UF IFAS Extension UNIVERSITY of FLORIDA

UF/IFAS PEER REVIEWED

ENH1341

doi.org/10.32473/edis-EP605-2021

Concepts for Sustainable Landscape Mosaics[1]

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Introduction

Florida is rapidly urbanizing, and with more and more new residents and businesses arriving daily, Florida's water resources may become limited in the future. If Florida continues to develop on trend, more than one-third of Florida's land will be developed by 2070 (UF GeoPlan Center et al. 2017). Nationwide, landscape irrigation is estimated to account for nearly one-third of all residential water use (EPA 2017). In order to be a steward of Florida's natural resources, it is important to create landscapes that do not use excessive amounts of water, fertilizer, pesticides and other resources. The concepts of Florida-Friendly Landscaping™ have been around since 1991 and continue to offer sustainable landscaping principles, including what is outlined in this document. This EDIS publication is for Florida homeowners, residential and commercial property managers, and landscape architects interested in creating aesthetically pleasing landscapes and to help individuals choose the right plant for the right place.

This document considers the need for sustainable landscaping in Florida, as well as the desire for aesthetically pleasing landscapes. As proposed by Piet Oudolf, a prominent Dutch garden designer, there is beauty in all seasons, and the dieback of a plant, if placed properly, can add to the overall effect of the garden. In this publication, we define a mosaic as a landscape composed of plants that bloom at specific times, have seasonality (including dieback), and exhibit different textures, shapes, and sizes. One can create a mosaic image of sustainable landscaping by selecting and utilizing Florida-friendly and native plants.

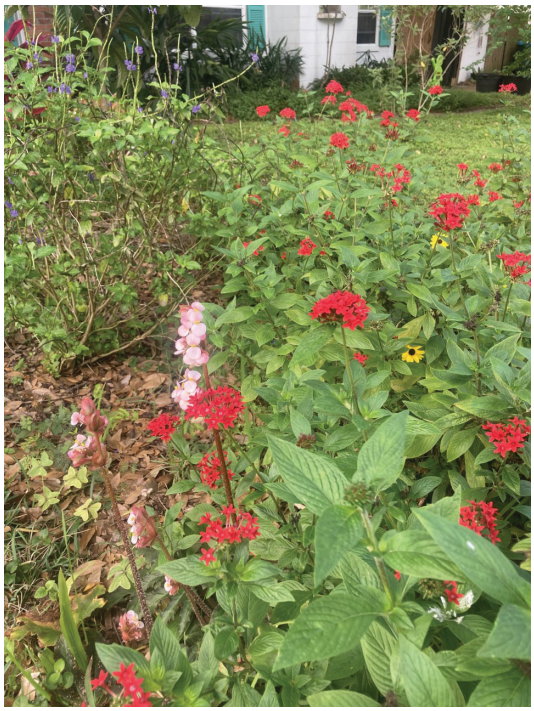

Figure 1. *Pentas lanceolata* (red) is interspersed with *Helianthus debilis* (yellow) and *Stachytarpheta jamaicensis* (purple) in the front yard of a residential home.
Credits: Tina McIntyre, UF/IFAS

Landscaping offers a great opportunity for homeowners to mimic Florida's beautiful natural environments and incorporate water-wise plant selections into their designs. We've created two primary mosaic concepts that embrace and highlight a certain theme. They include the pollinator concept and the seasonal concept, which can be used separately or combined to help landscapers, homeowners,

1. This document is ENH1341, one of a series of the Environmental Horticulture Department, UF/IFAS Extension. Original publication date June 2021. Visit the EDIS website at https://edis.ifas.ufl.edu for the currently supported version of this publication.

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landscape architects, and HOAs (homeowners' associations) responsibly choose appealing plants to meet that conceptual goal.

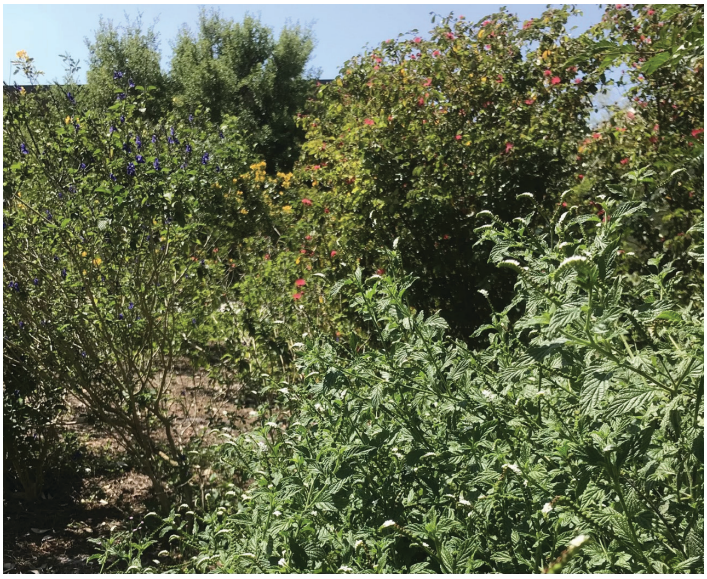

Figure 2. Scorpion tail, *Heliotropium angiospermum*, in the front of the mosaic garden, with *Calliandra hematocephala* (pink), *Stachytarpheta frantzii* (purple), and *Senna mexicana* var. *chapmanii* (yellow) in the background.
Credits: Rachel Gutner, UF/IFAS

Green spaces, such as residential yards, commercial properties, and shared communal parks, enrich our lives in many different ways. Horticulture is linked to improved mental health, improved human performance and energy, reduced stress, and much more. There are also economic benefits to investing in green spaces, such as reduced healthcare costs and increased property values. Green spaces reduce noise pollution and stormwater runoff and help to improve water quality by absorbing nutrients from pet waste, excess landscape fertilizers, and toxic organic chemicals such as pesticides before they enter surrounding waterways. They also reduce heat and cold damage in urban areas (International Society for Horticultural Science 2012). By embracing these plant concepts and proposed species in your yard, managed area, or shared space, you and your community can actualize these mental, physical, and financial benefits.

Site Preparation and Management

The best way to control weeds is to prepare your land effectively prior to installation. With a little time and planning, you can manage weeds by solarizing the area (McSorley and Gill 2019). Solarize your garden space by removing as much of the existing undesired plants as you can, then wet the soil thoroughly. Cover the area with 1 ml thick polyethylene (PE) heavy-duty clear plastic and secure the edges with landscape ties or soil to trap heat, prevent photosynthesis, and smother the remaining unwanted plants or seeds. Leave this covering on for about six to eight weeks. When you remove the plastic, all the roots of the weeds in the upper 4"–6" of soil should be dead. Because this treatment only targets the upper part of the soil, deeper soil may still be affected by pests, and after 3–4 months, the effects of solarization diminish (McSorley and Gill 2019).

Soil tests, which can be sent to the UF/IFAS Extension Soil Testing Laboratory (ESTL), will help determine the site conditions most accurately. See the pH column in Table 1 below to determine if the selected plants will do well in your site. Most plants will benefit from soil enhancement, but native plants are particularly well suited to sandy soil and acidic conditions. If you wish to enhance your soil, we recommend mixing organic material into the existing soil during this phase (Treadwell et al. 2019).

Although native plants typically require less maintenance and fewer resources, it is virtually impossible to create a landscape with no maintenance. Weed control (including invasive species removal) is important to maintaining the aesthetics of a landscape. However, before weeds can be controlled, they must be identified. Landscape managers or property owners should identify the weed and determine if it is problematic before removing it. Some weeds, if not invasive, might be a good addition to the landscape, depending on its purpose. To identify a plant you are unfamiliar with, visit the UF/IFAS Weed Identification Guide, submit a specimen to your local Master Gardener Volunteer program, or submit a specimen to the Distance Diagnostic and Identification System.

After planting, two to three inches of mulch should be applied to the landscape to suppress weed germination, hold moisture in the root zone, prevent erosion and provide aesthetic uniformity. Pine needles and other leaves are a sustainable selection while being readily available most of the year. Lightly pruning plants at certain times of the year will help regenerate growth and promote blooms. Plant replacement might also be necessary if some plants fail to thrive due to natural causes.

Pollinator Concept

A pollinator is any animal that helps carry pollen from the male part of the flower to the female part of the same or another flower. Pollination must occur for the plants to become fertilized and produce fruits, seeds, and young plants. The relationship between pollinators and plants is one of the oldest and most striking symbiotic relationships that still exists today. This symbiosis can be observed in your yard: hummingbirds are naturally drawn to the

reddish flowers of coral porterweed, *Stachytarpheta mutabilis*, and their long tongues are perfectly adapted to the long broad tubes of the flower, which lead to a high nectar reward. Hummingbirds pollinate by tending to plants with long nectaries: as they forage for nectar, pollen sticks to their beaks and faces and spreads to other plants. Through this relationship, pollinators feed and the female plant parts are fertilized. If successful, plant pollination leads to seeds that, when germinated, differ genetically from the parent. Further, the leaves of some pollinator plants may serve as food for the larval stages (i.e., caterpillars) of certain butterflies and some insects. Plants that also function as larval host plants are designated in the plant matrix. This dance and relationship that is mutually beneficial and reciprocal carries the species involved through time and space.

Pollinators are essential to human existence; their efforts contribute to a third of all food that humans eat. Even if pollinators are not directly pollinating human food crops, those plants often feed other organisms that we depend on. Pollinators also contribute greatly to healthy ecosystems because they transport pollen to plants that stabilize our soil, clean our air, supply oxygen, and support wildlife.

It is important to provide a habitat oasis to native and nonnative pollinators, such as bees, butterflies, and wasps. Some birds and hummingbirds are also effective pollinators. Many birds consume the fruits and excrete the seeds, which spreads the plant offspring. By creating a pollinator-focused landscape, you create a refuge for these vital creatures. Table 1 outlines many plant species that are suitable for pollinator gardens, with host species denoted by a dagger. Additionally, mobile web applications, such as the FFL Plant Guide, are available to assist with choosing native and nonnative pollinator plants and to learn about Florida's diverse butterfly (https://ffl.ifas.ufl.edu/butterflies) and bee pollinators (https://ffl.ifas.ufl.edu/bees).

Because this concept focuses on wildlife, it is important not to use harsh chemicals when managing weeds. Some chemicals and common weed killers can also kill some species of bees, particularly honeybees (McSorley and Gill 2019).

Seasonal Concept

Florida's natural ecosystems typically have a colorful display in fall and spring. Table 1 offers a list of plants that bloom by season. The "Year-Round" section contains plants that bloom throughout the year.

Because the list is primarily organized by bloom period, landscapers and homeowners also have the option of creating a colorful seasonal landscape. Florida's unique, semitropical environment creates a hotbed of plants that respond to seasonal changes. These plants can make for an eye-catching yard full of blooms up to 6 months out of the year. We encourage landscapers and homeowners to explore the idea of nature-inspired, seasonally based landscapes because they highlight Florida's many attractive plants. With the tendency for seasonally interesting plants to die back, many plants that are listed provide strong structural integrity with evergreen foliage.

Plant Matrix

Listed here are Florida-friendly plants organized by seasonal bloom period. All plants in this list are pollinator plants, meaning that their blooms provide a significant source of either nectar or pollen. Some of the species also function as host plants, providing food and resources for the larval stages of adult pollinators. The growing information for each plant is included, such as USDA hardiness zones, pH preference, light and moisture preferences, native status, and perennial/annual condition.

Because all annuals selected reseed, the homeowner/groundskeeper does not have to worry about replacing the entire section when the plant dies back. Some perennials, marked with an asterisk, also reseed, but not as prolifically.

Special thanks to Dr. Timur Momol, District Director for UF/IFAS Extension Central District, for funding and inspiration for this project.

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Figure 3. Colorful bracts of spotted bee balm (*Monarda puntata*) and floral visitation by a wasp pollinator.
Credits: Tina McIntyre, UF/IFAS

Figure 4. Pollinator on *Bidens alba*, which is typically targeted as a weed but can be a good source for pollinators. Also pictured, *Pentas lanceolata*.
Credits: Tina McIntyre, UF/IFAS

Figure 5. *Gaillardia pulchella* providing great ground coverage for soil and habitat for pollinators.
Credits: Tina McIntyre, UF/IFAS

Figure 6. Rapidly growing dune sunflower, *Helianthus debilis*.
Credits: Tina McIntyre, UF/IFAS

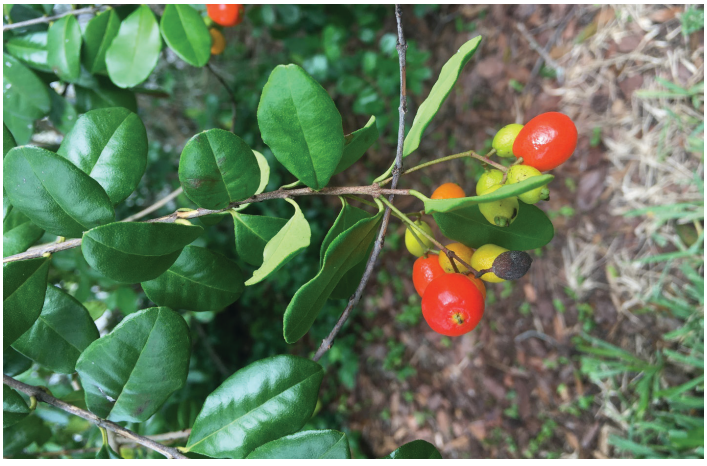

Figure 7. Berries and leaves of the native Simpson's stopper, *Myrcianthes fragrans*.
Credits: Tina McIntyre, UF/IFAS

Figure 8. Butterfly on *Pentas lanceolata*.
Credits: Tina McIntyre, UF/IFAS

Figure 9. Bumble bee on hairy chaffhead, *Carphephorus paniculatus*.
Credits: Tina McIntyre, UF/IFAS

Figure 10. *Rudbeckia* sp. cultivated in a backyard.
Credits: Tina McIntyre, UF/IFAS

Figure 11. *Phlox* sp. growing after reseeding itself from a previous year.
Credits: Tina McIntyre, UF/IFAS

Figure 12. *Rudbeckia fulgida* growing in a cultivated governmental landscape.
Credits: Vincent Marcucci

Figure 13. *Lantana involucrata*.
Credits: Vincent Marcucci

Figure 14. American beauty berry, *Callicarpa americana,* showcasing its beautiful purple berries.
Credits: Vincent Marcucci

Figure 15. Purple porterweed, *Stachytarpheta frantzii,* a common spring bloomer of Florida's natural areas.
Credits: Vincent Marcucci

Figure 16. *Stachytarpheta jamaicensis* (purple) is showcased with *Pentas lanceolata* (red) and Heli*anthus debilis* (yellow).
Credits: Tina McIntyre, UF/IFAS

Table 1. This table lists selected Florida-friendly plants in order of bloom period: fall, spring, or year-round. Native status, USDA Zone, and pH are listed as well. N/A in the pH column means that the preferred pH was not available. An asterisk (*) on the binomial denotes a reseeding perennial. A dagger (†) on the binomial name of the plant signifies that the species serves as a host plant.

Binomial	Common Name	Native	USDA Zone	pH	Wet	Dry	Sun	Part-Shade	Shade	P/A
Fall Bloom										
Ampelaster carolinianus (a.k.a. *Symphyotricum carolinianum*)	Climbing aster	Yes	8a–11	5.1–6.5	x	x	x			P
Asclepias incarnata †	Swamp milkweed	Yes	3b–11	6.5–8.0	x		x			P
Asclepias perennis †	Aquatic milkweed	Yes	6a–9b	5.1–7.5	x		x	x		P
Caesalpinia pulcherrima	Dwarf poinciana	No	9a–11	6.1–7.8		x	x			P
Calliandra haematocephala	Powderpuff tree	No	9a–11	6.0–7.5	x	x	x	x		P
Callicarpa americana (Figure 14)	American beautyberry	Yes	6–10b	5.2–7.0		x	x	x		P
Carphephorus paniculatus (Figure 9)	Deer tongue/hairy chaffhead	Yes	8a–9b	5.8–7.0	x	x	x			P
Chamaecrista fasciculata†	Partridge pea	Yes	3–9b	6.0–8.0		x	x			A
Chrysopsis floridana	Florida goldenaster	Yes	9a–9b	5.5–7.0		x	x			P
Chrysopsis mariana	Maryland goldenaster	Yes	4a–10b	5.1–7.5	x		x			P
Chrysopsis subulata	Scrubland goldenaster	Yes	8a–11	N/A		x	x			P
Conradina canescens	False rosemary	Yes	8a–9b	<6.0		x	x			P
Echinacea purpurea†	Purple coneflower	Yes	3–8b	6.5–7.2		x	x	x		P
Heliotropium curassavicum	Seaside/salt heliotrope	Yes	3a–11	6.5–8.5	x	x	x	x		P
Liatris spicata†	Slender head blazing star	Yes	8a–10b	5.6–7.5	x	x	x			P
Monarda punctata (Figure 3)†	Spotted bee balm; horsemint	Yes	3a–8b	6.1–7.8		x	x			P
Muhlenbergia capillaris	Pink muhly grass	Yes	7a–11	5.8–6.8		x	x	x		P
Ocimum basilicum	Sweet basil	No	2a–11	5.1–8.5		x		x	x	P
Oenothera lindheimeri	Whirling butterflies/ beeblossom	No	5–9b	6.1–7.8		x	x			P
Palafoxia integrifolia	Coastal plain palafox	Yes	9a–10b	4.5–7.5		x	x			P
Passiflora incarnata†	Purple passion vine	Yes	5a–10b	6.1–7.5		x	x			P
Pityopsis graminifolia	Narrow leaf silk grass	No	8a–11	5.8–7.0		x	x			P
Polygonella polygama	Jointweed	Yes	9a–10b	4.5–5.5		x	x	x		P
Psychotria nervosa	Wild coffee	Yes	9a–11	6.1–7.5		x	x			P
*Silphium asteriscus**	Starry rosinweed	Yes	8a–10b	5.1–7.6		x	x	x		P
Rudbeckia hirta (Figure 10)	Black-eyed Susan	Yes	8a–10b	6.0–7.0		x	x			A
Rudbeckia laciniata	Green headed/cutleaf coneflower	Yes	8a–8b	4.5–7.0	x		x	x		P
Ruellia caroliniensis†	Carolina wild petunia	Yes	6a–10b	7.9–8.5	x	x	x	x	x	P
Salvia azurea	Azure blue sage	Yes	5–9b	6.1–7.8		x	x			P
Salvia miniata	Belize sage	No	9a–11	6.1–7.8		x	x			P
Senna ligustrina†	Privet senna	Yes	9a–11	6.1–7.8		x	x			P
Senna mexicana var. *chapmanii*† (Figure 2)	Bahama senna	Yes	10a–11	>7.0		x	x			P
Serenoa repens†	Saw palmetto	Yes	6a–11	5.6–6.5	x	x	x			P

Binomial	Common Name	Native	USDA Zone	pH	Wet	Dry	Sun	Part-Shade	Shade	P/A
*Solidago odora**†	Sweet goldenrod	Yes	8b–11	5.6–7.8		x	x			P
*Solidago sempervirens**†	Seaside goldenrod	Yes	3a–8a	5.5–7.5		x	x	x		P
Sorghastrum secundum†	Lopsided Indiangrass	Yes	8a–9b	6.1–6.5		x	x			P
Spartina bakeri	Sand cordgrass	Yes	8a–10b	6.8–7.2		x	x			P
Stokesia laevis	Stoke's aster	Yes	8a–10b	5.6–7.0		x	x	x		P
Trichostema dichotomum	Blue curls	Yes	8a–11	N/A		x	x			A
Tripsacum floridanum†	Dwarf fakahatchee grass	Yes	8a–10b	7.9–8.5		x	x	x		P
Vernonia angustifolia	Narrow-leaf ironweed	Yes	8a–9b	5.1–7.5		x	x	x		A
Spring Bloom										
Asclepias incarnata†	Swamp milkweed	Yes	3b–11	6.5–8.0	x		x			P
Asimina obovata†	Flag pawpaw	Yes	8a–10b	6.0–6.8		x	x	x		P
Asimina pygmaea†	Dwarf pawpaw	Yes	7a–10b	5.0–7.0	x	x	x	x		P
Caesalpinia pulcherrima	Dwarf poinciana	No	9a–11	6.1–7.8		x	x	x		P
Calamintha ashei	Ashe's calamint	Yes	8a–9b	6.1–7.8		x	x			P
Calliandra haematocephala	Powderpuff tree	No	9a–11	6.0–7.5		x	x			P
Callicarpa americana	American beautyberry	Yes	6–10b	5.2–7.0	x	x	x	x		P
Coccoloba uvifera	Seagrape	Yes	9a–11	4.5–7.2		x	x	x		P
Coreopsis lanceolata	Large-flower tickseed	Yes	4–9b	6.0–7.0	x	x	x	x	x	A
Duranta erecta	Sapphire showers duranta	No	9b–11	5.6–7.5		x	x	x	x	P
Dyschoriste oblongifolia†	Oblong snakeherb	Yes	8a–11	6.0–7.2	x	x	x	x		P
Heliotropium curassavicum	Seaside/salt heliotrope	Yes	3a–11	6.5–8.5		x	x	x		P
Ilex glabra†	Gallberry	Yes	8–10a	4.5–6.5		x	x	x	x	P
Lonicera sempervirens†	Coral honeysuckle	Yes	8–9b	4.5–7.2	x			x		P
Magnolia grandiflora	Southern magnolia	Yes	8–9b	4.5–7.2	x	x	x	x		P
Magnolia virginiana	Sweet bay magnolia	Yes	8–9b	4.5–6.5		x	x	x	x	P
Myrcianthes fragrans (Figure 7)	Simpson's stopper	Yes	10a–11	7.9–8.2		x	x			P
Oenothera simulans†	Southern beeblossom	Yes	7a–11	N/A		x	x	x		P
Passiflora incarnata†	Purple passion vine	Yes	5a–10b	6.1–7.5		x	x			P
Phlox divaricata	Wild blue phlox/phlox woodland	Yes	3a–8b	6.8–7.2		x	x	x		A
Phlox drummondii	Annual phlox	No	2a–11	6.1–7.2		x	x			A
Psychotria nervosa	Wild coffee	Yes	9a–11	6.1–7.5		x	x	x		P
Rhododendron austrinum or *Rhododendron canescens*	Azalea	Yes	8–10b	4.5–6.5		x	x	x		P
Rudbeckia hirta	Black-eyed Susan	Yes	8a–10b	6.0–7.0		x	x	x	x	A
Ruellia caroliniensis†	Carolina wild petunia	Yes	6a–10b	7.9–8.5	x		x			P
*Scutellaria integrifolia**	Skullcap	Yes	6b–9a	4.8–5.2		x	x	x		P
*Silphium asteriscus**	Starry rosinweed	Yes	8a–10b	5.1–7.6		x	x			P
Stachytarpheta frantzii (Figure 15)	Large-flowered purple porterweed	No	9b–11	6.1–7.8		x	x	x		P
Stachytarpheta jamaicensis	Porterweed	Yes	8b–11	6.1–7.8	x	x	x	x	x	P
Trichostema dichotomum	Blue curls	Yes	8a–11	N/A		x	x	x		P
Tripsacum floridanum†	Dwarf fakahatchee grass	Yes	8a–10b	7.9–8.5		x	x			A

Binomial	Common Name	Native	USDA Zone	pH	Wet	Dry	Sun	Part-Shade	Shade	P/A
Vaccinium darrowi	Little blueberry	Yes	8–10b	<7.0		x	x	x		P
Vaccinium myrsinities	Shiny blueberry	Yes	8a–11	<7.0		x	x	x		P
Viburnum obovatum	Walter's viburnum	Yes	8–10b	4.5–8.0		x	x	x		P
Viburnum odoratissimum	Sweet viburnum	No	8b–10a	4.5–8.0		x	x	x		P
Year-Round Bloom										
Berlandiera subacaulis	Florida greeneyes	Yes	8b–11	5.1–7.5	x	x	x	x		P
Calliandra emarginata	Dwarf powderpuff	No	9a–11	7.9–8.5		x	x	x		P
Funastrum clausum†	White twinevine	Yes	9b–11	6.0–8.5	x	x	x	x		P
Gaillardia pulchella (Figure 5)	Indian blanket flower	Yes	8a–11	7.0–8.5		x	x			A
Glandularia maritima	Beach verbena	Yes	9a–11	Calcareous but adapable		x	x	x		P
Hamelia patens	Firebush	Yes	9a–11	5.5–8.2		x	x	x		P
Helianthus debilis (Figures 1, 6, and 16)	Dune sunflower	Yes	8b–10	5.5–8.2		x	x	x		P
*Heliotropium angiospermum** (Figure 2)	Scorpion tail	Yes	8a–9b	7.9–8.5		x	x	x		P
Heliotropium polyphyllum	Pineland heliotrope	Yes	8a–11	6.1–6.8		x	x	x		P
Lantana depressa	Florida lantana or gold lantana/cream carpet	Yes	10a–11	>7.2		x	x			P
Lantana involucrata (Figure 13)	Buttonsage, wild lantana	Yes	8a–11	6.6–7.3		x	x			P
Passiflora suberosa†	Corkystem passionflower	Yes	9a–11	7.5–8.5		x	x			P
Pentas lanceolata (Figures 4 and 8)	Egyptian starcluster	No	10a–11	6.5–7.1		x	x	x		P
Phyla nodiflora†	Frogfruit	Yes	6a–11	4.5–8.0	x	x	x	x	x	P
*Rivina humilis**	Rouge plant, pigeon berry	Yes	8a–10b	6.1–7.8		x	x	x		P
Salvia leucantha	Mexican sage	No	4a–12	7.6–9.0		x	x			P
Salvia longispicata × *farinacea*	Mystic spires blue sage	No	7–10a	6.1–7.8		x	x	x	x	P
Stachytarpheta jamaicensis	Blue porterweed	Yes	8b–11	6.1–7.8		x	x	x		P
Zamia pumila†	Coontie	Yes	8b–11	4.5–8.0		x	x	x	x	P