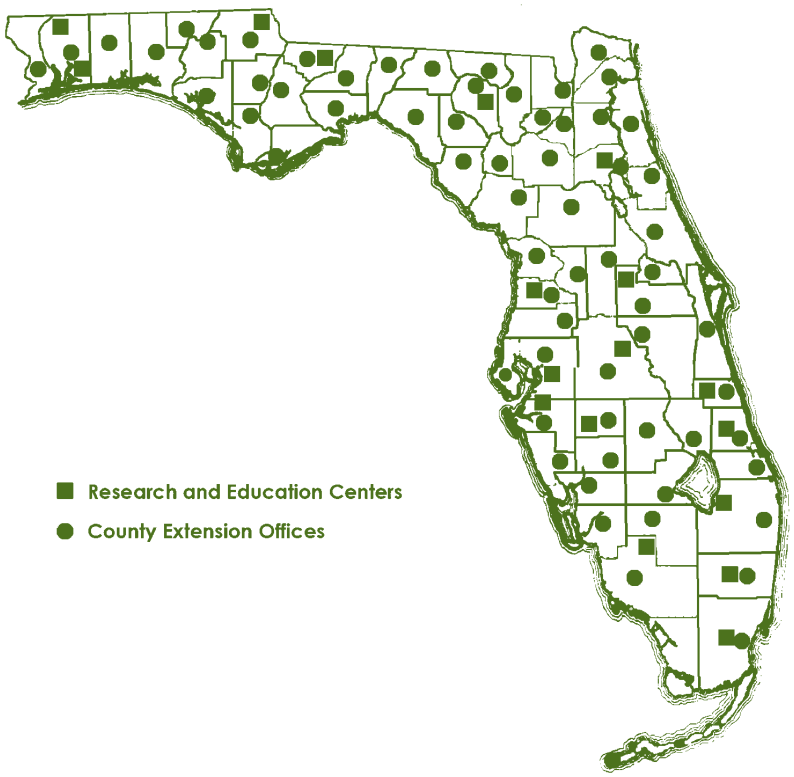
We are proud to note that this handbook is printed on Forest Stewardship Council™ (FSC®)-certified paper, is printed with soy based inks and is produced in Florida.

# Services

Florida Yards & Neighborhoods is brought to Floridians as part of the Florida-Friendly Landscaping™ Program, a partnership between the University of Florida/IFAS Extension Service and the Florida Department of Environmental Protection, and in cooperation with Florida's Water Management Districts and with the support of industry and local governments. The University of Florida/IFAS Extension Service has offices in every county in the state and offers the public the following services at either no charge or for a minimal fee:

- Workshops and classes
- Plant and landscape advice based on current University of Florida research
- Official yard recognition program
- Certification program for new communities and developments
- Online resources, including numerous publications, a tutorial for custom landscape design, and a plant database.

# Florida-Friendly Landscaping™ Program County Extension Offices




**Phone:**
(352) 273-4518

**Website:**
http://ffl.ifas.ufl.edu
Please visit our website to find your county extension office.

# Create A Florida-Friendly Landscape

Yards and landscapes can be a positive asset to Florida. You can design and maintain your own Florida-Friendly Landscape by following the simple practices in this book. You will learn the basics of designing a landscape featuring carefully selected plants suited to Florida's unique climate, natural conditions, and wildlife.

We offer you cost-saving tips that, if implemented properly, will help you reduce water, fertilizer, and pesticide use. There is also a helpful section for waterfront homeowners addressing the special concerns of shoreline landscape management.

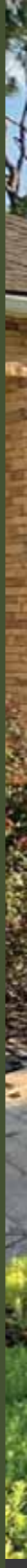
Whether you are starting from scratch with a new landscape or considering changes to an existing yard, the Florida Yards & Neighborhoods Handbook offers helpful concepts, tools, and techniques for creating your own Florida-Friendly yard. We hope you enjoy the publication and look forward to assisting you in creating an aesthetically pleasing landscape that will also help to protect Florida's natural resources.


# NOTES

UF | IFAS Extension
UNIVERSITY of FLORIDA

Florida-Friendly Landscaping™ PROGRAM

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



UF | IFAS Extension
UNIVERSITY of FLORIDA

Florida-Friendly Landscaping™ PROGRAM

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

UF | IFAS Extension
UNIVERSITY of FLORIDA

# Florida-Friendly Landscaping™
# Handbook for Home Landscapes

Florida-Friendly Landscaping™ PROGRAM