

CENTER FOR LANDSCAPE CONSERVATION AND ECOLOGY



ANNUAL REPORT

2013-2014

Focusing on the social, environmental, and economic issues affecting urban Florida landscapes.



OVER \$10 MILLION IN TOTAL FUNDING

Received \$695,523 in
internal funding

Received \$9.7 million
in external funding

2013-2014

AT A GLANCE

- **12** Interdisciplinary Faculty
- **13** Affiliate Faculty
- Chaired **30** M.S. candidates
- Chaired **10** Ph.D. candidates
- Produced **45** referred publications
- Produced **40** non-referred publications
- Contributed to **8** books
- Launched **2** mobile web tools
- Hosted **2** distinguished seminars
- Hosted **5** webinars with **70** participants
- Created **19** infographics
- **6,151** eNewsletter subscribers
- **684,634** website sessions

DIRECTOR'S MESSAGE

I AM PLEASED TO BRING YOU OUR 2013-14 ANNUAL REPORT. We've had activity in many areas in the past year. Some highlights include the launch of the Landscape Unit Florida-Friendly demonstration plots and the Gardening Solutions website.

We initiated the process to become a formally recognized center at UF. Our application was approved on July 18, 2014 by the State University System of Florida Board of Governors. As part of this process we are forming a formal Advisory Board composed of industry, agency, and academic representatives.

In the past year, two CLCE faculty members have been hired—Dr. Laura Warner in Agricultural Education and Communication, Gainesville, and Dr. Chris Marble in Environmental Horticulture, MREC Apopka. We have completed our third enhancement grant program with more than \$650,000 awarded to CLCE faculty projects and graduate student support in the past couple years.

We are excited about several new initiatives that are coming to fruition later this year including a comprehensive statewide Master Gardener curriculum, iPest mobile website and smartphone application, Trees of North and Central Florida field guide book and smartphone application, and Gardening Solutions application.

We look forward to continuing our mission to protect and conserve Florida's natural resources through research-based sustainable urban landscape practices.

MICHAEL D. DUKES
CLCE DIRECTOR



MISSION

To protect and conserve Florida's natural resources through research-based sustainable urban landscape practices.

VISION

To be the leading source of science-based information on horticulture and the urban environment in Florida.

GOAL

Seeks to promote research-based best management practices among landscape professionals and other members of the agricultural industry, and to educate homeowners on sustainable landscape practices through its research, education, and outreach. The Center for Landscape Conservation and Ecology (CLCE) also seeks to train students who will enter careers that allow them to engage in and promote sustainable landscape practices.

HISTORY

The center was established in 2006 by an act of the Florida Legislature in response to concerns about the sustainability of current landscape management practices and interests in water availability and quality. With Florida's ever-growing population, it was recognized that a large focus needed to be placed on landscapes, urban water and fertilizer use, plant choice, and maintenance practices. The center serves multiple stakeholders including landscape professionals, trade organizations, commercial developers, urban planners, policy makers, Extension agents, and Florida residents, and provides CLCE research findings, recommendations, and education.

CLCE FACULTY & AFFILIATES

INTERDISCIPLINARY, COLLABORATIVE, AND INNOVATIVE. The Center for Landscape Conservation and Ecology brings together an interdisciplinary team of faculty and affiliate faculty to conduct crosscutting research and deliver innovative, issues-based Extension outreach. The CLCE communications office coordinates faculty outreach efforts and ensures the center's goal and mission are at the forefront of all activities.

CLCE FACULTY

MICHAEL DUKES
CLCE DIRECTOR
Agricultural & Biological Engineering, Water Conservation & Irrigation

STEVEN ARTHURS
Entomology & Nematology, Landscape Biological Control

GAIL HANSEN
Environmental Horticulture, Sustainable Landscape Design

HAYK KHACHATRYAN
Food & Resource Economics, Horticultural Economics

ANDREW KOESER
Environmental Horticulture, Landscape Maintenance

CHRIS MARBLE
Environmental Horticulture, Landscape Weed Management

CHRIS MARTINEZ
Agricultural & Biological Engineering, Water Resource Management

ESEN MOMOL
Florida-Friendly Landscaping™ Program

PAUL MONAGHAN
Agricultural Education & Communication, Community-Based Social Marketing

LAURA WARNER
Agricultural Education & Communication, Social Marketing & Program Evaluation

GURPAL TOOR
Soil & Water Science, Urban Water Quality

TOM WICHMAN
Florida Master Gardener Program

FLORIDA-FRIENDLY LANDSCAPING™ STAFF

CLAIRE LEWIS
FFL/FYN Statewide Coordinator

CJ BAIN
FFL Website and Information Technology Coordinator

DON RAINEY
FFL/GI-BMP Statewide Coordinator

JEN MARVIN
FFL/GI-BMP Education Coordinator

JOHN BOSSART
FFL Information Specialist

CLCE COMMUNICATIONS OFFICE STAFF

EMILY EUBANKS
Education & Media Coordinator

CARALINE STEPHENS
Horticulture Writer

JENNIFER SYKES
Web Coordinator

AFFILIATES

LYNN BARBER
Hillsborough County, Urban Horticulture

EILEEN BUSS
Entomology & Nematology, Turf & Ornamental IPM

ZHANA O DENG
Environmental Horticulture, Plant Breeding

ED GILMAN
Environmental Horticulture, Urban Tree Management

KEVIN KENWORTHY
Agronomy, Turfgrass Breeding

JASON KRUSE
Environmental Horticulture, Sports Turf Management

RAMON LEON
Agronomy, Turfgrass Weed Science

MATT ORWAT
Washington County, Urban Horticulture

SYDNEY PARK BROWN
Environmental Horticulture, Consumer Horticulture

BRIAN PEARSON
Environmental Horticulture

JOE SEWARDS
Volusia County, Urban Horticulture

LAURIE TRENHOLM
Environmental Horticulture, Urban Turfgrass Management

WENDY WILBER
Alachua County, Urban Horticulture

CURRENT CLCE GRADUATE STUDENTS

PH.D STUDENTS

TAYLOR CLEM
Environmental Horticulture
CLCE faculty: Gail Hansen, Esen Momol, Paul Monaghan

DI TIAN
Agricultural & Biological Engineering
CLCE faculty: Chris Martinez

YOGESH KHARE
Agricultural & Biological Engineering
CLCE faculty: Chris Martinez

WAN XU
Food & Resource Economics
CLCE faculty: Hayk Khachatryan

YAO "JULIANA" XU
Entomology
CLCE faculty: Eileen Buss

NASTARAN TOFANGSAZI
Entomology
CLCE faculty: Steven Arthurs

WENWEN LIU
Agronomy
CLCE faculty: Ramon Leon, Kevin Kenworthy

JOHN ROBERTS
Environmental Horticulture
CLCE faculty: Andrew Koeser

ANIL KUMAR CHAUDHARY
Extension Education
CLCE faculty: Laura Warner

MACKENZIE BOYER
Agricultural & Biological Engineering
CLCE faculty: Michael Dukes

MARY LUSK
Soil & Water Science
CLCE faculty: Gurpal Toor

MRIGANKA DE
Soil & Water Science
CLCE faculty: Gurpal Toor

JARIANI JANI
Soil & Water Science
CLCE faculty: Gurpal Toor

IGNACIO RODRIGUEZ
Interdisciplinary Ecology
CLCE faculty: Gurpal Toor

M.S. STUDENTS

DAVID MOORE
Environmental Horticulture
CLCE faculty: Zhanao Deng, Sydney Park Brown

LUIS ARISTIZABAL
Entomology
CLCE faculty: Steven Arthurs

LISA HICKEY
Environmental Horticulture
CLCE faculty: Sydney Park Brown, Gail Hansen

LYNN BARBER
Environmental Horticulture
CLCE faculty: Sydney Park Brown

RYAN KLEIN
Environmental Horticulture
CLCE faculty: Andrew Koeser

STEFAN KALEV
Soil & Water Science
CLCE faculty: Gurpal Toor

STEPHANIE MCLEAN
Soil & Water Science
CLCE faculty: Gurpal Toor

JOSEFIN EDEBACK
Soil & Water Science
CLCE faculty: Gurpal Toor

SARA MECHTENSIMER
Soil & Water Science
CLCE faculty: Gurpal Toor

MATT JABLONSKI
Soil & Water Science
CLCE faculty: Gurpal Toor

ELIZA BREDER
Agricultural & Biological Engineering
CLCE faculty: Michael Dukes

WEINING WANG
Environmental Horticulture
CLCE faculty: Zhanao Deng, Sydney Park Brown

COMMUNITY-BASED SOCIAL MARKETING

THE SOCIAL AND ENVIRONMENTAL DIMENSION OF STORMWATER POND LANDSCAPES

Stormwater ponds prevent flooding, help protect water quality in local watersheds, are a valued neighborhood aesthetic feature, and provide habitat for wildlife. Inappropriate fertilizer and pesticide uses have created water quality problems in the ponds, raising the cost of maintenance and threatening downstream water bodies.

Researchers partnered with several large master-planned developments in Manatee County and investigated the social and cultural barriers to the adoption and use of sustainable urban landscapes, with a focus on stormwater ponds.

Focus groups were shown photos of a turf shoreline with no plants, a turf shoreline with

sparse plantings in the water, a well-maintained shoreline with trees and plants, a maintained shoreline with a seawall and trees and plants, and an overgrown, poorly maintained shoreline. Participants indicated high preference for an open, clear water view with no algae and well-maintained shoreline plants. Preferred plant characteristics included colorful plants, a diversity of colors and textures, non-weedy looking plants (clumping, broadleaf plants were seen as cleaner and less likely to spread), green turf and evergreen plants, and mature trees on the banks (but not in the water). Residents with a pond view from their house did not like tall plants on the shore that blocked the view. They generally characterized the preferred looks as a well-kept natural landscape, sometimes referring to it as a controlled look versus an uncontrolled natural setting.

“PREFERRED PLANT CHARACTERISTICS INCLUDED COLORFUL PLANTS, A DIVERSITY OF COLORS AND TEXTURES, NON-WEEDY LOOKING PLANTS (CLUMPING, BROADLEAF PLANTS WERE SEEN AS CLEANER AND LESS LIKELY TO SPREAD), GREEN TURF AND EVERGREEN PLANTS, AND MATURE TREES ON THE BANKS (BUT NOT IN THE WATER).”

**PAUL MONAGHAN, GAIL HANSEN
CLCE FACULTY**

ENGAGING HOMEOWNER ASSOCIATIONS TO REDUCE NUTRIENT RUNOFF IN STORMWATER PONDS

Engaged homeowners, Cooperative Extension, and homeowner associations (HOAs) in Manatee County are seeking to reduce nutrient runoff in stormwater ponds and improved shoreline landscaping. Primary areas of focus for the program included raising awareness among homeowners of the many provisions in the county fertilizer ordinance, ensuring that grass clippings are removed from streets and stormwater systems, and changing attitudes towards enhanced shoreline and aquatic plantings. Researchers developed a relationship with a community advisory board of diverse stakeholders that include HOA property managers, industry representatives, and residents. The community board has been assisting in the creation of educational signage, development and implementation of an online survey, observations of grass clippings, and community outreach events.

MOBILIZING COMMUNITY SUPPORT AND ADVOCACY FOR URBAN FORESTRY

Urban residents benefit from trees in many ways, including energy savings, public health, well-documented social and economic benefits, and ecological benefits. However, urban residents are also aware of costs associated with having trees, especially those with a mature canopy, including issues with landowners failing to maintain trees properly.

In 2014, Hillsborough County Extension will implement three tree stewardship workshops on the planting, pruning, care, and ordinances of trees, encouraging urban residents to plant more trees in Tampa. Participants will receive trees to plant in their yards and pre/post surveys to measure their knowledge, attitudes, and behaviors.

“Urban residents generally place a high value on trees as part of neighborhood identity. However, translating this belief into active stewardship and planting efforts will require a community-based approach and Extension can facilitate this.”

**PAUL MONAGHAN,
GAIL HANSEN
CLCE FACULTY**

HOMEOWNER AND HOA BOARD PERCEPTIONS OF FLORIDA-FRIENDLY LANDSCAPES

Homeowners and HOA board members have differing perceptions on how to develop landscape codes and strategies about Florida-Friendly landscapes. Focus groups revealed differences in perception on four key topics surrounding Florida-Friendly landscapes, including aesthetic appearance, environmental health, cultural/social challenges, and education programs. Landscape aesthetics issues were the primary concern of both groups – specifically related to promoting attractive landscapes that maintain property value and environmental health. HOA board members agreed they would be more willing to recommend/approve FFL yards if they could visualize the look of an FFL yard and homeowners agreed they would be more likely to install FFL yards if the HOA covenants allowed flexibility in the appearance. The primary environmental issue concern for both groups was protection of the environment, particularly wildlife habitat, but the HOA board members were not convinced that the desired aesthetic look could be achieved if environmental issues took precedent. Both felt the best compromise was reduce water use, but not to the extent of compromising the look of green, well-maintained turf. For both groups the social/cultural topic centered on the role of regulations and the role of the HOA board members. Both agreed that FFL principles and codes are useful to maintain property value, provide a sense of community, and improve neighbor relations, but the enforceable codes desired by the board members were often seen as overly strict by homeowners. Well-written codes were seen as the key to addressing the cultural concerns of both groups.



HOMEOWNERS CONCERNS

HOA BOARD MEMBER CONCERNS

LANDSCAPE WATER USE

- | | |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <ul style="list-style-type: none">• Conservation• Cost Savings | <ul style="list-style-type: none">• Cost Savings |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------|

ENVIRONMENTALLY-FRIENDLY LANDSCAPES

- | | |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• Conserve Water• Pollinators• Wildlife (Birds) | <ul style="list-style-type: none">• Conserve Water• Poor Aesthetics• Wildlife (Birds) |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|

FLORIDA-FRIENDLY LANDSCAPES

- | | |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• Less Turf–Not Very Colorful, Better for Pollinators• Maintenance | <ul style="list-style-type: none">• What Does FFL Look Like?• Concern for Visual Quality• Maintenance |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

HOW IMPORTANT IS TURF IN THE LANDSCAPE?

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• Important–Small Amount, Maintenance Expectations | <ul style="list-style-type: none">• Very Important–To be Green, Well Maintained |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|

“FOCUS GROUPS BETWEEN HOMEOWNERS AND HOAS REVEALED DIFFERENCES IN PERCEPTION ON FOUR KEY TOPICS SURROUNDING FLORIDA-FRIENDLY LANDSCAPES, INCLUDING AESTHETIC APPEARANCE, ENVIRONMENTAL HEALTH, CULTURAL/SOCIAL CHALLENGES, AND EDUCATION PROGRAMS.”

PAUL MONAGHAN, GAIL HANSEN
CLCE FACULTY

WATER RESOURCE MANAGEMENT

FERTILIZER BANS IN FLORIDA’S URBAN LANDSCAPE: DOES THE SCIENCE SUPPORT POLICY? After a particularly severe red tide outbreak along Florida’s Gulf Coast in 2006, regulatory solutions were proposed that could potentially prevent future episodes of red tide and the associated water quality degradation. Since 2006, more than 50 Florida counties and municipalities have enacted rainy season (June to September) nitrogen fertilizer bans or blackouts. During the blackout period, nitrogen-bearing fertilizers cannot be applied to urban lawns, under the premise that rainy season storms drive excess nitrogen into stormwater, which then flows to the bays and estuaries, possibly triggering red tide episodes. The research seeks to characterize the stormwater-borne nitrogen in Florida’s urban areas by tracking the sources (fertilizers, organic materials such as grass clippings and leaf litter left on urban streets and sidewalks, atmospheric deposition). Stormwater samples were collected from an urban residential neighborhood in the Tampa Bay area to determine the nitrogen sources and assess the concentrations of nitrogen entering an urban residential stormwater pond. The research is being expanded to other residential neighborhoods to capture the wide diversity in landscape design and patterns. The over-arching goal of this research is to identify dominant nitrogen sources in stormwater runoff that may assist policy-makers in formulating policy based on solid science to protect the quality of Florida’s water bodies.

“...SEEKS TO CHARACTERIZE THE STORMWATER-BORNE NITROGEN IN FLORIDA’S URBAN AREAS BY TRACKING THE SOURCES—FERTILIZERS, ORGANIC MATERIALS SUCH AS GRASS CLIPPINGS AND LEAF LITTER LEFT ON URBAN STREETS AND SIDEWALKS, AS WELL AS ATMOSPHERIC DEPOSITION.”

GURPAL TOOR
CLCE FACULTY

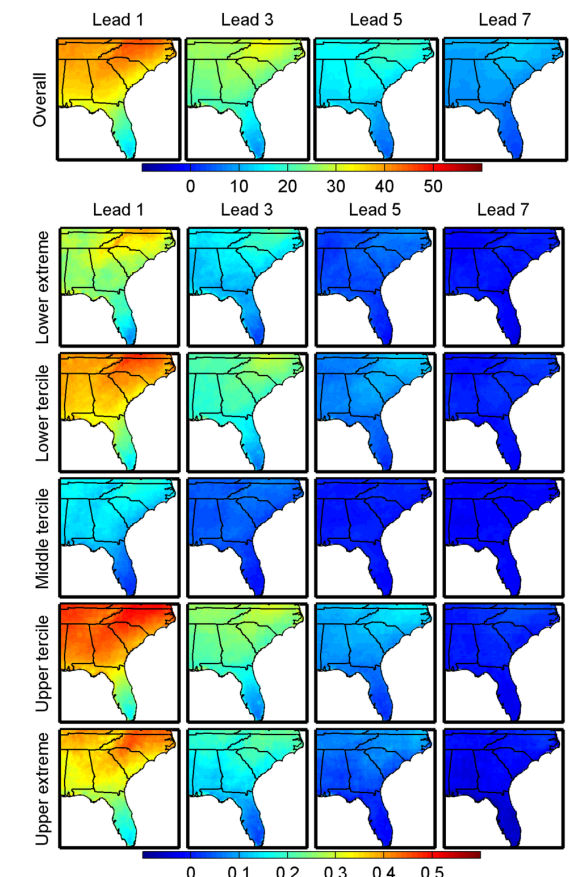
FORECASTING REFERENCE EVAPOTRANSPIRATION IN THE SOUTHEASTERN USA

Using numerical weather prediction models and global climate models, forecasts of reference evapotranspiration can be accurately cast not only several days in advance, but as far ahead as one to six months.

Research has also shown that forecasts of the expected rainfall, temperature, number of rainy days, and number of “hot” days (above 85 F) can improve the short-term urban demand models currently used by Tampa Bay Water.

The research made use of recently available “retrospective forecast datasets” - weather and climate forecasts that are made using computer models for what has happened in the past.

CHRIS MARTINEZ, DI TIAN
CLCE FACULTY AND GRAD STUDENT



The figure shows the forecast skill of reference evapotranspiration 1, 3, 5, and 7 days ahead of time, where any value greater than zero indicates a skillful forecast.

The top row shows the overall skill. The bottom 5 rows show how well the forecasts are for different categories, where the upper and lower extremes show how well the forecasts are for very high and very low values (upper 90% and lower 10%), and the terciles are for above normal (upper 33%), near normal, and below normal (lower 33%).

HORTICULTURAL ECONOMICS

PREFERENCES AND WILLINGNESS TO PAY FOR SUSTAINABLE LAWN CARE PRACTICES: THE CHOICE OF LAWN FERTILIZERS. Urban sprawl in the United States has substantially increased the area of maintained residential landscapes. While there are social and economic benefits associated with well-maintained residential lawns, improper landscaping practices such as excessive irrigation and fertilization may result in adverse environmental effects such as runoff into waterways. This study investigated whether and how the presence of eco-friendly traits influences consumers’ preferences and willingness to pay for lawn fertilizers. Results showed that homeowners were willing to pay price premiums for products featured with environmentally-sustainable attributes (i.e., controlled-release nitrogen, phosphorus-free, and natural and/or organic). It was also found that the experiment participants preferred lawn fertilizers that were labeled as pet-friendly and those that included pest control features. The study also found that homeowners with higher household income were more likely to choose fertilizers with the highest level of control-release nitrogen, suggesting that more comprehensive consumer studies are needed for effective targeting of different consumer segments.



MADE FROM (MATERIALS)

Natural Organic.....	\$11.37
Natural Inorganic.....	\$8.43
Synthetic Organic.....	\$5.31

NITROGEN CONTROLLED RELEASE RATE

15-20%.....	\$9.64
76%.....	\$14.00

OTHER FEATURES

Insect Control.....	\$5.18
Pre-Emerged Weed Control.....	\$11.82
Post-Emerged Weed Control.....	\$7.11
Pet-Friendly.....	\$13.13
Phosphorus Free.....	\$3.11

ECONOMIC IMPACTS OF FLORIDA’S HIGHWAY BEAUTIFICATION PROJECTS

Professionally landscaped and maintained highways result in **GREENER AND MORE ENVIRONMENTALLY SUSTAINABLE ROAD INFRASTRUCTURE** for import/export firms, tourism, real estate industries, and other industries.

According to the Florida Department of Transportation (FDOT), the Florida Legislature allocates significant financial resources to highway landscape projects. The funding allocation and availability for Florida’s highway beautification program is based on Florida Statutes, according to which no less than 1.5% of the amount allocated for highway projects in each fiscal year should be distributed to highway beautification. While it is presumed that highway beautification projects provide positive returns on investment—by enhancing the highway system user experience and contributing to the state’s economy—to date, the economic viability of the program has not been explicitly investigated.

Total economic impacts for highway beautification in Florida were summarized using data from 2008 to mid-2013. Findings show that total expenditures for highway beautification by the FDOT in all districts from 2008 to 2013 generated:

- **2,112** full-time and part-time jobs
- **\$245.2 MILLION** in output or revenue impacts
- **\$147.6 MILLION** in value added contribution to GDP
- **\$110.0 MILLION** in labor income impacts
- **\$32.6 MILLION** in other property income impacts
- **\$5.0 MILLION** in indirect business taxes impacts

“FDOT highway beautification projects generated \$245.2 million in revenue impacts from 2008–2013.”

HAYK KHACHATRYAN
CLCE FACULTY

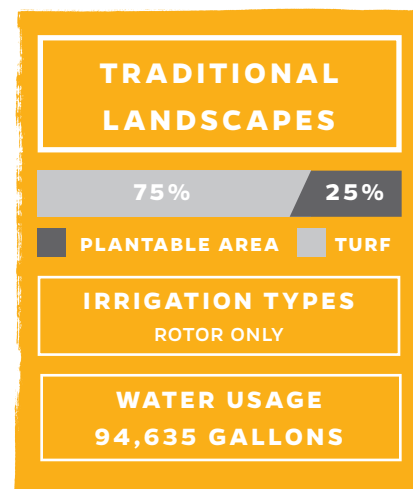
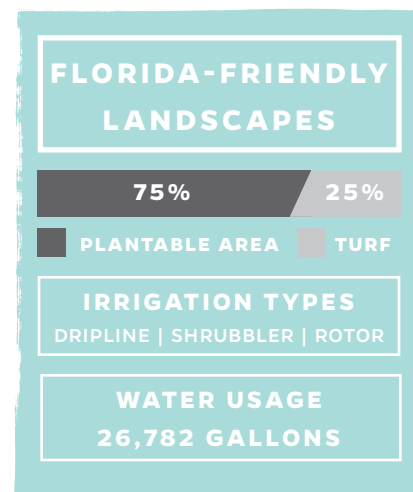


“CONSUMERS WERE WILLING TO PAY \$11.37 MORE PER BAG IF THE LAWN FERTILIZERS WERE MADE FROM NATURAL ORGANIC MATERIALS.”

HAYK KHACHATRYAN
CLCE FACULTY

LANDSCAPE DESIGN AND MANAGEMENT

FLORIDA-FRIENDLY DEMONSTRATION PLOT STUDY LAUNCHED

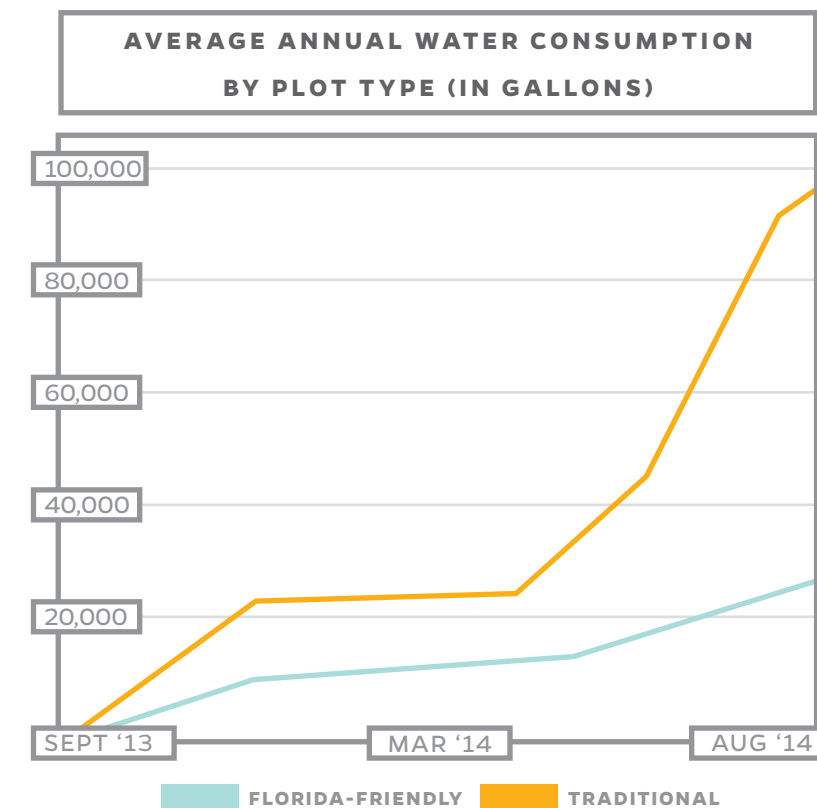


Over the past year, CLCE faculty and grad students have been monitoring resource inputs of three landscapes representative of typical landscaped areas for homes within a homeowners association (HOA). The purpose of the project is to identify quantifiable information to communicate with contractors and HOA board members about the Florida-Friendly Landscaping™ (FFL) program. Each individual landscape was divided into two separate zones that represented a Florida-Friendly landscape or a traditional Florida landscape. The Florida-Friendly landscape is characterized as a home landscape with 75% plantable area and 25% turf with irrigation alternatives compared to traditional rotors; whereas the traditional Florida landscape represents the antithesis. To compare the two landscape types, researchers gathered data on labor hours for installation, pruning, mowing, weeding, etc.; applications of fertilizers, herbicides, and pesticides; gas consumption, and water consumption.

Since data collection began, water resource consumption for irrigation has produced the most notable information. For the Florida-Friendly landscapes, three different irrigation types were utilized—dripline, shrubbler, and rotor irrigation. The traditional landscapes utilized only rotor irrigation. The intention of utilizing different irrigation types for the Florida-Friendly landscapes is to test the aesthetic quality of landscapes while using low-flow irrigation technologies when compared to traditional rotor irrigation. Over the course of the last year, from September 2013 to August 2014, average consumption for the Florida-Friendly landscapes was 26,782 gallons, whereas traditional Florida landscapes water consumption averaged 94,635 gallons.

Of the FFL plots, dripline irrigation consumed an average of 5.37% of total water, shrubblers consumed an average of 17.17% of total water, and turf rotors consumed the remaining 77.46% of average water utilized on the Florida-Friendly landscape plots.

Further investigation of the landscape units will continue, and once more data becomes available, additional analysis will unveil more information regarding fertilizers, herbicides, pesticides, labor hours, gas consumption, and water consumption.



**“FLORIDA-FRIENDLY LANDSCAPES
USED 26,782 GALLONS OF WATER
COMPARED TO 94,635 GALLONS IN
THE TRADITIONAL LANDSCAPE.”**

**GAIL HANSEN, JASON KRUSE,
ESEN MOMOL, TAYLOR CLEM
CLCE FACULTY & GRAD STUDENT**



LANDSCAPE PEST MANAGEMENT

CHILI THRIP

ONE OF FLORIDA'S MOST UNWANTED RECENT ARRIVALS, the tiny chilli thrip, has quickly become the primary pest on ornamental roses, especially KnockOut® which traditionally have had few serious pests. Although only detected in Florida in 2005, CLCE researchers are testing new biological insecticides to determine if they can be used by growers and landscapers to thwart this pest and help offset resistance to the few remaining chemical pesticides that are effective. KnockOut® roses are one of the major ornamental plants grown in Florida and are a multimillion dollar crop for the state.

STEVEN ARTHURS & LUIS ARISTIZABAL
CLCE FACULTY AND GRAD STUDENT

SHADE CLOTH

An emerging approach in the production of ornamental crops is the use of photoselective (colored) and color-neutral dispersive shade netting which scatter radiation. These nets scatter radiation creating more diffused light that can penetrate inside plant canopies. Colored nets contain chemical additives that selectively filter solar radiation for specific wavelengths of light that promote desirable plant growth characteristics. Research shows that the colors also impact pest insects. Blue nets attract thrips and whiteflies while pearl (white) nets repel insects. Most aphids were found under red nets. This information should help growers target their pest management programs for crops grown under colored shade nets.

STEVEN ARTHURS
CLCE FACULTY

LOVE BUGS

CLCE researchers developed a love bug trap by discovering a potent lure (a floral scent called phenylacetaldehyde) and optimal color for traps. In 2013, they tested existing insect traps and found that a modified moth trap worked well and caught thousands of love bugs in 24 hours.

STEVEN ARTHURS
CLCE FACULTY

TROPICAL SOD WEBWORM

The tropical sod webworm is one of Florida's most notorious lawn visitors. Researchers compared the latest insecticides to determine which works best and also showed that the pest can be controlled non-chemically by entomopathogenic nematodes. Major pheromone components were identified and should lead to a lure for this insect.

STEVEN ARTHURS & NASTARUM TOFANGSAZI
CLCE FACULTY AND GRAD STUDENT

**"BLUE PHOTOSELECTIVE
SHADE NETS ATTRACT
THRIPS AND WHITEFLIES,
APHIDS WERE FOUND
MOSTLY UNDER RED NETS,
AND PEARL (WHITE) NETS
ACTUALLY REPELLED
INSECTS."**

STEVEN ARTHURS
CLCE FACULTY

THE FLORIDA MASTER GARDENER PROGRAM HAS BEEN PROVIDING HORTICULTURE VOLUNTEER SERVICE TO FLORIDIANS FOR 35 YEARS.

STATEWIDE CURRICULUM DEVELOPMENT

We are developing a new statewide Master Gardener curriculum which will be released at the end of 2014. This new curriculum will help to standardize the training statewide and should serve as a great resource for new and experienced Master Gardener coordinators.

STATE TRAINING OPPORTUNITIES

The 2013 Master Gardener Continued Training Conference was held in Kissimmee and was attended by 307 Master Gardener volunteers from all over Florida. These three day conferences will now be held every two years and will be replaced in the even years with five one-day low cost trainings. One will be held in each administrative district. This should make the training available to 800-1000 individuals statewide.

VISION STATEMENT

To be Florida's most trusted resource for horticultural education.

MISSION STATEMENT

To assist Extension agents in providing research-based horticultural education to Florida residents.

- Total Statewide Volunteer Hours: **382,648**
- Total Statewide Continuing Education Hours: **64,456**
- Total Statewide Master Gardeners: **4,761**
- Total Statewide Clientele Contacts: **536,524**

Florida Master Gardeners provide \$7.21 million or 184 FTEs in volunteer time to Florida's economy.

Florida-Friendly Landscaping™ PROGRAM



The Florida-Friendly Landscaping™ (FFL) program was created to include the Florida Yards and Neighborhoods (FYN) program and FYN Builder and Developer programs. It also includes the Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries (GI-BMP) Program.

FFL GRANT FUNDING

For the 2013 fiscal year the FFL program received \$404,567.60 in grant funding from the Florida Department of Environmental Protection Nonpoint Source Pollution Program.

FFL & FLORIDA WATER STAR

The FFL yard recognition program is now an official partner with the Florida Water Star (FWS) program to cross-promote the two for the mutual benefit of Florida's water resources. FWS works with new home builders to incorporate water saving design features and landscaping. Once certified as an FWS home, it is easy for a new homeowner to receive the additional recognition as a Florida-Friendly Landscape.

GI-BMP HAITIAN CREOLE INITIATIVE

The GI-BMP program undertook a major new initiative during 2013 to reach the Haitian Creole speaking community employed in Florida's landscaping industry. UF/IFAS Extension agents estimate there are 3,000-5,000 Creole speaking landscapers in South Florida who will benefit from the new program. The GI-BMP program has always offered training in both English and Spanish. However, Florida, especially the southeast counties of Miami-Dade, Broward, and Palm Beach, has a substantial number of Haitians employed in landscaping who speak neither English nor Spanish, but must have the FDACs fertilizer applicator's certification to continue working. The GI-BMP program subsequently undertook the task of translating the existing English/Spanish training materials. Formal GI-BMP training in Creole will begin during 2014.

FFL SUPPORTS 52 COUNTIES WITH ACTIVE FFL PROGRAMS.

GI-BMP TRAINING PROGRAM

7,436 LANDSCAPING PROFESSIONALS COMPLETED GI-BMP TRAINING AND RECEIVED A CERTIFICATE DURING 2013.



DIGITAL PLATFORM OUTREACH EFFORTS

GARDENING SOLUTIONS

The website Gardening Solutions brings Florida homeowners and gardeners the best information about Florida-Friendly plants, sustainable landscape practices, and ways to beautify your yard and garden. From blooming natives to heat-friendly vegetables, we share what works where in Florida's unique environment. The research-based information comes straight from University of Florida/IFAS experts and, with the help of county Extension agents and Master Gardeners, Gardening Solutions extends the reach of university research and information. UF/IFAS brings the vast resources of the University of Florida directly to every community across the state.

INFOGRAPHICS

The center launched a very successful infographics campaign in 2013. Infographics include monthly Edibles to Plant, monthly What's Flowering, quarterly Herbs to Grow, Water Conservation in the Landscape, and Air Potatoes.

Infographics are distributed through the Florida Master Gardener Facebook page and have a potential exposure of 58,091. The engagement (people who like, comment, share) reached more than 14,365.



Gardening Solutions had
1.2 MILLION pageviews
in 2013-2014!

THE NEIGHBORHOOD GARDENER

Since 2008, The Neighborhood Gardener has published more than 48 issues. The monthly e-newsletter currently has 5,707 subscribers. For the last 12 issues sent by email, the average open rate is 47.5% and the average click rate is 41%. Compare this to the industry average open rate of 20% and click rate of 13%.

Sent by email and published online, the newsletter features several stories each month, including "Plant of the Month," "Friend or Foe," and "This Month in Your Garden." The plant of the month feature is the most popular and brings many visitors to the Gardening Solutions website.

MOBILE TOOLS & APPS

FLORIDA-FRIENDLY LANDSCAPING™ PLANT GUIDE APPLICATION

FFL created a smart phone application with a database of over 400 Florida-Friendly landscape plants. The FFL application was designed to create an accurate system, based on the art and science of landscaping, to guide decision-making when choosing plants for the landscape.

LANDSCAPE PESTS

The Landscape Pests website and app features 250 different pests of ornamental and vegetable plants found in Florida and elsewhere in the Southeast region. The site is designed to allow landscape professionals, as well as homeowners to quickly identify pests and provides associated information.



WATER IN THE

LANDSCAPE

DISTINGUISHED

SEMINARS



IN 2013, THE CENTER BEGAN THE WATER IN THE LANDSCAPE DISTINGUISHED SEMINAR SERIES.

Expert researchers are invited to Florida to present topics that directly influence Florida's landscapes.

2013

Efficiency within Sufficiency: Analyzing and Promoting Landscape Water Conservation

- Dr. Joanna Endter-Wada

Reducing the Cost of Complexity: Undemanding Estimates of Landscape Water Demand

- Dr. Roger Kjelgren

2014

Moving Forward in Nutrient Research and Management: Critical Knowledge Provided by High Time Resolution Water Quality Data

- Dr. François Birgand