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Features

4 Meadows for Home Landscapes:
More Than Just Wildflowers

The zeal to use native wildflowers to create pollinator gardens falls short of meeting the maximum value that a pollinator garden is capable of providing. Learn how adding native grasses increases the diversity of plants and pollinators. Article and photos by Craig Huegel.

8 Rethinking Florida’s Urban Trees

Florida’s natural tree populations have been vastly reduced as more and more people have settled here. In suburban communities new trees have been planted at much lower densities than the original populations. In urban areas, tree density is even lower, but urban trees provide a number of important benefits. Article and photos by Ginny Stibolt.

12 The Native Passionflowers of Florida

There are six native members of the genus Passiflora in Florida. Two of the most common species are popular among gardeners because of their availability, but especially because they serve as larval host plants for a variety of butterflies. Article and photos by Roger L. Hammond.
Rethinking Florida’s Urban Trees

Article and photos by Ginny Stibolt

Florida’s natural tree populations have been vastly reduced as more and more people have settled here. In suburban communities new trees – often non-native species – have been planted at much lower densities than the original populations. In urban areas, the tree density is even lower, but urban trees provide a number of important benefits. While restoring more native tree habitat in suburban areas is relatively straightforward, in urban areas there are some complicating factors, so it’s time to rethink Florida’s urban trees.

Urban heat island effect

According to the Environmental Protection Agency (EPA), “the annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F warmer than its surroundings during the day. But in the evening, the difference can be as high as 22°F. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution, greenhouse gas emissions, heat-related illness, mortality, and water pollution.”

The usual advice to combat the urban heat island effect is to plant more trees. The benefits of trees in cities are amazing.

- An urban tree canopy helps to cool the air between four to twelve degrees Fahrenheit, depending upon conditions. This temperature reduction can reduce the need for air conditioning by up to 30%. The cooling by trees is due to a combination of shade and transpiration. Transpiration is the process where more than 90% of water that a plant absorbs runs right through it and evaporates through the stomata (pores) on the leaves. As each water molecule goes from liquid to gas, the air is cooled.
- A single healthy, full-grown tree absorbs more than 4,000 gallons of water per year. This helps to mitigate street flooding and reduce the strain on stormwater management systems, but this effect will be far greater if the trees are installed with infrastructure designed for this purpose, such as curb cuts and bioswales or more technical systems with grates and overflow drainage. Integrating stormwater management with tree installations is beyond the scope of this article, but do your research to come up with the most viable solution for your situation before beginning an urban tree program.
- A single, healthy, full-grown tree absorbs about 300 pounds of carbon dioxide, our most abundant greenhouse gas, each year. Other urban air pollutants are also absorbed and metabolized.
- The presence of healthy trees improves neighborhood real estate values.
Baltimore, Maryland values each tree in its canopy at $57,000, which includes all the benefits of reduced temperatures, reduced pollution, carbon sequestration, water absorption, increased tax base, and decreased crime. When trees are viewed as an investment like this, the arguments for preserving and maintaining them are easier to make, because urban trees require more care than those growing in a forest.

The monetary value of trees in Florida is probably higher than those further north. In fact, Florida has more urban trees than any other state, especially in the northern half of the state. Tallahassee is among America’s most treed cities with 55% total tree coverage, the highest percentage of any comparable city.

Successful urban tree programs are complex tapestries of public and private initiatives

Once it’s decided that a new tree program will happen, it’s best to include local residents early in the planning so they’ll know what’s going on and play a part in some of the decision making. This is especially important if they are expected to help with ongoing irrigation, maintenance, and clean up. In some cases, public/private partnerships to implement and manage ongoing support for greening projects in cities work well.

A good example of this is Friends of High Line Park in New York City (www.thehighline.org), which raised funds for the creation and ongoing maintenance of this immensely popular park. Built on a section of abandoned elevated train tracks, this park has enhanced and uplifted the nearby neighborhoods on the west side of Manhattan.

Ideas to consider when planning an urban tree program

Wherever possible, keep old trees. Mature trees soak up more water, absorb more carbon dioxide, produce more oxygen, and provide more shade than newly planted trees. It might take a newly planted tree 15 or 20 years to gain enough size to provide the level of benefits provided by a mature tree. Baltimore places a high value on each tree to make the case for financial support. This protects trees with a well-planned program of monitoring and maintenance. In many cases it also means rethinking sidewalks and curbs to accommodate the roots of mature trees.

For new plantings, select a variety of native trees that will work well in an urban setting. Instead of the default option of planting the same tree species up and down every street, select five to ten different species planted more randomly. This diversity avoids the problems that happened a generation ago when Dutch elm disease decimated elm-lined streets in the northern region of the country. Elms were glorious – perfect street trees with high arching branches – but communities lost their entire tree canopy. Planting a variety of trees means that if one species suffers a blight, the spread will be slower and other tree species will continue on. Also, different species may react differently to climate change, so having a variety of trees will make the urban tree canopy more resilient. A diversity of native trees and shrubs also provides better support for birds, butterflies, and other wildlife that need our help in the face of climate change.
Characteristics of sustainable street trees

Size – Smaller native trees will grow well in a variety of planting locations. But wherever there is room, even in small pocket parks, choose medium to large native trees, because they absorb more carbon dioxide, soak up more water, and cool the air more.

Shape – Reduce tree interference with the movement of people and cars. Choose trees with a more vertical shape whose branches grow at an upward angle, not straight out or drooping down.

Maintenance – Trees that don’t send up a lot of suckers or knees from the base require less maintenance as do trees that are not too messy. When fruits and leaves are dropped in a short amount of time, clean-up does not become a year-round project.

Water use – Florida has a seven-month dry season. Where there are curb cuts or rain gardens that soak up urban rainfall, choose trees that can withstand both flooding and drought.

Spending time and money on urban tree programs is a smart investment

Increasing urban tree populations provides many benefits. Some are immediate and measurable, while others are harder to define. But people feel better physically and mentally when they live in cities with good tree canopies. Seeing more birds and butterflies is a bonus.

References and Further Reading:
- Heat Island Effect: [www.epa.gov/heat-islands](http://www.epa.gov/heat-islands)
- MS4 Stormwater Discharges from Municipal Sources: [www.epa.gov/npdes/stormwater-discharges-municipal-sources](http://www.epa.gov/npdes/stormwater-discharges-municipal-sources)
- The Baltimore Tree Trust: [www.baltimoretreetrust.org/](http://www.baltimoretreetrust.org/)
- The USDA Urban Natural Resources Stewardship website: [www.nrs.fs.fed.us/urban/utc/](http://www.nrs.fs.fed.us/urban/utc/)

A look at Jacksonville’s LaSalle bioswale project

This bioswale project had a lot of initial support. The City of Jacksonville and various agencies in the city, including the St. Johns Riverkeeper, worked together to come up with a plan and found a big sponsor. It was completed in 2012 and was to be the first of many bioswales. Over the years, no other such swales have been installed by the city and the maintenance of the LaSalle bioswale is still handled by volunteers, not city workers.

I talked to Jimmy Orth, Executive Director for the St. Johns Riverkeeper, about this bioswale project a few years ago. I thought it was time for some updated questions about where things stand now and the possibility of similar projects in the future. Here is the Q & A:

Ginny Stibolt (GS): Have any more bioswale projects been built in Jacksonville since then? If not, what would change this?

Jimmy Orth (JO): There may have been a few constructed for private construction projects, but none by the City to manage stormwater. A big part of the problem is that the Florida Department of Environmental Protection has not adopted green infrastructure strategies as preferred stormwater Best Management Practices (BMPs) for local communities to meet their Municipal Separate Storm Sewer Systems (MS4) stormwater permit requirements. Many local governments, like Jax, are also reluctant to implement these strategies due to concerns about the effectiveness of green infrastructure BMPs (less research and data exist), a perception that they will cost more and be more difficult to maintain, and lack of consideration for the multiple benefits provided (aesthetics, water quality, resiliency, habitat, etc.).

GS: Are volunteers still doing all the maintenance on the bioswale, or have city workers taken over?

JO: Volunteers, but it really doesn’t require much maintenance since the plants have filled in.

GS: Are there regrets about the limited plant palette – bald cypress (Taxodium distichum), dwarf yaupon holly (Ilex vomitoria) ‘Nana’ (a male clone), muhly grass (Muhlenbergia capillaris), and sand cord grass (Spartina bakeri)?

JO: No. At the time, we wanted to use plants that were fairly easy to find, could easily be incorporated into other landscaping projects, and seemed like the best for this location.

GS: Are there any other lessons learned from this site?

JO: Bald cypresses really the best trees for this location? Won’t they get too large?

JO: No, cypress have proven successful in many right-of-way projects and seem to withstand dry conditions and the occasions when there may be periods of standing water.

GS: Are there any other lessons learned from this site?

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Dealing with container-grown trees

Here are two major considerations to increase success when using container-grown trees in urban environments. This advice does not apply to field-grown trees, which are often much larger and installed with heavy machinery.

1. Use younger, un-topped trees with a caliper of less than half an inch (caliper is the trunk diameter at six inches above the soil line). These small trees will adjust much faster to their new surroundings and will begin to grow more quickly than older ones that have been held in pots much longer. In an urban environment, young saplings will need protection for two years or more, so you will need to install two to four sturdy stakes placed firmly in soil surrounding the tree to protect it from foot traffic and more. It’s best not to tether the tree tightly to the stakes, because the tree should be able to move and grow.

2. The best practice for planting container-grown trees is to rinse all the growing medium away and to not add any amendments into the planting hole. This may go against everything you’ve heard before, but there is real science behind this advice. The growing medium in the container is much richer than the soil in the tree’s new location, so if you don't rinse it away, the roots will tend to circle around in the rich soil and not spread out. You want the roots to spread out so the tree will be more wind and drought tolerant.

Rinsing the roots also allows you to find and correct circling roots so the tree does not girdle itself as it grows. You can also find the real root flare, which is sometimes buried during repotting. It should be at least an inch or two above the final soil line, because trees that are planted too deeply don’t do as well. The root flare is the outward curve at the bottom of the trunk where the first roots act as a buttress to stabilize the tree. Trees that are grown from cuttings may not have well-developed root flares.

Dig a shallow, wide hole with a higher, solid center, because you don’t want the tree to sink. Spread out the roots in all directions. At this point, correct the circling roots. To keep them from coiling back toward the tree, stake them in place. Then mud in the tree’s roots with only the soil you dug out. This harsh treatment of the tree will require more initial irrigation at planting time and on a daily basis for a week or more and then a couple of times per week until it stops wilting. If you plant dormant trees, this is reduced because there are no leaves to wilt, but the roots still need to be watered during this period.

What to do with all that rich planting media that you rinsed away? Use it (mixed with compost if you have it) as a topdressing on the soil in a wide circle around the tree, but well outside of the planting hole. Don’t dig it into the soil, but you could add an organic mulch on top of it. This compost topdressing will enrich the soil outside of the planting hole and thus entice the tree’s roots to spread outward instead of circling in the planting hole. Mulch new trees with organic mulch such as chipped wood from tree cutters or pine needles to help retain moisture and reduce weeds, but do not let the mulch touch the trunks.

Reference:

Root rinsing: www.informedgardener.com
allowed to climb trees like it does in nature, even though John Vanderplank, in his book Passion Flowers (2000) writes, “It has little value as an ornamental pot plant or garden plant.” We lovers of Florida native plants would respectfully disagree. The sepals are green with very narrow greenish yellow petals, and the yellow filaments are green or white basally.

So, whether you grow Florida’s native passionflowers for their compelling blossoms, or to attract songbirds and butterflies, they are certain to add charm and beauty to your home garden.

References:

About the Author:
Roger L. Hammer is an award-winning professional naturalist, author, botanist and photographer. His most recent book is Complete Guide to Florida Wildflowers. Find him online at www.rogerlhammer.com

LaSalle bioswale project

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JO: I think the project has proven that green infrastructure can be successfully implemented as a stormwater management tool in Jax. With sea level rise and climate change now on the radar, the time has come to embrace green infrastructure and the benefits of natural solutions.

Takeaways from this project

• The state has not yet incorporated green infrastructure into their BMPs (Best Management Practices) and cities are reluctant to act on their own to do so.
• Organizing urban green infrastructure projects takes a lot of planning because there are so many groups that need to weigh in. And it’s very important to have local residents heavily involved.
• Plants and their landscapes do not take care of themselves in urban settings. Funding for coordination of ongoing care needs to be included in the initial cost.
• If bioswales will be the new normal, then city workers need training on how to care for them. Volunteers cannot be expected to do all the maintenance.

My personal take on the bioswale plant selection

Bald cypresses will be fine for a while, but they are large trees and may develop knees that could disrupt sidewalks and roads. They are excellent for large bioswales with lots of space because they tolerate standing water and drought. For this location, I would have chosen sweetbay magnolia (Magnolia virginiana), East Palatka holly (Ilex x attenuata), red maple (Acer rubrum), blackgum (Nyssa sylvatica) and cabbage palm (Sabal palmetto).

Male dwarf yaupon hollies will not feed birds. They get large if not trimmed back and also produce suckers. This project uses too many hollies and they are planted too close together. A variety of shrubs like beautyberry (Callicarpa americana), inkberry (Ilex glabra), native blueberries (Vaccinium spp.), and viburnums (Viburnum spp.) would be visually interesting and more useful to pollinators and wildlife.

The grasses are fine, but more than one species should be used, along with perennial wildflowers such as goldenrods (Solidago spp.) or swamp sunflower (Helianthus angustifolius).

Further Reading:
For background and project progress, visit: http://jaxlid.blogspot.com/
For a wide-ranging and detailed report on storm resiliency for Jacksonville, see: www.coj.net/sraidrcommittee. Click on two handouts for 05-10-19: “Jacksonville’s-storm-resiliency-and-infrastructure” (includes the LaSalle bioswale), and “Trees to Offset Stormwater Case Study.”

About the Author:
Ginny Stibolt is a botanist, native plant enthusiast, and an award-winning garden writer. She’s coauthor of Climate-Wise Landscaping: Practical Actions for a Sustainable Future (www.climatewiselandscaping.com) and author or coauthor of four Florida gardening books published by the University Press of Florida. Ginny’s blog is www.greengardeningmatters.com.