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Redesigning Your Yard This Spring

The spring season is a great time of year to work on widening and adding plant beds in your yard. Sometimes, though, it can be hard to know what plants to add to your garden. Luckily, there are several websites and places to get planting ideas and inspiration.

**Plant List.** The St. John’s River Water Management District has a searchable database of plants on their website at [floridaswater.com/waterwiselandscapes/](http://floridaswater.com/waterwiselandscapes/). The website allows you to narrowly search for plants based on type (e.g. fern, flowers, shrubs, trees, etc). You can also include specific information on the planting location to help you select the right plant for that spot.

**Garden Design.** For redesigning your yard, the Florida-Friendly Landscaping website at [www.floridayards.org](http://www.floridayards.org) is a great place to start. You can learn the principles of Florida-Friendly Landscaping, including planting the right plant in the right place. There is also an interactive yard tool that takes you through the steps needed to create a yard that needs no fertilizer or irrigation. This website also includes a searchable plant list.

Another resource is the Florida Yards and Neighborhoods Handbook. It includes not only detailed descriptions on how to add Florida-Friendly techniques to your yard, but it also includes a landscape planning worksheet. The handbook can be found at [fyn.ifas.ufl.edu/materials/FYN_Handbook_2015_web.pdf](http://fyn.ifas.ufl.edu/materials/FYN_Handbook_2015_web.pdf).

A good place to visit for design inspiration is the Hillsborough County Extension Office. It is located at 5339 County Road 579 in Seffner. Their Bette S. Walker Discovery Garden includes different themed areas, including: Florida-Friendly, wildlife habitat, backyard bar-b-que, sensory, and water features. The garden is open Monday through Friday from 8:15 a.m. until 4:45 p.m.

Solar Highways

Recently, France announced their plans to pave over 600 miles of their streets in solar panels. Over the next five years, they will lay special solar panels directly on top of existing streets.

The solar panels have been five years in development to test whether they can stand up to heavy, high-speed traffic. The panels are only 7 millimeters thick and their surface provides traction for vehicles to prevent slippery roads. They can even withstand temperature changes and small shifts in the pavement. Testing has shown they can last from 10 to 20 years, depending on the amount of traffic.

The project is expected to provide power to five million homes (about 8% of France’s population).

This type of technology has already proven successful in the Netherlands with a solar panel bike path. There is talk of bringing this technology to the United States. Maybe one day we will be driving on solar highways too!
Osprey Place Pond’s Transformation

The winner of the 2015 Best Maintained Pond Competition, Osprey Place Pond, in Sun City Center, has gone through a big transformation since they first started with the Adopt-A-Pond program three years ago. Here are some of their challenges and how they tackled them:

Erosion - One of the main reasons why the group applied to be a part of the Adopt-A-Pond program was because their shoreline was washing away. A lot of the rain water draining into their pond was directed over swales or low spots in between their houses. The pond’s worst shoreline erosion issues were in these areas. Through the program, they added clumps of muhly grass and sand cordgrass to the edge of the pond. These plants are helping slow down the water and hold the dirt in place.

Plants - Another main area of concern they had was the lack of plants around half of the pond. Not only was it contributing to the erosion issues, but they also did not like the look. For their first pond planting, they had over 20 of their neighbors, friends, and even people who lived on other ponds show up to help. They accomplished a lot in less than two hours of work. Before each planting, they would form their plan of attack. They would create a diagram showing the areas of the pond they would work on and the plants they would add. This helped them focus their attention and efforts. And although they had a large turnout at the first planting, they decided it was worth the expense to hire a pond company to install the plants for them. Their plant diagrams helped guide the company doing the planting. To celebrate the improvements being made, the group would also host a bar-b-que lunch.

Problem Plant Control - In the beginning, their existing management company visited the pond every month. After noticing the good plants dying, the pond group decided to make a change. Not only did they hire a different company, but they also reduced the frequency of visits down to twice a year. Now the problem plants are being specifically targeted with herbicide or hand pulled and the good plants are thriving.

Wildlife Habitat - With the variety of native plants and fewer problem plants, the pond group is noticing more wildlife using the pond. Each year, a couple sandhill cranes nest in the pond. To increase wildlife usage, the neighbors also built a bird nest box for the pond.

If you would like to transform your pond into a healthy pond environment, apply to be a part of the Adopt-A-Pond program. The application can be found at www.HillsboroughCounty.org/AdoptAPond.
“I Have Never Seen This Before”

We hear variations of this phrase all the time. Believe it or not, lakes are always changing, and so is everything else in nature. It may seem the same if we are not paying close enough attention, but it is not. Climate, rainfall, groundwater levels, building of roads and houses, air and water pollution, nutrients in the soil, growth rates, populations of plants, animals, and people…are changing all the time. With all that change, it is really no surprise that something new to you might occur in 10, 30, 50 or more years. As environmental scientists, we are seeing changes occurring all the time that have not happened in thousands of years. For example, sea-level rise. Miami Beach now floods at high tides. We also did not know about Multi-decadal Oscillations, weather patterns that occur on the scale of several decades. We simply had not been looking long enough to notice the cycles.

One of these oscillations that can influence your lake is El Niño. This pattern brings us more rain and warmer winters. Remember the record rains we had last summer? This was a new thing for us. We have had El Niño’s in the past, but not like that! This weather pattern can have longer reaching effects on your lake. More rain and a warm winter can result in algae blooms, increased plant growth, etc. You may not have seen these particular effects before, but there might be a slight difference this time around that has caused the change. It could be anything from fish and bird populations, to maintenance or lack of it on a nearby waterbody, to an increase in paved areas altering the microclimate over the lake. We just do not know.

One thing that helps in these situations is long-term monitoring. If you collect regular samples and other recorded measurements and observations, the results can go a long way in identifying causes and understanding if these changes are anything to worry about. Sign up to take monthly samples of your lake by emailing McGeeJ@HillsboroughCounty.org.

Plant Spotlight: Broadleaf Arrowhead

By: Kimberly Peyton, University of South Florida, Volunteer

*Sagittaria latifolia* is not an easy thing to say. Thankfully, it comes with an easier name to pronounce, broadleaf arrowhead. This plant averages three feet tall and likes to have its roots in the water. Their leaves are interesting for the shape they take: a large arrowhead that grows along the stems and points outward, hence the plant’s name.

Its small white flowers bloom along the top and add a pop of color against their green stems and large leaves. Broadleaf arrowhead is known to bloom in the summer and enjoys nice moist soil and warm sun to grow. However, because of their small average height, you would never have to worry about it blocking the view to your pond!

Another great thing about broadleaf arrowhead is that once established, it is known to be a good home for ducks and draws in songbirds with its lovely colors.
Resistance is NOT Futile

You may have heard about superbugs forming from overusing antibiotics. The same thing happens with weeds and bugs in the environment. Here is how it works:

In any population, there is natural variability. Unless you have identical twins, your kids will all look a little different. The same goes for every other reproducing thing. This may be variation in the thickness of a leaf coating, or a slightly faster metabolism, etc. Pesticides and herbicides work by altering various functions in the target’s life cycle, which causes it to die. Sometimes they stop a plant from photosynthesizing, block endocrine systems, etc. They also enter the target in different ways: root, leaves, mouth, etc. These small variations in the population can make a chemical less effective on some individuals over others.

If we keep using the same method of control long enough, we can actually kill off all the weaker individuals and leave only the ones that are resistant. Studies have shown that resistant traits pop up about one in a billion. That sounds like a lot, but every acre of duckweed contains about a billion plants. We treat literally thousands of acres of hydrilla and many square miles of food crops every year. It is no wonder we see resistance popping up.

To combat it, scientists try to develop a larger variety of chemicals. Managers do their part by watching kill rates and varying chemical use.

The surest way to prevent resistance from becoming a problem is to work smart. Our programs work on the premise that we should understand the root of an environmental problem and make minimal interventions to help the system correct itself. It is the difference between eating healthy so you do not get heartburn and taking pills to block your body’s signal that the food is bad for you. Eventually, treating the symptom instead of addressing the cause of the problem is going to catch up with you.

Two good examples of herbicide resistance found in some ponds and lakes are hydrilla and duckweed. In parts of the state where they have massive herbicide programs, resistance has been a problem that had people concerned for a few years. In Hillsborough County, herbicide resistant aquatic plants never really showed up because we approach invasive plant control differently.

There is no such thing as a magic bullet. Nature is really good at adapting. We have to take our cue from nature and learn how to be adaptable. Herbicides and pesticides are useful tools that help us a lot, but they are no substitute for good brains that can understand a problem and find good ways to resolve it. We call this Integrated Pest Management or IPM. Find out more here: [http://ipm.ifas.ufl.edu/](http://ipm.ifas.ufl.edu/)
Unsung Heroes: Dr. John L. Leal

This is the first in a series of articles highlighting people who changed our lives dramatically, but in ways most of us have never heard.

Have you ever heard of John L. Leal? Most people haven’t. He was a doctor in New Jersey at the turn of the 20th century. At that time, tens of thousands of people were dying from typhoid fever and chronic diarrhea. His job was to ensure that drinking water was safe.

Research at the time was pointing to contaminated water supplies and sanitary sewers were being constructed to remove wastes from cities. But this was only part of the problem. It did nothing for nonpoint source pollution or the stuff that gets in stormwater runoff. We still battle this pollution today, though the resulting problems are far less, largely because of Dr. Leal.

When Jersey City was constructing a new reservoir, it was found to be contaminated. Courts ruled that Dr. Leal had 90 days to fix it. He was convinced that adding chlorine to the water would solve the problem. It was doing wonders in hospital disinfection and had some success treating water in Europe. But people were afraid of the toxic chemical.

Dr. John L. Leal, however, stood on his convictions and built a chlorine injection system for the reservoir in near secrecy. Instantly, deaths from typhoid and other water borne illnesses plummeted.

Of course when people found out, Dr. Leal was called a terrorist and court cases continued. But the results were too powerful to argue with and Dr. Leal was vindicated. From there, chlorination spread across the country and is now so commonplace we don’t even blink at it. Thanks to Dr. Leal’s efforts, this process has saved millions of lives around the world.

Hillsborough County’s Drinking Water

Thanks to the discovery made by Dr. John L. Leal, we can turn on our sinks and feel confident we have safe drinking water. But where does that water come from in Hillsborough County? There are various sources, with the majority being managed by Tampa Bay Water.

Tampa Bay Water gets water from three main sources: groundwater, surface water, and seawater. Groundwater was once the only type of water used for drinking in our area. Some of the groundwater wells have been pumped for over 50 years.

River water was added to Tampa Bay Water’s sources for drinking water in the early 2000s. When water levels are high enough, they pump water from the Alafia River, Hillsborough River and the Tampa Bypass Canal.

Our third drinking water source comes from Tampa Bay. Tampa Bay Water collects seawater at the desalination plant located near Tampa Electric Company’s Big Bend Power Station. After collecting water from these three main sources, it goes through a multi-step process of treatment so it is safe for us to drink. Thanks to Dr. Leal’s discovery and other advancements along the way, we now have several sources of water and ways to treat it for drinking.
Record Rains Drive Slight Decline in Bay Water Quality

Two major segments of Tampa Bay showed slight declines in water quality last year. This followed record-setting summer rains that saw large volumes of untreated stormwater and wastewater discharged to the bay, as well as a recurring algae bloom.

Old Tampa Bay and Middle Tampa Bay - which together comprise 50% of the open waters of Tampa Bay - failed to meet their average annual targets for chlorophyll-a, an indicator of microscopic algae in the water. They have been designated as yellow, or “caution” areas in the annual “stoplight” report card used by bay managers to help assess the bay’s health.

Old Tampa Bay had exceptionally high chlorophyll levels for the months of August and September in comparison to previous years for which data is available (1974-2014). Middle Tampa Bay had chlorophyll concentrations that were higher than normal in September.

The “caution” rating means that corrective actions may be needed if water quality problems persist or worsen for two years or more.

All major bay segments had sufficient sunlight penetrating to the bay bottom to foster the growth of underwater seagrasses, a positive sign indicating that the elevated chlorophyll levels in Old and Middle Tampa Bay may be a short-lived, temporary response to the record-setting rains of last summer. An average of 15 inches of rain fell on the region in one two-week period last August, with higher amounts in many places.

Good water quality is critical to recovering underwater seagrasses that are the foundation of a healthy bay. Seagrass surveys announced last Spring showed that Tampa Bay had 40,295 acres of seagrass, more than at any time in the last 60 years.

To help track seagrass recovery, the Tampa Bay Estuary Program annually compares water quality to established targets in the bay and summarizes the results in a simple report card with a red, green and yellow color system. The rating system considers two factors: The amount of chlorophyll in the water, and the amount of visible sunlight penetrating the water column.

“Green” means a bay segment is meeting both measures of water quality, while “red” means it is not meeting either of them. “Yellow” indicates that an area failed to meet either chlorophyll or water clarity targets for a given year, and bears watching.

Prior to 2015, all bay segments met water quality goals for three years in a row. Local agencies will continue to check the water quality and seagrass coverage in Tampa Bay to see what trends will form over time.

Science Experiment: Make a Winogradsky Column

Invented in the 1880s by the microbiologist Sergei Winogradsky, the Winogradsky column is a tube of pond muck. With a few things added to the column and after leaving it in the sun for a few months, the muck begins to separate into different layers. These colorful layers are formed by different bacteria and algae based on their oxygen and sulphur needs.

To create your own Winogradsky column, you will need the following:

- Half a gallon of pond muck
- 1/4 page of shredded newspaper
- 1 egg yolk
- 1 two-liter soda bottle with the top cut off
- Plastic wrap
- Rubber bands

Collect the pond muck and add water to it until it has the consistency of a milkshake. Mix a quarter of the mud with the egg yolk and shredded newspaper. Add the mixture to the soda bottle. Start adding the rest of the mud to the bottle until it is two inches from the top. Add one inch of pond water to the bottle. Cover the bottle with the plastic wrap and seal it with the rubber band. Set the bottle near a sunny window, but out of direct sunlight. After two to three months, you will see the colored layers representing different types of bacteria and algae.