# A Guide to Florida-Friendly Landscaping

*Florida Yards & Neighborhoods Handbook*

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# About the Florida Yards & Neighborhoods (FYN) Program

The Florida Yards & Neighborhoods (FYN) program is a partnership of the University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS), Florida's water management districts, the Florida Department of Environmental Protection (FDEP), the National Estuary Program, the Florida Sea Grant College Program, concerned citizens, members of private industry and numerous other nongovernmental agencies. FYN addresses the serious problems of pollution in stormwater runoff, water shortages and disappearing habitats by enlisting Floridians in the battle to save our natural resources. The program, which is implemented through the counties' UF/IFAS Cooperative Extension Service, provides education and outreach activities in the community to help residents reduce pollution, conserve water and enhance their environment by improving home and landscape management.

This integrated approach to landscaping emphasizes nine interrelated principles:

1. **Right plant, right place**
2. **Water efficiently**
3. **Fertilize appropriately**
4. **Mulch**
5. **Attract wildlife**
6. **Manage yard pests responsibly**
7. **Recycle yard waste**
8. **Reduce stormwater runoff**
9. **Protect the waterfront**

Photo by: Michael Andreas

*FYN teaches Floridians to create and maintain Florida-friendly landscapes.*

FYN is an educational program and not a regulatory agency; however, the FDEP, the U.S. Environmental Protection Agency (EPA), the U.S. Department of Agriculture (USDA) and local governments strongly support the program. The best part is that practicing these principles benefits both the environment and you — saving you valuable time and money.

This FYN handbook provides helpful concepts, tools and techniques for creating your own Florida-Friendly Yard — a yard that is beautiful and environmentally friendly. In these pages you will learn the basics of designing a landscape that features carefully selected plants suited to your climate, soil and wildlife. Tips on cost-saving, energy-efficient landscape maintenance are also included to help you reduce water, fertilizer and pesticide use. Waterfront property owners will find helpful information about shoreline management. Whether starting from scratch with a new landscape or considering changes to an existing one, this book will help you create your own beautiful Florida-Friendly Yard.

## How to Use This Book

This handbook is arranged in two sections. The first section contains background information that will help you as you make plans to create a Florida-Friendly Yard. The second section offers detailed descriptions of landscape ideas and practices that explain and illustrate the nine FYN principles. To locate a principle quickly, refer to the color-coded tab at the outer edge of each page.

Throughout the book, you will discover glossary boxes that define words that might be new to you, and those words are highlighted when they first appear in the text. Other tip boxes feature Florida Yard Tips — handy, practical tips that explain concepts and share ideas central to creating or maintaining a Florida-Friendly Yard.

Photo by: UF/IFAS

*The practices discussed in this book can help you do your part to protect our natural resources while maintaining a healthy and attractive landscape.*

The information contained within these pages describes the fundamentals of creating a low-impact landscape, but your preferences may vary. Refer to updated versions of other UF/IFAS publications, such as the *Florida Lawn Handbook,* to obtain a broader range of recommendations specific to each region of Florida. The *Florida Lawn Handbook* can be purchased from the IFAS Extension Bookstore, 1-800-226-1764, or can be viewed at all county UF/IFAS Extension offices or online at **http://edis.ifas.ufl.edu**. The FYN handbook is also available on-line at **http://fyn.ifas.ufl.edu/** (where you will find sources for the information in this book and updated references to web sites listed throughout the book).

Photo by: Teresa Watkins, Orange/Lake/Seminole County FYN

*Florida-friendly landscapes are being installed in single family homes as well as multiple-unit residential properties and commercial properties.*

Other relevant UF/IFAS publications are available online or in printed form. Visit UF/IFAS Extension's Electronic Data Information Source (EDIS) online at **http://edis.ifas.ufl.edu** and UF/IFAS Extension at **http://solutionsforyourlife.ufl.edu**. You can search for authors, titles, keywords or publication numbers. Publications in PDF format print best. For printed copies or further assistance, contact the UF/IFAS Extension office in your county and ask about the Florida Yards & Neighborhoods program.

# Florida Neighborhoods: Connecting Our Yards to Florida's Water

Our yards and neighborhoods are channels to our waterways. Your yard is the first line of defense for preserving Florida's fragile environment. The health of Florida's estuaries, rivers, lakes, springs and aquifers depends partly on how you landscape and maintain your yard. You don't even have to live on the water to make a big difference. Rain that falls on yards, roads and parking lots can wash into waterways or leach into ground water, carrying pollutants — including fertilizers, pesticides, animal waste, soil and petroleum products. Improperly applied fertilizers and pesticides from residential areas pose a serious threat to the health of Florida's waters.

Photo by: UF/IFAS

*We are all connected to our water resources, and what we do in our yards can have great effects on the quality of our water.*

For decades, Florida landscaping has been portrayed as picture postcards of lavish resorts, tourist destinations and tropical gardens. But the pictures of natural Florida are quite different. The Florida Natural Areas Inventory identifies 82 different natural ecological communities in Florida, from wetlands to **xeric uplands**. Unfortunately, much of the state's original rich diversity has been

## FYN Glossary Box

**Xeric uplands:** very dry, well-drained, high areas of sand with plants adapted to dry conditions; xeric uplands are home to many threatened and endangered species

**Impervious:** resistant to penetration by fluids, such as rain or irrigation water, or by roots

**http://sofia.usgs.gov/publications/reports/floridawaters/**

replaced with **impervious** surfaces, such as asphalt and concrete, and housing developments with standardized yards that bear little resemblance to native Florida. Expanses of high-maintenance lawns have formed the dominant landscape in most of our communities for years, but that is changing. You can be a part of the movement in Florida to have a more environmentally friendly landscape. Look around your neighborhood or nearby parks to see if any natural landscapes remain. Can your own landscape be changed to replace a piece of what has been lost?

The ideal Florida-Friendly Yard — the smart way to grow — should boast natural beauty that reflects the native landscapes of our state. But this beauty must be created and sustained by environmentally safe landscape practices. What are some of those practices?

- Cooperate with pre-existing natural conditions — instead of working against nature.
- Conserve water and energy — both indoors and out.
- Landscape with native and suitable non-native trees, shrubs and **groundcovers** that will require minimal maintenance when planted under appropriate conditions.
- Choose plants that blend beauty with environmental benefits.
- Use pesticides only when necessary and according to label instructions. Choose least-toxic products and focus on preventing pests.

## FYN Glossary Box

**Groundcovers:** low-growing plants used for erosion control, to replace grass or simply for aesthetic reasons

# Creating Your Florida-Friendly Yard

A Florida-Friendly Yard doesn't merely offer good-looking landscapes; it also becomes an asset to the environment, protecting natural resources and preserving the state's unique beauty. Recognizing that the home landscape is part of a larger natural system will help in creating a Florida-Friendly Yard. Designing an aesthetically pleasing Florida-Friendly Yard begins with good decisions based on what you and your landscape require:

Drawing by Carol Keiper-Bennett

**1.** Your needs and desires

**2.** Knowing your site's conditions

**3.** Maintaining a healthy environment

Whether you are designing on a shoestring budget or hiring a professional landscape architect, understanding a few basic concepts will help you make environmentally appropriate decisions and avoid problems down the road.

## *Plan First, Plant Last*

The secret to creating a successful landscape design is using a logical planning process. Follow the steps outlined below to develop your own landscape plan.

**Tip:** You might want to read this section in conjunction with *The Florida Yardstick Workbook*, which you can get from your county's UF/IFAS Extension office.

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 might prove more problem-oriented, such as trying to reduce noise, create a microclimate or lure wildlife to a yard. The FYN program adds one more idea to the palette of reasons to landscape: to protect the environment. Appropriate landscaping stabilizes soil, prevents erosion, filters pollutants and reduces harmful **runoff** — all of which contribute to preserving Florida's unique natural resources.

Photo by: Jim Phillips

*Planning the uses of your landscape is an important part of creating a Florida-Friendly Yard that will meet your needs.*

2. **Set goals for use and maintenance.** Determine how you will use your property. Do you need a play area for your children, or perhaps you would like to focus on entertaining family and friends outdoors? Your passion may be raising vegetables or simply savoring a waterfront view. Decide how much time you want to spend in your yard. You may want to create a low-maintenance yard to save time and money.

## FYN Glossary Box

**Runoff:** the portion of rain or irrigation water on an area that is discharged through stream channels; the water that is lost without entering the soil is called surface runoff

3. **Analyze the existing site.** Walk around your property, noting conditions that make your yard unique. Does your site demand plants that are tolerant of cold, wind, full sun, shade, drought, occasional flooding or salt spray? Do you know your soil's pH and nutrient content? Not sure what kinds of information to note as you walk your yard? See page 14 for a list of ideas to get started.

   Look at existing plants and decide which ones you want to keep. Plants that always seem to have one problem or another throughout the year are good candidates for removal. For other tips on deciding which plants to keep or remove, see page 18.

Photo by: Jim Phillips

*Creating a yard that meets your goals requires careful plant choice.*

   Soil plays a big part in any landscape project, determining the success of your efforts and influencing what plants will thrive in your yard. Before beginning any landscape project, take a soil sample to your county's UF/IFAS Extension office for testing. Read more about soil on page 16.

4. **Draw a land-use plan.** Don't be nervous — you do not have to be an artist to tackle this step! Round up the tools you will need: a pencil, ruler and graph paper. If you have the survey completed for your mortgage, photocopy it — it is really helpful at this stage. On the graph paper, draw your house, penciling in existing trees and shrubs you want to keep. If your yard includes a septic tank, underground utilities or overhead power lines, include these on your

drawing. If you have a sprinkler system, be sure to note the spray coverage. Once the yard's "bones" are on your drawing, sketch where various activities will take place. Consider views: Is there a view from indoors that you want to enhance with plants that attract birds or butterflies? Is there scenery you would like to hide?

If you live on the water, place *intensively* maintained plantings, such as turfgrass and vegetable gardens, away from the water's edge to reduce the potential for polluted runoff to reach surface waters. In many circumstances, a "no fertilizer, no pesticide" zone of at least 10 feet along the shoreline significantly reduces pollution from upland areas. Never allow fertilizers or pesticides to enter water directly.

Photo by: UF/IFAS

*Waterfront yards present special challenges and responsibilities.*

5. **Add the landscape plan to the sketch.** Determine the types of plants you want in different locations. Do not worry about specific plant identification yet — just draw in where you want trees, shrubs, groundcovers or flowering plants. Keep plants away from buildings to give them room to grow and to make building maintenance easier. Note the ultimate plant height you desire in each area. Group plants according to their water needs. This makes watering more efficient and keeps plants healthier.

6. **Incorporate an irrigation plan.** In-ground irrigation systems are not necessary in every landscape, especially if you use drought-resistant plants. Research your irrigation needs and determine which type of system, if any, you want to install. Consider this tip: While plants are becoming established in your yard, you may want a temporary watering system. It is convenient and usually worth the effort. Add any new irrigation plans to your drawing. Read more about irrigation techniques and water conservation strategies on pp. 41–45.

7. **Select landscape materials.** When choosing plants, consider the limitations of your site, maintenance requirements and wildlife value. Consult gardening books and plant lists specific to Florida (start with the plant list at the back of this book). It's wise to write both the common and scientific name (**genus** and **species**) into your plan; common names can cause confusion when it is time to buy plants.

Photo by: Holly Johnson Shirallipour, UF/IFAS

*Microirrigation systems conserve water when used properly.*

## FYN Glossary Box

**Genus (plural, genera):** a group of similar organisms representing a category within a family; a genus consists of one or more species

**Species:** a group of plants, animals or other organisms that resemble each other and interbreed freely

**http://www.dep.state.fl.us/water/nonpoint/urban1.htm**

Don't forget to list other landscaping materials you may need for walkways, mulch or borders. Read more about selecting plants beginning on page 30.

8. **Buy quality plants.** Choose the healthiest plants you can find. Slip plants out of pots to inspect roots. Healthy roots are white and smell like damp soil; diseased roots are brown to black and often have a sour or rotting odor. Roots that are growing in a circle inside the bottom of the pot indicate a rootbound plant. Purchase another plant, if possible.

   For trees, purchase the largest size you can afford. However, shrubs, perennials, groundcovers, annuals and smaller size plants will grow just as quickly as their pricier counterparts in larger pots. Take care to space and plant things properly. Allow enough space for each plant to grow to maturity. For tips on planting trees, see page 22.

Photo by: Angela Polo, Sarasota/Manatee/Charlotte FYN

*Consider how large plants will grow when deciding how far apart to plant them.*

9. **Maintain.** Maintenance includes proper watering, fertilizing, composting, pruning, mowing, mulching and pest management. The more thorough you are with steps 1–8 above, the less you will have to worry about maintenance. It is possible to maintain an established landscape with minimal amounts of pesticide, fertilizers and supplemental water. Watering *efficiently*, fertilizing *appropriately* and managing yard pests *responsibly* are all part of proper landscape maintenance.

**10. Enjoy!** Photograph the evolution of your Florida-Friendly Yard, and share pictures with the horticulture agent or FYN program coordinator at your county's UF/IFAS Extension office. Let us learn from your experience and share your knowledge with others. "Before" and "after" shots with captions are particularly useful to illustrate your success.

Photo by: UF/IFAS

*Elementary students select plants for their butterfly garden.*

Photo by: UF/IFAS

*Learning how to plant a Florida-Friendly Yard can start at a young age.*

**http://www.epa.gov/OWOW/NPS/facts/**

## Florida Yard Tip:

# Site Analysis

To choose the right plants for your yard, determine your site characteristics, remembering that conditions may differ at various points throughout your yard. This site characteristics listing isn't complete. Use it as a springboard to begin your yard's site analysis.

**SOIL**
- r **Texture** (% of sand, silt and clay)
- r **pH**
- r Nutrients present
- r Compaction

**DRAINAGE**
- r Well-drained
- r Poorly drained

**LIGHT**
- r Full sun
- r Partial sun
- r Shade

**TEMPERATURE**
- r Exposure to freezing temperatures
- r Exposure to extreme heat

**STRUCTURAL LIMITATIONS**
- r Power lines
- r Underground utilities
- r Septic tank
- r Roof overhangs
- r Paved surfaces
- r Security lights

**OTHER**
- r Exposure to salt spray or salty well water
- r Exposure to strong wind
- r Exposure to wet/dry seasonal extremes

## FYN Glossary Box

**Soil Texture:** the relative proportions of sand, silt and clay in a soil; clay is the smallest particle size, and clay soils tend to hold water and nutrients well and drain poorly; conversely, soils containing a large proportion of sand, the largest particle size, tend to drain well and do not hold water and nutrients well

**Soil pH:** the degree of acidity or alkalinity of soil

## Florida Yard Tip:

# Is It Safe to Dig?

### Do you know where your underground utilities are?

Digging without knowing where it is safe to dig can cause tremendous damage, interrupting your electric, telephone, cable television, water, sewer and gas service, even causing injury or loss of life! If you are doing any digging in Florida, state law requires you to notify the Sunshine State One Call of Florida two full business days before you dig. The toll free number is 1-800-432-4770. Underground facility owners will locate any underground utilities in the area you wish to dig. The service is free. If you don't follow this procedure and underground lines are damaged, you could be fined. This can be a substantial amount if a fiber optics cable is cut. For more information, visit the website **http://www.callsunshine.com**.

## Soil Know -How

In much of Florida, "soil" and "sand" are almost synonymous. The exceptions to the sand-soil situation occur in three main locations:

1. In Miami-Dade County the soils are clays; drainage is slow.
2. In the Keys there is really no soil at all — it is rock.
3. In parts of the Panhandle the soil is reddish clay.

For the rest of the state, where the soil is essentially sand, water and nutrients move downward quickly. As a result, sandy 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.

- **Improving soil.** The simplest way to avoid problems in your landscape is to use plants compatible with your site. To grow roses or vegetables, you will need to amend the planting bed frequently by adding organic matter, such as compost. Organic matter retains moisture, provides nutrients and attracts beneficial organisms like earthworms. On average — in a typical Florida sandy soil — add organic matter to annual flower and vegetable gardens just before planting.

  The easiest way to add organic matter to a planting bed is to put down a layer 2–3 inches thick, then mix it into the soil using a tiller, a shovel or a digging fork. In established planting areas, such as a rose bed, add organic matter as **mulch** around established plantings each spring, before the rainy season. Daily rains will help to work the material down into the soil. Add organic matter to soil each time you plant a shrub, perennial or annual.

### FYN Glossary Box

**Mulch:** a material on the soil surface to conserve soil moisture, influence soil temperature and control weeds

- **Soil pH.** Test your soil's pH (acidity/alkalinity). In general, sandy coastal areas are usually alkaline (high pH), while inland areas are acidic (low pH). But different areas on the same property may have vastly different soils, so site-specific pH testing is a good idea. For instance, you might want to test the pH in each bed where you will grow a different kind of plant.

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

Photo by: UF/IFAS

*Roses (Rosa spp.) planted in a bed.*

  Knowing your soil's pH will also help you make better use of plant reference guides, which often provide this information along with other requirements for plants listed. Although many plants tolerate a wide pH range, they do best when planted in the right soil. Modifying soil pH is only a temporary solution and not recommended. Contact your county's UF/IFAS Extension office for information on soil testing services in your area.

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

- **Hardpan.** Some soils have a sub-layer of hardpan, rock or shell, which limits root penetration, essentially establishing a barrier to plant roots. Always examine your soil to a depth of about 18 inches before making final plant selections. If you intend to plant deeply rooted trees that will grow large, examine soil to a depth beyond 18 inches. Your county extension agent can guide you on how deep to check soil.

**http://soils.usda.gov/education/**

# Plant Sorting: To Keep or Not to Keep


Photo by: UF/IFAS

*Soil mounded against the base of this tree could result in slow decline and eventual death, even years after the problem is corrected.*

Once you decide that you want to change your landscape, it is 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:

- **Keep healthy plants** that show good form and are growing in appropriate locations. Consider pruning healthy, overgrown shrubs or trees if the only reason they are on your discard list is due to appearance. Pruning is less costly than replacement, especially when you are dealing with a mature plant.

- **Retain individual trees with long lifespans.** Some examples are live oak *(Quercus virginiana)*, sweetgum *(Liquidambar styraciflua)* and bald cypress *(Taxodium distichum)*. Mature laurel oak *(Quercus laurifolia)*, water oak *(Quercus nigra)*, silver maple *(Acer saccharinum)*, cherry laurel *(Prunus caroliniana)* and wild black cherry *(Prunus serotina)* are less desirable trees because of their relatively short lifespans.

- **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 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 botanical trio of trees, shrubs and groundcovers buffers wind.

## *To determine which plants to remove, consider this checklist:*

- **Unhealthy and invasive plants** are not worth saving. Read more about invasive plants on page 32. Also, don't think twice about removing plants that are ill-suited for your site. A plant that requires tender loving care to survive may not prove worth the effort in the long run.
- **Foundation plants** located too closely to walls block air currents and prevent access for home maintenance. Mark these plants for removal.
- **Discard tightly spaced plants.** Over time, tight spacing fosters moisture problems, which can lead to **disease** problems and stress the plants.
- **Plants under eaves** often prove problematic; they may not receive adequate rainfall or may be damaged by the force of rainwater dripping from a gutter. Consider carefully before keeping these plants.

Once you know which plants you intend to save, ensure that roots are not damaged through construction activities or soil compaction, which slows growth. Avoid disturbing the root zone of these plants in any way. This includes driving over them with heavy vehicles, digging into the root zone area or mounding soil against the base of plants. To protect trees, construct barricades at the edge of the canopy dripline to prevent construction equipment from driving over roots. Even though this does not protect the entire root system, it will improve your trees' odds for survival.

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

### FYN Glossary Box

**Disease:** an interaction between an organism and its environment that results in an abnormal condition; can be biotic or abiotic

## Landscape Design

Landscape design combines art and science to create functional, aesthetically pleasing and ecologically sound surroundings that complement a home or other structure. Many elements of art — including color, form, line and texture — interact within a landscape to produce the design principles of unity, balance, simplicity and focus.

In a landscape, plants fulfill dual roles: they form eye-pleasing scenes and are a key to reducing energy use and protecting our natural resources. For example, landscape designers often recommend grouping plants into masses to unify the design of plant beds. Groups of three, five or seven plants are visually pleasing to the eye — 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, as already noted, trees planted with accompanying shrubs and groundcovers beneath them form effective windbreaks.

For a more thorough overview of the artistic elements of landscape design, search for appropriate articles on the EDIS website (**http://edis.ifas.ufl.edu**), or consult a professional landscape architect.

**Florida Yard Tip:**

### Color in the Landscape

Choose two or three colors that complement each other and repeat this color combination throughout the landscaped area. This creates a scene that's visually attractive, and the repetition of color draws your eye through the planting beds so that you take in the entire scene — and not just one small piece of it.

## Florida Yard Tip:

### Where Are Tree Roots?

A tree resembles a wine glass placed on a dinner plate. Consider the base of the wine glass as the 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 five times the canopy's diameter, depending on the species. Vertically speaking, most tree roots are located in the top two inches of soil, where oxygen is available through exchange between the soil surface and atmosphere.

illustration by: Morton Arboretum

## FYN Glossary Box

**Drip line:** the circle that forms at the ends of the branches of a tree where water drips off the leaves onto the ground

http://www.plantatlas.usf.edu/

## Proper Tree Planting

Once you determine which plants you want to add to your Florida-Friendly Yard, it is time to break ground and start planting. Begin your landscape renewal by putting hardscape, such as walkways, irrigation systems or patios, into place first; then plant trees. Because trees are a more permanent addition to the landscape, site selection and proper planting techniques are essential. (This section is adapted from Dr. Ed Gilman's website, **http://hort.ifas.ufl.edu/woody/planting**, reprinted with permission.)

1. **Look up.** If there is a wire, security light or building nearby that could interfere with the tree as it grows, find a new planting site.

2. **Dig a shallow hole that is as wide as possible.** Shallow is better than deep! Many people plant trees too deep. Dig a hole that is 1½ to 3 times the width of the root ball. Use even wider holes for compacted soil and wet sites. Make sure the depth of the hole is slightly LESS than the height of the root ball, especially in compacted or wet soil. If you inadvertently dig the hole too deep, add soil to the bottom of the hole.

   Break up compacted soil around a newly planted tree to give emerging roots room to expand into loose soil. This will hasten root growth and encourage **establishment**.

### FYN Glossary Box

**Establishment:** acclimating a new plant to the environmental conditions of the planting site

3. **Find the point where the topmost root emerges from the trunk.** This point is called trunk flare, root flare or root crown and should be within two inches of the soil surface. If the topmost root is buried within the rootball, remove enough soil from the top of the rootball so the point where the topmost root emerges from the trunk will be within the top two inches of soil.

   Loosen circling roots, especially in the top half of the rootball. Selectively remove small roots that are kinked or circling. If many roots circle the bottom or sides of the rootball, slice the rootball about one inch deep in four places (like at the points of a compass) from top to bottom before planting. This reduces the likelihood of these roots causing problems later. If you cut large roots, the tree might go into shock and die.

Photo by: Ed Gilman, UF/IFAS

*Rootbound (or "pot-bound") plant – thick roots encircle the rootball.*

   The way to avoid having to slice roots is to buy plants that are not rootbound. For plants that are not too large to handle, slip them out of pots at the nursery and inspect the roots. If plants are too heavy to lift, tilt the pot and inspect the roots as much as possible through the drainage holes. Sometimes you will be able to see circling roots through the drainage holes.

4. **Slide tree carefully into the planting hole.** To avoid damaging the tree when placing it in the hole, lift it with straps or rope around the rootball, not by the trunk. Use

special strapping mechanisms constructed for carefully lifting trees out of large containers.

5. **Position the trunk flare** (where the topmost root emerges from the trunk) slightly above the surface of the landscape soil. Most horticulturists agree it is better to plant the tree a little high than to plant it too deep. If the tree is a little too deep, tip it to one side and slide some soil under it; then tip it back the other way and slide more soil under the root ball. Once the tree is at the appropriate depth, place a small amount of soil around the rootball to stabilize it. Soil amendments are usually of no benefit. The soil removed from the hole usually makes the best backfill, unless it is substandard or contaminated.

Photo by: Flagler County Master Gardener Program

*Planting a tree at the proper height is important to its healthy establishment — remember not to plant too deeply.*

6. **Straighten the tree in the hole.** Before you begin filling the hole with soil, have someone view the tree from two directions perpendicular to each other to confirm that it is straight. Fill in with some more backfill soil to secure the tree in the upright position. Once you add large amounts of soil, it is difficult to reposition the tree.

7. **At planting time, remove all synthetic materials** from around the trunk and root ball. This includes string, rope, synthetic burlap, strapping, plastic and other materials that won't decompose in the soil.

8. **Fill the planting hole with backfill soil.** As you add the soil, slice a shovel down into it 20 to 30 times, all around the tree. Break up clay soil clumps as much as possible. Do NOT step

firmly on the backfill soil. This could compact it, restricting root growth, especially in clay soil. When the planting hole is filled with soil, the rootball should rest one inch (small trees) to three inches (larger trees) above the backfill soil.

9. **Add 10 to 20 gallons of water to the rootball.** Fill any air pockets with soil.

10. **Cover the backfill soil with mulch.** Apply mulch to a minimum 8-foot diameter circle around the tree, if possible. Do not construct a **berm** from soil, since this soil could end up over the root ball several months later. Water the mulch well after spreading.

11. **Stake the tree, if necessary.** Staking holds the rootball firmly in the soil. If the tree moves in the wind, the rootball may shift, and emerging roots could break or the plant could fall over. Young trees might require staking until enough trunk strength develops. Remove staking materials after the tree becomes established. If not removed, ties and stakes can **girdle** a tree, which can kill it.

## FYN Glossary Box

**Berm:** a raised earthen area

**Girdle:** to constrict or destroy the bark in a ring around the trunk or branch of a plant, cutting off flow of nutrients and water through the bark; ultimately the plant dies

http://hort.ifas.ufl.edu/shrubs/TAXON.HTM

## SAMPLE

### Watering Schedule

**To establish a one-gallon size plant with average water requirements:**

- Week 1 .....water daily
- Weeks 2–3.....water every two days
- Weeks 4–6.....water twice per week
- Weeks 7–12 .....water once per week

**12. Water trees frequently so roots fully establish.** Light, frequent irrigation fosters the quickest establishment for trees. Following the initial few months of frequent irrigation, water weekly until plants are fully established. At each watering, apply about 1–2 gallons of water per inch of trunk diameter (i.e., 2–4 gallons for a two-inch tree). Never water if the rootball is saturated. In Florida, trees typically require about three months per inch of trunk diameter to become established, but could take longer depending on climate, watering schedule and species. Fertilizing during the establishment period doesn't improve survival rates.

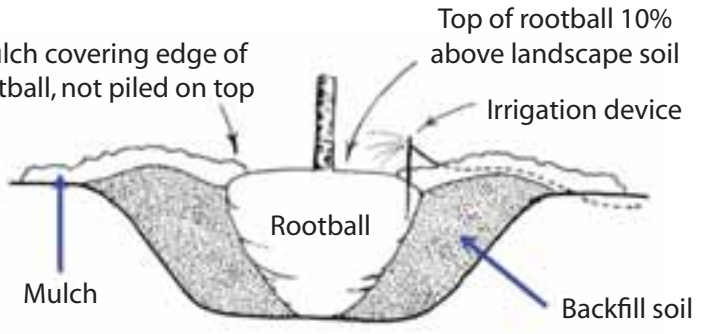



illustration by: Ed Gilman, University of Florida

## Hire Reputable Professionals

This handbook forms a solid resource for do-it-yourselfers, but what if you lack the time, desire or ability to tackle your own landscape work? There are many landscaping companies throughout the state that offer varying types of maintenance services. Select a company that has been trained in use of the Green Industries **Best Management Practices** to produce a visually pleasing and environmentally safe yard. Companies whose employees have earned a certificate for completion of training in "Florida Green Industries: Best Management Practices for Protection of Water Resources in Florida" from UF/IFAS Extension are familiar with Florida-friendly maintenance practices. You will find a listing of these companies at **http://turf.ufl.edu/bmp.htm**.

### *Types of Maintenance Services*

***Fertilizer and Pest Control Companies:*** Some homeowners are looking for a company to provide all fertilization and pesticide spraying services to their lawn and landscape. These services are provided by pest control companies, who do structural and outdoor pest control. Any business that applies pesticides to lawns and ornamentals in Florida must be licensed by the Florida Department of Agriculture and Consumer Services (FDACS). Pest control companies have one or more Certified Pest Control Operators, plus technicians who operate under their license. These companies will typically be on your property every other month, but may not always need to apply fertilizer or pesticides. They will have you sign a contract stating exactly what they will provide. In addition to this, they should do the following:

- Follow fertilization guidelines as developed by the University of Florida Best Management Practices program. These guidelines cover fertilizer rates, sources and application timings. Fertilizers containing herbicide (**weed** killer) or **insecticide** should be avoided.

**FYN Glossary Box**

**Best Management Practices:** methods that have been determined to be the most effective, practical means of preventing or reducing pollution

**Insecticide:** a pesticide that kills insects and other arthropods

- Follow an **Integrated Pest Management** (IPM) program where pest scouting and monitoring is common and pesticides should only be applied when other options will not control the pest. See descriptions of these options beginning on page 68. If pesticides are used, they should be applied at labeled rates and a sign should be posted to alert you that they have applied a pesticide. When pesticides are necessary, least-toxic products should be chosen.

***Landscape Maintenance Services:*** These companies perform a variety of services, from mowing and edging to fertilizer applications, planting, renovating, etc. A commercial landscape maintenance worker who holds a Limited Commercial Landscape Maintenance Certification from FDACS can apply herbicides in plant beds or certain pesticides in an IPM program [**only** those with the signal word "caution," insecticidal soaps, horticultural oils, and *Bacillus thuringiensis* (Bt)]. **If landscape maintenance service employees do not hold a pesticide license, they may not apply any pesticide, even a weed and feed product, to your lawn.** For descriptions of all categories of turf and ornamental pesticide licenses in Florida, see **http://pested.ifas.ufl.edu/licencing.html**). Landscape maintenance companies should also be trained in the Green Industries Best Management Practices and should follow the fertilization guidelines as described above. They should leave grass clippings on the lawn and properly dispose of any other yard waste, whether it is used on-site as mulch or compost or is removed from the yard.

## FYN Glossary Box

**Weed:** a plant out of place; weeds are troublesome because they compete with desirable plants for water, minerals and light; sometimes weeds can harbor insect pests or diseases

**Integrated Pest Management:** a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks

**Pesticide:** a chemical or other substance used to prevent, destroy or repel pests


http://www.floridagardening.org/

## RIGHT PLANT, RIGHT PLACE

Have you ever bought a plant that looked great at the nursery or garden center, only to have it die once you planted it? One way to avoid this heartbreaking scenario is by putting the right plant in the right place — matching the plant to the site conditions. This encompasses far more than simply putting sun-worshiping plants in your yard's sunny spots. You also need to consider things like maintenance and water needs. Our checklist will help you review some basic guidelines for getting the right plant in the right place in your Florida-Friendly Yard.

- **Wet vs. dry.** Many **drought-tolerant** plants thrive on elevated dry spots or in windy areas, but they can quickly succumb to root diseases and pest problems if you plant them in low-lying areas where water tends to pool after heavy rains. Drought-favoring plants also do well in exposed areas, on berms and along the unshaded southern or western walls of buildings.

  Position plants adapted to wet soils in low spots, waterways and areas with poor drainage. The bottom line 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 you have set aside for it.

- **Wind-wise plantings.** In Florida, winter's prevailing winds hail 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 and reduces evaporative water loss. Winds from the south, southeast and southwest predominate during summer months, when welcome air circulation cools outdoor living spaces and reduces moisture buildup on foliage.

- **Made in the shade.** Position trees and shrubs strategically to improve your home's heating and cooling capacity. Tree shade, for instance, can reduce air conditioning costs by an estimated 50 percent. Plant **deciduous** shade trees on the south, east and west sides of a house to cast shade in summer and let warming light enter windows in winter.

### FYN Glossary Box

**Drought tolerant:** describes plants that require less water because they are adapted to regions with frequent drought or to soils with low water-holding capacity

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.

Photo by: UF/IFAS

*Live oak (Quercus virginiana) provides shade on the western side of this home.*

- **Plant matchmaking.** A common landscape "plan" scatters woody plants across an expanse of lawn, with no clear design pattern. While this may look the "norm," the truth is that turf and woody ornamentals have different water, fertilizer and maintenance needs. All it takes is one misplaced shrub to disrupt mowing and irrigation patterns. Reduce maintenance and conserve water in the landscape by grouping plants in beds according to water requirements and maintenance needs.

- **The lowdown on grass.** For sunny recreational areas, turfgrass makes an excellent choice — but most types do not grow well in dense shade. In shady spots, if you want to cultivate a green carpet underfoot, plant groundcovers.

## FYN Glossary Box

**Evergreen:** a plant that retains at least some of its leaves year-round

**Deciduous:** a plant that sheds all of its leaves at one time each year

## Plant Selection

Choosing plants is the fun part of landscaping! Florida's climate supports countless varieties of plants — many of which are grown by local nurseries. The plants you choose determine how much maintenance your Florida-Friendly Yard will require and also how long your landscape will last. For example, fast-growing trees often have a shorter life span than slow-growing trees.

How can you be sure you are making the best plant choices? Begin the process by completing a site analysis of your yard (see pages 8–14). With that information in hand, use these steps as a guide to selecting the right plants for the right places in your Florida-Friendly Yard.

Photo by: UF/IFAS

*Bromeliads are remarkably drought tolerant. Use them in mass plantings beneath palm trees or along patios, paths or walkways.*

- **Focus first on low maintenance plants** suitable to your site. Once these plants are established in the right location, most require little, if any, supplemental water, fertilizers or pesticides.
- **Don't want to water?** Select drought-tolerant plants suited to your soil. Once they are established, your watering chores will be done.
- **Welcome wildlife.** Provide flowering and fruiting plants to bring birds and butterflies into your yard. Florida is a stopover for many migrating and wintering butterflies and birds — design a landscape that caters to these colorful, winged creatures.
- **Plant for impact.** Limit the number of plants with high water and maintenance requirements, placing them where they will have the greatest visual impact.
- **Avoid invasives.** Do not plant noxious, invasive species. The State of Florida prohibits planting of Brazilian pepper *(Schinus terebinthifolius),* Australian

pine *(Casuarina equisetifolia),* melaleuca *(Melaleuca quinquenervia),* carrotwood *(Cupaniopsis anacardioides),* Chinese tallow *(Sapium sebiferum)* and many others. If these plants are present in your yard, remove them. They crowd out native plants and seriously threaten Florida's ecosystems and wildlife.

Several other common landscape plants can become invasive in parts of Florida and should be avoided. The UF/IFAS Invasive Plants Working Group evaluates the invasive properties of plants and provides recommendations on their use. For a copy of the most recent recommendations from the IFAS Assessment of Non-Native Plants in Florida's Natural Areas, see your county's UF/IFAS Extension office or visit **http://plants.ifas.ufl.edu/assessment.html**. For more information on invasive plants, see the website of the Center for Aquatic and Invasive Plants at **http://aquat1.ifas.ufl.edu**.

- **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 accommodate your mower without tricky maneuvering.

- **Cope with a slope.** Use groundcovers on slopes where grass may not thrive but the potential for runoff exists. Count on groundcovers to fill in shady areas where turf won't survive.

- **Beg off quick fixes.** Do not be fooled by the quick-fix appeal of fast-growing plants. Such plants require frequent pruning, which creates more clippings and yard waste. 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.

- **Upkeep tips.** Do not overlook maintenance needs when designing your landscape. It's hard to mow grass on sloped or in extremely wet areas, so avoid planting turf where you can't easily cut it. Place hedges where you can access them easily from all sides — or trimming chores will quickly become nightmares.

## Florida Yard Tip:

# Know Your Zone!

The USDA and American Horticultural Society (AHS) describe plants in terms of the lowest and highest temperatures where they can be grown.

To use this information, you need to know:

- Your zones for heat tolerance and cold hardiness. Discover that information at these links:

  ***For cold:*** **http://www.usna.usda.gov/Hardzone/hzm-se1.html**

  ***For heat:*** **http://www.ahs.org/publications/heat_zone_finder.htm**

- The zones for plants you want to grow. Unearth that information on plant tags, in reference books or on the EDIS website at **http://edis.ifas.ufl.edu** or the FYN website at **http://fyn.ifas.ufl.edu**.

Match the plants you want to grow with your growing zones and you will improve your odds of gardening success.

## Florida Yard Tip:

# Plant Selection Savvy

As you choose plants for your Florida-Friendly Yard, remember that plants do more than just look good. Many types pull double duty in the landscape, adding beauty and also fulfilling some other function — like providing privacy, attracting butterflies or bearing tasty fruit. Consider these plant characteristics as you design your landscape:

**Plant traits that reduce maintenance and prevent runoff pollution**

- Drought resistance
- Pest resistance
- Non-invasiveness
- Slow growth
- Wind resistance
- Low nutritional requirements

**Plant traits that attract wildlife**

- Cover and habitat
- Seeds and nuts
- Fleshy fruits and berries
- Nectar and larval food for butterflies
- Red tubular flowers for hummingbirds

**Plant traits that affect humans**

- Shade
- Scent
- Allergies
- Thorns
- Screen for privacy
- Attractive flowers or foliage
- Edible fruits, flowers, leaves or roots
- Deciduous or evergreen

## Florida Yard Tip:

### Plant Know-How

Throughout Florida, experts who can assist you in your plant choices abound. Try these services, most of which are free, for advice on putting the right plant in the right place:

- UF/IFAS Extension Service
- Florida Master Gardeners
- Florida Certified Horticultural Professionals
- Florida Native Plant Society
- Florida Division of Forestry
- Water Management Districts
- USDA Natural Resources Conservation Service
- Libraries

## For More Information on Natives

While it may be rare to encounter a native Floridian, plants native to Florida prove easy to find in some areas. Some Florida **native plants** are widely available at local garden centers, and others are becoming more available as demand for them grows. Want to learn more about native plants suitable for your yard? Try these tips to get started:

- Visit parks, wildlife preserves, botanical gardens, FYN demonstration landscapes and nurseries to view native plants. Some plant nurseries specialize in Florida native plants.

## FYN Glossary Box

**Native plants:** plants that were present at the time of first European contact in Florida (about 1500 A.D.); a plant that occurs naturally in a particular region, state, ecosystem and habitat without direct or indirect human actions

- Visit the library or bookstores (particularly those at botanical gardens) to find good reference books on Florida native plants.
- Search the web for information on native plants. For some sources, see the references at **http://fyn.ifas.ufl.edu** under the link for the FYN Handbook.
- Consider hiring a landscape architect/contractor or designer who is knowledgeable about native plants. For a consulting fee, you can ask a native plant expert simply to survey your yard and make suggestions — and you can still do the planting yourself.
- Consult the plant list in the back of this book (native plants are identified).

**Remember:** Just because a plant is native does not guarantee its success in your landscape. Always put the right plant in the right place.

## Florida Yard Tip:

### Trees Can Help

Not sure where to start? Plant trees. Establishing a tree canopy is a great way to begin your Florida-Friendly Yard. Trees not only provide shade and wildlife habitat, but they also help to reduce stormwater runoff. Trees significantly increase the value of a home and lot.

Photo by: UF/IFAS

*Members of a 4-H club planting a tulip tree (Liriodendron tulipifera) on Arbor Day.*

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 total of $273 annually for 50 years at 5% interest results in a tree value of $57,151. The overall benefits far outweigh the initial cost of each tree.

## Florida Yard Tip:

# Soaker Hoses

After you invest your hard-earned cash in plants, count on an inexpensive solution to help establish them in the landscape — soaker hoses. These hoses seep or leak water along their length, delivering it to the soil around plantings. Lay the hose on top of the soil, or bury it slightly in soil or mulch. Landscape staple pins work great to hold the hose in place. Use the soaker hose until the plant is established and showing new growth, then store the hose for future use.


# WATER EFFICIENTLY

2

## LANDSCAPING PRINCIPLES FOR FLORIDA-FRIENDLY YARDS

http://solutionsforyourlife.ufl.edu

## WATER EFFICIENTLY

Even though watering restrictions are commonplace throughout Florida, many homeowners still overwater. Overwatering does more than deplete the water supply, it also makes plants prone to pests and adds to stormwater runoff, which pollutes our water systems. By choosing and operating a watering system correctly, you can reduce water bills, insect and disease problems, and maintenance requirements. For example, the more you water your lawn, the faster it grows and the more it needs to be mowed.

Photo by: Jim Phillips

*Micro-spray jets directly delivery small volumes of water.*

Most watering restrictions limit irrigation to certain days and times. But realize that even if it is your assigned day to irrigate, that does not mean you *must* irrigate. Scheduled watering can waste time, money and resources. Don't let the calendar tell you when to water — look to your plants for telltale signs of water needs. Water lawns when 50 percent of the lawn shows signs of wilt: leaf blades folded in half, blue-gray color and footprints remain on the lawn. Water established bedding plants and shrubs when you see early signs of **wilting**.

### FYN Glossary Box

**Wilting:** the drooping of plant parts, especially leaves, generally because of a lack of water

## Watering Tips

Photo by: Jim Phillips

*Do not water when it is raining — use a working rain sensor on your irrigation system to shut it off automatically.*

- Reduce the need for watering by choosing water-efficient and drought-tolerant plants, including those native to your site, and plant them in the right place. If you group plants according to their water (and light) needs, you can simplify watering methods and systems. For example, separate turf irrigation zones from tree and shrub zones.
- If you have an automatic sprinkler system, install a rain shutoff device or sensor that will override the system when it rains. Set this device to shut off your system when half an inch of rain has fallen. Florida law requires rain shutoff devices on all automatic sprinkler systems installed since 1991. Your county's UF/IFAS Extension office, the USDA Natural Resources Conservation Service (NRCS) or a certified irrigation professional can provide technical assistance.
- Water in the early morning (4–7 a.m.). This is the most efficient time because temperature and wind speeds are at their lowest, which reduces evaporation. Also, grasses are less susceptible to fungus if water is applied at the time that dew normally forms.
- Avoid watering between 10 a.m. and 4 p.m. Temperature and wind speeds are at their highest during this time — so evaporative losses are more likely.
- Follow this simple watering schedule for grass: Apply ½" to ¾" of water when grass shows signs of distress (bluish-gray color/folded leaf blades). Do not water again until symptoms reappear.
- If rain is predicted within the next 24 hours, don't irrigate.
- Use a rain gauge to measure rainfall volume.

- Experiment with gradual reductions in irrigation to see if plants can tolerate less water. Some people use no irrigation, but have healthy plants.
- Water less in cooler months (November–March). Turn off automatic watering systems in summer if rainfall is consistent and in winter months when little water evaporates.
- Make sure your sprinkler system is applying uniform coverage and operating properly. This single action proves to be one of the best ways to conserve water.
- Check your system periodically for broken heads or leaks.

## To Sprinkle or Not to Sprinkle

You are probably familiar with sprinklers that are part of an automated system. In some landscapes, such as a lawn or annual flower bed, those kinds of sprinklers can be the best watering method. For other landscape areas, learn about water-conserving micro-irrigation systems.

- Micro-irrigation systems deliver small volumes of water directly to the root zone through low-flow-rate emitters, such as micro-spray jets, bubblers or drip tubes.

### Florida Yard Tip:

### Soil Moisture

Photo by: Dan Culbert, Okeechobee Ext.

If the soil in your yard appears dry, that does not mean the root zone is dry. A soil-coring tool like the one shown pulls up a soil sample that allows you to see and feel the moisture in a plant's root zone. A soil core also reveals whether you are watering so much that water is wasted below the root zone. Using a soil corer can help you judge when to turn off an automatic watering system. Look for coring tools at most irrigation and some garden supply stores.

- Although micro-irrigation equipment releases small amounts of water, it does not prevent overwatering. Nutrient **leaching** can occur if the system runs for excessively long time periods and waterlogs soil. Sandy soils permit water to distribute laterally to a limited degree only; this can also cause overwatering by micro-irrigation systems.

- Drip or micro-spray fittings can clog and may require that you filter the water source. Inspect fittings regularly and possibly clean them. Insects and rodents can damage drip tape or tubing.

Photo by: UF/IFAS

*Sprinkler water misdirected toward the pavement is more likely to run off the impervious surface and be wasted.*

- If you already have an irrigation system, your options for retrofitting to micro-irrigation may be limited. Sometimes low-pressure emitters, such as bubblers, can be adapted to existing sprinkler heads. This may require an attachment at the source to reduce water pressure.

## FYN Glossary Box

**Leaching:** the downward movement of water (and any particles dissolved in it, such as nutrients or pollutants) through soil

## Water-Wise Advice

### Get practical advice on state-of-the-art irrigation systems from several sources:

- The water management districts (**http://www.dep.state.fl.us/secretary/watman/**) and Florida Irrigation Society (**http://www.fisstate.org/**) provide information on irrigation system selection, maintenance and appropriate watering practices.
- If you are changing areas of your landscape from turf to trees or planted beds, consult with your county's UF/IFAS Extension office or with the Natural Resources Conservation Service regarding watering options.
- If you are in the market for a new irrigation system, find a reputable certified irrigation contractor who has experience with these systems.
- A free inspection of irrigation system efficiency is available in some areas through the Natural Resources Conservation Service and water management districts' Mobile Irrigation Labs. For contact information in the south Florida area, please visit: **http://www.sfwmd.gov/images/pdfs/splash/spl_mobile_irrig.pdf**

## Florida Yard Tip:

# Calibrating Irrigation Systems

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

- Set several similar, flat-bottomed, straight-sided cans (all must be of equal size) in various places within one watering zone. Tuna cans work well for this.
- Turn on sprinklers for 15 minutes.
- Pour the water from all containers into one container. Measure the depth of the water to the nearest 1/8".
- Divide the measurement by the number of containers to determine the average amount of water applied in that zone in 15 minutes.
- In the future, water the area only as long as it takes to apply ½" to ¾" of water.

**http://www.tampabaywater.org/conservation/residentialoutdoor.aspx**

# FERTILIZE APPROPRIATELY

3

LANDSCAPING PRINCIPLES FOR FLORIDA-FRIENDLY YARDS

http://lakewatch.ifas.ufl.edu/

# FERTILIZE APPROPRIATELY

At the most basic level, fertilizers feed plants, helping them to grow better. Did you know that you can choose fertilizers that can direct your plants' growth in specific ways? Different types of fertilizers encourage plants to develop:

- More or larger blooms
- Faster growth
- Greener leaves
- More fruit

Fertilizing can be done by applying composted organic material, packaged fertilizer or a specific mineral, such as iron. Different types of plants benefit from different fertilizers, so we'll discuss fertilizing lawns, woody landscape plants and palms in separate sections.

## Fertilizing Lawns

Grass that receives appropriate levels of fertilizer — not too little and not too much — produces a dense root and shoot system capable of filtering out impurities or other components of leachate or runoff.

A properly fertilized lawn absorbs nonpoint source pollutants, helps stabilize soil, reduces ambient air temperatures and promotes a healthy ecosystem of its own. Since it grows more vigorously, a properly fertilizered lawn might also require fewer cultural or chemical controls for weeds, insects or diseases.

Overfertilizing can aggravate pest problems, stimulate excessive growth and require frequent watering. In addition, when people use too much fertilizer on their landscapes, it can seep through the ground, past the root zone of the grass, plants or trees and into the aquifer. It can also be washed off by rainfall directly into surface water or via stormwater systems.

The way you fertilize your lawn influences how much fertilizer is taken up by grass — and how much might be lost to leaching or runoff. Several factors determine pollution potential from lawn fertilizing. Among these are:

- Type of fertilizer
- How much you apply
- How you apply it
- When you fertilize
- How much irrigation you apply afterwards
- Overall health of the lawn

Before you apply fertilizer, it is very important that you read and understand the label. If you do not feel confident in your ability to comprehend and follow label instructions, consider hiring a lawn service professional.

## Selecting a Fertilizer

When selecting 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 refers to potassium. For example, a 50 lb. bag of 16-2-8 is 16% nitrogen, or eight pounds of nitrogen, 2% phosphorus, or one pound, and 8% potassium, or four pounds. The remaining weight is usually comprised of inert ingredients. Nitrogen and phosphorus cause the most problems with regard to water pollution.

### *What fertilizer is safest to buy?*

Look for **slow-release fertilizers**, or fertilizers that have a high percentage of slow-release nitrogen in them. These products have less potential to leach or run off into Florida's waterways than quick-release sources. Nitrogen promotes shoot growth, so if you use slow-release nitrogen, you'll have less growth surge. In lawns, that means less **thatch** accumulation following fertilizer application — which ultimately means less mowing.

### *How do you know if a fertilizer is slow-release?*

Look at the fertilizer sources listed on the back of the bag and find the amount of nitrogen that is "slow-release." The higher the percentage of slow-release, the less chance of leaching — and less thatch and mowing!

### FYN Glossary Box

**Slow-release fertilizer:** a fertilizer that releases its nutrients gradually, over a period of time

**Thatch:** a layer of dead and living plant matter that accumulates between soil and turf, often blocking water and nutrient movement into soil

**http://turf.ufl.edu/residential/fertilize.htm**

## *How much phosphorus and potassium should I look for in a fertilizer?*

Many Florida soils are naturally high in phosphorus, so you should use a soil test to determine if you even need to apply this nutrient. Contact your county's UF/IFAS Extension office to get a soil test form and learn how to take one.

If you have ample phosphorus in your soil, look for a fertilizer with no more than 2% phosphorus. As for potassium, look for a fertilizer with at least half as much potassium as nitrogen (16-2-8) or equal amounts of nitrogen and potassium (15-0-15), depending on the results of your soil test.

## *How much fertilizer should I apply to a lawn?*

### How much to apply depends on three things:

1. Your desired level of maintenance
2. The amount of nitrogen in the bag
3. What percentage of that nitrogen is slow-release

To get the maximum points based on FYN guidelines outlined in *The Florida Yardstick Workbook*, apply the lowest of the fertilizer ranges recommended by the UF Turfgrass Science program. Understand that at times an underfertilized lawn may be less pest- or disease-resistant and unable to perform as well in preventing erosion. On the other hand, lawns receiving more fertilizer than recommended by FYN guidelines generally require more mowing, additional irrigation and may develop more pest problems. Regardless of the level of maintenance you desire, adhere to the following guidelines.

- If you are applying a fertilizer with less than 30% of its nitrogen in a slow-release form, only apply ½ pound of nitrogen per 1,000 square feet of lawn per application.
- If it has at least 30% slow-release nitrogen, you may apply up to 1 pound of nitrogen per 1,000 square feet of lawn per application.

For more help calculating the amount of fertilizer to apply to your lawn, see Tables 1 and 2 (pages 51 and 52).

Regardless of the total nitrogen applied over a year, even at high maintenance levels, it is the amount of nitrogen applied at any one time and the proper application and watering-in that has the greatest impact on the potential for creating pollution.

## *How should I apply fertilizer to a lawn?*

### Follow these simple steps:

1. Determine the annual fertility needs of your grass species by referring to Table 1 below.
2. Measure the square footage of your lawn area. Do not include landscape plants in this area calculation.
3. Determine how much slow-release nitrogen is in your fertilizer.

Table 1. Fertilization Guidelines for Established Turfgrass Lawns in Three Regions of Florida

| | Nitrogen recommendations (lbs N/1000 ft$^2$/year)* | | |
|---|---|---|---|
| **Species** | **North** | **Central** | **South** |
| Bahiagrass | 2-3 | 2-4 | 2-4 |
| Bermudagrass | 3-5 | 4-6 | 5-7 |
| Centipedegrass | 1-2 | 2-3 | 2-3 |
| St. Augustinegrass | 2-4 | 2-5 | 4-6 |
| Zoysiagrass | 3-5 | 3-6 | 4-6 |

* Homeowner preferences for lawn quality and maintenance will vary, so we recommend a range of fertility rates for each grass species and location. Also, effects within a localized region (for instance, shade, drought, soil conditions and irrigation) will require using a range of fertility rates. These recommendations assume that grass clippings are recycled.

4. Refer to Table 2 (below) to find out how much fertilizer to apply to your lawn area, based on the percentage of nitrogen in your fertilizer product. These figures are based on ½ pound of soluble fertilizer per 1,000 square feet. If you are using a product with over 30% of nitrogen in slow-release form, double these amounts to apply 1 pound nitrogen per 1,000 square feet.

5. Broadcast the fertilizer over the lawn with a drop spreader.

Table 2. Proper Application Rates for Specific Fertilizer Products[1]

| Area (sq ft) | % Nitrogen in Fertilizer Bag | | | | | | |
|---|---|---|---|---|---|---|---|
| | 6% | 10% | 12% | 15% | 16% | 23% | 27% |
| 10 | 1.3 oz<br>3 TB | 0.8 oz<br>1½ TB | 0.7 oz<br>1½ TB | 0.5 oz<br>3½ tsp | 0.5 oz<br>1 TB | 0.4 oz<br>2½ tsp | 0.3 oz<br>2¼ tsp |
| 50 | 6.6 oz<br>14 TB | 4 oz<br>½ c. | 3.3 oz<br>7 TB | 2.7 oz<br>6 TB | 2.5 oz<br>5¼ TB | 1.7 oz<br>4½ TB | 1.5 oz<br>¼ c. |
| 100 | 13.3 oz<br>1¾ c. | 8 oz<br>1 c. | 6.7 oz<br>14 TB | 5.3 oz<br>¾ c. | 5 oz<br>10½ TB | 3.5 oz<br>9 TB | 3 oz<br>½ c. |
| 1000 | 8.4 lbs<br>17½ c. | 5 lbs<br>9½ c. | 4.2 lbs<br>8¾ c. | 3.3 lbs<br>7¼ c. | 3.1 lbs<br>6½ c. | 2.2 lbs<br>5½ c. | 1.9 lbs<br>4 ¾ c. |
| 1500 | 13 lbs<br>26¼ c. | 7.5 lbs<br>14¼ c. | 6.5 lbs<br>13 c. | 4.9 lbs<br>11 c. | 4.8 lbs<br>9¾ c. | 3.3 lbs<br>8¼ c. | 2.9 lbs<br>7¼ c. |
| 3000 | 25.2 lbs<br>52¼ c. | 15 lbs<br>28½ c. | 12.6 lbs<br>26 c. | 9.8 lbs<br>21¾ c. | 9.4 lbs<br>19½ c. | 6.6 lbs<br>16½ c. | 5.8 lbs<br>14½ c. |
| 5000 | 42.0 lbs<br>87¼ c. | 25 lbs<br>47½ c. | 21 lbs<br>43½ c. | 16.4 lbs<br>36½ c. | 15.8 lbs<br>32½ c. | 11 lbs<br>27½ c. | 9.8 lbs<br>24½ c. |

[1] The chart explains the approximate weight of fertilizer to use for a given lawn or landscape area in pounds (first number) and also in cups (second number) to deliver ½ lb N/1000 sq. ft. (the recommended rate for a single application of soluble fertilizer).

**One of the main things you can do to prevent pollution is to use caution when applying fertilizers.**

- Do not spill fertilizer granules. If you do have an accident, sweep the granules up. Rinsing fertilizer off with a hose could send it down the storm drain.
- Do not spread fertilizer onto water bodies or impervious surfaces, such as driveways or sidewalks. Particles on hard surfaces can wind up in waterways.
- Use a drop spreader, which puts particles down directly beneath the spreader, rather than a rotary spreader, which flings particles a farther distance.
- Avoid using "weed and feed" products that contain **herbicides** and fertilizer together. These products can injure some trees and shrubs. Tree and shrub root systems can extend far beyond the visible foliage, intermingling with turf. In addition, pesticides should be applied only to affected areas, rather than broadcast over the entire yard as occurs with a weed and feed product.
- Do not fertilize if heavy rain is forecast. This increases the potential for fertilizers to run off into storm drains or to leach through soil with the rainwater.
- In summer, when turf is actively growing, apply an iron source instead of a nitrogen fertilizer to green the lawn without increasing growth. Use **chelated** iron or iron sulfate.

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

Some parts of Florida have year-round growing seasons; other parts have dormant lawns for parts of the year. Apply fertilizer when grass is actively growing, not when it is dormant. Do not apply too much nitrogen at one time in summer months when grass is already growing rapidly. Consult your county UF/IFAS Extension office with questions.

### FYN Glossary Box

**Herbicide:** a chemical that kills plants or inhibits their growth; typically intended for weed control

**Chelate:** a complex organic molecule that surrounds certain trace elements, such as iron, and keeps them dissolved in a solution

**http://turf.ufl.edu/BMPmanual.pdf**

### *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 ¼" of irrigation water. To find out how long it takes your sprinkler system to deliver this much water, read the Florida Yard Tip, "Calibrating Irrigation Systems," on page 45. Do not over-water or you increase the potential to move fertilizer past the root zone and into ground water. When fertilizing lawns, follow recommendations in the *Florida Lawn Handbook*, available for viewing at all county UF/IFAS Extension offices.

## Fertilizing Woody Landscape Plants

In the soil, roots of trees, shrubs, turfgrass and **bedding plants** intermingle and compete for water and nutrients. In fact, the roots of a single **mature tree** may extend 60 feet or more out into your lawn or flowerbeds. Fertilizer applied to one plant is often absorbed by the roots of a nearby plant. Every treatment you apply to your lawn (fertilizer and herbicide, for example) can impact your trees and shrubs. Conversely, treatments applied to a tree, such as pruning and fertilizing, can influence the appearance and health of underlying turfgrass.

Table 3. Fertilization Guidelines for Established Landscape Plants

| Level of Maintenance | Amount of Nitrogen (lbs N/1000 $ft^2$/year) |
|---|---|
| Basic | 0-2 lbs |
| Moderate | 2-4 lbs |
| High | 4-6 lbs |

### FYN Glossary Box

**Bedding plants:** herbaceous annual or perennial plants that are used in flower or vegetable gardens

**Mature tree:** a tree that has reached at least 75 percent of its final height and spread

In areas where tree or shrub fertilization zones overlap with lawn fertilization zones, fertilize for one or the other of the plant types, but not both. If trees and shrubs are *not* located near fertilized turfgrass, you can apply additional nitrogen to enhance growth of established trees and shrubs. Refer to Table 3 (see page 54) for specific rate recommendations.

Tables 2 (page 52) and 4 (below) contain helpful information on calculating the amount of fertilizer to apply to a given area. Broadcast fertilizer uniformly over the desired areas of the landscape. Apply water-soluble fertilizers at no more than ½ pound of actual nitrogen per 1,000 square feet per application. Application rates of controlled-release fertilizers depend on release rates of the product.

Photo by: UF/IFAS

*Magnesium deficiency is quite common on some species of palms in Florida, including this Canary Isalnd Date Palm (Phoenix canariensis). Magnesium deficiency of palms and cycads usually appears as broad yellow bands along the margins of the oldest leaves with a green midrib. Later leaves become completely yellow with tip necrosis.*

Table 4. Equal Plant Bed Areas with Differing Shapes

| Bed Area (sq. ft.) | Circle diameter (ft.) |
|---|---|
| 10 | 3.6 |
| 50 | 8.0 |
| 100 | 11.3 |
| 1000 | 35.7 |

## Fertilizing Palms

Palms have different nutritional requirements than other landscape plants. Fertilize landscaped areas within 30 feet of large established palms with a 4-1-6-2 Mg ($N$-$P_2O_5$-$K_20$-Mg) ratio fertilizer (an 8-2-12-4 Mg is an example of a fertilizer using this ratio). Nitrogen, potassium and magnesium should have equivalent percentages of each nutrient in controlled-release form. If you use a fertilizer with a ratio other than specified, you may bring about or intensify nutrient deficiencies in palms.

Base fertilization rates on Table 3 (see page 54). Palms are highly prone to several potentially fatal micronutrient deficiencies, so any fertilizer you apply to them should contain 1%–2% iron (Fe) and manganese (Mn), plus trace amounts of zinc (Zn), copper (Cu) and boron (B).

### Florida Yard Tip:

### Turf Fertilizer

Apply granular grass fertilizer (bottom left) and slow-release fertilizer (bottom right) with a drop spreader. Both of these fertilizer forms are recommended for use on turf. Soluble powders (top), such as the kind used on houseplants, are dissolved in solution. This form is not recommended for lawns.

## MORE INFORMATION

For more detailed information on how to properly maintain your lawn, including fertilizer schedules, disease and pest management, please refer to the *Florida Lawn Handbook*, available for viewing at all county UF/IFAS Extension offices.

# MULCH


# 4

## LANDSCAPING PRINCIPLES FOR FLORIDA-FRIENDLY YARDS

http://edis.ifas.ufl.edu/EP052

# Mulch

A mulch layer around trees, shrubs, planted beds and covering bare ground 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 plants don't grow well.

## Here are a few simple facts about mulch:

- Organic mulch materials improve soil fertility as they decompose.
- Mulch buffers soil temperature, keeping soils warmer in winter and cooler in summer.
- Mulch helps maintain soil moisture by reducing evaporation. A layer of mulch also minimizes water needs for established plants.
- Fresh mulch inhibits weed germination and growth.
- Over time, many types of mulch improve soil aeration, structure and drainage.
- A mulch layer can inhibit certain plant diseases.
- Mulch around trees and shrubs (not against the trunk) eases maintenance and reduces the likelihood of damage from string trimmers.
- Mulch gives planting beds a neat and uniform appearance, adding a contrast of color and texture that complements plantings.

# Guidelines for Using Mulch

## Follow these tips when adding mulch to your landscape:

- For well-drained sites, apply a 2–3 inch layer (after settling) of mulch around trees, shrubs and bedding plants. If there are drainage problems, use a thinner layer. Coarse materials, such as pine nuggets, may be applied to a depth of 4", but don't allow mulch to accumulate to a greater depth. If mulch is already present, check the depth. Do not add mulch if there is a sufficient layer in place (2"-3").

Photo by: Ed Gilman, University of Florida.

*Mulch that is too deep or touching the trunk is applied improperly. This is commonly referred to as "volcano mulching."*

- "Volcano mulching," or mulch applied too deeply, hinders oxygen exchange to roots, which stresses the plant and causes root rot. Do not place mulch on top of a tree's rootball or against the trunk. More than about an inch of mulch on the rootball of newly planted trees and shrubs can stress plants because mulch can intercept water meant for the roots.

- If mulch is piled against the trunk, pull it back several inches to uncover the base of the trunk and the root flare. Mulch piled against tree trunks holds moisture against the trunk, and stems and trunks that remain constantly wet are prone to root rot. Mulch piled high against the trunks of young trees may also create habitats for rodents that chew the bark and can girdle the trees.

- Mulch out to a tree's drip line or beyond, at least an 8-foot diameter around the tree. Remember that in a forest environment, a tree's entire root system (which usually extends well beyond the drip line) would be mulched.

- Thick blankets of fine mulch can become matted and may prevent water and air from seeping through, or become like potting soil and may support weed growth. Rake old mulch to break up any matted layers and to refresh the appearance.
- Organic mulches may require weeding and replenishment once or twice a year to maintain a total depth of 2"–3".
- Do not use cypress mulch because harvesting from the wild depletes wetlands.
- Shell, crushed stone or pebbles can be used as mulch but they won't contribute to the soil's nutrient and organic content or water-holding capacity. Limestone and shell both raise soil pH. They also reflect heat, increasing the water needs of plants.

## Florida Yard Tip:

### How Much Mulch?

Bulk quantities of mulch are sold in cubic yard volumes. To calculate the amount of mulch you need, first measure the area to be mulched, in square feet. Next convert the desired depth to a fraction of a foot. For example, 3" divided by 12" equals ¼ ft. or 0.25 ft. Multiply this fraction by the square foot measurement of the area to be covered (.25 feet x 100 square feet = 25 cubic feet). Convert cubic feet to cubic yards by dividing cubic feet by 27 (25/27 = .926). To cover a 100-square-foot area to a depth of 3", you will need .926 cubic yards of mulch.

# Recycled Mulch

Search locally for sources of recycled mulch. Sometimes you can even acquire mulch for free! Here are some tips on obtaining recycled mulch products:

- Use mulch that originates in your own landscape, such as leaves, pine needles, grass and shrub clippings.
- Local power companies, municipal solid waste departments and tree services may supply free or low-cost utility mulch and may sometimes deliver bulk quantities. Try to get only mulch from trimming. It is generally more disease-free than mulch from other sources, such as roots.
- Team up with other homeowners and have bulk quantities delivered to your neighborhood.
- Check the phonebook for commercial suppliers of mulch made from recycled materials.
- If you need lots of mulch for a new landscape, place an ad in the local newspaper so suppliers come to you.

Photo by: UF/IFAS

Photo by: UF/IFAS

*Recycled mulch products made from the invasive plant melalueca are an excellent alternative to cypress mulch. Melaleuca mulch should be made entirely of bark and wood (right) and heat composted to kill any stray seeds (left).*


http://www.epa.gov/epaoswer/non-hw/green/pubs/brochure.htm

# ATTRACT WILDLIFE

Florida has the third most diverse wildlife population of any state. But rapidly growing urban development, particularly in coastal communities, is destroying native wildlife habitat. As our communities expand, we lament the loss of birds and other wildlife, but often our own yards are partly to blame.

Photo purchased from iStock Photo

## Your Florida-Friendly Yard can provide habitat for wildlife in two major ways:

1. By increasing biodiversity, in part by using a variety of plants in your yard's design.
2. By creating landscaped islands and natural corridors of plants that connect bordering properties. Animals use these corridors to travel from one natural area to another, which in turn fosters and benefits wildlife on a larger neighborhood scale.

As you create a new landscape or improve your existing one, add a few features for wildlife, and you will bring your yard to life with birds, butterflies and beneficial insects. Just remember that food, water and cover attract wildlife, but providing habitat is not enough. You also need to maintain your yard so the impact it has on the environment is minimal.

## Try a few of these ideas for luring wildlife to your yard:

- **Food** — Provide food in the form of plants that bear seed, fruit, foliage or flowers that you're willing to have eaten by birds, larval butterflies (caterpillars) or adult butterflies. Berries, fleshy fruits, nuts and acorns are all treats for wildlife. Wildlife find meadow grasses especially attractive, and they add a graceful feature to any landscape.
- **Running Water** — The sound of running water will attract wildlife to your yard. This sound could come from a natural feature, such as a pond, creek or other body of fresh water. A fountain will also beckon wildlife. Even a simple

birdbath that captures rainwater can suffice. 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. Changing water regularly prevents mosquito breeding and bacterial contamination.

Photo by: UF/IFAS

*There are many ways to provide water for wildlife, such as this small pond.*

- **Birds** — To attract birds, design planted areas that include a tree canopy, smaller understory trees and shrubs, and grasses or 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 are those that unfurl flowers, and profuse bloomers are even better. See the plant list at the back of this handbook or consult your county's UF/IFAS Extension office for examples of plants that attract butterflies.

- **Caterpillars** — These are the larvae of butterflies and moths. Each butterfly species lays its eggs on a preferred host plant, which may differ from the adults' preferred nectar source. The caterpillars of butterflies must eat to grow large enough to form a **chrysalis**, so they often strip larval plants of leaves. If you want to attract butterflies to your yard, expect a certain level of damage. One way to keep outdoor living areas attractive and to cultivate a

## FYN Glossary Box

**Chrysalis:** the pupa (last stage before adult) of a butterfly

crop of butterflies is to intersperse larval and nectar plants in a bed. Or devote an entire planting area that is out of view to larval plants.

- **Snags** — Leave dead trees in place if they do not create a hazard. Many birds use snags for perching, nesting and feeding.

- **Manage Pets** — If you permit pets to harass wildlife, you will only frustrate any efforts you make toward attracting wildlife. This is especially true for house cats allowed to roam in yards. If you permit your cat to wander in your yard, it is better not to try to attract birds and other animals whose lives would be in danger.

- **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 also can poison birds and other animals that feed on affected insects.

- **Reduce the Amount of Mowed Lawn Area** — Over time, unmowed areas contain more plant species than mowed areas. Reduce the mowed area around your house, especially in low-traffic areas, such as corners of the yard. In other spots, trade turf for diverse plant species that will create shelter and food for many animal species. Plant diversity attracts more wildlife species.

- **Increase Vertical Layering** — Plant a variety of plants in different sizes and heights. This provides more cover and feeding opportunities for wildlife species.

- **Extension's Urban Wildlife Program** — For more information on wildlife in Florida and help in creating a wildlife-friendly landscape, visit the Florida Wildlife Extension website: **http://www.wec.ufl.edu/extension/landscaping.htm**. Your yard could be recognized as a Florida Backyard Landscape for Wildlife.


http://www.nwf.org/backyardwildlifehabitat/createhabitat.cfm

# MANAGE YARD PESTS RESPONSIBLY

Due to concerns about health, the environment, and **pesticide resistance,** pest control practices once taken for granted are now under scrutiny. Regular preventive pesticide applications are still common for some pests but are often unnecessary. Healthy plants can usually defend against or tolerate pest attacks, while beneficial insects, birds and other natural controls often suppress undesirable insects — which makes the preventive and indiscriminate use of pesticides ill-advised.

Photo by: UF/IFAS

*Weeding by hand is an environmentally friendly pest management practice.*

A better approach to managing pests — **Integrated Pest Management** (IPM) — emphasizes using a combination of environmentally friendly methods that focus on preventing pest problems. What are the basic building blocks of IPM?

- IPM begins at planting time, with pest-free and pest-resistant plants and a landscape design that encourages natural controls.

## FYN Glossary Box

**Pesticide Resistance:** after repeated applications of a certain pesticide, some pests may adapt to the chemical and are not harmed by it — those individuals that survive then breed and pass the resistance genes to their offspring

**Integrated Pest Management:** a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks

- Keeping your plants healthy is the best defense against pests.
- Regular scouting, or keeping an eye on your yard's plants, helps detect pest problems early, before significant damage occurs.
- Plants with aesthetic damage don't necessarily need to be treated. Consider the amount of aesthetic damage you are willing to accept.
- If you see a pest outbreak, determine if a problem really exists or if natural enemies are already present and are working on your behalf.
- If pest control proves necessary, try the safest alternatives first, such as handpicking insects or pruning infected parts of a plant. If pesticides become necessary, choose the least harmful materials. The "softest" insecticides on beneficials and other non-target organisms (people, pets and wildlife) include insecticidal soap, horticultural oil, and microbials (e.g., spinosad, abamectin, *Bacillus thuringiensis* 'Kurstaki').
- Use pesticides only to **spot-treat** affected plants or lawn, not in blanket applications.

## FYN Glossary Box

**Spot-treatment:** application of a pesticide to the problem plant or area, rather than a blanket application or "wall-to-wall" coverage

# Avoiding Pest Problems

The way that you design and maintain your yard either establishes a barrier against pests — or throws out the welcome mat for them.

## Follow these tips to prevent pests:

- Think before you plant. Each time you place a plant in a spot that's not ideal, you will likely have to protect it from pests. Plants in unfavorable growing conditions (compacted soil, inappropriate pH or light, competition with weeds, etc.) are targets for pests! Choose plants that can tolerate the conditions in your yard.
- Choose insect- and disease-resistant plant varieties.
- Go easy on water and fertilizer. Too much can cause excessive growth, making plants vulnerable to some insects and diseases. Encourage healthy growth by applying fertilizer and water only when needed and in moderate amounts.
- Mowing grass too short and severely pruning trees and shrubs weakens them, inviting pests. Mow to the proper height and prune selectively.
- Use barriers to block pest entry.

Photo by: Clemson University, www.insectimages.org

*The assassin bug feeds on many different plant pests.*

Photo by: UF/IFAS

*Caterpillar killed with Bacillus thuringiensis "Kurstaki."*

Photo by: UF/IFAS

*Ants tending plant hoppers.*

- Encourage beneficial insects by choosing some plants that provide the nectar needed by adults and by minimizing the use of broad-spectrum pesticides.

## Identifying Pest Problems

Inspecting plants helps identify pest problems early, before they get out of hand. You can give plants the once-over anytime you water by hand, mow or are tending to other outdoor chores. If you are not in your yard until the weekend, you will need to set aside a time twice or more each week to walk through the 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.

Photo by: J. Castner, UF Entomology/Nematology.

*This person is scouting for pests by tapping branches over a white sheet of paper.*

Common plant pests in Florida include aphids, mealybugs, scales, whiteflies, thrips, plant-feeding mites and caterpillars. Often you will spot evidence of a pest's activity before you see the insect itself. If you see curled, rolled or deformed leaves, mold on leaves or stems, 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 ten-power (10X) magnifying glass to search for movement or evidence of pests.

For pests that attach to the plant, such as scales and whitefly nymphs, look on the branches and on both the upper and undersides of leaves. Sooty mold on leaves is a telltale clue to an infestation by what are known as piercing-sucking insects. Aphids are one example. These pests pierce the plant with sharp mouthparts and suck the sap. Some piercing-sucking insects secrete a sugary substance called honeydew, on which the black-colored sooty mold fungus feeds and 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. Ants 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 (syrphid or hoverfly larvae and tachinid flies).

Photo by: Bradley Higbee, Paramount Farming, www.insectimages.org

*The big-eyed bug is a beneficial insect often mistaken for a chinch bug.*

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 Extension office for identification and suggestions on how to proceed using IPM techniques.

## Treating Pest Problems

What do you do when you have a pest infestation or a disease outbreak? IPM focuses on using chemicals as a last resort. IPM methods form a first line of defense to deal with problems.

- When pests are heavily concentrated on a plant, you can often reduce or eliminate the problem simply by removing the affected leaves or plant parts. Crush, burn or compost these infested plant parts to prevent the disease or insect from spreading.

### FYN Glossary Box

**Photosynthesis:** the process that turns light energy into chemical energy in green plants

- For large, slow-moving pests, picking insects off by hand can often defeat the problem. Dispose of any captured insects so they do not return to feed again. Try one of these disposal methods:
  - Drop pests into soapy water or isopropyl alcohol.
  - Place pests in the freezer overnight.
  - Crush them and put them in your household trash.

- Avoid using broad-spectrum pesticides. They are not selective — they also kill beneficial insects and insects that aren't problematic. Safe alternatives to traditional pesticides include insecticidal soaps and horticultural oils, both of which work to reduce populations of sucking insects. Products containing an extract of the bacterium *Bacillus thuringiensis* 'Kurstaki' take care of caterpillars.

- Always treat for specific pests, and only treat the affected plant.

- Read all product labels carefully and follow them accordingly. Remember that the label is the law! Do not attempt to mix your own chemicals or apply homemade recipes unless you have been properly trained to do so.

- It is usually best to apply soaps, oils and other pesticides during the cooler part of the day to avoid injuring plants. Always read the label to find out if any plants are listed as being sensitive to the product. To determine if the product will hurt your plants, apply it to a small portion of a leaf first, and check for leaf burn after 1–2 days. **Phytotoxicity** often looks like a burn on the edge of leaves.

## FYN Glossary Box

**Phytotoxicity:** degree to which a chemical is toxic to (injures) plants; plant sensitivity to a particular chemical, application rate and environmental conditions influence degree of damage that may result from chemical treatment

# Common Landscape Pests and Their Management

Ants: Three body segments. Range in size from 1/16"–1/2", depending on species. Most species are not harmful. In the landscape, they do not affect plants but the bite and sting of fire ants and carpenter ants affects people. When ants are present, you may observe mounds, ants in trails and on plants.

Photo by: J.F. Butler, Entomology and Nematology, UF.

*Imported fire ants sting and bite, but only the sting causes the painful white pustule.*

***Natural enemies:*** Phorid flies (decapitate fire ants), *Thelohania* fire ant disease.

***Other controls:*** Bait effectively controls fire ants. Be sure material is dry/fresh. Apply in late afternoon or evening around edges of mound. Do not apply when ground or grass is wet. Do not disturb mound. Store baits in a cool environment.

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 or sooty mold may also be present.

Photo by: Anne W. Gideon, www.insectimages.org

*Oleander aphid with lady beetle larvae predators.*

***Natural enemies:*** Lady beetle (ladybug) adults and larvae, lacewing larvae, syrphid fly larvae, parasitic wasps.

***Other controls:*** Prune infested plant parts. Apply insecticidal soaps or horticultural oils. Soil drench with product containing imidacloprid.

Caterpillars: Larvae of butterflies and moths. Chew on foliage, which creates skeletonized or notched 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 pliers to remove stinging caterpillars), apply *Bacillus thuringiensis* 'Kurstaki' (most effective when caterpillars are small).

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

***Natural enemies:*** Big-eyed bugs, earwigs, a parasitic wasp.

Photo by: J. Castner, Entomology and Nematology, UF.

*Chinch bug and damage to turfgrass.*

***Other controls:*** Avoid high fertilizer rates. Maintain St. Augustinegrass at height of 3" in sun and 4" in shade. Use chinch bug-resistant grass varieties when available. Spot-treat infestations with insecticides labeled for chinch bugs.

Mealybugs: Soft-bodied insects 1/16"–1/8" long with well-developed legs. Bodies and egg masses covered by powdery white wax. Attack leaves, twigs and roots and leave behind white, mealy wax deposits. Sooty mold or ants may also be present.

***Natural enemies:*** Lady beetles, lacewing larvae.

Photo by: J. Castner, Entomology and Nematology, UF.

*Longtailed mealybugs feeding on the underside of leaves.*

***Other controls:*** Spray with horticultural oil or insecticidal soap. If that fails, apply a systemic insecticide (i.e., imidacloprid) to the root system. Soil systemics may take several weeks to work. Choose a product that affects only pests that feed on plant sap.

Mole crickets: Velvety brown, 1½" long, feed on turfgrass and vegetable roots. Flattened front legs adapted for burrowing. Mole crickets affect all grasses, but prefer bahiagrass and bermudagrass. Injured turf may be spongy and thinning, with ¾"-round holes that are signs of tunneling. Infestation usually occurs in same area each year. Test for infestation by flushing area with soapy water (1–2 tablespoons soap in a gallon of water). Crickets will surface within 3–5 minutes if present.

***Natural enemies:*** Parasitic wasp *(Larra bicolor)*, red-eyed fly *(Ormia depleta)*, insect-parasitic nematodes *(Steinernema scapterisci)* and birds.

***Other controls:*** For chronic infestation, consider replacing turf with trees, shrubs or groundcovers. If necessary, spot-treat infestations in May or June with insecticides labeled for mole cricket control.

Plant-feeding mites: Tiny (1/32") red, yellow or green with oval bodies. May have spots. Some spin loose webs on foliage. Mites reproduce rapidly in hot weather. Injuries to plants look like light-colored dots, giving leaves a dull, gray-green, speckled appearance.

***Natural enemies:*** Lady beetles, predatory mites.

***Other controls:*** Flush with water, then alternate with soap and oils if necessary.

Scales: Vary in size, shape and color; approximately 1/8" in diameter. Soft scales and armored scales are the most common. Soft scales produce

Photo by: Ken Gray, Oregon State University

*Hemispherical scale immatures (green) and adults (brown).*

**Mole Cricket Knowledgebase and Tutorials:**

honeydew (sugary secretion). The armored scale body is hidden under a waxy scale covering. Mature scales are stationary and feed on leaves, twigs, stems and fruit. Watch for yellow spots (feeding damage) on top of leaves with scale underneath. Ants or sooty mold may be present. "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.

Thrips: Tiny (1/32") winged insects that scar leaves, buds and flower petals to drink sap from wounds. Injured plant may be dull gray with curling, distorted leaves.

***Natural enemies:*** Predaceous thrips, predatory mites.

***Other controls:*** Apply horticultural oils, insecticidal soaps, spinosad spray.

Whiteflies: Adults look like tiny white moths on plants. They take flight when leaves are disturbed. Eggs are on leaf undersides. Nymphs are oval, flat, transparent-to-greenish in color and may look like scales. They are stationary and are located on undersides of leaves. Dead nymphs are dull white; pupae have red eyes. Ants or sooty mold may be present.

***Natural enemies:*** Fungi (most effective in humid weather), parasitic wasps, lady beetles.

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

Photo by: Scott Bauer, USDA ARS, www.insectimages.org

*Silverleaf whiteflies.*

# What About Plant Diseases?

Photo by: Robert McGovern, UF/IFAS

*Fungal disease on petunia.*

Many organisms, including viruses, fungi and bacteria, can cause diseases in plants. Diseases can be quite specific in the plant species they commonly attack, but identifying diseases 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 plants themselves. 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 select leaves. Such minor aesthetic concerns are no cause for alarm or treatment. There are serious diseases, however, that can damage or kill plants they affect. Examples are mushroom root rot on woody ornamentals, fire blight on loquat and brown patch on turf. Such diseases can seriously damage the plant's appearance or yield.

Because diseases are difficult to identify, do not assume a disease is in the works just because of 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's UF/IFAS Extension office for advice on how to collect and submit plant samples for disease diagnosis and recommendations on the least-toxic methods of treatment.


http://spdn.ifas.ufl.edu/

# RECYCLE

Landscape maintenance activities — mowing, pruning, raking — generate yard waste that you can return to the soil, recycling valuable nutrients. It is easy to recycle yard waste. Try a few of these simple ideas to get started.

- Compost or mulch with yard wastes to reduce the amount of solid waste to be hauled away. Florida Statutes prohibits disposing of yard trash in landfills.

- Leaves and pine needles provide a source of mulch that is a real asset in the landscape, and it is virtually free! If your yard generates more leaf mulch than you can use, compost the material or share some with a neighbor.

Photo by: UF IFAS

*Materials generated by the plants in your own yard are a free and easy source for mulch or compost.*

- After pruning trees and shrubs, toss small cuttings into a compost pile or behind a shrub.

- Never dump grass clippings or other yard waste into storm drains or waterways. Such activities are illegal and can pollute water systems and clog drains. Grass clippings are a significant source of nitrogen, so keep them on the lawn and out of the water.

# Recycle While You Mow

**Following a few simple tips is all it takes to cultivate a lush lawn.**

Photo purchased from iStock Photo

*Always leave grass clippings on the lawn.*

- Leave clippings on the lawn to decompose and return nitrogen to the soil. Research indicates this practice improves soil fertility over time, gradually reducing the need for nitrogen fertilization up to 50 percent without a decrease in turfgrass quality.
- Never remove more than one-third of an individual grass leaf blade at one time.
- For procrastinators who don't mow regularly, mulching mowers cut grass into smaller pieces, speeding decomposition.
- If grass grows too tall between mowings, spread clippings behind shrubs or add them to a compost pile to avoid unsightly buildup.
- Sharpen mower blades monthly to protect against pathogen invasion.
- If your yard isn't turf intensive, you'll mow less, saving time, energy and money. Where grass doesn't serve a function, opt for low-maintenance groundcovers instead of grass, or underplant trees with shrubs and groundcovers.

**http://www.dep.state.fl.us/waste/categories/recycling/default.htm**

## Florida Yard Tip:

# Ideal Grass Height

Each turfgrass grows best when it is mowed to a specific height. Turf cut shorter than the recommended height will be stressed and more susceptible to pests and diseases.

- St. Augustinegrass *(Stenotaphrum secundatum)* and bahiagrass *(Paspalum notatum)*: Keep at a minimum height of 3"–4", except for dwarf varieties, which can be cut shorter.
- Centipedegrass *(Eremochloa ophiuroides)*: When actively growing, mow every 7 to 14 days to 1 ½"–2".
- Bermudagrass *(Cynodon dactylon)*: Cut at a height of ¾"–1 ½". This may require mowing one to three times per week.
- Seashore paspalum *(Paspalum vaginatum)*: Cut at a height of 1"–2".

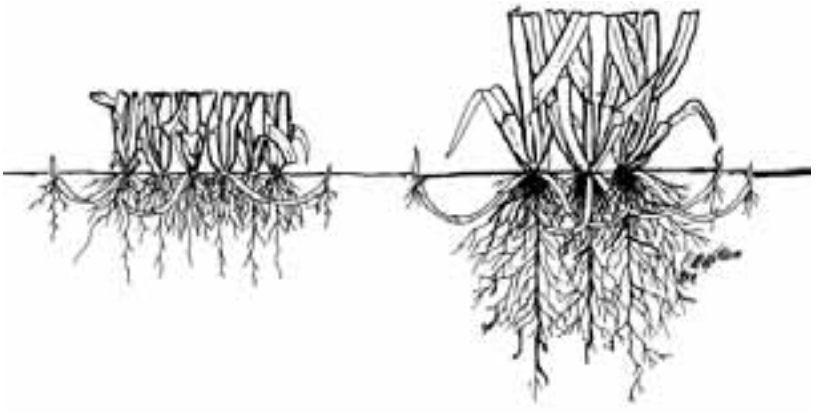


illustration by: Morton Arboretum

*Closer mowed turfgrass (left) is finer textured and denser, but has less underground growth of roots and rhizomes. A deeper root system develops in response to taller mowing heights (pictured right).*

# Pruning

Pruning is selectively removing parts of a plant to improve plant health, control growth or enhance fruiting, flowering or appearance. Most often pruning removes shoots and branches.

Photo by: Ed Gilman, UF/IFAS

*Proper pruning can prevent property damage.*

**Prune using one of three techniques: thinning, heading back or hedging.**

## *Thinning*

**What is thinning?** Completely removing side branches. In trees, cut side branches back to lateral branches or the main trunk. In shrubs, remove them to the ground.

**What does thinning do?** Gives a plant an open appearance. Where growth was dense before pruning, afterwards you can see daylight. Thinning encourages new growth inside the plant crown and increases light penetration and air circulation inside the crown. It also results in fewer branches that grow thicker, developing stronger resistance to wind damage.

## *Heading back*

**What is heading back?** Selectively cutting the tips of twigs or young branches back to a **bud**.

### FYN Glossary Box

**Bud:** an undeveloped or compressed stem

**What does heading back do?** Produces a denser tree or shrub because it usually increases the number of shoots and leaves. Place pruning cuts so they aren't visible by locating them inside the plant, covered up by remaining foliage. Use heading back on annuals at planting time to create more flowering stems.

### *Hedging*

**What is hedging?** Removing shoots or branches from a shrub to maintain a dense row of plants that creates a barrier. Formal hedges feature neatly clipped shrubs; informal hedges let shrubs grow to their natural shape. Formal hedges must be clipped frequently during the growing season; informal hedges can be trimmed annually, enough to keep growth from overwhelming nearby walkways or structures or from shading lawns.

**What does hedging do?** Establishes and maintains a barrier that can provide privacy or form a windbreak. Correct hedging cuts help a hedge to remain healthy and grow actively from top to bottom. The way to accomplish this is to cut your hedge so that the top is narrower than the bottom. This ensures that light can reach each part of the hedge — which keeps the entire barrier healthy and growing. Make cuts during the growing season when growth is green and tender.

## Basic Pruning

### Use these simple steps as a guideline for every pruning job you tackle:

- Remove all dead, diseased or injured branches.
- Dip pruning shears and saws in a weak alcohol solution (one part alcohol to nine parts water) to prevent spreading diseases between plants.
- Remove branches that cross or touch each other and any that look out of place.
- If a shrub is too tall, heading and thinning may both be necessary. Don't use hedge shears, but cut each branch individually to different lengths with hand pruners. This maintains a neat informal shrub with a natural shape.

## Calling the Professionals

If you are unsure about proper pruning techniques, consider hiring a **Certified Arborist** to prune your trees. An arborist is a specialist in the care of individual trees. Certified Arborists are knowledgeable about the needs of trees and are trained and equipped through continuing education administered by the International Society of Arboriculture to provide proper care.

To find a Certified Arborist in your area, check out the International Society of Arboriculture's website, **http://www.floridaisa.org** and search by ZIP code.

Pruning trees can be a technical, detailed and dangerous process. Learn more about it online at **http://hort.ufl.edu/woody/pruning**.

### FYN Glossary Box

**Certified Arborist:** an arborist who has passed an exam and receives, on a regular basis, continuing education administered by the International Society of Arboriculture or another certifying agency

**http://hort.ifas.ufl.edu/woody/pruning/index.htm**

## Florida Yard Tip:

# Reduce Your Pruning Load

Keep pruning chores to a minimum by doing things the environmentally friendly way.

1. Select slow-growing plants.

2. Place plants far enough from walkways, driveways or buildings to allow them to reach maturity without encountering obstructions that require hauling out the pruners.

Photo by: Holly Johnson Shiralipour, UF/IFAS

*When pruning trees and shrubs, put small cuttings into a compost pile or use as mulch.*

3. Forget the clipped, formal look. Soft, flowing, natural lines are attractive and easy to maintain.

## Raking

Deciduous trees reduce energy costs by shading a house in summer and, after leaves fall, by allowing sunshine to heat a house in winter. Many new Floridians avoid having deciduous trees in their yards because they believe that fallen leaves require raking. If you desire high-quality turf under trees, then you should rake leaves to improve light penetration to the turf.

Photo by: UF/IFAS

*Lilyturf groundcover (Liriope muscari) growing underneath a shade tree borders a self-mulching area along a footpath.*

If you do not want turf, 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 shrubs under trees to avoid raking. They 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 plants require fertilizer. Plants 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 take up. Some key nutrients for plants include nitrogen, phosphorus, potassium, magnesium, calcium, zinc, iron and manganese.

*Composted organic matter is dark in color.*

**http://www.nrcs.usda.gov/feature/backyard/**

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 or kitchen waste. As compost decomposes in soil, it releases essential nutrients. Add generous amounts of composted material frequently to soil and it can create the perfect medium for sustained plant health.

*Compost can be made in a pile.*

## 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, earthworms 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; many are attractive. Gardening magazines, catalogs and garden centers are good sources for composting products. For more information, visit Florida's Online Composting Center at **http://compostinfo.com**.

### FYN Glossary Box

**Composting:** the process of converting plant and animal waste into useful soil additives

**EPA Composting Site:**

A compost pile needs adequate moisture, oxygen, nitrogen and carbon sources to generate the right conditions for decomposition. The more closely you monitor and manipulate these factors, the faster decomposition can occur — and the sooner you will have rich compost for fertilizing plants and amending soil.

## Follow these tips for successful composting:

- Bins are not necessary, but they help keep piles neat, retain heat and moisture and prevent complaints from neighbors. The minimum recommended size is one cubic yard (three feet square by three feet high).
- 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.
- 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.
- Heat is important in composting, so a sunny location is better than a shady one.
- Combining different materials in the pile, such as grass clippings and leaves, will achieve the right proportions of carbon and nitrogen for effective composting.

Photo by: UF/IFAS

*Compost bins with several compartments aid in turning the material.*

Photo by: UF/IFAS

*Compost can also be made in a manufactured bin.*

**http://www.epa.gov/compost/**

- Always bury kitchen waste inside the pile to discourage pests and to prevent odor from rotting fruit and vegetables.

- Generally, for fastest composting, turn the pile with a pitchfork or stir it on a weekly basis in warm weather. Stabbing the pile with a length of pipe or rake handle will help aerate and mix the material.

- Never place meat, animal fat or dairy products in a compost pile.

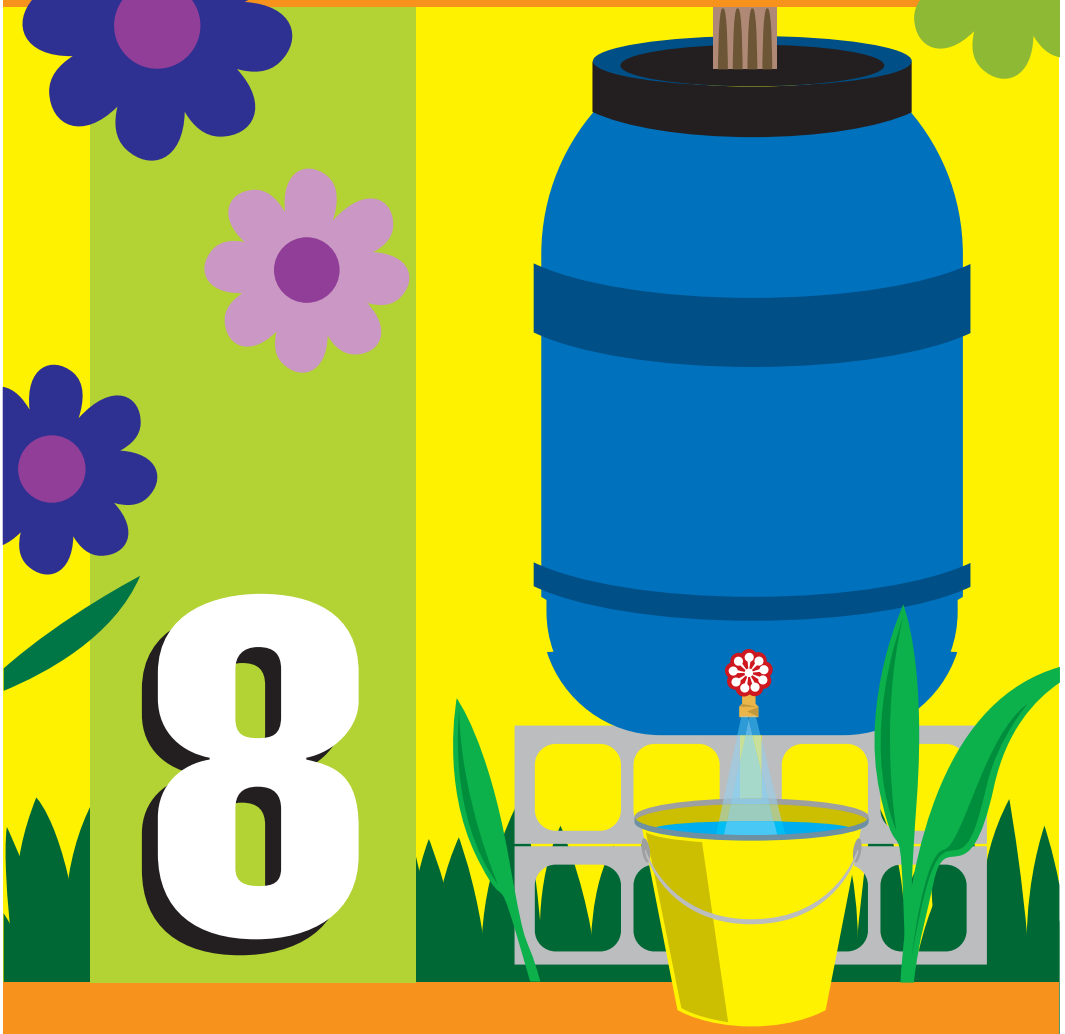
## Florida Yard Tip:

### The Squeeze Test

To find out if your compost pile is getting too much water, try this test. Grab a handful of compost from the bottom of the pile. Squeeze it. You shouldn't be able to squeeze drops of water from the composted material.

*Squeeze test illustrating adequate moisture (above) and excessive moisture (below).*

# REDUCE STORMWATER RUNOFF



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## LANDSCAPING PRINCIPLES FOR FLORIDA-FRIENDLY YARDS

http://www.epa.gov/watertrain/

## REDUCE STORMWATER RUNOFF

Since the formation of the EPA and the passage of the Clean Water Act, great strides have been made toward maintaining and restoring water quality throughout the United States. This has been accomplished through regulating **point sources** of pollution, such as smokestacks and sewage discharge. But a more diffuse source of pollution — **nonpoint source (NPS) pollution** — threatens Florida's ecosystems.

Many of Florida's water resources are especially susceptible to pollution because of our unique geology and climate. Floridians obtain most of their drinking water from ground water supplies. Ground water often lies near the surface, covered by porous limestone and sandy soils, both of which allow water to infiltrate rapidly. Dissolved pollutants reach ground water through a process called leaching. These impurities affect the quality of our drinking water. Heavy rainfall, typical during Florida's rainy season, is a major cause of leaching and **stormwater runoff**. Surface waters in Florida such as lakes, streams, rivers and estuaries are very sensitive to even small amounts of pollution.

### FYN Glossary Box

**Point source pollution:** water pollution that results from water discharges into receiving waters from easily identifiable points; common point sources of pollution are discharges from factories and municipal sewage treatment plants

**Nonpoint source (NPS) pollution:** NPS pollution cannot be pinpointed to a single source. Over time, pollutants from our everyday activities accumulate on the land. Examples of NPS pollutants include gasoline, fertilizer, pesticides and even soil. NPS pollution is a problem when rainfall or heavy irrigation carries sediments and dissolved chemicals to waterways in stormwater runoff and by leaching or percolating through soil

**Stormwater runoff:** water that runs off impervious or water-saturated surfaces, transporting sediments and dissolved chemicals into nearby waters

**DEP NPS Page:**

A healthy, properly maintained lawn absorbs stormwater runoff, protecting Florida's natural waters. If stormwater runoff is not absorbed and contains unused nitrogen and phosphorus from fertilizers, when these chemicals enter natural waterways, they can fuel abundant algal blooms that smother natural vegetation, deplete oxygen and possibly kill fish. These nutrients, if applied improperly, can cause invasive weeds to flourish, changing Florida's natural plant communities. More alarming, potentially harmful substances, such as common household pesticides and fertilizers, are leaching into our water supply. These materials damage aquatic life and harm people, too. These substances that are washed from and through soil in stormwater runoff form NPS pollution.

Following FYN landscaping guidelines will reduce nonpoint sources of pollution. A properly designed and managed landscape can help slow down and filter stormwater runoff.

## Making Every Raindrop Count

One of the basic concepts of a Florida-Friendly Yard is that rain that falls in your yard should soak into your yard. After all, rainfall is an excellent water source for your landscape, and reducing runoff protects waterways. Retaining rainfall long enough for it to percolate through soil is challenging in neighborhoods built on compacted fill soils. Consider these practical tips for reducing the amount of rainfall that runs off your yard.

purchased iStock photo image

*Downspout directed into the yard.*

- Downspouts. If your roof has rain gutters, aim the downspouts at a porous surface so water can soak into soil. Be sure water doesn't pool next to buildings.

  **Helpful hint:** If you decide to landscape the area where downspouts drain, choose plants adapted to wet/dry extremes.

- Earth Shaping. Incorporate attractive, functional earth shaping into your landscape. Swales (small dips in the ground) and berms (raised earthen areas) can help divert runoff that would otherwise rush from your yard. A densely growing turfgrass or groundcover

**http://www.dep.state.fl.us/water/nonpoint/index.htm**

proves especially useful to capture rainwater, filter nutrients, recharge ground water and reduce soil erosion.

In a waterfront yard with a seawall, use a berm and swale combination to reduce stormwater runoff. Add a maintenance-free zone of native wetland plants to a berm or swale to make your yard more waterfront-friendly.

**Helpful hint:** Minor alterations to the lay of the land won't require permits or engineers, but any major earthwork should have a professional touch and will require regulatory review. Also, check with your local Florida DEP office before making any changes to shorelines.

Photo by: Chris Claus

*Connect a rainbarrel to a swimming pool to replace water.*

- Rain Barrels and Cisterns. These ancient technologies are making a comeback as water shortages prompt homeowners to save and use rain that falls on their properties. Large plastic rain barrels are now available at some home and garden stores. FYN also offers rain barrel workshops in some counties where you can learn to build your own. The barrel has a hole in the top where a roof downspout can fit snugly. A valve near the bottom allows you to fill a watering can or connect a hose.

  Barrels are great for hand watering, and they are not mosquito breeding grounds if the downspout fits tightly. If your barrel is open at the top, use *Bacillus thuringiensis* (Bt) products (often sold in a donut form) to kill mosquito larvae in an environmentally safe way. If you happen to have algae take root in your rain barrel, treat the water with submersible bacterial packets sold in pond supply stores. A rain

Photo by: Jim Phillips

*Rain barrels reduce water pollution by reducing stormwater runoff.*

**EPA NPS Page:**

barrel is not unsightly, but a four foot shrub easily shields it from view.

A cistern also catches rain, but requires more engineering and greater storage capacity than a rain barrel. Water from a roof is collected, filtered and stored in a container made of concrete, metal, wood, fiberglass or plastic. Water travels from the cistern upon demand by either gravity feed or pump action.

**Helpful hint:** Currently in Florida, water obtained from a cistern is only for non-potable uses, such as landscape watering. In other words: Do not drink it! Before building a cistern, check with local authorities to make sure that it is not against the law in your area.

Photo by: Mark Shelby

*Cistern collects rain for nonpotable uses.*

- Porous Surfaces. Whenever possible, use bricks, gravel, turf block, mulch, pervious concrete or other porous materials for walkways, driveways or patios. These materials allow rainwater to seep into the ground, helping to filter pollutants and reducing the amount of runoff from your yard. In some cases these porous materials may even cost less to install than typical paving materials.

  **Helpful hint:** A cost comparison of some pervious surfaces can be found in Table 5 (see page 96).

Photo by: UF/IFAS

*Recycled railroad ties, bricks and gravel make a unique footpath capable of absorbing rainwater.*

Photo by: UF/IFAS

*The combination of turf growing between flagstone withstands foot traffic and absorbs rainwater.*

Table 5. Comparison of Surfaces for a 15'x30' Driveway (450 sq. ft)

| Material | Depth | Relative Cost* |
|---|---|---|
| Melaleuca Mulch | 2" | $ |
| Municipal Waste Mulch | 2" | $ |
| Recycled Yard Waste | 2" | FREE |
| Compost | 2" | $ |
| Washed Shell | 2" | $ |
| Gravel | 2" | $$ |
| Recycled Tire mulch | 1.5" | $$ |
| Red Mulch | 2" | $ |
| Lime rock | 2" | $ |
| River Rock | 2" | $$ |
| Pine Bark | 2" | $ |
| Concrete (plain) | 4" | $$$$ |
| Concrete (stamped) | 4" | $$$$$ |
| Asphalt | 1.5" | $$$-$$$$ |

* $=<$200 total cost; $$=$200-499; $$$=$500-999; $$$$=$1000-2999; $$$$$=>$3000

# PROTECT THE WATERFRONT

# 9

## LANDSCAPING PRINCIPLES FOR FLORIDA-FRIENDLY YARDS

http://www.dep.state.fl.us/secretary/watman/

# PROTECT THE WATERFRONT

Waterfront property owners have firsthand knowledge of the special contribution lakes, ponds, rivers, streams and lagoons make to Florida's quality of life. Florida-Friendly Yards located on a waterfront must address certain challenges and responsibilities. As next-door neighbor to these natural resource treasures, you must make it your mission to practice good environmental stewardship.

To design and maintain a landscape that borders a waterfront of any sort requires a strong focus on the natural environment, as well as on environmental impact. If you presently live on the waterfront or are considering moving to a waterfront location, review these points to make the most of your landscape — to create a yard that is beautifully functional for you and environmentally safe for the natural resources of our state.

Photo by: Jim Phillips

*Homeowners are encouraged to leave a minimum of a 10-foot low impact zone along the waterfront to protect the water from pollutants.*

## Saltwater Considerations

Naturally sloping shorelines, particularly when buffered by a fringe of mangroves or marsh grass, help smooth out waves and reduce cloudiness in the water. In addition, mangroves and other shoreline plants contribute to the food web, attract wildlife such as wading birds, and help prevent erosion at the water's edge.

The area in which shoreline plants grow is known as the **littoral zone**, the boundary between land and water. Unfortunately, seawalls have traditionally been placed directly in this intertidal, littoral zone. If you desire to restore a natural shoreline with natural vegetation, you face a complex decision. Begin

by inquiring about your city and county ordinances to determine whether removal is an option.

If you can legally replace a shoreline protection structure with a natural littoral zone along your property, your options will be limited by several factors:

1. Depth of your lot
2. Distance from the waterline to upland structures
3. Wave impact against your shore
4. Your budget
5. Shoreline condition of neighboring properties

Photo by: UF/IFAS

*Container garden along a seawall of the intracoastal waterway.*

Shoreline protection alternatives comprise very site-specific considerations, and you need expert advice. The Florida Sea Grant Marine Extension agent in your county, natural resources employees of local governments and the Florida Department of Environmental Protection are good places to find help and information. Keep in mind that submerged land is probably not your property, but belongs to the State of Florida. For information on permitting requirements, contact the Florida Department of Environmental Protection office in your area.

## FYN Glossary Box

**Littoral zone:** the area between high and low tide in coastal waters, or the shoreline of a freshwater lake

## Those Marvelous Mangroves

Beauty, wildlife value and erosion protection make mangroves an asset to a Florida-Friendly Yard. Florida has four native mangrove species:

- Red mangroves (*Rhizophora mangle*) usually live closest to open water. They have arching red prop roots, and their seeds look like green cigars.
- Black mangroves (*Avicennia germinans*) typically grow further upland than red mangroves. Taller than their red and white cousins, black mangroves are the most cold tolerant of the mangrove species found in Florida. Black mangroves send up nobby projections called pneumatophores, which provide oxygen to the tree's roots.
- White mangroves (*Laguncularia racemosa*) are usually found at higher elevations, interspersed with black mangroves.
- Buttonwood (*Conocarpus erectus*) is not considered a true mangrove by some scientists. It grows most landward of the mangrove species. Once established, it is quite drought resistant and can also withstand flooding, making it an ideal landscape plant for coastal areas.

Some mangrove pruning requires a permit, and the rules are periodically

Photo by: Greg Ira, FDEP

*Mangrove seedlings.*

Photo by: Greg Ira, FDEP

*Pneumataphores are sometimes called knees.*

revised. Homeowners and the individuals they hire to trim their mangroves are jointly responsible for trimming mangroves appropriately. The booklet *Mangrove Trimming Guidelines for Homeowners* is available at FDEP's district offices throughout the state. You can read these materials online at **http://www.dep.state.fl.us/water/wetlands/mangroves/mangrove.htm**.

If you have mangroves, contact the following organizations for information on properly managing these fascinating plants: Florida Sea Grant Extension Program, Florida Department of Environmental Protection and your local government's natural resources department.

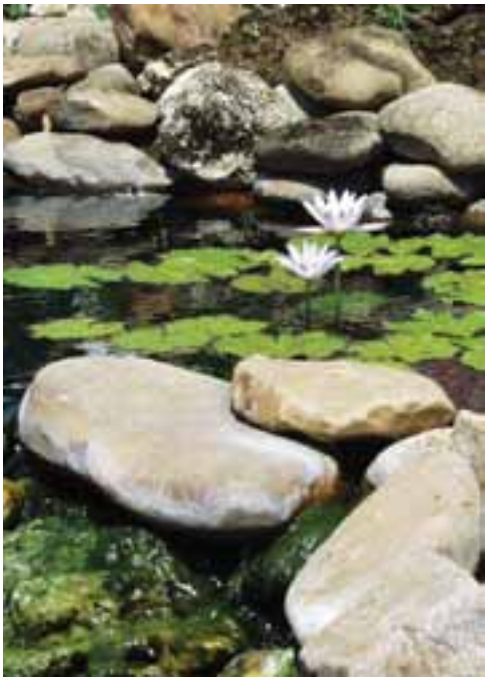
## Freshwater Considerations

Lakes, rivers, streams and ponds also have littoral zones, which offer many benefits. Littoral zones:

- Slow the velocity of runoff
- Filter nutrients and sediments from runoff
- Hold soil in place

To protect a freshwater resource from nutrient and pesticide runoff, designate a "maintenance-free zone" of at least 10 feet between your lawn or landscape and the water body. Don't mow, fertilize or apply pesticides to the littoral zone.

Enhance natural wetland vegetation with additional plantings. The FDEP's book, *Florida Wetland Plants: An Identification Manual*, is an excellent reference source for information on plant materials.



*Fragrant white water-lilies (Nymphaea ordorata) growing in a man-made stream.*

## Man -Made Lakes and Ponds

If your property does not border or contain a natural waterway, consider

building one. A pond is relatively easy to maintain, and it can add value, beauty and ecological soundness to your Florida-Friendly Yard. It does not matter whether your pond measures in square feet or acres, it will contribute significantly to wildlife in your area.

Selecting a good pond site requires evaluating many factors, including slope, soil type, water table, septic tank and house foundation setbacks, and utility easements. When planning, try to strike a balance between what your permit allows and what would fit most naturally into the landscape.

In nature, Florida lakes and ponds feature some common characteristics:

1. They are usually located at the lowest elevation in a landscape.
2. They have a high edge-to-depth ratio — that means that they are wide and shallow.
3. A shallow depth increases the amount of littoral shelf area — the area receiving maximum sunlight penetration. The shelf area provides a place for plants to root and quickly becomes a beehive of pond life activity. Florida ponds less than four feet deep often exhibit complete plant coverage. (It takes 6–10 foot depths to maintain open water.)

## Stormwater Control Ponds (Retention Ponds)

If you live on a waterfront, evaluate stormwater runoff patterns to determine if you are inadvertently "dumping" runoff from your landscape directly into the natural waterway. One way to filter runoff is by installing a series of swales and channels, followed by a small pond as a final collection point for runoff.

A pond provides a natural filter for potential waterway pollutants. Vegetation and filter traps act as active filtration systems for pollutants, and the settling action in the pond itself serves as another way to remove pollutants. A well-built pond that supports plant life can significantly improve the quality of water draining into Florida's waterways.

Another advantage these systems offer is extending the "soak time" of stormwater, or increasing the amount of water allowed to percolate. Water that percolates through soil recharges ground water directly, as opposed to water that empties into waterways.

If you find yourself managing one of these natural stormwater filtration systems, follow our do's and don'ts checklist to maintain them properly:

*Shallow ponds, typical in Florida, allow sunlight to penetrate the bottom.*

## POND MANAGEMENT DO's

- DO plant appropriate aquatic, emergent and upland vegetation — they stabilize soil greatly.
- DO use pond water for non-potable irrigation needs.
- DO fertilize surrounding areas with the least amount of fertilizer possible, always using a slow-release type.
- DO use organic compost in lieu of fertilizer.
- DO use mulch around plants to retain moisture.
- DO keep pet wastes out of water bodies.

## POND MANAGEMENT DON'TS

- DON'T allow livestock to graze pond bank sides.
- DON'T swim in or eat fish caught in stormwater ponds.
- DON'T allow invasive plants to clog waterways.
- DON'T direct grass clippings into stormwater ponds.

## Seasonal Ponds

A common pond type — and perhaps the easiest to imitate as a yard feature — is a shallow "seasonal" pond, typically 2'–5' deep and 25'–150' across. Variations in seasonal rainfall cause fluctuations in water level, appearance and function.

In winter, standing water recedes, often drying down completely, depending on the pond's water depth, soil type and the local water table. But even in this "dry-down" condition, a seasonal pond offers moisture sources, the damp habitats required by many amphibians, reptiles, birds and small mammals.

**If you wish to construct a pond to replicate these important habitats, choose an area that:**

- accommodates the shallow and wide profile
- already contains suitable plant life and soil types
- provides access for wildlife

## Conclusions: Connecting Our Yards to Florida's Waterways

The future of Florida's treasured water resources begins in your yard. The decisions you make — from developing a home site, to landscaping your yard, to fertilizing your lawn — actually influence the health of Florida's natural waterways. Nature doesn't recognize property lines. A rainstorm can wash bare soil, landscape debris, gas, oil, fertilizers or pesticides from one yard to another. A butterfly attracted to one person's wildflowers can flit across a property line into another landscape. Landscapes do not just connect people to the outdoors; they also connect one person's property to the next, forming neighborhoods. Ultimately, yards and neighborhoods are connected to water resources. This connection may be immediate, as in a waterfront community, or gradual, through the flow of storm drains, ditches, streams, rivers and ground water.

For more information on Florida-friendly landscaping, contact the FYN Coordinator at your county's UF/IFAS Extension office (find contact information at **http://solutionsforyourlife.ufl.edu**) or visit the state FYN website at **http://fyn.ifas.ufl.edu**.

**EPA, Locate Your Watershed: http://cfpub.epa.gov/surf/locate/index.cfm**

## 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://fyn.ifas.ufl.edu** and follow the link to the FYN Handbook. You can also visit **http://FloridaYards.org** for more information on Florida-friendly landscaping, or contact your county's UF/IFAS Extension office and ask for the Florida Yards & Neighborhoods program. See **http://solutionsforyourlife.ufl.edu/offices.html** or check the government pages in your phone book to find your county's Extension office.

# *Create a Florida-Friendly Yard*

Yards and landscapes can be a positive asset to Florida. You can design and maintain your own Florida-Friendly Yard by following the simple, common sense 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 that addresses 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 we look forward to assisting you in creating an aesthetically pleasing landscape that will also help to protect Florida's natural resources.

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Florida Yards & Neighborhoods

http://fyn.ifas.ufl.edu

FloridaYards.org

Southwest Florida Water Management District

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FLORIDA

# Florida-Friendly Plant List
## 2006

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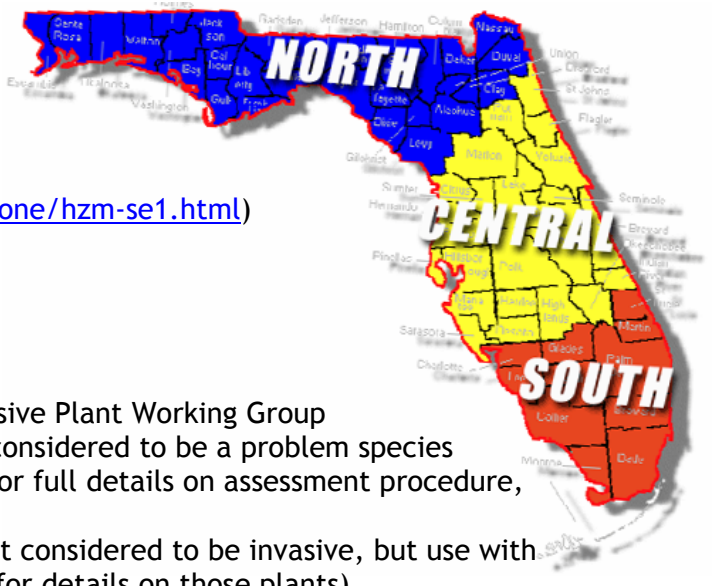
The plants on this list are considered by UF/IFAS horticulture specialists to be well adapted to growing in Florida landscapes. When planted under appropriate soil, light, and climatic conditions, most generally require little maintenance compared with other plants. Each plant's preferred growing conditions (soil pH, soil texture, relative drought tolerance, soil drainage/moisture, light range, light optimum, and salt tolerance) are included here as a guide to choosing plants for your specific site conditions. Additional information is given on growth rate, mature height and spread, flowering color and season, value to wildlife, wind resistance and other characteristics helpful for plant selection and maintenance.

See the key to symbols and abbreviations used in the tables for details. Remember to always put the right plant in the right place by matching each plant's needs with the environmental conditions found at the site. There may be variation in some characteristics, especially in the region (north, central or south) of Florida in which plants will grow. Check with your county's UF/IFAS Extension office to confirm the appropriateness of specific plants (look in the government pages of your phone book or see http://solutionsforyourlife.ufl.edu/offices.html for your county's contact information).

*Key to Symbols and Abbreviations:*




Florida Region and Cold Hardiness Zones:

Region (includes Florida regions in which plant will grow):
N=North; C=Central; S=South (see map at right).

USDA cold hardiness zone (http://www.usna.usda.gov/Hardzone/hzm-se1.html) is listed below the region and includes Florida zones only.

N/I = Native and Invasive Status:

FL = Florida native
NA = Not yet assessed for invasive potential by the IFAS Invasive Plant Working Group
No = Assessed by IFAS Invasive Plant Working Group and not considered to be a problem species (not considered invasive) and can be recommended (for full details on assessment procedure, see http://plants.ifas.ufl.edu/assessment.html)
No/C = Assessed by IFAS Invasive Plant Working Group and not considered to be invasive, but use with caution in at least one region (see comments column for details on those plants)
FL/NA = Some species are Florida natives and some are non-native species that have not yet been assessed

Growth Rate, Height and Spread:
Growth rate: Slow; Medium; Fast; S-M = Slow-Medium; M-F = medium to fast
↑ = mature height in feet; → = mature spread in feet

Soil pH (gives the range tolerated by the plant):

●○○○ = Acid
●●○○ = Acid to slightly acid
●●●○ = Acid to slightly alkaline
○●○○ = Slightly acid
○●●○ = Slightly acid to slightly alkaline
○●●● = Slightly acid to alkaline
●●●● = Tolerates any soil pH

Soil Texture: C/L = clay loam; S/L = sandy loam; S = sandy; S/C = sandy clay; any = any texture

Soil Moisture:

 = well drained  = medium drained  = wet  = well drained to medium drained

 = medium drained to wet  = well drained to wet

Drought Tolerance: High, Medium, Low, or None (Note: Both drought tolerance and soil moisture tolerance should be considered, and they are not the same. For example, a plant may tolerate wet soils and also have high drought tolerance, and another plant may prefer well drained soils but have low drought tolerance.)

Light Range and Light Optimum:

 = Full Sun  = Partial Shade  = Shade  = Optimum light conditions

Salt Tolerance: H = High; M=Medium; L-N: Low to None; U = Unknown

Wildlife:  = Attracts butterflies  = Attracts hummingbirds  = Attracts other birds

*Use this list to choose plants based on your site conditions, following these steps:*

1.) Find out and write down the conditions of the bed or other area you want to plant:
   - The region of the state you live in. (Check the map on page 2 and remember that if you live close to the border of a region, all of the plants listed for that region may not do well in your area and some of the plants that do well in the next region may do well in your area.)
   - The amount of light the site receives. (Check at various times throughout the day and through the seasons.)
   - Soil pH and texture. (Take samples and obtain a soil test through your county's Extension office.)
   - Soil moisture (Is it in a high, dry area or a low area where water frequently accumulates? To check drainage, dig a small hole, add water and see how quickly the water drains – if water stands for more than 24 hours, consider it a wet site.)
   - Exposure to salt spray or salty irrigation water.
   - Size of area for plants. (Are there height restrictions such as a window nearby or power lines above? Is the width of the area limited?)

2.) Determine the type of plant you want (tree, shrub, etc.) and go to that category on the list.

3.) Narrow down the list by choosing plants that match the region, light, soil conditions and moisture at the site.

4.) Further narrow your list to those plants that will fit the site based on mature height and spread.

5.) Consider the need for salt tolerant plants, if applicable, and any additional factors you are interested in, such as wildlife value or flower color and season.

For further assistance, contact the Florida Yards & Neighborhoods or horticulture program at your county's UF/IFAS Extension office.

This list is meant as a guide to start choosing plants appropriate for your conditions. The absence of a plant from this list does not imply that it is not well adapted to Florida landscape conditions. This list will be updated periodically. Please check with your county's UF/IFAS Extension office for future updates.

For photos of the plants on this list, see the on-line database of Florida-friendly plants at http://FloridaYards.org. There you can search for plants by choosing site conditions or look up specific plants. For additional information and fact sheets on many of the plants on this list, see also http://hort.ifas.ufl.edu/woody/.

**Acknowledgements:**

This list was developed using as a base the plant availability lists from the Florida Nursery, Growers and Landscape Association, Tampa Bay Wholesale Growers, and the Association of Florida Native Nurseries. Thanks to Marguerite Beckford, Stephen Brown, Doug Caldwell, Patty Connolly, Dan Culbert, Terry DelValle, Chris Dewey, Mary Duryea, Alison Fox, Kim Gabel, Crysta Gantz, Adrian Hunsberger, Claudia Larsen, Tom MacCubbin, Jim Moll, Jane Morse, Sydney Park Brown, Jyotsna Sharma, Erick Smith, Jessica Sullivan, Teresa Watkins, Wendy Wilber, Larry Williams, Sandy Wilson and members of the SWFWMD Green Industry Advisory Committee for contributions to and review of the list. This list was produced in collaboration with the Southwest Florida Water Management District and the Florida Department of Environmental Protection.

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **Large Trees** | | | | | | | | | |
| *Acer barbatum*<br>Florida Maple, Southern Sugar Maple | N<br>8b-9a | FL | M-F<br>25-60 ↑<br>25-40 → | ●○○○<br>Any | High | | L-N | | also known as *Acer saccharum* ssp. *floridanum;* green flowers in spring; watch for aphids and cottony maple scale |
| *Acer rubrum*<br>Red Maple | NCS<br>8-10 | FL | Fast<br>35-80 ↑<br>25-35 → | ●●○○<br>Any | Medium | | L-N | | red flowers in winter-spring; red fall foliage; watch for aphids, cottony maple scale, gall mites; shallow-rooted; good for wet sites; medium-low wind resistance |
| *Betula nigra*<br>River Birch | NC<br>8-9a | FL | Fast<br>40-50 ↑<br>25-35 → | ○●●○<br>Any | Low | | L-N | | needs soil space for root expansion; grows best with high soil moisture; chlorosis develops in alkaline soil; tolerates periodic flooding but not long periods of drought; medium-high wind resistance |
| *Bucida buceras*<br>Black Olive, Oxhorn Bucida, Gregorywood | S<br>10b-11 | No | M-F<br>45-60 ↑<br>35-50 → | ○○●●<br>Any | High | | H | | white flowers in spring; messy fruit and leaves, can stain walks and cars; medium-low wind resistance; pest sensitive; regular pruning in first 20 years required for dominant trunk structure |
| *Carya* spp.<br>Hickories, Pecan | NC<br>8b-9a | FL | Med.<br>varies ↑<br>varies → | ●●○○<br>Any | High | | L-N | | edible fruit (*C. illinoinensis* ); white/yellow flowers, spring; tolerates occasionally wet soil; wind resistance high for *C. floridana* , med-high for *C. glabra* and *C. tomentosa* , low for *C. illinoensis* |
| *Conocarpus erectus*<br>Buttonwood, Silver Buttonwood | S<br>10b-11 | FL | Med.<br>5-50 ↑<br>15-20 → | ○●●●<br>Any | High | | H | | white/cream flowers in spring; silver leaved form more susceptible to sooty mold and insect problems; do not plant in marl soil; high wind resistance; wildlife value (cover/nesting) |
| *Ficus aurea*<br>Strangler Fig | S<br>10b-11 | FL | Fast<br>40-60 ↑<br>30-50 → | ●●●●<br>Any | High | | M | | not for small areas; spreading canopy shades parks, large yards; may start as epiphyte, killing host tree (often encircling cabbage palm); fallen fruits may be messy; medium-low wind resistance |

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|---|---|---|---|---|---|---|---|---|---|
| *Fraxinus americana*<br>White Ash | N<br>8 | FL | Med.<br>50-80 ↑<br>50-80 → | ●●○○<br>Any | Medium | | L-N | | tolerates occasionally wet soil; does not tolerate compacted soil; watch for ash borer, cankers, leaf spots, dieback when stressed; medium-high wind resistance |
| *Fraxinus caroliniana*<br>Pop Ash, Carolina Ash, Water Ash | NC<br>8-9 | FL | Med.<br>30-50 ↑<br>20-35 → | ●●○○<br>Any | Medium | | L-N | | good plant for retention ponds, swales and canal banks; tolerates wet conditions |
| *Fraxinus pennsylvanica*<br>Green Ash | NC<br>8-9 | FL | Fast<br>50-100 ↑<br>30-70 → | ●●○○<br>Any | Medium | | L-N | | tolerates wet conditions; good for shaded areas; medium-low wind resistance |
| *Gordonia lasianthus*<br>Loblolly Bay | NC<br>8-9 | FL | Slow<br>30-60 ↑<br>20-30 → | ●●○○<br>C/L | Low | | L-N | | white flowers in spring-summer; good restoration tree; good for retention pond edges; do not plant in alkaline soils |
| *Halesia* spp.<br>Silverbell, Halesia | NC<br>8-9 | FL/<br>NA | M-F<br>15-60 ↑<br>15-30 → | ○●○○<br>S/L | Low | | L-N | | flowers variable, usually white in early spring; winged seeds used by some wildlife; region depends on species |
| *Juniperus virginiana*<br>Red Cedar | NC<br>8-9 | FL | Fast<br>50 ↑<br>25 → | ●●●○<br>Any | High | | H | | very similar to *Juniperus silicicola* but branches straighter |
| *Liquidambar styraciflua*<br>Sweetgum | NC<br>8-9 | FL | Med.<br>40-100 ↑<br>40-60 → | ●●●●<br>Any | High | | M | | many cultivars; some wildlife value (seeds of limited use to some birds and mammals); medium-high wind resistance |
| *Liriodendron tulipifera*<br>Tulip Poplar, Tulip Tree, Yellow Poplar | N<br>8-9A | FL | Fast<br>80-100 ↑<br>40-80 → | ●●●○<br>Any | Medium | | L-N | | yellow/orange flowers, spring-summer; watch for borers/aphids/leaf spots/root and stem rot; newly transplanted trees susceptible to leaf yellowing and drop w/o enough moisture; low wind resistance |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Lysiloma latisiliquum* Wild Tamarind, Bahama Lysiloma | S 10b-11 | FL | Fast 40-60 ↑ 30-45 → | ○●●● Any | High | | H | | small white/pink flowers in spring-summer; needs to be pruned for strong form; no pest problems; medium-high wind resistance |
| *Magnolia grandiflora* and cvs. Southern Magnolia | NC 8-9 | FL | Med. 40-80 ↑ 15-40 → | ●●●○ Any | Medium | | H | | white/cream, fragrant flowers in summer; red seeds used by various wildlife; tolerates occasionally wet soil; high wind resistance |
| *Magnolia virginiana* and cvs. Sweet Bay Magnolia | NC 8-9 | FL | Med. 40-60 ↑ 20-50 → | ●●○○ Any | None | | L-N | | white flowers, spring; small red seeds used by wildlife; larval food plant for swallowtail butterflies; no serious pest problems, but watch for scales/borers; medium-high wind resistance |
| *Nyssa sylvatica* Tupelo, Black Gum | N 8b-9a | FL | Slow 65-75 ↑ 25-35 → | ●●○○ Any | High | | M | | showy fall color; white, inconspicuous flowers in spring; medium-high wind resistance |
| *Pinus elliottii* var. *densa* Southern Slash Pine | CS 9-11 | FL | Fast 75-100 ↑ 35-50 → | ●●○○ Any | High | | H | | flammable - in wildfire-prone area, plant min. 30' from bldgs; old trees dangerous, medium-low wind resistance; seeds provide wildlife food; tolerates occasionally wet soil; sensitive to disturbance |
| *Pinus elliottii* var. *elliottii* Northern Slash Pine | NC 8-9 | FL | Fast 75-100 ↑ 35-50 → | ●●○○ Any | High | | H | | flammable - in wildfire-prone area, plant min. 30' from bldgs; old trees can be dangerous, med-low wind resistance; tolerates occasionally wet soil; seeds eaten by wildlife; sensitive to disturbance |
| *Pinus glabra* Spruce Pine | N 8-9a | FL | Slow 30-60 ↑ 25-40 → | ●●○○ Any | Medium | | L-N | | flammable - in wildfire-prone area, plant min. 30' from bldgs; low wind resistance |

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|---|---|---|---|---|---|---|---|---|---|
| *Pinus palustris*<br>Longleaf Pine | NC<br>8-9 | FL | Med.<br>60-80 ↑<br>30-40 → | ●●●○<br>Any |  <br>High |  | L-N |  | flammable - in wildfire-prone area, plant min. 30' from bldgs; old trees dangerous, med-low wind resistance; watch for borers; resistant to fusiform rust/pine bark beetle; tolerates occasionally wet soil |
| *Piscidia piscipula*<br>Jamaican Dogwood, Fish Poison Tree | S<br>11 | FL | Fast<br>30-50 ↑<br>30-50 → | ●●●●<br>Any |  <br>High |  | H |  <br>  | lavender/white flowers; all parts are poisonous; good wildlife value (birds/insects) |
| *Platanus occidentalis*<br>Sycamore, American Planetree | NC<br>8b-9a | FL | Fast<br>75-90 ↑<br>50-70 → | ●●○○<br>Any |  <br>Medium |  | M | | needs space; sheds continually; leaf scorch if insufficient water; watch for mites/lace bugs/anthracnose; good for erosion control on stream banks; medium-low wind resistance |
| *Quercus acutissima*<br>Sawtooth Oak | N<br>8-9a | NA | Med.<br>40-50 ↑<br>50-70 → | ●●○○<br>Any |  <br>High |  | M | | wildlife food; tolerates occasionally wet soil; chlorosis from micronutrient deficiency occurs in alkaline soils |
| *Quercus alba*<br>White Oak | NC<br>8-9 | FL | Slow<br>60-100 ↑<br>60-80 → | ●●○○<br>Any |  <br>High |  | H |  | wildlife food; tolerates occasionally wet soil; medium-high wind resistance |
| *Quercus austrina*<br>Bluff Oak | NC<br>8-9 | NA | Med.<br>40-60 ↑<br>35-50 → | ●●●○<br>Any |  <br>Medium |  | L-N |  | |
| *Quercus falcata*<br>Southern Red Oak, Spanish Oak, Turkey Oak | NC<br>8-9a | FL | Med.<br>60-80 ↑<br>60-70 → | ●●●○<br>Any |  <br>High |  | M |  <br>  | low wind resistance; provides wildlife food |
| *Quercus hemisphaerica*<br>Laurel Oak | NC<br>8-9 | FL | Fast<br>60-70 ↑<br>35-45 → | ●●●○<br>Any |  <br>Medium |  | M |  <br>  | short lived; low wind resistance; tolerates occasionally wet soil but does not tolerate poor drainage well; trunk decays easily when large branches removed |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Quercus laurifolia* Laurel Oak | NC 8-9 | FL | Fast 60-70 ↑ 35-45 → | ●●●○ Any | Medium | | M | | short lived; low wind resistance; tolerates occasionally wet soil but does not tolerate poor drainage well; trunk decays easily when large branches removed |
| *Quercus michauxii* Swamp Chestnut, Swamp Chestnut Oak | NC 8-9 | FL | Med. 60-200 ↑ to 148 → | ●●○○ C/L | Low | | L-N | | wildlife food; tolerates occasionally wet soils; in wet soils rot rot may be a problem; best in full sun but tolerates shade when young; very tolerant of urban conditions; medium-high wind resistance |
| *Quercus nuttallii* Nuttall Oak | N 8 | NA | Med. 60-80 ↑ 35-50 → | ●●○○ Any | Medium | | L-N | | wildlife food; tolerates occasionally wet soil |
| *Quercus shumardii* Shumard Oak | N 8-9a | FL | Fast 55-80 ↑ 40-50 → | ●●●○ Any | High | | M | | wildlife food; tolerates occasionally wet soil; medium-high wind resistance |
| *Quercus virginiana* Live Oak | NCS 8b-10b | FL | Med. 40-80 ↑ 60-120 → | ●●●○ Any | High | | H | | wildlife food; not for small lots; caterpillars, root rot and insect galls sometimes a problem; tolerates occasionally wet soil; high wind resistance |
| *Simarouba glauca* Paradise Tree | S 10b-11 | FL | Med. 30-50 ↑ 25-30 → | ●●●● Any | Medium | | H | | yellow flowers in summer; medium-high wind resistance; no major pest problems; don't plant near sidewalks and driveways (surface roots) |
| *Swietenia mahagoni* West Indian Mahogany | S 10b-11 | FL | Fast 40-75 ↑ 40-60 → | ●●●● Any | High | | H | | medium-high wind resistance; tolerates occasionally wet soil; watch for webworms on foliage |

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|---|---|---|---|---|---|---|---|---|---|
| *Taxodium ascendens*<br>Pond Cypress | NCS<br>8b-<br>10b | FL | Fast<br>50-60 ↑<br>10-15 → | ●●●●<br>Any | High | | M | | also known as *Taxodium distichum* var. *nutans* ; wetland plant & adapts to dry sites; flammable - in wildfire-prone area, plant min. 30' from bldgs; us. has yellow-brown fall color; high wind resistance |
| *Taxodium distichum*<br>Bald Cypress | NCS<br>8-10 | FL | Fast<br>60-80 ↑<br>25-35 → | ●●●●<br>Any | High | | L-N | | flammable plant - in wildfire-prone area, plant min. 30' from bldgs.; wetland plant & adapts to dry sites; deciduous; yellow-brown color in fall; small seeds used by some birds; high wind resistance |
| *Ulmus alata*<br>Winged Elm | NC<br>8-9 | FL | Fast<br>45-70 ↑<br>30-40 → | ●●●●<br>Any | High | | M | | watch for Dutch elm disease; medium-high wind resistance |
| *Ulmus americana*<br>American Elm | NC<br>8-9 | FL | Fast<br>70-90 ↑<br>50-70 → | ●●●●<br>Any | High | | M | | long-lived (300+years); watch for Dutch elm disease; medium-low wind resistance |
| *Ulmus crassifolia*<br>Cedar Elm | NC<br>8-9 | FL | Med.<br>50-70 ↑<br>40-60 → | ●●●●<br>Any | High | | M | | watch for Dutch elm disease and powdery mildew |
| *Ulmus parviflora* and cvs.<br>Chinese Elm, Lacebark Elm | NC<br>8-9 | NA | Med.<br>40-50 ↑<br>35-50 → | ●●●●<br>Any | High | | M | | low wind resistance; may experience freeze problems and pest problems in north FL; tolerates occasionally wet soil |
| **Medium Trees** | | | | | | | | | |
| *Avicennia germinans*<br>Black Mangrove | CS<br>9a-<br>11 | FL | Med.<br>20-30 ↑<br>10-20 → | ●●●●<br>S | None | | H | | white flowers all year; very good for salty shorelines with full sun; produces pneumatophores (breathing roots) that protrude around base of tree; flowers attractive to bees |
| *Bursera simaruba*<br>Gumbo Limbo | CS<br>10b-<br>11 | FL | Med.<br>20-50 ↑<br>25-40 → | ○●●●<br>Any | High | | M | | wood borers may become a problem if trees are stressed, but otherwise pest resistant; high wind resistance |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Caesalpinia* spp. and cvs. Poinciana | CS 9-11 | NA | Med. varies varies | ○●●○ S/L | Medium | | M | | region depends on species and cultivar, choose species adapted to climate; flowers variable |
| *Carpentaria acuminata* Carpentaria Palm | S 10b-11 | NA | Fast 35-40 8-10 | ○●●○ Any | Medium | | L-N | | white/cream flowers in spring-fall; tolerates occasionally wet soil; can cause skin irritation |
| *Carpinus caroliniana* American Hornbeam, Musclewood, Ironwood | NC 8-9a | FL | Slow 20-30 20-30 | ●●●○ Any | Medium | | L-N | | orange/yellow flowers in spring; pest resistant; small enough to plant under powerlines; seeds and catkins used by birds and squirrels; excellent understory tree; medium-high wind resistance |
| *Cassia fistula* Golden Shower | CS 10b-11 | No | Fast 30-40 25-40 | ○●●○ Any | Medium | | L-N | | yellow flowers in summer; low wind resistance; showy when blooming |
| *Cercis canadensis* Eastern Redbud | NC 8b-9a | FL | M-F 20-30 15-35 | ●●●○ Any | High | | L-N | | cultivars provide various foliage and flower color; purple/lavendar/pink flowers in spring; pest sensitive; some birds eat beans; medium-high wind resistance |
| *Chrysophyllum oliviforme* Satinleaf | S 10b-11 | FL | Slow 30-45 18-25 | ●●○○ Any | High | | H | | fragrant flowers; attracts wildlife; edible fruit; may need native soil incorporated in hole for better establishment; medium-high wind resistance |
| *Coccoloba diversifolia* Pigeonplum | S 10a-11 | FL | Fast 30-40 10-20 | ●●●○ S | High | | H | | white flowers in summer; edible fruit; watch for weevils; attracts wildlife; compact crown makes it good for small areas; medium-high wind resistance |

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|---|---|---|---|---|---|---|---|---|---|
| *Cordia sebestena*<br>Geiger Tree | S<br>10b-11 | NA | Slow<br>25-30 ↑<br>20-25 → | ○●●●<br>Any |  <br>High |  | H |  | tolerant of salt or brackish water; orange flowers all year; geiger beetles eat some foliage so don't plant in high visibility area; damaged by severe freezes; high wind resistance |
| *Crataegus* spp.<br>Hawthorn | NC<br>8-9 | FL/<br>NA | Med.<br>varies ↑<br>varies → | ●●●●<br>Any |  <br>High |  | L-N |  | "haws" eaten by variety of wildlife; provides good nesting cover; flowers variable; best for north Florida; many species and cultivars; optimal soil conditions depend on species |
| *Delonix regia*<br>Royal poinciana | S<br>10b-11 | No/<br>C | Fast<br>35-40 ↑<br>40-60 → | ●●●●<br>Any |  <br>High |  | M | | orange/red flowers in summer; med-low wind resistance; needs large area; invasive assessment: not considered a problem species in N and C; caution-manage to prevent escape in S |
| *Eriobotrya japonica*<br>Loquat | NCS<br>8-11 | No/<br>C | Med.<br>20-30 ↑<br>30-35 → | ●●●●<br>Any |  <br>Medium |  | M |  | white flowers, fall-winter; med-low wind resistance; Medfly host-don't plant in citrus areas; invasive assessment: not a problem species in N; caution-manage to prevent escape in C and S |
| *Ficus citrifolia*<br>Shortleaf Fig, Wild Banyan Tree | S<br>10b-11 | FL | M-F<br>25-50 ↑<br>40 → | ●●●●<br>Any |  <br>High |  | M |  | edible; don't plant in drainfields, aggressive roots |
| *Ilex* × *attenuata* and cvs.<br>East Palatka Holly | NCS<br>8-10 | FL | Fast<br>30-45 ↑<br>10-15 → | ●●●○<br>Any |  <br>Medium |  | M |  | may have severe disease problems in central parts of the state; important source of pollen for bees |
| *Ilex cassine* and cvs.<br>Dahoon Holly | NCS<br>8-10 | FL | Med.<br>20-30 ↑<br>15-20 → | ●●○○<br>Any |  <br>Medium |  | M |  | white flowers in spring; important source of pollen for bees; berries provide food for many wildlife species; needs to be in a wet area; high wind resistance |
| *Ilex myrtifolia*<br>Myrtleleaf Holly, Myrtle Holly | NCS<br>8-11 | FL | Med.<br>25-50 ↑<br>10-15 → | ●●●○<br>Any |  <br>Medium |  | M |  | inconspicuous white flowers in spring; wildlife widely use red fruit in late fall; no pest problems; important source of pollen for bees |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Ilex rotunda* Round Holly, Roundleaf Holly, Rotund Holly | NCS 8-11 | NA | Slow 20-30 ↑ 20-30 → | ●●○○ Any | Medium | | L-N | | white flowers in spring; important source of pollen for bees; attracts wildlife |
| *Jacaranda mimosifolia* Jacaranda | CS 9b-11 | NA | Fast 25-40 ↑ 45-60 → | ○●●○ Any | High | | L-N | | lavendar/blue flowers in spring-summer; messy when leaves and flowers drop; soft wood and breaks easily; low wind resistance |
| *Juniperus silicicola* Southern Red Cedar | NCS 8a-10b | FL | Fast 40 ↑ 20 → | ●●●● Any | High | | H | | low wind resistance; attracts birds (excellent nesting cover and fruit provides food); good for dune planting; watch for juniper blight and mites; branches drooping |
| *Lagerstroemia indica* Crape/Crepe Myrtle | NCS 8-10b | No | Fast 10-30 ↑ 15-30 → | ●●●● Any | High | | L-N | | flowers vary, summer; use mildew resistant cvs., good air circulation; watch for aphids/sooty mold/root rot; high wind resistance; invasive assessment: not a problem, incomplete conclusions |
| *Lagerstroemia indica* × *fauriei* Crape Myrtle, Japanese Crape Myrtle | NC 8-9 | NA | Fast 25-50 ↑ 25-35 → | ●●●● Any | Medium | | M | | white, showy flowers in summer; many cultivars are mildew resistant |
| *Lagerstroemia speciosa* Crape/Crepe Myrtle, Pride of India, Queen's Crape Myrtle | S 10-11 | No | Med. 45 ↑ 35 → | ●●●● Any | Medium | | L-N | | lavendar/pink flowers in spring-summer; watch for cottony cushion scale and aphids; tolerates alkaline soil when fertilized regularly |
| *Mangifera indica* Mango | S 10b-11 | NA | Fast 30-45 ↑ 30-40 → | ●●●● S/L | Medium | | M | | many cultivars; white flowers, winter; med-low wind resistance; use anthracnose and mildew resistant varieties; watch for mites/scales/thrips; new dwarf varieties better for small yards |

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|---|---|---|---|---|---|---|---|---|---|
| *Ostrya virginiana*<br>American Hophornbeam,<br>American Hornbeam | NC<br>8-9a | FL | Slow<br>30-40 ↑<br>25-30 → | ●●●○<br>Any |  <br>High |  | L-N |  | fall color; nuts used by some birds and mammals; medium-high wind resistance |
| *Persea americana*<br>Avocado | CS<br>9b-<br>11 | NA | Fast<br>35-40 ↑<br>25-35 → | ●●●○<br>Any |  <br>Medium |  | L-N |  | many cultivars for edible fruit; low wind resistance; watch for avocado lace bug, mites, scales, root rot (especially in poorly drained soils), fire blight |
| *Persea borbonia*<br>Red Bay, Bay Oak | NCS<br>8b-<br>11 | FL | Med.<br>30-50 ↑<br>30-50 → | ●●●○<br>Any |  <br>High |  | H | <br> | only for northern part of southern region; larval food plant for swallowtail butterflies; generally pest-free but insect galls can distort leaves; medium-low wind resistance |
| *Persea palustris*<br>Swamp Bay | NCS<br>8-10 | FL | Med.<br>20-30 ↑<br>20-30 → | ●●○○<br>Any |  <br>Medium |  | L-N | <br> | purple fruit; good wetland plant |
| *Podocarpus gracilior*<br>Weeping Fern Pine,<br>Weeping Podocarpus | CS<br>9b-<br>11 | NA | Slow<br>30-50 ↑<br>25-35 → | ●●●○<br>Any |  <br>Medium |  | L-N | | relatively pest free; grows slowly in full shade; high wind resistance |
| *Pyrus* spp.<br>Pear | NC<br>8-9 | NA | S-M<br>30 ↑<br>12-15 → | ○●●○<br>S/L |  <br>Medium |  | M | | flowers variable; edible; only grows well in parts of central Florida; tolerates occasionally wet soil; *Pyrus calleryana* has low wind resistance |
| *Quercus chapmanii*<br>Chapman's Oak | NC<br>8-9 | FL | Slow<br>30-45 ↑<br>20-30 → | ●●●○<br>Any |  <br>High |  | H | <br> | provides wildlife food |
| *Quercus lyrata*<br>Overcup Oak | NC<br>8-9a | FL | Med.<br>30-40 ↑<br>30-40 → | ●●●○<br>Any |  <br>Medium |  | L-N |  | tolerates occasionally wet soil |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Rhizophora mangle* Red Mangrove | S 10-11 | FL | Med. 20-40 ↑ 30-40 → | ●●●● Any | Medium | | H | | yellow flowers all year |
| *Tabebuia chrysotricha* Yellow Trumpet Tree, Golden Trumpet Tree | CS 9B-11 | NA | Fast 25-35 ↑ 25-35 → | ●●●● Any | Medium | | M | | yellow flowers in spring; medium-low wind resistance |
| *Tabebuia heterophylla* Pink Trumpet Tree | CS 9B-11 | No | Med. 20-30 ↑ 15-25 → | ●●●● Any | High | | M-H | | pink/white flowers in spring to summer; medium-low wind resistance; watch for holopothrips; invasive assessment: not considered a problem, incomplete conclusion in C and S |
| *Tabebuia impetiginosa* Purple Trumpet Tree | CS 9b-11 | NA | Slow 12-18 ↑ 10-15 → | ●●●● Any | High | | M | | showy, pinkish-purple flowers in spring; medium-low wind resistance |
| **Small Trees** | | | | | | | | | |
| *Acacia farnesiana* Sweet Acacia | CS 9-11 | FL | S-M 10-25 ↑ 15-25 → | ○●●○ S/C | High | | M | | also known as *Abelia smallii;* yellow flowers all yr., esp. spring;thorny;tolerates occasionally wet soil;provides seeds/cover for birds;good nectar plant for beneficial insects;don't plant next to sidewalk |
| *Aesculus pavia* Red Buckeye, Florida Buckeye | N 8-9a | FL | Med. 15-20 ↑ 15-25 → | ○●●○ Any | Medium | | M | | red flowers in spring; tolerates occasionally wet soil |
| *Aralia spinosa* Devil's Walkingstick | NC 8-9a | FL | Med. 10-25 ↑ 6-10 → | ○●●○ Any | Medium | | L-N | | also known as *Angelica spinosa; small* white flowers in spring-summer; purplish berries widely used by wildlife; spiny stems; tolerates occasionally wet soil |

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| *Ardisia escallonioides*<br>Marlberry, Marbleberry | CS<br>9-11 | FL | M-F<br>10-21<br>3-12 | ○●●●<br>S/L | High | | H | | fragrant, white flowers all year; attractive foliage; round purple fruits widely used by wildlife, mostly in fall and winter; no pest problems; good for screens and hedges |
| *Arenga engleri*<br>Formosa Palm, Dwarf Sugar Palm | CS<br>9a-<br>11 | NA | Med.<br>10<br>16 | ○●●○<br>Any | None | | L-N | | red/orange/green flowers in spring |
| *Baccharis halimifolia*<br>Groundsel Tree, Sea Myrtle, Salt-bush | NCS<br>8-10 | FL | Med.<br>8-12<br>6-12 | ●●●●<br>Any | Medium | | M | | white flowers in fall; poisonous seeds; useful for reclaiming wet sites, by retention ponds and drainage ditches |
| *Butia capitata*<br>Pindo Palm, Jelly Palm | NCS<br>8b-<br>11 | NA | Slow<br>15-25<br>15-25 | ○●●○<br>Any | High | | M | | edible fruit used for jelly; attracts wildlife; looks best in full sun; white flowers; pest sensitive; high wind resistance |
| *Calliandra* spp. and cvs.<br>Powderpuff | CS<br>9b-<br>11 | NA | Fast<br>10-15<br>8-15 | ○●●○<br>Any | High | | L-N | | pink/white flowers in spring-fall; invasive assessment: *Calliandra haematocephala* assessed as not a problem, others not yet assessed |
| *Callistemon* spp.<br>Bottlebrush | NCS<br>8b-<br>11 | NA | Med.<br>6-30<br>6-15 | ○●●○<br>S/L | High | | M | | red flowers, spring-summer; medium-low wind resistance; attracts beneficial insects; invasive assessment: *Callistemon citrinus* , *Callistemon rigidus* not a problem, others not yet assessed |
| *Camellia japonica*<br>Camellia | NC<br>8-9 | No | Slow<br>10-20<br>10-20 | ●●○○<br>Any | Medium | | L-N | | many cultivars; flowers up to 6 inches, in winter-spring, color variable; watch for scales, aphids, chewing insects and fungal diseases; requires acid soil and will have problems if pH is too high |
| *Camellia sasanqua*<br>Sasanqua, Sasanqua Camellia | NC<br>8-9 | No | Slow<br>3-15<br>varies | ●●○○<br>Any | Medium | | L-N | | some groundcover cultivars available; flowers in fall-winter, color variable; watch for scales, mites, aphids and chewing insects; requires acid soil and will have problems if pH is too high |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Canella winterana* Wild Cinnamon, Cinnamon Bark | S 10b-11 | FL | Slow 10-30 10-30 | ○●●● S/L | High | | H | | purple flowers in summer; poisonous (except flowers, fruit and leaves) |
| *Capparis cynophallophora* Jamaica Caper Tree, Mustard Tree | S 10-11 | FL | Slow 6-20 6-15 | ○●●● Any | High | | H | | purple/white flowers in spring |
| *Cephalanthus occidentalis* Buttonbush | NCS 8-11 | FL | Med. 6-20 6-8 | ●●●○ Any | None | | L-N | | flammable, in wildfire-prone area, plant min.30' from bldg; attracts insects; white flowers, spring-summer; good for retention ponds/swales/canal banks; well adapted to disturbed soils |
| *Cephalotaxus harringtonia* Japanese Plum Yew, Harrington Plum Yew | NC 8-9 | No | Slow varies varies | ●●○○ S | Medium | | L-N | | flammable plant - in wildfire-prone area, plant a minimum 30' from buildings |
| *Chamaerops humilis* European Fan Palm | NCS 8-11 | NA | Fast 5-15 6-15 | ○●●○ Any | High | | M | | clumping palm; yellow flowers in summer; pest sensitive; very cold hardy; relatively low maintenance compared to other palms; petioles with sharp teeth |
| *Chionanthus pygmaeus* Pygmy Fringetree | C 9 | FL | Med. 6-12 15-20 | ●●●○ S | Medium | | L-N | | white flowers in spring; purple fruits in late summer |
| *Chionanthus retusus* Chinese Fringetree | N 8 | NA | Slow 15-20 10-12 | ●●○○ S | Medium | | L-N | | white flowers in spring-summer |

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|---|---|---|---|---|---|---|---|---|---|
| *Chionanthus virginicus*<br>Fringetree | NC<br>8-9 | FL | Slow<br>12-20<br>10-15 | ●●●○<br>Any | Medium | | L-N | | showy, white flowers in spring; flowers best in sun; poisonous; pest sensitive; tolerates occasionally wet soil; medium-high wind resistance |
| *Citharexylum spinosum*<br>Fiddlewood | S<br>10-<br>11 | FL | Med.<br>15-25<br>12 | ●●●○<br>Any | High | | M | | also known as *Citharexylum fruticosum* ; white, fragrant flowers all year; attracts wildlife |
| *Citrus* spp.<br>Citrus | NCS<br>8b-<br>11 | FL/<br>NA | Med.<br>12-30<br>15-30 | ○●●○<br>S/L | Medium | | M | | region depends on species - choose species adapted to your climate; check Extension office or www.doacs.state.fl.us/pi/ for current quarantine information; medium-low wind resistance |
| *Coccoloba uvifera*<br>Seagrape | CS<br>9-11 | FL | Med.<br>3-35<br>10-50 | ●●●○<br>S | High | | H | | fragrant, white flowers, spring; fruit attractive to large wildlife; watch for weevils; grows as shrub on coastal dunes and as tree inland; deciduous, continual leaf drop; medium-high wind resistance |
| *Cordia boissieri*<br>White Geiger, Texas Olive | CS<br>9a-<br>11 | NA | Slow<br>15-20<br>10-15 | ○●●●<br>Any | High | | M | | white flowers all year |
| *Cornus foemina*<br>Swamp Dogwood, Stiff Dogwood, Stiff Cornel | NCS<br>8-10 | FL | Med.<br>10-16<br>10-16 | ○●●○<br>Any | Low | | L-N | | white flowers in spring; larval food plant for spring azure butterfly; blue berries used by various birds |
| *Cyrilla racemiflora*<br>Titi, Swamp Cyrilla, Leatherwood | NC<br>8b-<br>10a | FL | Fast<br>10-30<br>6-15 | ●●○○<br>Any | Medium | | L-N | | white flowers in late spring-summer; wetland plant; good for edges of retention ponds; attractive to bees |
| *Dodonaea viscosa*<br>Hopbush, Varnish Leaf | CS<br>9-11 | FL | Med.<br>10-18<br>6-15 | ●●●●<br>S/L | High | | H | | yellow flowers in summer-fall; relatively pest free |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Eugenia* spp. (natives only) Stoppers | CS 9-11 | FL | Fast 10-30 5-20 | ●●●● Any | High | | H | | flowers variable; few pests; needs little attention once established; natives are *E. axillaris, E. foetida, E. rhombea* , and *E. confusa* ; *E. axiliaris* , *E . confusa, E. foetida* have high wind resistance |
| *Forestiera segregata* Florida Privet | NCS 8b-11 | FL | Med. 4-15 3-12 | ○●●● S/L | High | | H | | yellow flowers in early spring; great hedge; fruit provides food for wildlife, flowers attract insects |
| *Ilex* × 'Mary Nell' Mary Nell Holly | NC 8-9 | FL | Med. 10-20 10 | ●●●○ S/C | Medium | | M | | white flowers in spring; important source of pollen for bees |
| *Ilex* × 'Nellie R. Stevens' Nellie R. Stevens Holly | NC 8-9 | FL | Med. 15-25 10-12 | ●●●○ S/C | Medium | | M | | white flowers in spring; important source of pollen for bees; attracts wildlife |
| *Ilex cornuta* and cvs. Chinese Holly, Horned Holly | NC 8-9 | No | Med. varies varies | ●●○○ Any | High | | M | | can have severe tea scale problem, especially in cool, shady areas; fruit attracts wildlife; many cultivars; important source of pollen for bees |
| *Ilex glabra* Gallberry | NCS 8-10a | FL | Slow 6-8 8-10 | ●●○○ Any | Medium | | M | | flammable plant - in wildfire-prone area, plant a min. 30' from bldgs.; white flowers in spring; black fruit used by wildlife in late fall and winter; good for wetland/pine areas; high wind resistance |
| *Ilex vomitoria* and cvs. Yaupon Holly | NCS 8-10 | FL | Med. varies varies | ●●●○ Any | High | | H | | flammable, in wildfire-prone area, plant min. 30' from bldgs; white flowers, spring-summer; red fruit (wildlife food), late fall-winter; 'Pendula' - FNGLA Plant of the Year, 2005; high wind resistance |

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|---|---|---|---|---|---|---|---|---|---|
| *Illicium* spp.<br>Star Anise | NC<br>8-9 | FL/<br>NA | Med.<br>varies<br>varies | ●●○○<br>Any | Medium | | L-N | | flowers variable |
| *Jatropha integerrima*<br>Peregrina | CS<br>9b-<br>11 | NA | Med.<br>15<br>10 | ●●●●<br>Any | High | | L-N | | scarlet flowers all year; very poisonous, use with caution; watch for scales and mealybugs; sensitive to frost |
| *Ligustrum japonicum* and cvs.<br>Ligustrum, Japanese Privet | NCS<br>8-<br>10b | No | Med.<br>8-12<br>15-25 | ○●●○<br>Any | High | | H | | white flowers, summer; watch for scale/whiteflies /sooty mold/nematodes/root rot; used as hedge; thins at bottom unless in full sun; invasive assessment: not a problem, incomplete conclusion |
| *Magnolia* × *soulangiana* and cvs.<br>Saucer Magnolia | NC<br>8-9a | NA | Med.<br>20-25<br>15-25 | ●●○○<br>Any | Low | | L-N | | many cultivars; pink/white/lavender fragrant flowers, late winter-spring; no major pests but watch for scales/nematodes/leaf spots/mushroom root rot; medium-high wind resistance |
| *Musa* spp.<br>Banana | CS<br>9b-<br>11 | NA | Fast<br>7-30<br>10-15 | ●●●●<br>Any | Low | | L-N | | edible; in cooler parts requires protection, foliage dies in winter, emerges in spring if no killing frost; grows quickly when fertilized; needs regular watering; watch for Sigatoka leaf spot disease |
| *Myrcianthes fragrans*<br>Simpson's Stopper, Twinberry | CS<br>9b-<br>11 | FL | Slow<br>6-30<br>15-20 | ○●●○<br>Any | High | | H | | edible fruit; white, fragrant flowers all year and red berries used by many birds; tolerates occasionally wet soil; needs little attention once established |
| *Myrciaria cauliflora*<br>Jaboticaba, Brazilian Grape Tree, Brazilian Grape | S<br>10b-<br>11 | No | Slow<br>15-40<br>15-40 | ●●●●<br>Any | Medium | | L-N | | white flowers, time of flowering depends on cultivar; edible fruit |
| *Myrica cerifera* and cvs.<br>Wax Myrtle | NCS<br>8-10 | FL | Fast<br>10-40<br>20-25 | ●●●●<br>Any | Medium | | H | | flammable, in wildfire-prone area, plant min. 30' from bldgs; watch for lobate lac scale, severe in S FL; trunk disease can shorten life; good hedge plant for wildlife; medium-low wind resistance |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Osmanthus americanus* Wild Olive | NC 8b-9 | NA | Med. 15-25 ↑ 10-15 → | ○●●○ Any | Medium | | H | | white, fragrant flowers in spring; fruits of some used by birds/mammals |
| *Parkinsonia aculeata* Jerusalem Thorn, Mexican Palo Verde, Retama | CS 9-11 | No | Fast 15-20 ↑ 20-25 → | ●●●● Any | High | | H | | yellow flowers in spring-summer; not for wet areas; roots rot in poorly drained soil |
| *Plumeria rubra* Frangipani, Nosegay, Templetree | S 10b-11 | No | Slow 20-25 ↑ 20-25 → | ●●●● Any | High | | H | | fragrant, showy flowers in spring to fall; watch for frangipani caterpillar; needs cold protected spot if grown in central Florida |
| *Prunus angustifolia* Chickasaw Plum | NC 8-9 | FL | Med. 12-20 ↑ 15-20 → | ●●●○ Any | High | | M | | white flowers in winter; reddish plums provide wildlife food; medium-high wind resistance |
| *Prunus persica* and cvs. Peach | NC 8-9 | NA | Fast 15-25 ↑ 15-25 → | ●●●○ Any | Medium | | L-N | | white/red flowers in spring; edible; select cultivars appropriate for your area, based on chill hours |
| *Prunus persica* var. *nucipersica* Nectarine | NC 8-9 | NA | Fast 15-25 ↑ 15-25 → | ●●●○ Any | Medium | | L-N | | white/red flowers in spring; edible; select cultivars appropriate for your area, based on chill hours |
| *Prunus umbellata* Flatwoods Plum | NC 8-9 | FL | Med. 12-20 ↑ 12-20 → | ●●●○ Any | Medium | | L-N | | white flowers in spring; purple plums provide wildlife food; edible fruits, ranging from very tart to sweet; watch for tent caterpillars |

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|---|---|---|---|---|---|---|---|---|---|
| *Quercus geminata*<br>Sand Live Oak, Small Sand Live Oak | NCS<br>8-10a | FL | Med.<br>12-15<br>10-12 | ○●●○<br>S/L | High | | H | | high wind resistance; good in dune areas; important for wildlife food |
| *Quercus myrtifolia*<br>Myrtle Oak | NC<br>8a-9b | FL | Slow<br>6-20<br>10-25 | ●●●○<br>S | High | | M | | wildlife food; used often by threatened Florida scrub jay; useful for stabilizing banks and in coastal reclamation; tolerates poor growing conditions; no pest problems; high wind resistance |
| *Raphiolepis* spp. and cvs.<br>Indian Hawthorn | NC<br>8-9 | NA | Med.<br>2-10<br>2-6 | ○●●○<br>Any | High | | M | | flowers variable; wildlife food; use disease-resistant cvs., plant in full sun, don't overirrigate to avoid disease; invasive assessment: *R. indica* assessed as not a problem, others not yet assessed |
| *Sambucus* spp.<br>Elderberry | NCS<br>8-11 | FL/NA | Fast<br>12-20<br>12-15 | ●●●○<br>Any | Medium | | V | | flowers variable; salt tolerance depends on species, check with county Extension office or local nursery before making final selection |
| *Senna polyphylla*<br>Desert Cassia | S<br>10a-11 | NA | Fast<br>6-10<br>6-8 | ○●●●<br>S/L | Medium | | H | | yellow flowers in summer |
| *Sideroxylon* spp. (natives only)<br>Buckthorn | NCS<br>8-11 | FL | Med.<br>varies<br>varies | ●●●●<br>Any | High | | H | | beach plant; region depends on species; flowers variable; soil texture and acidity and drainage depend on species; *Sideroxylon foetidissimum* has medium-high wind resistance |
| *Sophora tomentosa*<br>Necklace Pod | S<br>10-11 | FL | Med.<br>6-10<br>8-12 | ●●●●<br>S/L | High | | H | | yellow flowers all year; attractive foliage; seeds poisonous |
| *Tabebuia aurea*<br>Silver Trumpet Tree, Yellow Tab | S<br>10-11 | No | Med.<br>15-25<br>10-15 | ●●●●<br>Any | High | | M | | also known as *Tabebuia caraiba* ; yellow flowers in winter to spring; flowers emerge after leaves drop; not wind resistant; invasive assessment: not considered a problem, incomplete conclusion in C,S |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** | | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Tecoma stans*<br>Yellow Elder, Yellow Trumpetbush | CS<br>9b-11 | No | Fast<br>20 ↑<br>15 → | ●●●●<br>Any | Medium | | L-N |  | yellow flowers, summer-winter; FNGLA Plant of the Year, 2005; may die to the ground in N FL and return in the spring; invasive assessment: not considered a problem, incomplete conclusion in C,S |
| *Viburnum obovatum* and cvs.<br>Walter's Viburnum | NCS<br>8-10 | FL | Med.<br>varies ↑<br>varies → | ●●●●<br>Any | High | | L-N |  | white flowers in winter-spring; small black fruit used by many birds; good nesting cover |
| *Viburnum odoratissimum*<br>Sweet Viburnum | NCS<br>8b-10a | No | S-M<br>15-30 ↑<br>15-25 → | ●●●●<br>Any | Medium | | L-N |  | white flowers in spring; susceptible to leaf spots, powdery mildew, and downy mildew; no major insect problems, but watch for aphids and scales; often grown as a hedge; thins in shaded sites |
| *Viburnum odoratissimum* var. *awabuki*<br>Awabuki Viburnum | NCS<br>8-10b | NA | Slow<br>15-20 ↑<br>15-20 → | ●●●○<br>Any | Medium | | L-N |  | also known as *Viburnum awabuki* ; white flowers in spring; good under power lines - takes well to pruning |
| *Viburnum rufidulum*<br>Rusty Blackhaw, Southern Blackhaw | NC<br>8b-9 | FL | Slow<br>20-25 ↑<br>20-25 → | ●●●●<br>Any | High | | H |  | fall color (scarlet-purple); large cluster of small white flowers in spring; small black fruit used by many birds; tolerates occasionally wet soil |
| **Large Shrubs** | | | | | | | | | |
| *Abelia* × *grandiflora*<br>Glossy Abelia | NC<br>8-9 | No | Med.<br>6-10 ↑<br>6-10 → | ○●●○<br>S/C | Medium | | L-N |  | pink/white flowers in spring-fall (nearly year round in central Florida); no pest problems; doesn't flower in the shade |
| *Acacia farnesiana*<br>Sweet Acacia | CS<br>9-11 | FL | S-M<br>10-25 ↑<br>15-25 → | ○●●○<br>S/C | High | | M |  | also known as *Abelia smallii;* yellow flowers all yr., esp. spring;thorny;tolerates occasionally wet soil;provides seeds/cover for birds;good nectar plant for beneficial insects;don't plant next to sidewalk |

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| *Acca sellowiana*<br>Pineapple Guava, Feijoa | NCS<br>8-11 | NA | Med.<br>8-15 ↑<br>8-15 → | ○●●○<br>S/C |  <br>High |  | L-N | | also known as *Feijoa sellowiana;* red/white flowers in spring; no pest problems; often used as a hedge |
| *Acrostichum danaeifolium*<br>Leather Fern, Giant Leather Fern | CS<br>9-11 | FL | Med.<br>4-8 ↑<br>3-5 → | ●●●○<br>Any |  <br>Low |  | M | | large fern; good for wet sites in shaded landscape; foliage sometimes discolors in full sun without regular irrigation |
| *Agarista populifolia*<br>Pipestem, Fetterbush, Doghobble | NC<br>8-9 | FL | Med.<br>8-12 ↑<br>5-10 → | ●●○○<br>S/C |  <br>Medium |  | L-N | | also known as *Leucothoe axillaris* ; white, fragrant flowers in spring |
| *Agave* spp.<br>Century plant, Agave | NCS<br>var-<br>iable | FL/<br>NA | Slow<br>6 ↑<br>varies → | ○●●○<br>S |  <br>High |  | H | | choose species adapted to climate; flowers variable; sharp spines on leaf tips; don't plant next to walkways; invasive assessment: *Agave americana* assessed and not invasive, others not yet assessed |
| *Allamanda neriifolia*<br>Bush Allamanda, Bush Trumpet | CS<br>9-11 | NA | Fast<br>5-15 ↑<br>4-10 → | ○●●○<br>Any |  <br>Medium |  | L-N | | yellow flowers all year; no pest problems; makes an open hedge; plants in shade flower poorly |
| *Aralia spinosa*<br>Devil's Walkingstick | NC<br>8-9a | FL | Med.<br>10-25 ↑<br>6-10 → | ○●●○<br>Any |  <br>Medium |  | L-N |  <br>  | also known as *Angelica spinosa* ; small white flowers in spring-summer; purplish berries widely used by wildlife; spiny stems; tolerates occasionally wet soil |
| *Ardisia escallonioides*<br>Marlberry, Marbleberry | CS<br>9-11 | FL | M-F<br>10-21 ↑<br>3-12 → | ○●●●<br>S/L |  <br>High |  | H |  | fragrant, white flowers all year; attractive foliage; round purple fruits widely used by wildlife, mostly in fall and winter; no pest problems; good for screens and hedges |
| *Asimina* spp.<br>Pawpaw | NCS<br>8-10 | FL/<br>NA | Med.<br>varies ↑<br>varies → | ○●○○<br>S |  <br>Medium |  | L-N |  | region, light preferences vary by species, choose species appropriate for your conditions; flowers variable; larval food plant for zebra swallowtail butterfly; does not transplant well |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Baccharis halimifolia* Groundsel Tree, Sea Myrtle, Salt-bush | NCS 8-10 | FL | Med. 8-12 ↑ 6-12 → | ●●●● Any | Medium | | M | | white flowers in fall; poisonous seeds; useful for reclaiming wet sites, by retention ponds and drainage ditches |
| *Bambusa* spp. (clumping types only) Bamboo | NCS var-iable | NA | Med. varies ↑ varies → | ○●●○ Any | Medium | | M | | region depends on species, choose species adapted to climate; allow adequate space since bamboo grows aggressively |
| *Barleria micans* Giant Yellow Shrimp Plant | S 10-11 | NA | Fast 4-5 ↑ 4-5 → | ○●●○ Any | Medium | | U | | yellow flowers |
| *Berberis julianae* Wintergreen Barberry, Julian's berberis | N 8-9a | No | Slow 4-6 ↑ 2-5 → | ○●●○ Any | Medium | | M | | white flowers in winter-spring; grow in soil with good moisture holding capacity; requires some pruning to maintain best form; spiny; good barrier |
| *Berberis thunbergii* Japanese Barberry, Crimson Pygmy | N 8-9a | No | S-M 2-8 ↑ 4-6 → | ○●●○ Any | Medium | | L-N | | showy fall color; white flowers in spring; no pest problems; very good barrier; develops root rot in wet conditions |
| *Brunfelsia grandiflora* Yesterday-Today-and-Tomorrow | NCS 8b-11 | NA | Med. 7-10 ↑ 5-8 → | ○●●○ Any | Medium | | L-N | | lavendar/purple/white flowers in spring-fall; do not plant in wet soils |
| *Buddleia lindleyana* Butterfly Bush, Lindley's Butterflybush | NC 8-9 | No | Fast 4-6 ↑ 4 → | ○●●○ Any | Medium | | L-N | | excellent for butterflies |

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| *Calliandra* spp. and cvs. Powderpuff | CS 9b-11 | NA | Fast ↑ 10-15 → 8-15 | ○●●○ Any |  High |  | L-N |  | pink/white flowers in spring-fall; invasive assessment: *Calliandra haematocephala* assessed as not a problem, others not yet assessed |
| *Callicarpa americana* Beautyberry | NCS 8-10 | FL | Med. ↑ 6-8 → 6-8 | ●●●○ Any |  High |  | L-N |  | purple/light purple flowers in spring-fall; attracts wildlife; small purplish fruits eaten by some birds in late winter; cut fruiting branches are used in flower arrangements |
| *Callistemon* spp. Bottlebrush | NCS 8b-11 | NA | Med. ↑ 6-30 → 6-15 | ○●●○ S/L |  High |  | M |   | red flowers, spring-summer; medium-low wind resistance; attracts beneficial insects; invasive assessment: *Callistemon citrinus* , *Callistemon rigidus* not a problem, others not yet assessed |
| *Calycanthus floridus* Carolina Allspice, Eastern Sweetshrub | NC 8b-9 | NA | Slow ↑ 6-9 → 6-12 | ●●●● Any |  Medium |  | L-N | | good screen; red flowers in spring-summer; tolerates occasionally wet soil |
| *Camellia japonica* Camellia | NC 8-9 | No | Slow ↑ 10-20 → 10-20 | ●●○○ Any |  Medium |  | L-N | | many cultivars; flowers up to 6 inches, in winter-spring, color variable; watch for scales, aphids, chewing insects and fungal diseases; requires acid soil and will have problems if pH is too high |
| *Camellia sasanqua* Sasanqua, Sasanqua Camellia | NC 8-9 | No | Slow ↑ varies → varies | ●●○○ Any |  Medium |  | L-N | | some groundcover cultivars available; flowers in fall-winter, color variable; watch for scales, mites, aphids and chewing insects; requires acid soil and will have problems if pH is too high |
| *Capparis cynophallophora* Jamaica Caper Tree, Mustard Tree | S 10-11 | FL | Slow ↑ 6-20 → 6-15 | ○●●● Any |  High |  | H |  | purple/white flowers in spring |
| *Carissa macrocarpa* Natal Plum | CS 9-11 | No | Med. ↑ 2-20 → 2-20 | ○●●● S |  High |  | H | | also known as *Carissa grandiflora* ; edible fruit; white, fragrant flowers all year; poisonous |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Cephalanthus occidentalis* Buttonbush | NC 8-9 | FL | Med. ↑ 6-20 → 6-8 | ●●●○ Any | None | | L-N | | flammable, in wildfire-prone area, plant min. 30' from bldg; attracts insects; white flowers in spring-summer; good for retention ponds/swales/canal banks; well adapted to disturbed soils |
| *Cephalotaxus harringtonia* Japanese Plum Yew, Harrington Plum Yew | NC 8-9 | No | Slow ↑ varies → varies | ●●○○ S | Medium | | L-N | | flammable plant - in wildfire-prone area, plant a min. 30' from bldgs. |
| *Cestrum aurantiacum* Orange Jessamine | CS 9-11 | NA | Fast ↑ 10 → 8 | ○●●○ Any | Medium | | M | | yellow/orange flowers in spring-summer; poisonous parts |
| *Chionanthus pygmaeus* Pygmy Fringetree | C 9 | FL | Med. ↑ 6-12 → 15-20 | ●●●○ S | Medium | | L-N | | white flowers in spring; purple fruits in late summer |
| *Chrysobalanus icaco* Cocoplum | S 10-11 | FL | Med. ↑ 3-30 → 10-20 | ○●●○ Any | Medium | | H | | white flowers all year; good screen, used as a hedge; no pest problems; edible fruit; attracts wildlife (purple "plums" used by large birds and mammals); high wind resistance |
| *Citharexylum spinosum* Fiddlewood | S 10-11 | FL | Med. ↑ 15-25 → 12 | ●●●○ Any | High | | M | | also known as *Citharexylum fruticosum* ; white, fragrant flowers all year; attracts wildlife |
| *Clethra alnifolia* Sweet Pepperbrush | NC 8-9 | NA | Med. ↑ 4-8 → 4-8 | ●●○○ Any | Medium | | M | | white, fragrant flowers in summer; attracts bees and other wildlife; good for wet areas |

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| *Coccoloba uvifera*<br>Seagrape | CS<br>9-11 | FL | Med.<br>3-35<br>10-50 | ●●●○<br>S | High | | H | | fragrant, white flowers in spring; fruit attractive to large wildlife; watch for weevils; grows as a shrub on coastal dunes and as a tree inland; deciduous, continual leaf drop; medium-high wind resistance |
| *Cocculus laurifolius*<br>Laurelleaf Snailseed, Carolina Coralbead, Cocculus | CS<br>9a-<br>11 | No | Med.<br>12-18<br>18-20 | ○●●○<br>Any | High | | M | | yellow flowers; poisonous leaves |
| *Codiaeum variegatum*<br>Croton | CS<br>9b-<br>11 | No | S-M<br>3-8<br>3-6 | ●●●●<br>Any | Low | | L-N | | significant variation depending on cultivar; white/yellow flowers in summer; pest sensitive |
| *Conocarpus erectus*<br>Buttonwood, Silver Buttonwood | S<br>10b-<br>11 | FL | Med.<br>5-50<br>15-20 | ○●●●<br>Any | High | | H | | white/cream flowers in spring; silver leaved form more susceptible to sooty mold and insect problems; do not plant in marl soil; high wind resistance; wildlife value (cover/nesting) |
| *Cordyline* (spp. & cvs.) except *Cordyline guineensis*<br>Ti plant | S<br>10-<br>11 | NA | Fast<br>varies<br>varies | ○●●○<br>Any | Varies | | V | | soil drainage, drought tolerance, salt tolerance, size vary by species - check with your county's Extension office or local nursery before final species selection; flowers variable; cold sensitive |
| *Crataegus* spp.<br>Hawthorn | NC<br>8-9 | FL/<br>NA | Med.<br>varies<br>varies | ●●●●<br>Any | High | | L-N | | "haws" eaten by variety of wildlife; provides good nesting cover; flowers variable; best for north Florida; many species and cultivars; optimal soil conditions depend on species |
| *Cyrilla racemiflora*<br>Titi, Swamp Cyrilla, Leatherwood | NC<br>8b-9 | FL | Fast<br>10-30<br>6-15 | ●●○○<br>Any | Medium | | L-N | | white flowers in late spring-summer; wetland plant; good for edges of retention ponds; attractive to bees |
| *Duranta erecta*<br>Golden Dewdrop, Pigeonberry; Skyflower | CS<br>9b-<br>11 | No | Med.<br>4-18<br>10-15 | ○●●○<br>Any | High | | L-N | | also known as *Duranta repens* ; lavendar/blue/white flowers in summer-fall; showy, poisonous fruit; watch for scales, nematodes, chewing insects; irritating sap; thorns; may spread aggressively |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** | | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Eugenia* spp. (natives only)<br>Stoppers | CS<br>9-11 | FL | Fast<br>10-30<br>5-20 | ●●●●<br>Any | High | | H | | flowers variable; few pests; needs little attention once established; natives are *E. axillaris* , *E. foetida* , *E. rhombe* a, and *E. confusa* ; *E. axiliaris* , *E . confusa* , *E. foetida* have high wind resistance |
| *Fatsia japonica*<br>Japanese Aralia, Paperplant | CS<br>9-11 | No | Med.<br>5-8<br>3-10 | ○●●○<br>Any | Medium | | M | | white flowers in winter; watch for rat and termite problems |
| *Forestiera segregata*<br>Florida Privet | NCS<br>8b-11 | FL | Med.<br>4-15<br>3-12 | ○●●●<br>S/L | High | | H | | yellow flowers in early spring; great hedge; fruit provides food for wildlife, flowers attract insects |
| *Galphimia glauca*<br>Thryallis, Rain-of-Gold | CS<br>9b-11 | NA | Med.<br>5-9<br>4-6 | ○●●○<br>Any | Medium | | L-N | | yellow flowers all year; no major pest problems, but watch for caterpillars and mites |
| *Gardenia jasminoides*<br>Gardenia, Cape Jasmine | NCS<br>8-10 | No | Med.<br>4-8<br>4-8 | ●●○○<br>Any | Medium | | L-N | | also known as *Gardenia angusta* ; white, fragrant flowers, spring-summer; use only grafted varieties due to nematade susceptibility; watch for scales; use iron fertilizer to keep foliage green; requires acid soil |
| *Hamamelis virginiana*<br>Common Witchhazel | NC<br>8-9 | FL | S-M<br>15-30<br>15-25 | ●●●●<br>Any | Low | | L-N | | cream/yellow flowers in fall |
| *Hamelia patens*<br>Firebush, Scarletbush | CS<br>9-11 | FL | Fast<br>5-20<br>5-8 | ●●●●<br>Any | Medium | | L-N | | orange/red flowers, esp. summer; watch for mites/whiteflies/scales; foliage usually more attractive in shade but flowers best in sun; tolerates occasionally wet soil; dies back in freezes but returns |

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| *Heptapleurum arboricolum*<br>Dwarf Schefflera | CS<br>9-11 | NA | Fast<br>10-15<br>6-15 | ○●●○<br>S/L | Medium | | U | | also known as *Schefflera arboricola* |
| *Hibiscus* spp. (natives and their hybrids only)<br>Hibiscus, Mallows | NCS<br>var-<br>iable | FL | Med.<br>varies<br>varies | ●●○○<br>S/L | Medium | | V | | region and salt tolerance depend on species, check before final species selection; flowers variable, spring-fall; some hibiscus injured by freezes in extreme north FL; watch for pink hibiscus mealybug |
| *Hydrangea macrophylla*<br>Hydrangea, Bigleaf Hydrangea, French Hydrangea | NC<br>8b-<br>9a | No | Med.<br>6-10<br>6-10 | ●●●●<br>Any | Medium | | L-N | | white/pink/purple flowers in spring-summer; pest sensitive; tolerates occasionally wet soil |
| *Hydrangea quercifolia*<br>Oakleaf Hydrangea | NC<br>8b-9 | FL | Fast<br>6-10<br>6-8 | ●●●○<br>Any | Medium | | L-N | | white/cream flowers in summer; good flowering shrub for shade; tolerates occasionally wet soil |
| *Ilex* × 'Mary Nell'<br>Mary Nell Holly | NC<br>8-9 | FL | Med.<br>10-20<br>10 | ●●●○<br>S/C | Medium | | M | | white flowers in spring; important source of pollen for bees |
| *Ilex cornuta* and cvs.<br>Chinese Holly, Horned Holly | NC<br>8-9 | No | Med.<br>varies<br>varies | ●●○○<br>Any | High | | M | | can have severe tea scale problem, especially in cool, shady areas; fruit attracts wildlife; many cultivars; important source of pollen for bees |
| *Ilex vomitoria* and cvs.<br>Yaupon Holly | NCS<br>8-10 | FL | Med.<br>varies<br>varies | ●●●○<br>Any | High | | H | | flammable - in wildfire-prone area, plant min. 30' from bldgs; white flowers, spring-summer; red fruit wildlife food, late fall-winter; 'Pendula' was FNGLA Plant of the Year, 2005; high wind resistance |
| *Illicium* spp.<br>Star Anise | NC<br>8-9 | FL/<br>NA | Med.<br>varies<br>varies | ●●○○<br>Any | Medium | | L-N | | flowers variable |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Itea virginica* Virginia Willow, Virginia Sweetspire | NC 8-9 | FL | Slow 3-8 2-4 | ●●●○ S/L | Medium | | L-N | | white flowers in spring-summer; good plant for edges of retention ponds, swales and canals; occurs naturally in wet soils but may adapt to dry conditions (performs best with moderate moisture) |
| *Jasminum multiflorum* Downy Jasmine | CS 9b-11 | NA | Fast 5-10 5-10 | ●●●● Any | Medium | | L-N | | white, fragrant flowers all year; dies back when cold and comes back; pest sensitive |
| *Jasminum nitidum* Star Jasmine, Shining Jasmine | CS 9-11 | NA | Fast 20 10 | ●●●○ S/L | Medium | | L-N | | white, fragrant flowers in spring to summer |
| *Jatropha integerrima* Peregrina | CS 9b-11 | NA | Med. 15 10 | ●●●● Any | High | | L-N | | scarlet flowers all year; very poisonous, use with caution; watch for scales and mealybugs; sensitive to frost |
| *Juniperus chinensis* and cvs. Chinese Juniper, Japanese Juniper | NC 8-9 | No | M-F varies varies | ●●●● S | High | | M | | flammable - in wildfire-prone area, plant min. 30' from bldgs; does not tolerate wet feet; good pollution tolerance; watch for mites (especially when hot and dry), bagworms, root rot, Phomopsis blight |
| *Ligustrum japonicum* and cvs. Ligustrum, Japanese Privet | NCS 8-10b | No | Med. 8-12 15-25 | ○●●○ Any | High | | H | | white flowers, summer; watch for scale/whiteflies /sooty mold/nematodes/root rot; used as hedge; thins at bottom unless in full sun; invasive assessment: not a problem, incomplete conclusion |
| *Loropetalum chinense* and cvs Loropetalum, Chinese Fringe Bush | NC 8-9 | No | Med. 6-15 8-10 | ●●●○ Any | Medium | | L-N | | white/pink flowers in spring; size varies; no major pest problems but watch for mites/nematodes/root rot; eriophyid mites may be severe on cv 'Ruby'; in high pH soils may have minor element deficiencies |

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| *Lyonia ferruginea*<br>Rusty Lyonia | NCS<br>8-10 | FL | Slow<br>10-25 ↑<br>5-10 → | ●●●○<br>S |  <br>High |  | L-N |  | white/pink flowers in spring |
| *Mahonia bealei*<br>Oregon Hollygrape | N<br>8b-<br>9a | NA | Slow<br>5-10 ↑<br>3-4 → | ●●●○<br>Any |  <br>Medium |  | M |  | also known as *Berberis bealei* ; yellow, fragrant flowers in winter-spring; attracts wildlife |
| *Murraya paniculata*<br>Orange Jessamine,<br>Orange Jasmine, Chalcas | CS<br>9b-<br>11 | No | Slow<br>8-12 ↑<br>8-15 → | ●●●●<br>Any |  <br>High |  | L-N |  <br>  | white, fragrant flowers all year; good container plant; pest sensitive; often used as a hedge; attracts wildlife |
| *Musa* spp.<br>Banana | CS<br>9b-<br>11 | NA | Fast<br>7-30 ↑<br>10-15 → | ●●●●<br>Any |  <br>Low |  | L-N | | edible; in cooler parts requires protection, foliage dies in winter, emerges in spring if no killing frost; grows quickly when fertilized; needs regular watering; watch for Sigatoka leaf spot disease |
| *Myrcianthes fragrans*<br>Simpson's Stopper,<br>Twinberry | CS<br>9b-<br>11 | FL | Slow<br>6-30 ↑<br>15-20 → | ○●●●<br>Any |  <br>High |  | H |  <br>  | edible fruit; white, fragrant flowers all year and red berries used by many birds; tolerates occasionally wet soil; needs little attention once established |
| *Myrica cerifera* and cvs.<br>Wax Myrtle | NCS<br>8-10 | FL | Fast<br>10-40 ↑<br>20-25 → | ●●●●<br>Any |  <br>Medium |  | H |  <br>  | flammable - in wildfire-prone area, plant min. 30' from bldgs; watch for lobate lac scale, severe in south FL; trunk disease can shorten life; good hedge plant for wildlife; medium-low wind resistance |
| *Osmanthus americanus*<br>Wild Olive | NC<br>8b-9 | NA | Med.<br>15-25 ↑<br>10-15 → | ○●●○<br>Any |  <br>Medium |  | H |  | white, fragrant flowers in spring; fruits of some use by birds/mammals |
| *Osmanthus fragrans*<br>Tea Olive, Fragrant Olive,<br>Sweet Osmanthus | NC<br>8b-9 | No | Slow<br>15-30 ↑<br>15-20 → | ○●●○<br>Any |  <br>Medium |  | L-N | | white, fragrant flowers in fall-spring; pest sensitive |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Philadelphus inodorus* English Dogwood | NC 8-9a | NA | Fast 10-12 ↑ 6-10 → | ○●●○ Any | High | | U | | white flowers in spring |
| *Philodendron* cvs. Philodendron | CS var-iable | NA | Fast varies ↑ varies → | ○●●○ Any | Medium | | L-N | | many cvs; height/spread/region/flowers variable; choose for climate; tolerates occasionally wet soil; invasive assessment: *Philodendron scandens* assessed as not a problem, others not yet assessed |
| *Philodendron selloum* Selloum, Tree Philodendron | NCS 8b-11 | NA | Fast 6-12 ↑ 10-15 → | ○●●○ Any | Medium | | L-N | | green flowers all year; temperatures in mid to upper 20s burn foliage; tolerates occasionally wet soil |
| *Pittosporum* cvs. Pittosporum | NCS 8-11 | NA | Fast 8-12 ↑ 12-18 → | ●●●○ S/L | High | | H | | white, fragrant flowers in spring |
| *Podocarpus gracilior* Weeping Fern Pine, Weeping Podocarpus, Weeping Yew | CS 9b-11 | NA | Slow 30-50 ↑ 25-35 → | ●●●○ Any | Medium | | L-N | | relatively pest free; grows slowly in full shade; high wind resistance |
| *Podocarpus macrophyllus* and cvs. Podocarpus | NCS 8b-11 | NA | Slow 30-40 ↑ 20-25 → | ●●●○ S/C | High | | M | | no serious pest problems, but watch for scales, sooty mold, mites and root rot; high wind resistance |
| *Psychotria nervosa* Wild Coffee | S 10b-11 | FL | Med. 4-10 ↑ 4-10 → | ○●●○ Any | Medium | | M | | white flowers in spring-summer; caterpillar damage can be serious; red fruit eaten by many wildlife species |

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| *Rhododendron austrinum* and cvs. Florida Azalea | N 8b-9a | FL | Slow 6-10 4-8 | ●●○○ Any | Medium | | L-N | | yellow/orange flowers in spring; select disease-resistant varieties |
| *Rhododendron canescens* and cvs. Pinxter Azalea | N 8b-9a | FL | Slow 8-12 6-10 | ●●○○ Any | Medium | | L-N | | pink/white flowers in spring; prefers well drained soil that retains moisture |
| *Rhododendron* cvs. Azalea | NC var-iable | FL/ NA | Slow varies varies | ●●○○ Any | Medium | | L-N | | region depends on species, choose species adapted to climate; flowers variable; invasive assessment: *R. obtusum* , *R. simsii* assessed as not a problem, others not yet assessed |
| *Sabal minor* Dwarf Palmetto, Blue-stem Palmetto | NCS 8-10 | FL | Slow 4-9 4-8 | ●●●● Any | High | | M | | fruit attracts wildlife in fall; difficult to transplant; good understory plant and for retention ponds/drainage swales, prefers moist soils but tolerates drier conditions after establishment |
| *Sambucus* spp. Elderberry | NCS 8-11 | FL/ NA | Fast 12-20 12-15 | ●●●● Any | Medium | | V | | flowers variable; salt tolerance depends on species, check with county Extension office or local nursery before making final selection |
| *Senna polyphylla* Desert Cassia | S 10a-11 | NA | Fast 6-10 6-8 | ○●●● S/L | Medium | | H | | yellow flowers in summer |
| *Strelitzia nicolai* Giant Bird of Paradise, White Bird of Paradise | CS 9-11 | NA | Fast 20-30 15-20 | ○●●○ Any | Low | | L-N | | blue/white flowers all year; scales can be a problem when air circulation is inadequate; foliage may tear in the wind; needs protection in cooler parts of central region |
| *Suriana maritima* Bay Cedar | S 10b-11 | FL | Med. 5-20 5-8 | ●●●● S/L | High | | H | | yellow flowers all year; good beach plant; will grow in sand or on bare rock |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Tabernaemontana divaricata* Crape Jasmine, Pinwheel Flower | CS 9b-11 | NA | Fast ↑ 6-10 → 3-6 | ●●●● Any | Low | | L-N | | white, fragrant flowers in summer; watch for scales, mites, nematodes and sooty mold |
| *Tecoma stans* Yellow Elder, Yellow Trumpetbush | CS 9b-11 | No | Fast ↑ 20 → 15 | ●●●● Any | Medium | | L-N | | yellow flowers, summer-winter; FNGLA Plant of the Year, 2005; may die to the ground in N FL and return in the spring; invasive assessment: not considered a problem, incomplete conclusion in C,S |
| *Ternstroemia gymnanthera* Cleyera, Ternstroemia | NC 8-9 | NA | Med. ↑ 12-20 → 5-10 | ○●●○ Any | Medium | | L-N | | white, fragrant flowers in spring; good as hedge |
| *Thunbergia erecta* King's Mantle, Bush Clock Vine | CS 9-11 | NA | Fast ↑ 4-6 → 5-8 | ●●●● Any | Medium | | L-N | | purple flowers all year; used as hedge in south Florida; tough plant; pest resistant; unclipped plants sprawl across the ground |
| *Tibouchina urvilleana* Princess Flower, Glory Bush, Lasiandra | CS 9b-11 | No | Med. ↑ 10-15 → 10-15 | ○●●○ S/L | High | | L-N | | also known as *Tibouchina semidecandra* ; purple flowers all year; was one of the FNGLA Plants of the Year in 2005 |
| *Vaccinium arboreum* Sparkleberry | NC 8-9 | FL | Med. ↑ 6-25 → 4-15 | ●●○○ Any | Medium | | L-N | | white flowers in spring; showy fall color; attracts wildlife; attracts pollinating insects; tolerates occasionally wet soil |
| *Vaccinium* spp. Blueberry | NCS 8-10 | FL | Med. ↑ 1-12 → 1-10 | ●●○○ Any | Medium | | L-N | | white flowers in spring; black fruit in fall attracts wildlife; edible; prefers moist, well-drained conditions |

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| *Viburnum obovatum* and cvs.<br>Walter's Viburnum | NCS<br>8-10 | FL | Med.<br>varies<br>varies | ●●●●<br>Any | High | | L-N | | white flowers in winter-spring; small black fruit used by many birds; good nesting cover |
| *Viburnum odoratissimum*<br>Sweet Viburnum | NCS<br>8b-<br>10a | No | S-M<br>15-30<br>15-25 | ●●●●<br>Any | Medium | | L-N | | white flowers in spring; susceptible to leaf spots, powdery mildew, and downy mildew; no major insect problems, but watch for aphids and scales; often grown as a hedge; thins in shaded sites |
| *Viburnum odoratissimum* var. *awabuki*<br>Awabuki Viburnum | NCS<br>8-<br>10b | NA | Slow<br>15-20<br>15-20 | ●●●○<br>Any | Medium | | L-N | | also known as *Viburnum awabuki* ; white flowers in spring; good under power lines - takes well to pruning |
| *Viburnum rufidulum*<br>Rusty Blackhaw, Southern Blackhaw | NC<br>8b-9 | FL | Slow<br>20-25<br>20-25 | ●●●●<br>Any | High | | H | | fall color (scarlet-purple); large cluster of small white flowers in spring; small black fruit used by many birds; tolerates occasionally wet soil |
| *Viburnum suspensum*<br>Sandankwa Viburnum | NCS<br>8-10 | No | M-F<br>6-12<br>6-12 | ●●●●<br>Any | Low | | M | | pink/white flowers in winter-spring; no pest problems |
| *Vitex agnus-castus*<br>Chaste Tree | NC<br>8-9 | NA | Fast<br>10-20<br>10-20 | ○●●○<br>Any | High | | M | | purple flowers in summer; attracts wildlife |
| *Yucca elephantipes*<br>Spineless Yucca | S<br>10b-<br>11 | NA | Med.<br>30<br>8-10 | ○●●○<br>Any | High | | M | | white flowers in spring to summer |
| *Yucca* spp.<br>Yucca | NCS<br>8-11 | FL/<br>NA | Med.<br>3-12<br>3-6 | ●●●○<br>Any | High | | H | | region depends on species; white flowers in spring to summer |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** |  | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| **Small Shrubs** | | | | | | | | | |
| *Aloe* spp.<br>Aloe | NCS var. | NA | Med.<br>varies<br>varies | ○●●●<br>Any | High | | H | | choose species adapted to climate; flowers variable; injured by frost in extreme north FL; occasional caterpillars; invasive assessment: *Aloe vera* assessed and not invasive, others not yet assessed |
| *Caesalpinia* spp. and cvs.<br>Poinciana | CS var. | NA | Med.<br>varies<br>varies | ○●●○<br>S/L | Medium | | M | | region depends on species and cultivar, choose species adapted to climate; flowers variable |
| *Gamolepis* spp.<br>Bush Daisy | NCS 8b-11 | NA | Fast<br>2-4<br>3-4 | ○●●○<br>Any | Medium | | L-N | | yellow flowers all year |
| *Lantana depressa*<br>Weeping Lantana, Pineland Lantana | NCS 8-11 | FL | Med.<br>3-6<br>3-6 | ○●●○<br>S/L | Medium | | H | | small yellow flowers all year; susceptible to nematodes; poisonous to livestock |
| *Leucophyllum frutescens*<br>Texas Sage, Texas Ranger, Silverleaf, Barometer Bush | NC 8b-10a | No | Med.<br>3-5<br>3-5 | ○●●○<br>S | High | | M | | white/pink/lavender/blue flowers; prefers dry, hot sites |
| *Lyonia lucida*<br>Fetterbush, Shiny Lyonia | NC 8-9 | FL | Med.<br>3-10<br>2-5 | ●●○○<br>S/L | High | | L-N | | white/pink flowers in spring; leaf spotting may occur |
| *Mahonia fortunei*<br>Fortune's Mahonia, Chinese Mahonia, Holly Grape | N 8b-9 | No | Slow<br>3-5<br>3-5 | ●●●○<br>Any | Medium | | M | | also known as *Berberis fortunei* ; yellow flowers all year, esp. spring; no pest problems; low maintenance plant well suited as foundation plant on north or east side of a building; excellent shade tolerance |

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| *Malpighia coccigera*<br>Miniature Holly | S<br>10b-<br>11 | NA | Slow<br>2-5<br>4-6 | ●●●●<br>Any | Medium |  | M | | pink flowers in spring-summer; sensitive to nematodes |
| *Raphiolepis* spp. and cvs.<br>Indian Hawthorn | NC<br>8-9 | NA | Med.<br>2-10<br>2-6 | ○●●○<br>Any | High |  | M | | flowers variable; wildlife food; use disease-resistant cvs., plant in full sun, don't overirrigate to avoid disease; invasive assessment: *R. indica* assessed as not a problem, others not yet assessed |
| *Rosa* spp.<br>Rose | NCS<br>8-10 | FL/<br>NA | Fast<br>1-20<br>varies | ●●●●<br>Any | Medium |  | M |  | flowers variable; red spider mites and black leaf spot may be a problem; choose only disease-resistant cultivars like Knock |
| *Rosmarinus* spp.<br>Rosemary | NCS<br>8-11 | NA | Med.<br>2-5<br>3 | ○●●○<br>S/L | High |  | M | | flowers variable |
| *Russelia equisetiformis*<br>Firecracker Plant, Coral Plant | CS<br>9b-<br>11 | No | Med.<br>3-5<br>6-12 | ○●●○<br>Any | High |  | M |  | red flowers all year; good container plant; pest sensitive |
| *Russelia sarmentosa*<br>Firecracker Plant | NCS<br>8b-<br>11 | NA | Fast<br>3-4<br>2-4 | ○●●○<br>S/L | Medium |  | U |  | red flowers in summer to fall; attracts wildlife |
| *Sabal etonia*<br>Scrub Palmetto | CS<br>9-11 | FL | Slow<br>4-6<br>4-6 | ●●●●<br>S/L | High |  | M |  | flowers in spring-summer; small, black berries in summer-fall; long-lived (likely over 100 years); tolerates hot, dry conditions; endemic to central Florida sand scrub; difficult to transplant |
| *Spiraea* spp.<br>Spiraea | NC<br>8-9 | NA | Med.<br>3-5<br>3-4 | ○●●○<br>Any | Medium |  | L-N | | white flowers in spring; invasive assessment: *Spiraea cantoniensis* , *Spiraea thunbergii* assessed as not a problem, others not yet assessed |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Strelitzia reginae* Bird of Paradise | S 10-11 | NA | S-M ↑ 3-5 ↑ 2-4 → | ●●●○ Any | High | | L-N | | orange/blue striking flowers; pest sensitive; tolerates occasionally wet soil |
| *Symphyotricum carolinianum* Carolina Aster, Climbing Aster | NC 8b-9a | FL | Med. ↑ 1-12 ↑ 2-4 → | ○●●○ Any | Medium | | L-N | | also known as *Ampelaster carolinianus, Aster carolinianus* ; lavendar flowers in fall; tolerates but blooms poorly in dry soil; larval food plant for pearly crescent butterfly |
| *Zamia floridana* Coontie, Florida Arrowroot, Florida Zamia | NCS 8b-11 | FL | Slow ↑ 1-5 ↑ 3-5 → | ●●●● Any | High | | H | | Florida's only native cycad; seeds and caudex poisonous; sole larval food plant for atala butterfly; pest sensitive; temperatures in low 20s turn foliage brown |
| *Zamia furfuracea* Cardboard Plant | CS 9b-11 | NA | Slow ↑ 2-5 ↑ 5-8 → | ●●●● Any | High | | H | | seeds and caudex poisonous; freezes in central Florida and can come back |
| **Vines** | | | | | | | | | |
| *Allamanda cathartica* Yellow Allamanda | CS 9-11 | No | Fast ↑ varies ↑ varies → | ○●●○ Any | Medium | | L-N | | yellow flowers all year; all plant parts are poisonous |
| *Allamanda neriifolia* Bush Allamanda, Bush Trumpet | CS 9-11 | NA | Fast ↑ 5-15 ↑ 4-10 → | ○●●○ Any | Medium | | L-N | | yellow flowers all year; no pest problems; makes an open hedge; plants in shade flower poorly |
| *Aristolochia* spp. Dutchman's Pipe, Pipevine | CS 9-10 | FL/ NA | Fast ↑ 10-15 ↑ varies → | ○●●○ S | Medium | | L-N | | white/purple flowers in summer and winter; larval food plant for pipevine swallowtail (*Battus philenor* ) and polydamas butterfly (*Battus polydamas* ) |

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| *Bignonia capreolata*<br>Cross Vine, Trumpet Flower | NCS<br>8-10 | FL | Fast<br>varies<br>varies | ●●●○<br>Any | High | | M | | orange flowers in spring |
| *Bougainvillea* cvs.<br>Bougainvillea | CS<br>9b-11 | NA | Fast<br>varies<br>15-40 | ●●●○<br>S/L | High | | M | | pink/yellow/orange/white flowers all year, esp. winter spring; freezes in parts of central region; invasive assessment: *Bougainvillea glabra* assessed as not a problem, others not yet assessed |
| *Campsis radicans*<br>Trumpet Creeper, Trumpet Vine | NCS<br>8-10 | NA | Fast<br>to 40<br>varies | ●●●●<br>Any | Medium | | L-N | | orange/red flowers in spring-summer |
| *Decumaria barbara*<br>Climbing Hydrangea, Wood Vamp, Cow Itch Vine | N<br>8 | FL | Med.<br>60<br>varies | ●●○○<br>S/L | Medium | | L-N | | white flowers in spring |
| *Gelsemium sempervirens*<br>Carolina Jessamine, Yellow Jasmine | NC<br>8-9 | FL | M-F<br>40<br>20-30 | ●●●○<br>Any | Low | | L-N | | yellow flowers in late winter to spring; rapid growth when established; no pest problems; very poisonous |
| *Hedera canariensis*<br>Algerian Ivy, Canary Ivy | NCS<br>8b-10 | No | Fast<br>½ -1<br>1-6 | ●●●○<br>Any | Medium | | M | | watch for aggressive spread to keep contained; no pest problems; rich groundcover in the shade |
| *Hedera helix*<br>English Ivy | NC<br>8-9 | No | Fast<br>1-2<br>2-5 | ●●●○<br>Any | Medium | | L-N | | watch for aggressive spread and keep contained; no major pest problems but watch for scale and Rhizoctonia; poisonous; invasive assessment: not considered a problem, incomplete conclusion in C,S |
| *Ipomoea* spp. (natives only)<br>Morning Glory | NCS<br>8-11 | FL | Fast<br>½<br>10-75 | ○●●○<br>Any | High | | M | | flowers variable; use within a border, can spread easily |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Jasminum multiflorum* Downy Jasmine | CS 9b-11 | NA | Fast ↑ 5-10 5-10 → | ●●●● Any | Medium | | L-N | | white, fragrant flowers all year; dies back when cold and comes back; pest sensitive |
| *Lonicera sempervirens* Honeysuckle, Coral Honeysuckle | NC 8-9 | FL | Fast ↑ 10-15 varies → | ●●●○ Any | Medium | | M | | red flowers in spring-summer; relatively pest free; birds feed on fruit |
| *Mandevilla* cvs. Pink Allamanda, Mandevilla | CS 9b-11 | NA | Med. ↑ varies varies → | ○●●○ Any | Medium | | L-N | | many cultivars; pink/white flowers all year |
| *Millettia reticulata* Evergreen Wisteria | CS 9-11 | NA | Fast ↑ 12-15 10-12 → | ○●●○ S/L | Low | | M | | purple flowers in summer to fall |
| *Paspalum quadrifarium* Evergreen Paspalum, Crown Grass | NCS 8-10 | NA | Fast ↑ 3-4 3-4 → | ●●●● S/L | High | | H | | tan flowers in summer |
| *Passiflora incarnata* Maypop, Passion Vine | NCS 8b-11 | FL | Fast ↑ 5-10 varies → | ●●●● Any | High | | M | | pink/purple flowers in summer-fall; larval food plant of zebra longwing and gulf fritillary butterflies; tolerates occasionally wet soil |
| *Petraea volubilis* Queen's Wreath | S 10b-11 | NA | Fast ↑ varies varies → | ○●●● Any | Medium | | L-N | | purple flowers in spring |

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| *Thunbergia alata*<br>Black-Eyed Susan Vine | CS<br>9b-<br>11 | NA | Fast<br>10<br>10 | ○●●○<br>S/L | Low |  | L-N | | yellow flowers in summer |
| *Trachelospermum jasminoides*<br>Confederate Jasmine, Star Jasmine | NCS<br>8b-<br>10 | No | Fast<br>varies<br>varies | ●●●●<br>Any | Medium |  | L-N | | white, fragrant, showy flowers in spring; can be aggressive; no serious pests but watch for scales and sooty mold; invasive assessment: not considered a problem, incomplete conclusions in N and C |
| *Vitis* spp.<br>Grape | NC<br>8-9 | FL/<br>NA | Fast<br>10-50<br>varies | ●●○○<br>Any | High |  | V | | edible; only certain cultivars adapted to FL; salt tolerance varies by rootstock |
| *Wisteria frutescens*<br>American Wisteria | NC<br>8-9 | FL | Fast<br>10-20<br>6-12 | ○●●○<br>Any | Medium |  | L-N | | lavender, fragrant flowers in spring; poisonous parts |
| **Groundcovers** | | | | | | | | | |
| *Ajuga reptans*<br>Bugleweed, Carpet Bugleweed | NC<br>8-9a | NA | Fast<br>½ -1<br>1-2 | ○●●○<br>Any | Medium |  | L-N | | purple/blue flowers, spring-summer; spreads quickly; many cultivars; watch for southern blight; crown rot in poor ventilation or soggy soils; does not compete well against weeds, especially in sun |
| *Anthericum sanderii*<br>St. Bernard's Lily | NCS<br>8-11 | NA | Fast<br>1½<br>1 | ○●●○<br>Any | Medium |  | U | | |
| *Arachis glabrata*<br>Perennial Peanut | NCS<br>8-11 | No | Slow<br>½<br>varies | ○●●○<br>S | High |  | H | | yellow/orange flowers in summer-fall; no nitrogen fertilizer needed; spreads underground, keep contained; no pest problems; withstands foot traffic; best in south, damaged by frost in north, central |
| *Aspidistra elatior*<br>Cast Iron Plant, Barroom Plant | NCS<br>8b-<br>11 | No | Slow<br>1-3<br>1-3 | ○●●○<br>Any | Medium |  | L-N | | brown flowers periodically throughout the year; used for cut foliage; no pest problems; tolerates deep shade better than most plants |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** |  | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Caladium* x *hortulanum* Caladium | NCS 8-11 | NA | Fast 1-2 1-2 | ○●●○ Any | Medium | | L-N | | good container plant; attractive foliage (red/rose/pink/white/silver/bronze/green); leaves die back naturally in the fall; pest sensitive |
| *Carissa macrocarpa* Natal Plum | CS 9-11 | No | Med. 2-20 2-20 | ○●●● S | High | | H | | also known as *Carissa grandiflora* ; edible fruit; white, fragrant flowers all year; poisonous |
| *Catharanthus roseus* Periwinkle, Madagascar Periwinkle, Vinca | CS 9b-11 | No/ C | Med. 1-2 1-2 | ○●●○ Any | High | | M | | white/pink/purple flowers all year; watch for micronutrient deficiencies/disease if too much moisture; invasive assessment: not a problem in N and C; caution-manage to prevent escape in S |
| *Cyrtomium falcatum* Holly Fern | NCS 8b-11 | NA | Med. 2 3-4 | ○●●○ Any | Medium | | L-N | | no major pest problems but watch for scales, mites, mealybugs, snails and slugs; good low maintenance groundcover in shady sites; evergreen fern |
| *Dryopteris* spp. Autumn Fern | NCS 8-11 | FL/ NA | Slow varies varies | ●●○○ Any | Medium | | L-N | | region depends on species - choose species adapted to your area; used as cut foliage |
| *Dyschoriste oblongifolia* Twin Flower, Oblongleaf Snakeherb | NCS 8-11 | FL | Fast ½ -1 varies | ○●●○ Any | High | | L-N | | lavendar flowers all year |
| *Evolvulus glomeratus* ssp. *grandiflorus* Blue Daze | CS 9-11 | NA | Med. ½ -1 1-2 | ○●●○ S/L | Medium | | H | | blue flowers in spring to summer |

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| *Glandularia tampensis*<br>Tampa Vervain, Tampa Mock Vervain | CS<br>9-11 | FL | Med.<br>1½ -2<br>varies | ○●●○<br>S | High |  | L-N |  | also known as *Verbena tampensis* ; purplish-pink/white flowers in summer; endemic to Florida and endangered |
| *Hedera canariensis*<br>Algerian Ivy, Canary Ivy | NCS<br>8b-10 | No | Fast<br>½ -1<br>1-6 | ●●●○<br>Any | Medium |  | M | | watch for aggressive spread to keep contained; no pest problems; rich groundcover in the shade |
| *Hedera helix*<br>English Ivy | NC<br>8-9 | No | Fast<br>1-2<br>2-5 | ●●●○<br>Any | Medium |  | L-N | | watch for aggressive spread and keep contained; no major pest problems but watch for scale and Rhizoctonia; poisonous; invasive assessment: not considered a problem, incomplete conclusion in C,S |
| *Juniperus conferta* and cvs.<br>Shore Juniper | NC<br>8-9 | No | Slow<br>1-1½<br>6-10 | ●●●●<br>S | High |  | H |  | flammable - in wildfire-prone area, plant min. 30' from bldgs; must be in full sun and well drained soils; used for dune stabilization; sensitive to fungus blight, especially away from the beach |
| *Juniperus horizontalis and* cvs.<br>Creeping Juniper, Horizontal Juniper | NC<br>8a-9a | NA | Med.<br>½<br>8-10 | ●●●●<br>Any | High |  | M |  | no major pest problems, but watch for mites, bagworms, root rot, *Phomopsis* blight; plants become thin in partial shade; does not tolerate waterlogged conditions |
| *Lantana montevidensis*<br>Trailing Lantana | CS<br>9-11 | NA | Fast<br>1-3<br>4-8 | ●●●●<br>Any | Medium |  | H |  <br>  | white/pink/lavender flowers in summer-fall; watch for pests (caterpillars chew leaves, mites); leaf spots cause defoliation in partial shade |
| *Liriope muscari* and cvs.<br>Liriope, Monkey Grass, Lily Turf, Border Grass | NC<br>8-9 | No | Med.<br>½ -1<br>1-2 | ●●●●<br>Any | Medium |  | M | | purple flowers in summer; pest sensitive; forms a solid groundcover in a few years; variegated cultivar is damaged by frost |
| *Rumohra adiantiformis*<br>Leatherleaf Fern, Seven Weeks Fern | CS<br>9b-11 | No | S-M<br>1-3<br>4-5 | ○●●○<br>Any | Medium |  | L-N | | pest sensitive |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** | | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Scaevola plumieri* Inkberry | S 10-11 | FL | Slow 2-4 3-8 | ●●●● S/L |  High |  | H | | small pink and white flowers in summer; spreads by underground rhizomes; well suited to beachfront sandy soils |
| *Trachelospermum asiaticum* Small-Leaf Confederate Jasmine, Asiatic Jasmine | NCS 8b-10 | NA | Fast varies varies | ●●●● Any |  Medium |  | M | | withstands foot traffic; spreads aggressively, maintain to contain it; good for slopes/bank stabilization; no serious pest problems but watch for scales/whiteflies/sooty mold; foliage burns low 20s |
| *Trachelospermum jasminoides* Confederate Jasmine, Star Jasmine | NCS 8b-10 | No | Fast varies varies | ●●●● Any |  Medium |  | L-N |  | white, fragrant, showy flowers in spring; can be aggressive; no serious pests but watch for scales and sooty mold; invasive assessment: not considered a problem, incomplete conclusions in N and C |
| *Vinca major* Periwinkle | NC 8a-9 | NA | M-F 1-2 varies | ○●●○ Any |  Medium |  | L-N | | blue/purple/lavender flowers in summer; no pest problems; good for shaded, small gardens; does not tolerate hot, dry conditions |
| **Grasses** | | | | | | | | | |
| *Andropogon* spp. Bluestem Grass | NC 8-9 | FL/ NA | Fast 3-10 3-7 | ●●●● Any |  High |  | H | | soil moisture preference depends on species, check with Extension office or nursery before making final selection; silver/white/pink flowers in fall |
| *Aristida stricta* var. *beyrichiana* Wiregrass | NCS 8-11 | FL | Fast 2-4 2-3 | ●●○○ S |  High |  | L-N | | also known as *Aristida beyrichiana;* tan flowers all year |
| *Chasmanthium latifolium* River Oats, Northern Sea Oats, Indian Wood-oats | N 8-9a | FL | Fast 2-5 2-4 | ●●○○ Any |  Medium |  | L-N |  | fall color; tan/bronze flowers in summer-fall; used in floral arrangements |

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| *Conradina* spp.<br>False Rosemary, Scrub Mints, Beach Rosemary | NC<br>8-9 | FL | Fast<br>1-3 ↑<br>1-3 → | ○●●○<br>Any | High |  | M | | blue flowers all year; used in beach landscaping |
| *Cortaderia selloana*<br>Pampasgrass | NCS<br>8-10 | NA | Fast<br>10-12 ↑<br>6-8 → | ○●●○<br>Any | High |  | H | | flammable plant - in wildfire-prone area, plant a min. 30' from bldgs.; white flowers in summer; leaves have sharp edges |
| *Eragrostis elliottii*<br>Elliott's Lovegrass | NCS<br>8-10 | FL | Fast<br>1-3 ↑<br>1-3 → | ●●●○<br>S/L | High |  | L-N | | tan flowers all year, especially fall |
| *Eragrostis spectabilis*<br>Purple Lovegrass | NCS<br>8-10 | FL | Fast<br>1-3 ↑<br>1-3 → | ●●●○<br>S/L | High |  | L-N | | small red/purple flowers all year, especially fall; grows best in hot, dry sites; does not tolerate wet, shady sites |
| *Muhlenbergia capillaris*<br>Muhly Grass | NCS<br>8-11 | FL | Med.<br>2-5 ↑<br>2-3 → | ○●●●<br>S | High |  | H | | pink flowers in fall; tolerates extreme drought and flooding |
| *Ophiopogon japonicus* and cvs.<br>Mondo Grass, Dwarf Lilyturf, Dwarf Liriopoe | NCS<br>8-11 | No | Slow<br>to 1 ↑<br>varies → | ○●●○<br>Any | Medium |  | M | | white flowers in summer; no pest problems |
| *Panicum virgatum* and cvs.<br>Panic Grass | NCS<br>8-10 | FL | Fast<br>1-5 ↑<br>1-5 → | ●●●○<br>Any | High |  | H |  | tan flowers in summer |
| *Spartina* spp.<br>Cordgrass | NC<br>8-9 | FL/<br>NA | Fast<br>2-6 ↑<br>varies → | ●●●○<br>S | High |  | H | | tan flowers in summer; grows in brackish areas, use on saltwater shores; soil moisture preference depends on species |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Tripsacum dactyloides* and cvs. Fakahatchee Grass, Gamma Grass | NCS 8-11 | FL | Med. ↑ 4-6 → 4-6 | ●●●○ Any | Medium | | M | | cream/orange/red/yellow flowers (not showy) in spring-summer; pest resistant; tolerates occasionally wet soil |
| *Tripsacum floridana* Florida Gama Grass | NCS 8-11 | FL | Med. ↑ 2-4 → 4-6 | ●●●○ Any | Medium | | M | | yellow flowers in spring-summer; used to stabilize banks, steep slopes |
| **Palms and Palm-like Plants** | | | | | | | | | |
| *Acoelorrhaphe wrightii* Paurotis Palm, Saw Cabbage Palm | S 10-11 | FL | Slow ↑ 15-30 → 10-15 | ○●●○ Any | Medium | | M | | yellow/white flowers, spring; no pest problems; forms dense clump, needs space; w/o regular fertilization, older leaves lose color; susceptible to manganese deficiency; tolerates occasionally wet soil |
| *Arenga engleri* Formosa Palm, Dwarf Sugar Palm | CS 9a-11 | NA | Slow ↑ 10 → 16 | ○●●○ Any | None | | L-N | | red/orange/green flowers in spring |
| *Bismarckia nobilis* Green Bismarck Palm | S 10a-11 | NA | Med. ↑ 40-70 → 15-20 | ○●●○ Any | High | | M | | fronds blue-green; white/cream flowers; no pest problems |
| *Bismarckia nobilis* 'Silver Select' Bismarck Palm | S 10a-11 | NA | Slow ↑ 40-70 → 10-15 | ○●●○ Any | High | | H | | consistently silver fronds; white/cream flowers; don't plant under power lines |
| *Butia capitata* Pindo Palm, Jelly Palm | NCS 8b-11 | NA | Slow ↑ 15-25 → 10-15 | ○●●○ Any | High | | M | | edible fruit used for jelly; attracts wildlife; looks best in full sun; white flowers; pest sensitive; high wind resistance |

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| *Carpentaria acuminata*<br>Carpentaria Palm | S<br>10b-<br>11 | NA | Slow<br>35-40<br>8-10 | ○●●○<br>Any | Medium | | L-N | | white/cream flowers in spring-fall; tolerates occasionally wet soil; can cause skin irritation |
| *Chamaedorea* spp.<br>Chamaedorea, Bamboo Palm, Miniature Fishtail Palm | NCS<br>var-<br>iable | NA | Fast<br>varies<br>varies | ○●●○<br>Any | Medium | | L-N | | region depends on species, choose species adapted to climate; cream flowers in spring-summer; potential skin irritant; good container plant |
| *Chamaerops humilis*<br>European Fan Palm | NCS<br>8-11 | NA | Slow<br>5-15<br>6-15 | ○●●○<br>Any | High | | M | | clumping palm; yellow flowers in summer; pest sensitive; very cold hardy; relatively low maintenance compared to other palms; petioles with sharp teeth |
| *Coccothrinax argentata*<br>Silver Palm | S<br>10b-<br>11 | FL | Fast<br>3-15<br>6-7 | ●●●●<br>Any | High | | H | | white flowers in summer; key deer food source; high wind resistance |
| *Dioon edule*<br>Dioon, Chamal, Mexican Sago | NCS<br>8-11 | NA | Slow<br>1-8<br>4-6 | ●●●●<br>Any | High | | M | | watch for scale, mealybugs and occasionally thrips during leaf emergence; leaflets very sharp; can tolerate adverse conditions for periods but requires excellent drainage and full sun |
| *Dypsis lutescens*<br>Areca Palm, Yellow Butterfly Palm, Bamboo Palm | S<br>10a-<br>11 | NA | Med.<br>15-25<br>6-10 | ○●●○<br>Any | High | | M | | also known as *Chrysalidocarpus lutescens* ; regular fertilization for green leaves; watch for bagworms/banana moth/K deficiency; tolerates occasionally wet soil; high wind resistance |
| *Howea forsterana*<br>Kentia Palm, Sentry Palm | S<br>10-<br>11 | NA | Med.<br>15-25<br>6-10 | ○●●○<br>S/L | Medium | | L-N | | white flowers in summer; susceptible to Phytophthora root rot, so plant only in well drained site; watch for lethal yellowing disease |
| *Licuala grandis*<br>Ruffled Fan Palm, Vanuatu Fan Palm, Licuala Palm | S<br>10b-<br>11 | NA | Slow<br>10<br>6 | ○●●○<br>S/L | Medium | | L-N | | white flowers all year; palms have high fertilizer needs |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** | | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Livistona* spp.<br>Fan Palm | CS<br>9-11 | NA | Med.<br>varies<br>varies | ○●●○<br>S/L | High | | M | | flowers variable; *Livistona chinensis* has high wind resistance |
| *Phoenix* spp. except *Phoenix reclinata*<br>Date Palms | NCS<br>8-11 | NA | Slow<br>varies<br>varies | ○●●○<br>S/L | High | | M | | yellow flowers in summer; *Phoenix canariensis, Phoenix dactylifera and Phoenix roebelinii* have high wind resistance |
| *Pseudophoenix sargentii*<br>Buccaneer Palm, Sargent's Palm | S<br>10a-11 | FL | Slow<br>10-40<br>10-20 | ●●●●<br>Any | High | | M | | yellow flowers in summer; produces grape-sized red fruit; endangered in Florida; grows naturally in sandy or limestone soils where little rain falls |
| *Ptychosperma elegans*<br>Alexander Palm, Solitary Palm, Solitaire Palm | S<br>10a-11 | No | Slow<br>15-25<br>6-10 | ○●●○<br>S/L | High | | L-N | | white flowers in summer; resistant to lethal yellowing; high wind resistance |
| *Ptychosperma macarthurii*<br>Macarthur Palm | S<br>10b-11 | NA | Med.<br>15-25<br>6-10 | ○●●○<br>S/L | None | | L-N | | white flowers in summer |
| *Ravenea rivularis*<br>Majesty Palm | S<br>10a-11 | NA | Med.<br>50-80<br>10-15 | ○●●○<br>C/L | High | | M | | creamy white flowers in summer; no pest problems |
| *Rhapidophyllum hystrix*<br>Needle Palm | NCS<br>8-11 | FL | Fast<br>8<br>5-10 | ○●●○<br>S/L | Medium | | L-N | | red flowers in summer; mammals and large birds eat yellowish fruits |

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| *Rhapis excelsa*<br>Large Lady Palm | CS<br>9-11 | NA | Slow<br>7-14<br>15 | ○●●○<br>S/L | Medium | | L-N | | watch for scales, mealybugs and banana moth; manganese deficiency on alkaline soils; iron deficiency; in full sun leaves yellow and roots burn if too dry |
| *Rhapis humilis*<br>Slender Lady Palm | CS<br>9b-11 | NA | Med.<br>7<br>varies | ○●●○<br>S/L | Medium | | M | | watch for scales and mealybugs |
| *Sabal etonia*<br>Scrub Palmetto | CS<br>9-11 | FL | Slow<br>4-6<br>4-6 | ●●●●<br>S/L | High | | M | | flowers in spring-summer; small, black berries in summer-fall; long-lived (likely over 100 years); tolerates hot, dry conditions; endemic to central Florida sand scrub; difficult to transplant |
| *Sabal minor*<br>Dwarf Palmetto, Blue-stem Palmetto | NCS<br>8-10 | FL | Slow<br>4-9<br>4-8 | ●●●●<br>Any | High | | M | | fruit attracts wildlife in fall; difficult to transplant; good understory plant and for retention ponds/drainage swales, prefers moist soils but tolerates drier conditions after establishment |
| *Sabal palmetto*<br>Cabbage Palm, Sabal Palm, Cabbage Palmetto | NCS<br>8b-11 | FL | Slow<br>25-60<br>10-15 | ●●●●<br>Any | High | | H | | FL's state tree; adapted to most landscapes; white flowers, summer; watch for weevils/scale/ ganoderma butt rot; high wind resistance; older palms transplant easily; fruit important to wildlife |
| *Serenoa repens*<br>Saw Palmetto | NCS<br>8-11 | FL | Slow<br>3-10<br>4-10 | ●●●●<br>Any | High | | H | | flammable - in wildfire-prone area, plant min. 30' from bldgs; yellow/white flowers in spring; difficult to transplant; grows on first dune; round black fruits used by many mammals and large birds |
| *Thrinax morrisii*<br>Brittle Thatch Palm, Key Thatch Palm | S<br>10b-11 | FL | Slow<br>15-20<br>6-10 | ●●●●<br>Any | High | | H | | white flowers in summer; tolerates occasionally wet soil; tolerates light frost; high wind resistance |
| *Thrinax radiata*<br>Florida Thatch Palm | S<br>10b-11 | FL | Slow<br>15-25<br>6-10 | ●●●●<br>S | High | | H | | white flowers in summer; low maintenance palm for many landscapes due to small size; high wind resistance |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Trachycarpus fortunei* Windmill Palm | NCS 8-11 | NA | Med. 10-25 6-10 | ●●●● Any | Medium | | M | | inconspicuous, fragrant flowers in summer; moderately susceptible to lethal yellowing; good palm for shaded landscapes; tolerates occasional sun; watch for scale |
| *Wodyetia bifurcata* Foxtail Palm | S 10-11 | NA | Slow 30 8-20 | ○●●○ Any | Medium | | M | | white flowers in spring; no pest problems |
| *Zamia floridana* Coontie, Florida Arrowroot, Florida Zamia | NCS 8b-11 | FL | Fast 1-5 3-5 | ●●●● Any | High | | H | | Florida's only native cycad; seeds and caudex poisonous; sole larval food plant for atala butterfly; pest sensitive; temperatures in low 20s turn foliage brown |
| *Zamia furfuracea* Cardboard Plant | CS 9b-11 | NA | Slow 2-5 5-8 | ●●●● Any | High | | H | | seeds and caudex poisonous; freezes in central Florida and can come back |
| **Perennials** | | | | | | | | | |
| *Acrostichum danaeifolium* Leather Fern, Giant Leather Fern | CS 9-11 | FL | Med. 4-8 3-5 | ●●●○ Any | Low | | M | | large fern; good for wet sites in shaded landscape; foliage sometimes discolors in full sun without regular irrigation |
| *Adiantum capillus-veneris* Southern Maidenhair Fern, Venus' Hair Fern | S 10-11 | FL | Slow 1½ -2 1-1½ | ○●○○ Any | Medium | | L-N | | tolerates occasionally wet soil |
| *Agapanthus africanus* Lily of the Nile, African Lily | NCS 8-10 | NA | Fast 2 2 | ○●●○ S | Medium | | M | | purple/white flowers in summer; red flowers in spring; deciduous |

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|---|---|---|---|---|---|---|---|---|---|
| *Agave* spp.<br>Century plant, Agave | NCS<br>var-<br>iable | FL/<br>NA | Slow<br>6<br>varies | ○●●○<br>S |  <br>High |  | H | | choose species adapted to climate; flowers variable; sharp spines on leaf tips; don't plant next to walkways; invasive assessment: *Agave americana* assessed and not invasive, others not yet assessed |
| *Ajuga reptans*<br>Bugleweed, Carpet Bugleweed | NC<br>8-9a | NA | Fast<br>½ -1<br>1-2 | ○●●○<br>Any |  <br>Medium |  | L-N | | purple/blue flowers, spring-summer; spreads quickly; many cultivars; watch for southern blight; crown rot in poor ventilation or soggy soils; does not compete well against weeds, especially in sun |
| *Alocasia* spp.<br>Elephant Ears, Taro, Giant Taro | CS<br>9b-<br>11 | FL/<br>NA | Fast<br>2-10<br>1-10 | ○●●○<br>Any |  <br>Low |  | L-N | | small, green flowers in summer; large leaves; requires little attention once planted; no pest problems; freezing temperatures kill the foliage but grows back in warm weather |
| *Aloe* spp.<br>Aloe | NCS<br>var-<br>iable | NA | Med.<br>varies<br>varies | ○●●●<br>Any |  <br>High |  | H | | choose species adapted to climate; flowers variable; injured by frost in extreme north FL; occasional caterpillars; invasive assessment: *Aloe vera* assessed and not invasive, others not yet assessed |
| *Alpinia* spp.<br>Shell Ginger, Shell Flower | NCS<br>8-11 | NA | Fast<br>6-12<br>3-5 | ○●●○<br>S/C |  <br>Low |  | M | | white with pink/brown/red flowers in summer-fall; will not flower if freezes back |
| *Amorphophallus* spp.<br>Voodoo Lily, Snake Lily | NCS<br>9-11 | NA | Med.<br>6<br>varies | ○●●○<br>Any |  <br>Medium |  | L-N | | grows very slowly in north FL; flowers variable, have a foul odor |
| *Angelonia angustifolia*<br>Angelonia | NCS<br>9-11 | NA | Fast<br>1-3<br>1-3 | ○●●○<br>Any |  <br>Medium |  | U | | white and/or blue flowers in summer; can be grown as an annual bedding plant but survives winters in zones 9 and 10 |
| *Asclepias* spp.<br>Milkweed, Butterfly Weed | NCS<br>var-<br>iable | FL/<br>NA | Fast<br>2-5<br>1-4 | ○●●○<br>Any |  <br>Medium |  | L-N |  | region/light/soil moisture preferences vary by species, choose species appropriate for your conditions; reseeds and spreads; flowers variable; in north FL goes dormant in winter; sap may irritate |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Asimina* spp.<br>Pawpaw | NCS 8-10 | FL/ NA | Med.<br>varies ↑<br>varies → | ○●○○<br>S | Medium | | L-N | | region, light preferences vary by species, choose species appropriate for your conditions; flowers variable; larval food plant for zebra swallowtail butterfly; does not transplant well |
| *Aspidistra elatior*<br>Cast Iron Plant, Barroom Plant | NCS 8b-11 | No | Slow<br>1-3 ↑<br>1-3 → | ○●●○<br>Any | Medium | | L-N | | brown flowers periodically throughout the year; used for cut foliage; no pest problems; tolerates deep shade better than most plants |
| *Begonia semperflorens*<br>Wax Begonia | NCS 8-11 | NA | Slow<br>½ -1 ↑<br>½ -1 → | ○●●○<br>Any | Low | | L-N | | flowers variable; watch for powdery mildew and nematodes; grows as an annual in north and central regions, can be a perennial in south Florida |
| *Belamcanda chinensis*<br>Blackberry Lily | NCS 8-10a | NA | Fast<br>1-2 ↑<br>2-4 → | ○●●○<br>Any | Medium | | M | | yellow flowers in spring-fall; prone to crown rot if kept too wet |
| *Blechnum serrulatum*<br>Swamp Fern, Toothed Midsorus Fern, Saw Fern | CS 9-11 | FL | Med.<br>1-6 ↑<br>2-6 → | ●●○○<br>Any | Low | | L-N | | hardy fern; forms underground stems, persisting for many years, and spreads widely; excellent groundcover for moist sites (forms dense clumps); grows in full sun if in moist conditions |
| *Bromeliaceae* genera, species<br>Bromeliads, Airplants | NCS 8-11 | FL/ NA | Slow<br>varies ↑<br>varies → | ○●●○<br>S | High | | L-N | | flowers, light, region vary; choose species for climate; don't exchange bromeliads from areas with Mexican bromeliad weevil; air circulation prevents scale/mealybugs; cold/overwatering cause crown rot |
| *Caladium* x *hortulanum*<br>Caladium | NCS 8-11 | NA | Fast<br>1-2 ↑<br>1-2 → | ○●●○<br>Any | Medium | | L-N | | good container plant; attractive foliage (red/rose/pink/white/silver/bronze/green); leaves die back naturally in the fall; pest sensitive |

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| *Canna* spp.<br>Canna Lily | NCS<br>8-11 | FL/<br>NA | Fast<br>2-6<br>1-3 | ●●●○<br>Any | Medium | | L-N | | many cultivars; attractive foliage; flowers variable, in summer; invasive assessment: *Canna indica* assessed as not a problem, others not yet assessed |
| *Catharanthus roseus*<br>Periwinkle, Madagascar Periwinkle, Vinca | CS<br>9b-<br>11 | No/<br>C | Med.<br>1-2<br>1-2 | ○●●○<br>Any | High | | M | | white/pink/purple flowers all year; watch for micronutrient deficiencies/disease if too much moisture; invasive assessment: not a problem in N and C; caution-manage to prevent escape in S |
| *Coreopsis* spp.<br>Tickseed, Coreopsis | NCS<br>8a-<br>10b | FL/<br>NA | Fast<br>1-4<br>1-3 | ●●○○<br>Any | High | | M | | Florida's state wildflower; orange/yellow flowers in summer; may be annual or short-lived perennial, depending on species |
| *Costus* spp.<br>Spiral Ginger | NCS<br>8-11 | ? | Fast<br>6-10<br>4-8 | ○●●○<br>Any | Low | | L-N | | white, fragrant flowers in summer-fall |
| *Crinum* spp.<br>Crinum Lily | NCS<br>8b-<br>11 | FL/<br>NA | Med.<br>3-6<br>3-6 | ○●●○<br>Any | Medium | | M | | many cultivars; flowers variable, all year; watch for rust, Botrytis, leaf spots (esp. in south FL), caterpillars and other chewing insects; some are disease sensitive; poisonous |
| *Crossandra* spp.<br>Firecracker Flower | S<br>10 | NA | Fast<br>½ -4<br>1-3 | ○●●○<br>S/L | Medium | | L-N | | region varies by species, choose species adapted to climate; flowers variable; can be used as annual in north and central regions |
| *Cuphea hyssopifolia*<br>Mexican Heather, False Heather | NCS<br>8b-<br>11 | NA | Med.<br>1-2<br>2-3 | ○●●○<br>Any | High | | M | | purple/white/pink flowers all year; pest senstive; killed to the ground by hard freeze; may be weedy in landscapes |
| *Curcuma* spp.<br>Curcuma, Hidden Lily | NCS<br>8b-<br>11 | NA | Fast<br>1-6<br>1-4 | ○●●○<br>Any | Medium | | L-N | | pink/yellow flowers in spring |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt |  | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Dianella* spp.<br>Flax Lily | NCS<br>8-11 | FL/<br>NA | Fast<br>1-2<br>1-2 | ●●●○<br>Any |  <br>High |  | U | | flowers variable |
| *Dicksonia antarctica*<br>Tasmanian Tree Fern,<br>Australian Tree Fern | CS<br>9-11 | NA | Slow<br>to 50 | ●●○○<br>S/L |  <br>Low |  | L-N | | does not tolerate prolonged freezing or direct sun |
| *Didymochlaena truncatula*<br>Mahogany Fern, Tree Maidenhair Fern | S<br>10 | NA | Slow<br>1½<br>1½ | ●●○○<br>Loam |  <br>Low |  | U | | |
| *Dietes iridoides*<br>African Iris, Butterfly Iris | NCS<br>8b-<br>11 | NA | Slow<br>2-6<br>1-2 | ○●●○<br>Any |  <br>Medium |  | L-N | | also known as *Moraea iridoides* and *Moraea vegeta,* previously *Dietes vegata;* white/yellow/blue flowers in spring-summer; no pest problems |
| *Dryopteris eythrosora*<br>Autumn Fern, Japanese Shield Fern, Japanese Wood Fern | NCS<br>8-11 | NA | Slow<br>1-2<br>1-2 | ●●○○<br>Any |  <br>Low |  | L-N | | no pest problems |
| *Dryopteris* spp.<br>Autumn Fern | NCS<br>8-11 | FL/<br>NA | Slow<br>varies<br>varies | ●●○○<br>Any |  <br>Medium |  | L-N | | region depends on species - choose species adapted to your area; used as cut foliage |
| *Dyschoriste oblongifolia*<br>Twin Flower, Oblongleaf Snakeherb | NCS<br>8-11 | FL | Fast<br>½-1½<br>varies | ○●●○<br>Any |  <br>High |  | L-N |  | lavendar flowers all year |

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| *Echinacea purpurea*<br>Purple Coneflower | NCS<br>8-10 | FL | Med.<br>1-3 ↑<br>2-3 → | ○●●●<br>C/L | High |  | L-N |  | purple flowers in spring to summer; tolerates occasionally wet soil |
| *Euryops* spp.<br>Daisy Bush | NCS<br>var-<br>iable | NA | Med.<br>3-6 ↑<br>3-6 → | ○●●○<br>Any | High |  | M | | region varies by species, choose species appropriate to climate; flowers variable |
| *Evolvulus glomeratus*<br>ssp. *grandiflorus*<br>Blue Daze | CS<br>9-11 | NA | Med.<br>½-1 ↑<br>1-2 → | ○●●○<br>S/L | Medium |  | H | | blue flowers in spring to summer |
| *Gaillardia pulchella*<br>Blanket Flower | NCS<br>8a-<br>11 | FL | Fast<br>1-2 ↑<br>2-3 → | ○●●○<br>S/L | High |  | M |  | no pest problems |
| *Gaillardia* spp.<br>Blanket Flower | NCS<br>8-11 | FL/<br>NA | Fast<br>1-2 ↑<br>2-3 → | ○●●○<br>S/L | High |  | M |  | yellow/red flowers in summer; used in floral arrangements |
| *Gaura lindheimeri*<br>White Gaura, Whirling Butterflies, Lindheimer's Beeblossom | NC<br>8-9 | NA | Med.<br>1-3 ↑<br>2-3 → | ○●●○<br>Any | High |  | L-N |  | pink/white flowers in spring to fall |
| *Gazania* spp.<br>Gazania, Treasure Flower | NCS<br>8b-<br>11 | NA | Med.<br>½ -1 ↑<br>1-2 → | ○●●○<br>Any | High |  | M | | yellow/orange/red flowers in summer; no major pest problems, but roots may rot from overwatering |
| *Gloriosa* spp.<br>Gloriosa Lily | NCS<br>8-10 | NA | Fast<br>varies ↑<br>varies → | ○●●○<br>S/C | Medium |  | U | | crimson/yellow-orange flowers in spring-summer |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** | | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Haemanthus multiflorus* Blood Lily | NCS 8-11 | NA | Slow<br>1½ ↑<br>1 → | ○●●○<br>S/L | Medium |  | U | | also known as *Scadoxus multiflorus;* red flowers in summer |
| *Hedychium* spp., hybrids and cvs.<br>Butterfly Lily, Butterfly Ginger | NCS 8b-11 | NA | Fast<br>4-8 ↑<br>2-4 → | ○●●○<br>S/L | Low |  | M | | white/yellow/red flowers in spring; thrives in boggy soils |
| *Helianthus angustifolius* Swamp Sunflower, Narrowleaf Sunflower | NCS 8b-10 | FL | Fast<br>2-4 ↑<br>2-4 → | ●●●○<br>Any | Medium |  | H |  | yellow/brown flowers in fall |
| *Helianthus debilis* Beach Sunflower | NCS 8b-11 | FL | Fast<br>1-4 ↑<br>2-4 → | ●●●○<br>S/L | High |  | H |  | yellow/purple flowers all year; good groundcover for beaches and dune stabilization; develops fungus if planted in wet areas; no pest problems |
| *Heliconia* spp.<br>Heliconia | S 10b-11 | NA | Fast<br>2-15 ↑<br>3-6 → | ●●●●<br>Any | None |  | L-N | | flowers variable, all year |
| *Hemerocallis* spp.<br>Daylily | NCS 8-10 | NA | Fast<br>1-3 ↑<br>1-2 → | ●●●○<br>Any | Medium |  | H |  | many cultivars; flowers variable, in summer; watch for rust |
| *Hippeastrum* spp. and hybrids<br>Amaryllis | NCS 8-10 | NA | Med.<br>1-3 ↑<br>1-3 → | ○●●○<br>Any | Medium |  | L-N | | red/white flowers in spring |

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|---|---|---|---|---|---|---|---|---|---|
| *Hymenocallis* spp.<br>Daylily | NCS<br>8-11 | FL/<br>NA | Fast<br>1-3<br>3-5 | ●●●○<br>Any | High | | H | | region depends on species - choose species adapted to your area; white/yellow flowers in spring-fall |
| *Impatiens* spp.<br>Impatiens | NCS<br>8-11 | NA | Med.<br>½ -1<br>1 | ○●●○<br>Any | None | | L-N | | flowers variable |
| *Iris hexagona*<br>Louisiana Iris, Blue Flag Iris | NCS<br>8-10 | NA | Med.<br>2-5<br>½ | ●●○○<br>S/L | Low | | L-N | | purple flowers in spring; tolerates partial shade but flowers best in full sun; good for wet areas or rain gardens |
| *Iris virginica*<br>Virginia Iris, Blue Flag Iris | NCS<br>8b-<br>11 | FL | Med.<br>4-7<br>1-3 | ●●○○<br>Any | Medium | | L-N | | lavendar flowers in spring; for wet areas |
| *Justicia brandegeana*<br>Shrimp Plant | NCS<br>8b-<br>11 | NA | Fast<br>2-6<br>2-4 | ●●●○<br>Any | Medium | | L-N | | white flowers in summer; no major pest problems, but watch for caterpillars; grow in full sun for compact growth and better flowering; killed to ground when freezes but comes back |
| *Justicia carnea*<br>Jacobinia, Flamingo Plant | NCS<br>8b-<br>11 | NA | Slow<br>3-6<br>2-3 | ●●●○<br>Any | Low | | L-N | | flowers variable, in summer-fall; caterpillars occasionally eat foliage; watch for mealybugs; killed to ground at 20°F but emerges in spring |
| *Justicia spicigera*<br>Orange Plum | S<br>10b-<br>11 | NA | Fast<br>5<br>3-5 | ●●●●<br>Any | Low | | L-N | | orange flowers in summer |
| *Kaempferia* spp.<br>Peacock Ginger | NCS<br>8-10 | NA | Fast<br>2<br>varies | ○●●○<br>C/L | Medium | | L-N | | flowers variable; watch for snails |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** |  | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Kalanchoe blossfeldiana*<br>Kalanchoe, Madagascar Widow's Thrill | S<br>10-11 | NA | Slow<br>½-1<br>½-1 | ○●●○<br>S/L | High | | M | | pink/red/yellow flowers in winter-spring |
| *Lantana involucrata*<br>Wild Sage, Buttonsage | CS<br>9-11 | FL | Fast<br>2-5<br>1-5 | ●●●○<br>S/L | Medium | | H | | white flowers all year |
| *Leonotis leonurus*<br>Lion's Ear | CS<br>9-11 | NA | Fast<br>4-5<br>2-3 | ○●●○<br>Any | High | | H | | orange/red flowers in summer to winter |
| *Liatris* spp.<br>Blazing Star | NCS<br>8-10b | FL/ NA | Med.<br>3<br>½ -1 | ○●●○<br>Any | Medium | | L-N | | lavendar/pink/white flowers in summer-fall; attracts wildlife |
| *Liriope muscari* and cvs.<br>Liriope, Monkey Grass, Lily Turf, Border Grass | NC<br>8-9 | No | Med.<br>½ -1<br>1-2 | ●●●●<br>Any | Medium | | M | | purple flowers in summer; pest sensitive; forms a solid groundcover in a few years; variegated cultivar is damaged by frost |
| *Lycoris* spp.<br>Hurricane Lily | NC<br>8-9 | NA | Med.<br>1½<br>1 | ○●●○<br>Any | Medium | | L-N | | yellow/red/pink flowers in early fall |
| *Mimosa strigillosa*<br>Powderpuff, Sunshine Mimosa | NCS<br>8-11 | FL | Fast<br>½ -¾<br>varies | ●●●○<br>Any | Medium | | M | | pink powderpuff flowers |

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|---|---|---|---|---|---|---|---|---|---|
| *Musa* spp.<br>Banana | CS<br>9b-<br>11 | NA | Fast<br>7-30<br>10-15 | ●●●●<br>Any | Low | | L-N | | edible; in cooler parts requires protection, foliage dies in winter, emerges in spring if no killing frost; grows quickly when fertilized; needs regular watering; watch for Sigatoka leaf spot disease |
| *Neomarica gracilis*<br>Walking Iris | NCS<br>8b-<br>11 | NA | Med.<br>2-3<br>2-3 | ○●●○<br>Any | Low | | L-N | | white/blue flowers in spring to fall |
| *Odontonema strictum*<br>Firespike | NCS<br>8b-<br>11 | NA | Med.<br>2-6<br>2-3 | ○●●○<br>S/L | Medium | | L-N |  | red flowers in fall-winter; used in floral arrangements |
| *Osmunda cinnamomea*<br>Cinnamon Fern | NCS<br>8-10 | FL | Slow<br>2-5<br>3-4 | ●●○○<br>C/L | Low | | L-N | | deciduous, shrub-like fern; good plant for retention ponds, swales and canals |
| *Osmunda regalis*<br>Royal Fern | NCS<br>8-10 | FL | Med.<br>6-7<br>6-7 | ●●○○<br>Loam | Low | | L-N | | requires night temperature of 45° F to stay green; watch for caterpillars; may be less attractive during winter dormancy |
| *Pachystachys lutea*<br>Golden Shrimp Plant | CS<br>9b-<br>11 | NA | Med.<br>2-3<br>2-3 | ○●●○<br>Any | Low | | L-N | | yellow flowers in spring-fall |
| *Pentas lanceolata*<br>Pentas, Starflower | NCS<br>8b-<br>11 | NA | Fast<br>2-4<br>2-3 | ○●●○<br>Any | Medium | | M |  | many cultivars; red/pink/white/lilac flowers in summer; no pest problems; freezing temperatures kill plant to the ground |
| *Philodendron* cvs.<br>Philodendron | CS<br>var-<br>iable | NA | Fast<br>varies<br>varies | ○●●○<br>Any | Medium | | L-N | | many cvs; height/spread/region/flowers variable; choose for climate; tolerates occasionally wet soil; invasive assessment: *Philodendron scandens* assessed as not a problem, others not yet assessed |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Phlox divaricata* Blue Phlox | NCS 8-11 | NA | Fast 1-3 1-3 | ●●●○ Any | Medium | | L-N | | purple flowers in summer |
| *Plectranthus* spp. Plectranthus | NCS 8-11 | NA | Fast varies varies | ○●●○ S/L | Medium | | L-N | | flowers variable; 'Mona Lavender' was one of the FNGLA Plants of the Year in 2004 |
| *Plumbago auriculata* cvs. Plumbago | CS 9-11 | NA | Fast 6-10 8-10 | ●●●○ Any | Medium | | L-N | | blue/white flowers all year; pest sensitive; temperatures in mid 20s kill it to the ground, but it comes back from the roots |
| *Pteridium aquilinum* Bracken Fern | NCS 8-11 | FL | Med. 3-6 2-3 | ●●●○ S/L | Medium | | L-N | | poisonous to livestock |
| *Rudbeckia fulgida* Rudbeckia | NC 8-9 | FL | Fast 3 3 | ○●●○ S/L | Low | | L-N | | |
| *Rudbeckia hirta* Black-Eyed Susan | NC 8-9 | FL | Med. 2-3 1-2 | ○●●○ Any | Medium | | L-N | | large yellow-orange to reddish-orange flowers in summer; does not tolerate prolonged, wet weather |
| *Salvia spp.* Salvia, Sage | NCS 8a-11 | FL/ NA | Fast varies varies | ○●●○ S | Medium | | L-N | | flowers variable; attracts wildlife |

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|---|---|---|---|---|---|---|---|---|---|
| *Sisyrinchium angustifolium*<br>Blue-eyed Grass | NCS<br>8-11 | FL | Fast<br>½ -1½<br>½ -1½ | ●●●○<br>Any | Medium |  | L-N | | blue flowers in spring |
| *Solenostemon scutellorioides*<br>Coleus | NCS<br>8-11 | NA | Fast<br>varies<br>varies | ○●●○<br>Any | Low |  | L-N | | purple flowers in summer; many cultivars; 'Hurricane Louise' was one of the FNGLA Plants of the Year in 2005; watch for mealybugs, caterpillars, fungal diseases |
| *Solidago* spp.<br>Goldenrod | NCS<br>8-10 | FL/<br>NA | Med.<br>2-6<br>½--2 | ●●●○<br>S | High |  | H |  <br>  | yellow flowers in summer-fall; large colonies form in some species |
| *Sphaeropteris cooperi*<br>Australian Tree Fern | S<br>10b-<br>11 | NA | Slow<br>12-18<br>8-15 | ○●●○<br>S/L | Low |  | L-N | | also known as *Alsophila cooperi* |
| *Sprekelia formosissima*<br>Aztec Lily, Jacobean Lily, St. James Lily | NCS<br>8-<br>10b | NA | Fast<br>1-2<br>1-2 | ○●●○<br>S/L | Low |  | M | | red flowers in spring-summer |
| *Stachytarpheta* spp.<br>Porterweed | NCS<br>8-11 | FL/<br>NA | Fast<br>2-8<br>3-4 | ○●●○<br>Any | Medium |  | M |  | flowers variable |
| *Stokesia laevis*<br>Stokes' Aster | NC<br>8-9 | FL | Fast<br>1-2<br>1-2 | ●●○○<br>S/L | High |  | L-N |  | blue/white flowers in summer; many cultivars |
| *Tulbaghia violacea*<br>Society Garlic | NCS<br>8a-<br>11 | NA | M-F<br>1-2<br>1-2 | ○●●○<br>S/L | High |  | L-N | | lavender flowers in spring-fall; relatively pest free; does not flower well in shade; plant has strong garlic scent |

| ***Scientific name*** **Common Name(s)** | **Region** | **N/I** | **Growth Height Spread** | **Soil pH, text.** | **Soil Moisture/ Drought** | **Light Range/ Optimum** | **Salt** | | **Comments** |
|---|---|---|---|---|---|---|---|---|---|
| *Zamia floridana*<br>Coontie, Florida Arrowroot, Florida Zamia | NCS 8b-11 | FL | Slow<br>1-5 ↑<br>3-5 → | ●●●●<br>Any | High |  | H |  | Florida's only native cycad; seeds and caudex poisonous; sole larval food plant for atala butterfly; pest sensitive; temperatures in low 20s turn foliage brown |
| *Zamia furfuracea*<br>Cardboard Plant | CS 9b-11 | NA | Slow<br>2-5 ↑<br>5-8 → | ●●●●<br>Any | High |  | H | | seeds and caudex poisonous; freezes in central Florida and can come back |
| *Zephyranthes* spp.<br>Rain Lily, Zephyr Lily | NCS 8-11 | FL/ NA | Fast<br>½ -1 ↑<br>½ -1 → | ●●●○<br>Any | Medium |  | M | | white/yellow/pink/red flowers in spring-fall; watch for maggots, chewing insects, botrytis |
| *Zingiber zerumbet*<br>Pine Cone Ginger | NCS 8-11 | NA | Med.<br>4-7 ↑<br>4-6 → | ●●●○<br>Any | Medium |  | M | | red, fragrant flowers in fall; used in floral arrangements; tolerates occasionally wet soil |
| **Annuals** | | | | | | | | | |
| *Ageratum* spp.<br>Ageratum | NCS 8-11 | NA | Med.<br>½ -1 ↑<br>½ -1 → | ○●●○<br>Any | Low |  | L-N | | many cultivars; purple/white flowers all year |
| *Amaranthus* spp.<br>Amaranth | NCS 8-11 | FL/ NA | Fast<br>1-2 ↑<br>1-2 → | ○●●○<br>Any | Medium |  | M |  | many cultivars; attractive foliage; inconspicuous flowers |
| *Angelonia angustifolia*<br>Angelonia | NCS 9-11 | NA | Fast<br>1-3 ↑<br>1-3 → | ○●●○<br>Any | Medium |  | U | | white and/or blue flowers in summer; can be grown as an annual bedding plant but survives winters in zones 9 and 10 |

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| *Begonia semperflorens*<br>Wax Begonia | NCS<br>8-11 | NA | Slow<br>½ -1<br>½ -1 | ○●●○<br>Any | Low |  | L-N | | flowers variable; watch for powdery mildew and nematodes; grows as an annual in north and central regions, can be a perennial in south Florida |
| *Caladium* x *hortulanum*<br>Caladium | NCS<br>8-11 | NA | Fast<br>1-2<br>1-2 | ○●●○<br>Any | Medium |  | L-N | | good container plant; attractive foliage (red/rose/pink/white/silver/bronze/green); leaves die back naturally in the fall; pest sensitive |
| *Calendula* spp.<br>Pot Marigold | NCS<br>8-11 | NA | Fast<br>1-1½<br>1-1½ | ○●●○<br>Any | Low |  | M | | yellow/orange flowers in winter-spring |
| *Catharanthus roseus*<br>Periwinkle, Madagascar Periwinkle, Vinca | CS<br>9b-<br>11 | No/<br>C | Med.<br>1-2<br>1-2 | ○●●○<br>Any | High |  | M | | white/pink/purple flowers all year; watch for micronutrient deficiencies/disease if too much moisture; invasive assessment: not a problem in N and C; caution-manage to prevent escape in S |
| *Celosia* spp.<br>Celosia | NCS<br>8-11 | NA | Fast<br>½ -2<br>½ -1 | ○●●○<br>Any | Low |  | L-N | | many cultivars; flowers variable, in summer |
| *Coreopsis* spp.<br>Tickseed, Coreopsis | NCS<br>8a-<br>10b | FL/<br>NA | Fast<br>1-4<br>1-3 | ●●○○<br>Any | High |  | M |  | Florida's state wildflower; orange/yellow flowers in summer; may be annual or short-lived perennial, depending on species |
| *Gazania* spp.<br>Gazania, Treasure Flower | NCS<br>8b-<br>11 | NA | Med.<br>½ -1<br>1-2 | ○●●○<br>Any | High |  | M | | yellow/orange/red flowers in summer; no major pest problems, but roots may rot from overwatering |
| *Impatiens* spp.<br>Impatiens | NCS<br>8-11 | NA | Med.<br>½ -1<br>1 | ○●●○<br>Any | None |  | L-N |  | flowers variable |

| ***Scientific name*** **Common Name(s)** | Region | N/I | Growth Height Spread | Soil pH, text. | Soil Moisture/ Drought | Light Range/ Optimum | Salt | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| *Justicia brandegeana* Shrimp Plant | NCS 8b-11 | NA | Fast 2-6 2-4 | ●●●○ Any | Medium | | L-N | | white flowers in summer; no major pest problems, but watch for caterpillars; grow in full sun for compact growth and better flowering; killed to ground when freezes but comes back |
| *Justicia carnea* Jacobinia, Flamingo Plant | NCS 8b-11 | NA | Slow 3-6 2-3 | ●●●○ Any | Low | | L-N | | flowers variable, in summer-fall; caterpillars occasionally eat foliage; watch for mealybugs; killed to ground at 20 degrees but emerges in spring |
| *Justicia spicigera* Orange Plum | S 10b-11 | NA | Fast 5 3-5 | ●●●● Any | Low | | L-N | | orange flowers in summer |
| *Lobularia maritima* Sweet Alyssum | NCS 8-11 | NA | Med. ½ -1 ½ -1 | ●●●○ Any | Medium | | L-N | | purple/white/pink flowers in winter; tolerates light frost |
| *Monarda punctata* Spotted Horsemint, Dotted Horsemint, Spotted Beebalm | NC 8b-9 | FL | Fast 1-3 2-4 | ○●●○ Any | Medium | | H | | pink flowers in summer-fall |
| *Pachystachys lutea* Golden Shrimp Plant | CS 9b-11 | NA | Med. 2-3 2-3 | ○●●○ Any | Low | | L-N | | yellow flowers in spring-fall |
| *Pentas lanceolata* Pentas, Starflower | NCS 8b-11 | NA | Fast 2-4 2-3 | ○●●○ Any | Medium | | M | | many cultivars; red/pink/white/lilac flowers in summer; no pest problems; freezing temperatures kill plant to the ground |

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| *Petunia* x *hybrida*<br>Petunia | NCS<br>8-11 | NA | Fast<br>½ -1½<br>1 | ○●●○<br>Any | Low | | M | | many colors of flowers, in fall-spring; watch for mealybugs, downy mildew, caterpillars and aphids; can be grown as a perennial in south Florida |
| *Rudbeckia fulgida*<br>Rudbeckia | NC<br>8-9 | FL | Fast<br>3<br>3 | ○●●○<br>S/L | Low | | L-N | | |
| *Rudbeckia hirta*<br>Black-Eyed Susan | NC<br>8-9 | FL | Med.<br>2-3<br>1-2 | ○●●○<br>Any | Medium | | L-N | | large yellow-orange to reddish-orange flowers in summer; does not tolerate prolonged, wet weather |
| *Solenostemon scutellorioides*<br>Coleus | NCS<br>8-11 | NA | Fast<br>varies<br>varies | ○●●○<br>Any | Low | | L-N | | purple flowers in summer; many cultivars; 'Hurricane Louise' was one of the FNGLA Plants of the Year in 2005; watch for mealybugs, caterpillars, fungal diseases |
| *Tagetes* spp.<br>Marigold | NCS<br>8-11 | NA | Fast<br>1-3<br>1 | ○●●○<br>S/L | Medium | | L-N | | flowers variable |
| *Torenia fournieri*<br>Wishbone Flower | NCS<br>8-11 | NA | Med.<br>½ -1½<br>1-1½ | ○●●○<br>S/L | Low | | L-N | | lavendar/pink/blue/white flowers in spring-fall; watch for caterpillars and slugs |
| *Viola* spp.<br>Violet, Johnny-jump-up | NC<br>8-9 | FL/<br>NA | Fast<br>½ -1<br>½ -1 | ○●●○<br>S/L | Low | | L-N | | |
| *Viola* x *wittrockiana*<br>Pansy | NCS<br>8-11 | NA | Slow<br>½ -1<br>½ -1 | ○●●○<br>Any | Low | | L-N | | many cultivars; flowers variable, all year; no pest problems; needs regular watering in warm weather |
| *Zinnia* hybrids<br>Zinnia | NCS<br>8-11 | NA | Fast<br>½ -3<br>1 | ○●●○<br>Any | High | | L-N | | many cultivars with various colors and flower sizes, flowering all year; watch for stem borers, chewing insects and downy mildew; choose cultivars resistant to mildew; used for cut flowers |

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|---|---|---|
| African Iris | *Dietes iridoides* | 56 |
| African Lily | *Agapanthus africanus* | 52 |
| Agave | *Agave* spp. | 25,53 |
| Ageratum | *Ageratum* spp. | 64 |
| Airplants | *Bromeliaceae* | 54 |
| Alexander Palm | *Ptychosperma elegans* | 50 |
| Algerian Ivy | *Hedera canariensis* | 41,45 |
| Aloe | *Aloe* spp. | 38,53 |
| Amaranth | *Amaranthus* spp. | 64 |
| Amaryllis | *Hippeastrum* spp. | 58 |
| American Elm | *Ulmus americana* | 11 |
| American Hophornbeam | *Ostrya virginiana* | 15 |
| American Hornbeam | *Carpinus caroliniana* | 12 |
| American Hornbeam | *Ostrya virginiana* | 15 |
| American Planetree | *Platanus occidentalis* | 9 |
| American Wisteria | *Wisteria frutescens* | 43 |
| Angelonia | *Angelonia angustifolia* | 53,64 |
| Areca Palm | *Dypsis lutescens* | 49 |
| Asiatic Jasmine | *Trachelospermum asiaticum* | 46 |
| Australian Tree Fern | *Dicksonia antarctica* | 56 |
| Australian Tree Fern | *Sphaeropteris cooperi* | 63 |
| Autumn Fern | *Dryopteris eythrosora* | 56 |
| Autumn Fern | *Dryopteris* spp. | 44,56 |
| Avocado | *Persea americana* | 15 |
| Awabuki Viburnum | *Viburnum odoratissimum var. awabuki* | 24,37 |
| Azalea | *Rhododendron* cvs. | 35 |
| Aztec Lily | *Sprekelia formosissima* | 63 |
| Bahama Lysiloma | *Lysiloma latisiliquum* | 8 |
| Bald Cypress | *Taxodium distichum* | 11 |
| Bamboo | *Bambusa* spp. | 26 |
| Bamboo Palm | *Chamaedorea* spp. | 49 |
| Bamboo Palm | *Dypsis lutescens* | 49 |
| Banana | *Musa* spp. | 21,33 |
| Barometer Bush | *Leucophyllum frutescens* | 38 |
| Barroom Plant | *Aspidistra elatior* | 43,54 |
| Bay Cedar | *Suriana maritima* | 35 |
| Bay Oak | *Persea borbonia* | 15 |
| Beach Rosemary | *Conradina* spp. | 47 |
| Beach Sunflower | *Helianthus debilis* | 58 |
| Beautyberry | *Callicarpa americana* | 27 |
| Bigleaf Hydrangea | *Hydrangea macrophylla* | 31 |
| Bird of Paradise | *Strelitzia reginae* | 40 |
| Bismarck Palm | *Bismarckia nobilis* 'Silver Select' | 48 |
| Black Gum | *Nyssa sylvatica* | 8 |
| Black Mangrove | *Avicennia germinans* | 11 |
| Black Olive | *Bucida buceras* | 6 |
| Blackberry Lily | *Belamcanda chinensis* | 54 |
| Black-Eyed Susan | *Rudbeckia hirta* | 62,67 |
| Black-Eyed Susan Vine | *Thunbergia alata* | 43 |
| Blanket Flower | *Gaillardia pulchella* | 57 |
| Blanket Flower | *Gaillardia* spp. | 57 |
| Blazing Star | *Liatris* spp. | 60 |
| Blood Lily | *Haemanthus multiflorus* | 58 |
| Blue Daze | *Evolvulus glomeratus* ssp. *grandiflorus* | 44,57 |
| Blue Flag Iris | *Iris hexagona* | 59 |
| Blue Flag Iris | *Iris virginica* | 59 |
| Blue Phlox | *Phlox divaricata* | 62 |
| Blueberry | *Vaccinium* spp. | 36 |

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|---|---|---|
| Blue-eyed Grass | *Sisyrinchium angustifolium* | 63 |
| Bluestem Grass | *Andropogon* spp. | 46 |
| Blue-stem Palmetto | *Sabal minor* | 35,51 |
| Bluff Oak | *Quercus austrina* | 9 |
| Border Grass | *Liriope muscari* | 45,60 |
| Bottlebrush | *Callistemon* spp. | 17,27 |
| Bougainvillea | *Bougainvillea* cvs. | 41 |
| Bracken Fern | *Pteridium aquilinum* | 62 |
| Brazilian Grape | *Myrciaria cauliflora* | 21 |
| Brazilian Grape Tree | *Myrciaria cauliflora* | 21 |
| Brittle Thatch Palm | *Thrinax morrisii* | 51 |
| Bromeliads | *Bromeliaceae* | 54 |
| Buccaneer Palm | *Pseudophoenix sargentii* | 50 |
| Buckthorn | *Sideroxylon* spp. | 23 |
| Bugleweed | *Ajuga reptans* | 43,53 |
| Bush Allamanda | *Allamanda neriifolia* | 25,40 |
| Bush Clock Vine | *Thunbergia erecta* | 36 |
| Bush Daisy | *Gamolepis* spp. | 38 |
| Bush Trumpet | *Allamanda neriifolia* | 25,40 |
| Butterfly Bush | *Buddleia lindleyana* | 26 |
| Butterfly Ginger | *Hedychium* spp. | 58 |
| Butterfly Iris | *Dietes iridoides* | 56 |
| Butterfly Lily | *Hedychium* spp. | 58 |
| Butterfly Weed | *Asclepias* spp. | 53 |
| Buttonbush | *Cephalanthus occidentalis* | 18,28 |
| Buttonsage | *Lantana involucrata* | 60 |
| Buttonwood | *Conocarpus erectus* | 6,29 |
| Cabbage Palm | *Sabal palmetto* | 51 |
| Cabbage Palmetto | *Sabal palmetto* | 51 |
| Caladium | *Caladium* x *hortulanum* | 44,54,65 |
| Camellia | *Camellia japonica* | 17,27 |
| Canary Ivy | *Hedera canariensis* | 41,45 |
| Canna Lily | *Canna* spp. | 55 |
| Cape Jasmine | *Gardenia jasminoides* | 30 |
| Cardboard Plant | *Zamia furfuracea* | 40,52,64 |
| Carolina Allspice | *Calycanthus floridus* | 27 |
| Carolina Ash | *Fraxinus caroliniana* | 7 |
| Carolina Aster | *Symphyotricum carolinianum* | 40 |
| Carolina Coralbead | *Cocculus laurifolius* | 29 |
| Carolina Jessamine | *Gelsemium sempervirens* | 41 |
| Carpentaria Palm | *Carpentaria acuminata* | 12,49 |
| Carpet Bugleweed | *Ajuga reptans* | 43,53 |
| Cast Iron Plant | *Aspidistra elatior* | 43,54 |
| Cedar Elm | *Ulmus crassifolia* | 11 |
| Celosia | *Celosia* spp. | 65 |
| Century plant | *Agave* spp. | 25,53 |
| Chalcas | *Murraya paniculata* | 33 |
| Chamaedorea | *Chamaedorea* spp. | 49 |
| Chamal | *Dioon edule* | 49 |
| Chapman's Oak | *Quercus chapmanii* | 15 |
| Chaste Tree | *Vitex agnus-castus* | 37 |
| Chickasaw Plum | *Prunus angustifolia* | 22 |
| Chinese Elm | *Ulmus parviflora* and cvs. | 11 |
| Chinese Fringe Bush | *Loropetalum chinense* | 32 |
| Chinese Fringetree | *Chionanthus retusus* | 18 |
| Chinese Holly | *Ilex cornuta* | 20,31 |
| Chinese Juniper | *Juniperus chinensis* | 32 |
| Chinese Mahonia | *Mahonia fortunei* | 38 |
| Cinnamon Bark | *Canella winterana* | 18 |
| Cinnamon Fern | *Osmunda cinnamomea* | 61 |
| Citrus | *Citrus* spp. | 19 |
| Cleyera | *Ternstroemia gymnanthera* | 36 |
| Climbing Aster | *Symphyotricum carolinianum* | 40 |
| Climbing Hydrangea | *Decumaria barbara* | 41 |
| Cocculus | *Cocculus laurifolius* | 29 |
| Cocoplum | *Chrysobalanus icaco* | 28 |

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|---|---|---|
| Coleus | *Solenostemon scutellorioides* | 63,67 |
| Common Maidenhair | *Adiantum capillus-veneris* | 52 |
| Common Witchhazel | *Hamamelis virginiana* | 30 |
| Confederate Jasmine | *Trachelospermum jasminoides* | 43,46 |
| Coontie | *Zamia floridana* | 40,52,64 |
| Coral Honeysuckle | *Lonicera sempervirens* | 42 |
| Coral Plant | *Russelia equisetiformis* | 39 |
| Cordgrass | *Spartina* spp. | 47 |
| Coreopsis | *Coreopsis* spp. | 55 |
| Cow Itch Vine | *Decumaria barbara* | 41 |
| Crape Jasmine | *Tabernaemontana divaricata* | 16,36 |
| Crape/Crepe Myrtle | *Lagerstroemia indica* | 14 |
| Crape/Crepe Myrtle | *Lagerstroemia indica × fauriei* | 14 |
| Crape/Crepe Myrtle | *Lagerstroemia speciosa* | 14 |
| Creeping Juniper | *Juniperus horizontalis* | 45 |
| Crimson Pygmy | *Berberis thunbergii* | 26 |
| Crinum Lily | *Crinum* spp. | 55 |
| Cross Vine | *Bignonia capreolata* | 41 |
| Croton | *Codiaeum variegatum* | 29 |
| Crown Grass | *Paspalum quadrifarium* | 42 |
| Curcuma | *Curcuma* spp. | 55 |
| Dahoon Holly | *Ilex cassine* | 13 |
| Daisy Bush | *Euryops* spp. | 57 |
| Date Palms | *Phoenix* spp. | 50 |
| Daylily | *Hemerocallis* spp. | 58 |
| Desert Cassia | *Senna polyphylla* | 23,35 |
| Devil's Walkingstick | *Aralia spinosa* | 16,25 |
| Dioon | *Dioon edule* | 49 |
| Doghobble | *Agarista populifolia* | 25 |
| Dotted Horsemint | *Monarda punctata* | 66 |
| Downy Jasmine | *Jasminum multiflorum* | 32,42 |
| Dutchman's Pipe | *Aristolochia* spp. | 40 |
| Dwarf Jasmine | *Trachelospermum asiaticum* | 46 |
| Dwarf Lilyturf | *Ophiopogon japonicus* | 47 |
| Dwarf Liriopoe | *Ophiopogon japonicus* | 47 |
| Dwarf Palmetto | *Sabal minor* | 35,51 |
| Dwarf Schefflera | *Heptapleurum arboricolum* | 31 |
| Dwarf Sugar Palm | *Arenga engleri* | 17,48 |
| East Palatka Holly | *Ilex × attenuata* and cvs. | 13 |
| Eastern Redbud | *Cercis canadensis* | 12 |
| Eastern Sweetshrub | *Calycanthus floridus* | 27 |
| Elderberry | *Sambucus* spp. | 23,35 |
| Elephant Ears | *Alocasia* spp. | 53 |
| Elliott's Lovegrass | *Eragrostis elliottii* | 47 |
| English Dogwood | *Philadelphus inodorus* | 34 |
| English Ivy | *Hedera helix* | 41,45 |
| European Fan Palm | *Chamaerops humilis* | 18,49 |
| Evergreen Paspalum | *Paspalum quadrifarium* | 42 |
| Evergreen Wisteria | *Millettia reticulata* | 42 |
| Fakahatchee Grass | *Tripsacum dactyloides* | 48 |
| False Heather | *Cuphea hyssopifolia* | 55 |
| False Rosemary | *Conradina* spp. | 47 |
| Fan Palm | *Livistona* spp. | 50 |
| Feijoa | *Acca sellowiana* | 25 |
| Fetterbush | *Agarista populifolia* | 25 |
| Fetterbush | *Lyonia lucida* | 38 |
| Fiddlewood | *Citharexylum spinosum* | 19,28 |
| Firebush | *Hamelia patens* | 30 |
| Firecracker Flower | *Crossandra* spp. | 55 |
| Firecracker Plant | *Russelia equisetiformis* | 39 |
| Firecracker Plant | *Russelia sarmentosa* | 39 |
| Firespike | *Odontonema strictum* | 61 |
| Fish Poison Tree | *Piscidia piscipula* | 9 |
| Flamingo Plant | *Justicia carnea* | 59,66 |

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|---|---|---|
| Flatwoods Plum | *Prunus umbellata* | 22 |
| Flax Lily | *Dianella* spp. | 56 |
| Florida Arrowroot | *Zamia floridana* | 40,52,64 |
| Florida Azalea | *Rhododendron austrinum* | 35 |
| Florida Buckeye | *Aesculus pavia* | 16 |
| Florida Gama Grass | *Tripsacum floridana* | 48 |
| Florida Maple | *Acer barbatum* | 6 |
| Florida Privet | *Forestiera segregata* | 20,30 |
| Florida Thatch Palm | *Thrinax radiata* | 51 |
| Florida Zamia | *Zamia floridana* | 40,52,64 |
| Formosa Palm | *Arenga engleri* | 17,48 |
| Fortune's Mahonia | *Mahonia fortunei* | 38 |
| Foxtail Palm | *Wodyetia bifurcata* | 52 |
| Fragrant Olive | *Osmanthus fragrans* | 33 |
| Frangipani | *Plumeria rubra* | 22 |
| French Hydrangea | *Hydrangea macrophylla* | 31 |
| Fringetree | *Chionanthus virginicus* | 19 |
| Gallberry | *Ilex glabra* | 20 |
| Gamma Grass | *Tripsacum dactyloides* | 48 |
| Gardenia | *Gardenia jasminoides* | 30 |
| Gazania | *Gazania* spp. | 57,65 |
| Geiger Tree | *Cordia sebestena* | 13 |
| Giant Bird of Paradise | *Strelitzia nicolai* | 35,40 |
| Giant Leather Fern | *Acrostichum danaeifolium* | 25,52 |
| Giant Taro | *Alocasia* spp. | 53 |
| Giant Yellow Shrimp Plant | *Barleria micans* | 26 |
| Gloriosa Lily | *Gloriosa* spp. | 57 |
| Glory Bush | *Tibouchina urvilleana* | 36 |
| Glossy Abelia | *Abelia × grandiflora* | 24 |
| Golden Dewdrop | *Duranta erecta* | 29 |
| Golden Shower | *Cassia fistula* | 12 |
| Golden Shrimp Plant | *Pachystachys lutea* | 61,66 |
| Golden Trumpet Tree | *Tabebuia chrysotricha* | 16 |
| Goldenrod | *Solidago* spp. | 63 |
| Grape | *Vitis* spp. | 43 |
| Green Ash | *Fraxinus pennsylvanica* | 7 |
| Green Bismarck Palm | *Bismarckia nobilis* | 48 |
| Gregorywood | *Bucida buceras* | 6 |
| Groundsel Tree | *Baccharis halimifolia* | 17,26 |
| Gumbo Limbo | *Bursera simaruba* | 11 |
| Halesia | *Halesia* spp. | 7 |
| Harrington Plum Yew | *Cephalotaxus harringtonia* | 18,28 |
| Hawthorn | *Crataegus* spp. | 13,29 |
| Heliconia | *Heliconia* spp. | 58 |
| Hibiscus | *Hibiscus* spp. | 31 |
| Hickories | *Carya* spp. | 6 |
| Hidden Lily | *Curcuma* spp. | 55 |
| Holly Fern | *Cyrtomium falcatum* | 44 |
| Holly Grape | *Mahonia fortunei* | 38 |
| Honeysuckle | *Lonicera sempervirens* | 42 |
| Hopbush | *Dodonaea viscosa* | 19 |
| Horizontal Juniper | *Juniperus horizontalis* | 45 |
| Horned Holly | *Ilex cornuta* | 20,31 |
| Hurricane Lily | *Lycoris* spp. | 60 |
| Hydrangea | *Hydrangea macrophylla* | 31 |
| Impatiens | *Impatiens* spp. | 59,65 |
| Indian Hawthorn | *Raphiolepis* spp. | 23,39 |
| Indian Wood-oats | *Chasmanthium latifolium* | 46 |
| Inkberry | *Scaevola plumieri* | 46 |
| Ironwood | *Carpinus caroliniana* | 12 |
| Jaboticaba | *Myrciaria cauliflora* | 21 |
| Jacaranda | *Jacaranda mimosifolia* | 14 |
| Jacobean Lily | *Sprekelia formosissima* | 63 |
| Jacobinia | *Justicia carnea* | 59,66 |
| Jamaica Caper Tree | *Capparis cynophallophora* | 18,27 |
| Jamaican Dogwood | *Piscidia piscipula* | 9 |

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| Japanese Aralia | *Fatsia japonica* | 30 |
| Japanese Barberry | *Berberis thunbergii* | 26 |
| Japanese Crape Myrtle | *Lagerstroemia indica* × *fauriei* | 14 |
| Japanese Juniper | *Juniperus chinensis* | 32 |
| Japanese Plum Yew | *Cephalotaxus harringtonia* | 18,28 |
| Japanese Privet | *Ligustrum japonicum* | 21,32 |
| Japanese Shield Fern | *Dryopteris eythrosora* | 56 |
| Japanese Wood Fern | *Dryopteris eythrosora* | 56 |
| Jelly Palm | *Butia capitata* | 17,48 |
| Jerusalem Thorn | *Parkinsonia aculeata* | 22 |
| Johnny-jump-up | *Viola* spp. | 67 |
| Julian's berberis | *Berberis julianae* | 26 |
| Kalanchoe | *Kalanchoe blossfeldiana* | 60 |
| Kentia Palm | *Howea forsterana* | 49 |
| Key Thatch Palm | *Thrinax morrisii* | 51 |
| King's Mantle | *Thunbergia erecta* | 36 |
| Lacebark Elm | *Ulmus parviflora* and cvs. | 11 |
| Large Lady Palm | *Rhapis excelsa* | 51 |
| Lasiandra | *Tibouchina urvilleana* | 36 |
| Laurel Oak | *Quercus hemisphaerica* | 9 |
| Laurel Oak | *Quercus laurifolia* | 10 |
| Laurelleaf Snailseed | *Cocculus laurifolius* | 29 |
| Leather Fern | *Acrostichum danaeifolium* | 25,52 |
| Leatherleaf Fern | *Rumohra adiantiformis* | 45 |
| Leatherwood | *Cyrilla racemiflora* | 19,29 |
| Licuala Palm | *Licuala grandis* | 49 |
| Ligustrum | *Ligustrum japonicum* | 21,32 |
| Lily of the Nile | *Agapanthus africanus* | 52 |
| Lily Turf | *Liriope muscari* | 45,60 |
| Lindheimer's Beeblossom | *Gaura lindheimeri* | 57 |
| Lindley's Butterflybush | *Buddleia lindleyana* | 26 |
| Lion's Ear | *Leonotis leonurus* | 60 |
| Liriope | *Liriope muscari* | 45,60 |
| Live Oak | *Quercus virginiana* | 10 |
| Loblolly Bay | *Gordonia lasianthus* | 7 |
| Longleaf Pine | *Pinus palustris* | 9 |
| Loquat | *Eriobotrya japonica* | 13 |
| Loropetalum | *Loropetalum chinense* | 32 |
| Louisiana Iris | *Iris hexagona* | 59 |
| Macarthur Palm | *Ptychosperma macarthurii* | 50 |
| Madagascar Periwinkle | *Catharanthus roseus* | 44,55,65 |
| Madagascar Widow's Thrill | *Kalanchoe blossfeldiana* | 60 |
| Mahogany Fern | *Didymochlaena truncatula* | 56 |
| Majesty Palm | *Ravenea rivularis* | 50 |
| Mallows | *Hibiscus* spp. | 31 |
| Mandevilla | *Mandevilla* cvs. | 42 |
| Mango | *Mangifera indica* | 14 |
| Marbleberry | *Ardisia escallonioides* | 17,25 |
| Marigold | *Tagetes* spp. | 67 |
| Marlberry | *Ardisia escallonioides* | 17,25 |
| Mary Nell Holly | *Ilex* × 'Mary Nell' | 20,31 |
| Maypop | *Passiflora incarnata* | 42 |
| Mexican Heather | *Cuphea hyssopifolia* | 55 |
| Mexican Palo Verde | *Parkinsonia aculeata* | 22 |
| Mexican Sago | *Dioon edule* | 49 |
| Milkweed | *Asclepias* spp. | 53 |
| Miniature Fishtail Palm | *Chamaedorea* spp. | 49 |
| Miniature Holly | *Malpighia coccigera* | 39 |
| Mondo Grass | *Ophiopogon japonicus* | 47 |
| Monkey Grass | *Liriope muscari* | 45,60 |
| Morning Glory | *Ipomoea* spp. | 41 |
| Muhly Grass | *Muhlenbergia capillaris* | 47 |
| Musclewood | *Carpinus caroliniana* | 12 |
| Mustard Tree | *Capparis cynophallophora* | 18,27 |

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|---|---|---|
| Myrtle Holly | *Ilex myrtifolia* | 13 |
| Myrtle Oak | *Quercus myrtifolia* | 23 |
| Myrtleleaf Holly | *Ilex myrtifolia* | 13 |
| Narrowleaf Sunflower | *Helianthus angustifolius* | 58 |
| Natal Plum | *Carissa macrocarpa* | 27,44 |
| Necklace Pod | *Sophora tomentosa* | 23 |
| Nectarine | *Prunus persica* var. *nucipersica* | 22 |
| Needle Palm | *Rhapidophyllum hystrix* | 50 |
| Nellie R. Stevens Holly | *Ilex* × 'Nellie R. Stevens' | 20 |
| Northern Sea Oats | *Chasmanthium latifolium* | 46 |
| Northern Slash Pine | *Pinus elliottii* var. *elliottii* | 8 |
| Nosegay | *Plumeria rubra* | 22 |
| Nuttall Oak | *Quercus nuttallii* | 10 |
| Oakleaf Hydrangea | *Hydrangea quercifolia* | 31 |
| Oblongleaf Snakeherb | *Dyschoriste oblongifolia* | 44,56 |
| Orange Jasmine | *Murraya paniculata* | 33 |
| Orange Jessamine | *Cestrum aurantiacum* | 28 |
| Orange Jessamine | *Murraya paniculata* | 33 |
| Orange Plum | *Justicia spicigera* | 59,66 |
| Oregon Hollygrape | *Mahonia bealei* | 33 |
| Overcup Oak | *Quercus lyrata* | 15 |
| Oxhorn Bucida | *Bucida buceras* | 6 |
| Pampasgrass | *Cortaderia selloana* | 47 |
| Panic Grass | *Panicum virgatum* | 47 |
| Pansy | *Viola* x *wittrockiana* | 67 |
| Paperplant | *Fatsia japonica* | 30 |
| Paradise Tree | *Simarouba glauca* | 10 |
| Passion Vine | *Passiflora incarnata* | 42 |
| Paurotis Palm | *Acoelorrhaphe wrightii* | 48 |
| Pawpaw | *Asimina* spp. | 25,54 |
| Peach | *Prunus persica* | 22 |
| Peacock Ginger | *Kaempferia* spp. | 59 |
| Pear | *Pyrus* spp. | 15 |
| Pecan | *Carya* spp. | 6 |
| Pentas | *Pentas lanceolata* | 61,66 |
| Peregrina | *Jatropha integerrima* | 21,32 |
| Perennial Peanut | *Arachis glabrata* | 43 |
| Periwinkle | *Catharanthus roseus* | 44,55,65 |
| Periwinkle | *Vinca major* | 46 |
| Petunia | *Petunia x hybrida* | 67 |
| Philodendron | *Philodendron* cvs. | 34,61 |
| Pigeonberry | *Duranta erecta* | 29 |
| Pigeonplum | *Coccoloba diversifolia* | 12 |
| Pindo Palm | *Butia capitata* | 17,48 |
| Pine Cone Ginger | *Zingiber zerumbet* | 64 |
| Pineapple Guava | *Acca sellowiana* | 25 |
| Pineland Lantana | *Lantana depressa* | 38 |
| Pink Allamanda | *Mandevilla* cvs. | 42 |
| Pink Trumpet Tree | *Tabebuia heterophylla* | 16 |
| Pinwheel Flower | *Tabernaemontana divaricata* | 16,36 |
| Pinxter Azalea | *Rhododendron canescens* | 35 |
| Pipestem | *Agarista populifolia* | 25 |
| Pipevine | *Aristolochia* spp. | 40 |
| Pittosporum | *Pittosporum* cvs. | 34 |
| Plectranthus | *Plectranthus* spp. | 62 |
| Plumbago | *Plumbago auriculata* cvs. | 62 |
| Podocarpus | *Podocarpus macrophyllus* | 34 |
| Poinciana | *Caesalpinia* spp. | 12,38 |
| Pond Cypress | *Taxodium ascendens* | 11 |
| Pop Ash | *Fraxinus caroliniana* | 7 |
| Porterweed | *Stachytarpheta* spp. | 63 |
| Pot Marigold | *Calendula* spp. | 65 |
| Powderpuff | *Calliandra* spp. | 17,27 |
| Powderpuff | *Mimosa strigillosa* | 60 |
| Pride of India | *Lagerstroemia speciosa* | 14 |
| Princess Flower | *Tibouchina urvilleana* | 36 |

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| Purple Coneflower | *Echinacea purpurea* | 57 |
| Purple Lovegrass | *Eragrostis spectabilis* | 47 |
| Purple Trumpet Tree | *Tabebuia impetiginosa* | 16 |
| Pygmy Fringetree | *Chionanthus pygmaeus* | 18,28 |
| Queen's Crape Myrtle | *Lagerstroemia speciosa* | 14 |
| Queen's Wreath | *Petraea volubilis* | 42 |
| Rain Lily | *Zephyranthes* spp. | 64 |
| Rain-of-Gold | *Galphimia glauca* | 30 |
| Red Bay | *Persea borbonia* | 15 |
| Red Buckeye | *Aesculus pavia* | 16 |
| Red Cedar | *Juniperus virginiana* | 7 |
| Red Mangrove | *Rhizophora mangle* | 16 |
| Red Maple | *Acer rubrum* | 6 |
| Retama | *Parkinsonia aculeata* | 22 |
| River Birch | *Betula nigra* | 6 |
| River Oats | *Chasmanthium latifolium* | 46 |
| Rose | *Rosa* spp. | 39 |
| Rosemary | *Rosmarinus* spp. | 39 |
| Rotund Holly | *Ilex rotunda* | 14 |
| Round Holly | *Ilex rotunda* | 14 |
| Roundleaf Holly | *Ilex rotunda* | 14 |
| Royal Fern | *Osmunda regalis* | 61 |
| Royal poinciana | *Delonix regia* | 13 |
| Rudbeckia | *Rudbeckia fulgida* | 62,67 |
| Ruffled Fan Palm | *Licuala grandis* | 49 |
| Rusty Blackhaw | *Viburnum rufidulum* | 24,37 |
| Rusty Lyonia | *Lyonia ferruginea* | 33 |
| Sabal Palm | *Sabal palmetto* | 51 |
| Sage | *Salvia spp.* | 62 |
| Salt-bush | *Baccharis halimifolia* | 17,26 |
| Salvia | *Salvia spp.* | 62 |
| Sand Live Oak | *Quercus geminata* | 23 |
| Sandankwa Viburnum | *Viburnum suspensum* | 37 |
| Sargent's Palm | *Pseudophoenix sargentii* | 50 |
| Sasanqua | *Camellia sasanqua* | 17,27 |
| Sasanqua Camellia | *Camellia sasanqua* | 17,27 |
| Satinleaf | *Chrysophyllum oliviforme* | 12 |
| Saucer Magnolia | *Magnolia × soulangiana* | 21 |
| Saw Cabbage Palm | *Acoelorrhaphe wrightii* | 48 |
| Saw Fern | *Blechnum serrulatum* | 54 |
| Saw Palmetto | *Serenoa repens* | 51 |
| Sawtooth Oak | *Quercus acutissima* | 9 |
| Scarletbush | *Hamelia patens* | 30 |
| Scrub Mints | *Conradina* spp. | 47 |
| Scrub Palmetto | *Sabal etonia* | 39,51 |
| Sea Myrtle | *Baccharis halimifolia* | 17,26 |
| Seagrape | *Coccoloba uvifera* | 19,29 |
| Selloum | *Philodendron selloum* | 34 |
| Sentry Palm | *Howea forsterana* | 49 |
| Seven Weeks Fern | *Rumohra adiantiformis* | 45 |
| Shell Flower | *Alpinia* spp. | 53 |
| Shell Ginger | *Alpinia* spp. | 53 |
| Shining Jasmine | *Jasminum nitidum* | 32 |
| Shiny Lyonia | *Lyonia lucida* | 38 |
| Shore Juniper | *Juniperus conferta* | 45 |
| Shortleaf Fig | *Ficus citrifolia* | 13 |
| Shrimp Plant | *Justicia brandegeana* | 59,66 |
| Shumard Oak | *Quercus shumardii* | 10 |
| Silver Buttonwood | *Conocarpus erectus* | 6,29 |
| Silver Palm | *Coccothrinax argentata* | 49 |
| Silver Trumpet Tree | *Tabebuia aurea* | 23 |
| Silverbell | *Halesia* spp. | 7 |
| Silverleaf | *Leucophyllum frutescens* | 38 |
| Simpson's Stopper | *Myrcianthes fragrans* | 21,33 |

| | | |
|---|---|---|
| Skyflower | *Duranta erecta* | *29* |
| Slender Lady Palm | *Rhapis humilis* | *51* |
| Small Sand Live Oak | *Quercus geminata* | *23* |
| Small-Leaf Confederate Jasmine | *Trachelospermum asiaticum* | *46* |
| Snake Lily | *Amorphophallus* spp. | *53* |
| Society Garlic | *Tulbaghia violacea* | *63* |
| Solitaire Palm | *Ptychosperma elegans* | *50* |
| Solitary Palm | *Ptychosperma elegans* | *50* |
| Southern Blackhaw | *Viburnum rufidulum* | *24,37* |
| Southern Magnolia | *Magnolia grandiflora* | *8* |
| Southern Maidenhair Fern | *Adiantum capillus-veneris* | *52* |
| Southern Red Cedar | *Juniperus silicicola* | *14* |
| Southern Red Oak | *Quercus falcata* | *9* |
| Southern Slash Pine | *Pinus elliottii* var. *densa* | *8* |
| Southern Sugar Maple | *Acer barbatum* | *6* |
| Spanish Oak | *Quercus falcata* | *9* |
| Sparkleberry | *Vaccinium arboreum* | *36* |
| Spider Lily | *Hymenocallis* spp. | *59* |
| Spineless Yucca | *Yucca elephantipes* | *37* |
| Spiraea | *Spiraea* spp. | *39* |
| Spiral Ginger | *Costus* spp. | *55* |
| Spotted Beebalm | *Monarda punctata* | *66* |
| Spotted Horsemint | *Monarda punctata* | *66* |
| Spruce Pine | *Pinus glabra* | *8* |
| St. Bernard's Lily | *Anthericum sanderii* | *43* |
| St. James Lily | *Sprekelia formosissima* | *63* |
| Star Anise | *Illicium* spp. | *21,31* |
| Star Jasmine | *Jasminum nitidum* | *32* |
| Star Jasmine | *Trachelospermum jasminoides* | *43,46* |
| Starflower | *Pentas lanceolata* | *61,66* |
| Stiff Cornel | *Cornus foemina* | *19* |
| Stiff Dogwood | *Cornus foemina* | *19* |
| Stokes' Aster | *Stokesia laevis* | *63* |
| Stoppers | *Eugenia* spp. | *20,30* |
| Strangler Fig | *Ficus aurea* | *6* |
| Sunshine Mimosa | *Mimosa strigillosa* | *60* |
| Swamp Bay | *Persea palustris* | *15* |
| Swamp Chestnut | *Quercus michauxii* | *10* |
| Swamp Chestnut Oak | *Quercus michauxii* | *10* |
| Swamp Cyrilla | *Cyrilla racemiflora* | *19,29* |
| Swamp Dogwood | *Cornus foemina* | *19* |
| Swamp Fern | *Blechnum serrulatum* | *54* |
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| Sweet Acacia | *Acacia farnesiana* | *16, 24* |
| Sweet Alyssum | *Lobularia maritima* | *66* |
| Sweet Bay Magnolia | *Magnolia virginiana* | *8* |
| Sweet Osmanthus | *Osmanthus fragrans* | *33* |
| Sweet Pepperbrush | *Clethra alnifolia* | *28* |
| Sweet Viburnum | *Viburnum odoratissimum* | *24,37* |
| Sweetgum | *Liquidambar styraciflua* | *7* |
| Sycamore | *Platanus occidentalis* | *9* |
| Tampa Mock Vervain | *Glandularia tampensis* | *45* |
| Tampa Vervain | *Glandularia tampensis* | *45* |
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| Tulip Tree | *Liriodendron tulipifera* | 7 |
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