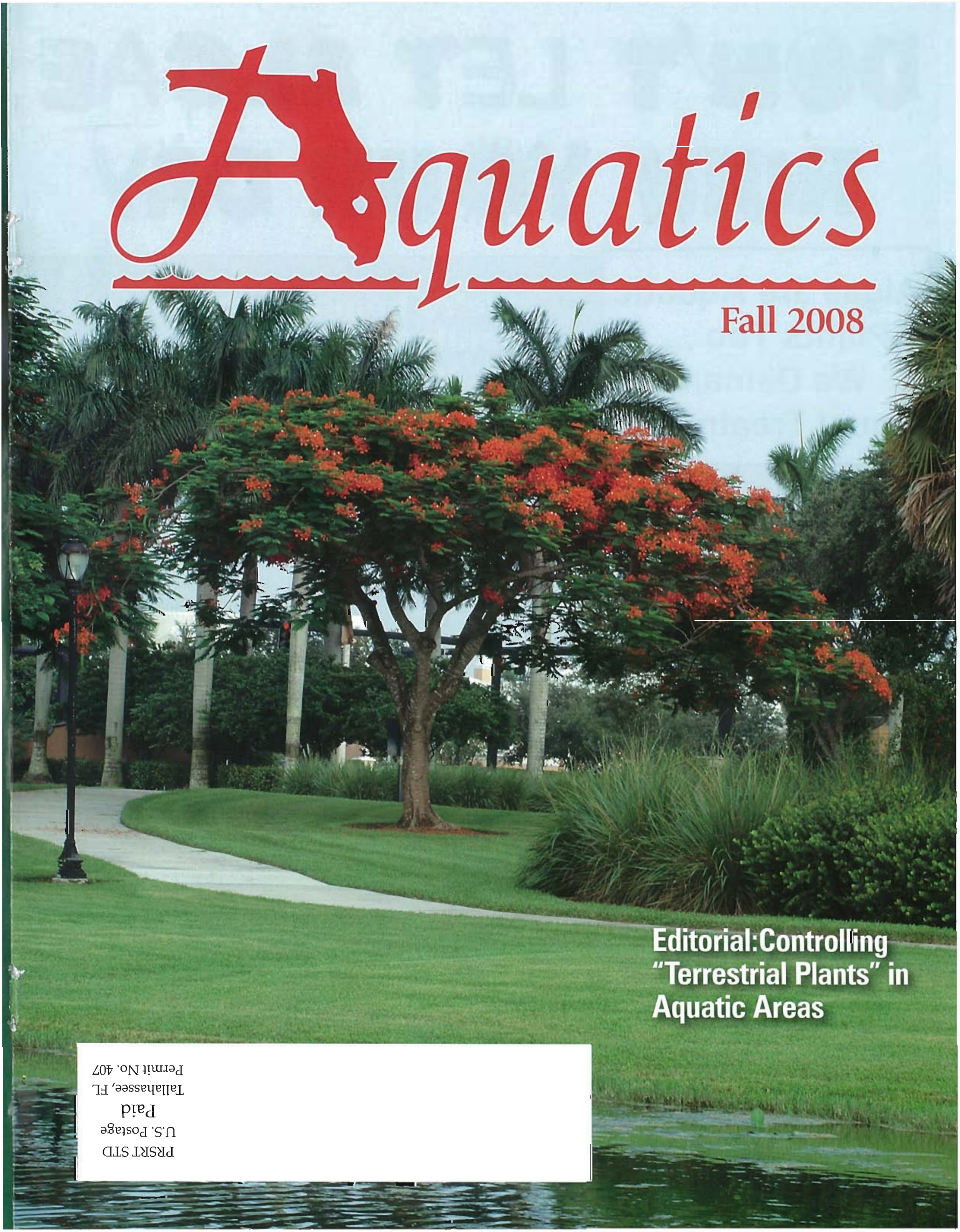
Aquatics

Fall 2008



Editorial: Controlling "Terrestrial Plants" in Aquatic Areas

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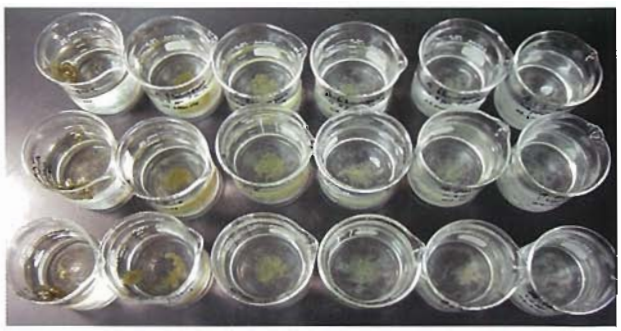

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Royal Poinciana, Delonix regia, growing on a canal bank in Coral Springs, Florida (August, 2007)

Cover photo: Royal Poinciana in an aquascape setting. Photographs by Vernon V. Vandiver, Jr.

Aquatics

Fall 2008 / Vol. 30, No. 3

Contents

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EDITORIAL: Address all correspondence regarding editorial matter to Jeff Holland, *Aquatics Magazine*.

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Editorial:
Controlling "Terrestrial Plants" in Aquatic Sites

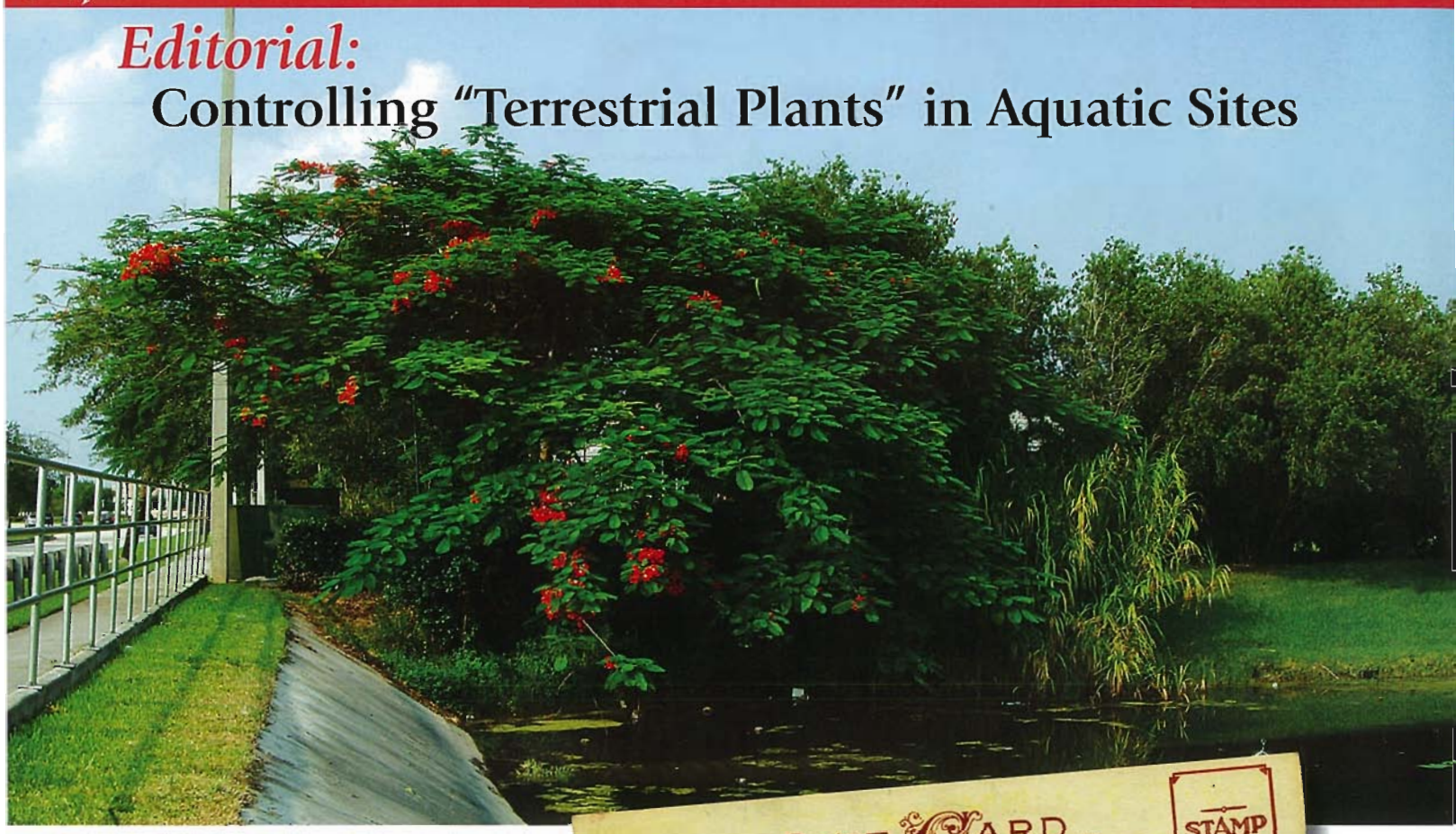

Figure 1. Royal Poinciana (*Delonix regia*) is one example of a terrestrial plant frequently installed in aquatic sites. Torpedograss (*Panicum repens*), Paragrass (*Urochloa mutica*), and Melaleuca (*Melaleuca quinquenervia*) are species often considered terrestrial yet require an Aquatic Category Pest Control license to control along canal and ditch banks with Restricted Use herbicides.

By Vernon V. Vandiver, Jr. and Colette C. Jacono

"Is that an aquatic plant or is it a terrestrial plant?" "Is that an aquatic weed or is it a terrestrial weed?" These questions often come from both the public and the industry in attempts to make distinctions between somewhat artificial groupings of plants. Many introduced species tend to show little consideration for such distinction as they become established and grow outside their natural range. Such is often the case with the Royal Poinciana (*Delonix regia*), appearing on the cover of this issue of *Aquatics*.

It is not uncommon for plant species to grow in what would be considered both aquatic and terrestrial habitats. Torpedograss (*Panicum repens*) serves as a good example. Introduced to the southeastern United States in the late 19th century as cattle forage (www.sms.si.edu/irLspec/Panicum_repens.htm), its original use was of course terrestrial. Nevertheless, there is little dispute today that Torpedograss is an important aquatic weed. The same circumstances hold true for Paragrass (*Urochloa mutica*).

The "aquatic vs. terrestrial" designation similarly caused an historical debate when efforts were made to list Melaleuca (*Melaleuca quinquenervia*) on the Federal Noxious Weed List. Officials perceived Melaleuca as a "tree," and therefore, not an aquatic weed. Weed scientists countered that it was growing inside the levees of Lake Okeechobee and in other aquatic sites, and that by definition made it an aquatic weed.

The Royal Poinciana is a popular candidate for planting along canal banks (Figure 1). From a regulatory point of view, one conducting weed control work on canal banks (and ditch banks) is considered to be working in an aquatic site. It is from this territorial view that we wish to highlight the Royal Poinciana in aquascaping.

See the accompanying article, "The Royal Poinciana," in this issue of Aquatics magazine for more information on this popular landscaping/aquascaping plant.

Too Many Weeds Spoil the Fishing

Exotic invasive aquatic plants such as Hydrilla, Eurasian Water Milfoil, Curlyleaf Pondweed, Water Chestnut and Water Hyacinth can be detrimental to a healthy fishery in lakes across the country.

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The Royal Poinciana

By Colette C. Jacono[1] and Vernon V. Vandiver, Jr.[2]

One of the most striking and colorful specimen trees in the subtropical and tropical regions of the world is the Royal Poinciana, *Delonix regia*. Its spectacular scarlet flowers give vibrant color to the residential, commercial, and open-area plantings that are dominated by green foliage in the spring and summer in the subtropical South Florida landscape.

Figure 1. Small Royal Poinciana lining a golf course green at the Heron Bay Golf Club, Coral Springs, FL.

Even when not in full flower, the foliage of the Royal Poinciana forms a large, flattened canopy that is frequently wider than its height, which can reach 40 ft. or more (www.floridata.com/ref/D/delo_reg.cfm).

In South Florida the Royal Poinciana is used extensively to enhance landscapes with aquatic features. The tree is showcased along upper pond margins and along upper canal banks in residential and urban settings. Note the cover photograph. They are also valuable specimen trees in public areas such as parks and along the fairways on golf courses (Figure 1.)

The Royal Poinciana derives its name from having been in the genus *Poinciana*. The origin of this name dates to 1725-35, named after M. de

[1] Botanist , U. S. Geological Survey, Florida Integrated Science Center, Center for Aquatic Resources Studies, 7920 NW 71st St Street, Gainesville, FL 32653-3071

[2] Weed Scientist, Vandiver Consultants Corporation, 9715 NW 63rd Lane, Gainesville, FL 32653-6808

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Figure 2. Mature fruit (pods) of the Royal Poinciana. One pod on the left of the scene has dehisced and discharged the seed.

Poinci, 17th-century governor of the French Antilles (http://dictionary.reference.com/browse/Poinciana).

The tree is wide-branching, with large, doubly-compound leaves that serve to highlight the scarlet flowers, which are 3-4 inches or larger across. The primary divisions of a pinnate leaf, or pinnae, can number 20 pairs or more, each with numerous pairs of pinules, the secondary divisions of the pinnate leaf.

The fruit are dark brown to black pods which grow to 2 feet or more long and 2 inches wide, shown in Figure 2. Note that one of the pods on the left side of the photograph has dehisced, releasing the seed.

Figure 3 shows an open pod and seed.

In Florida the tree likely grows best in USDA Climate Zones 10b and 11, however it grows in warmer area of Zone 10 (Note Figure 4).

The Royal Poinciana is planted in frost free areas for the vibrancy it adds to the summer landscape, not to mention it's tolerance to salt air and variable soil types. The first author was introduced to the Royal Poinciana far from the landscaped suburbs of South Florida. On a hilltop village in Honduras, its spectacular flaming dome vied for admiration with the enormous, tattered leaves of an adjacent banana tree. Perfectly suited as it seemed to the tropical landscape, the Royal Poinciana is as alien to Central America as is the African banana.

The Royal Poinciana is indigenous to Madagascar, where it is very rare, in fact, so rare that it became lost to science after its naming only to be rediscovered in 1932. Its long pods and compound foliage, sometimes up to 1000 leaflets per leaf, are giveaways for the Legume family of plants (Fabaceae). You will find, however, that the flowers are the diagnostic feature used to delineate species into three distinct subfamilies, the Mimosa (Mimosoideae), the Nickerbean (Caesalpinioideae), and the Pea (Faboideae) subfamilies. Why bother learning the subfamilies? Because they are key to recognizing the large and diverse number of leguminous species that range from tropical trees and shrubs to temperate herbs, food crops, and weeds.

The Royal Poinciana belongs to the Nickerbean subfamily. Its large and spreading flowers develop on individual stalks. This feature is characteristic for the subfamily. The invasive Purple Orchid-Tree (*Bauhinia purpurea*) is another non-native example, while the Gray Nickerbean (*Caesalpinia bonduc* and the Eastern Redbud (*Cercis Canadensis*) are Nickerbean subfamily members that are native to Florida.

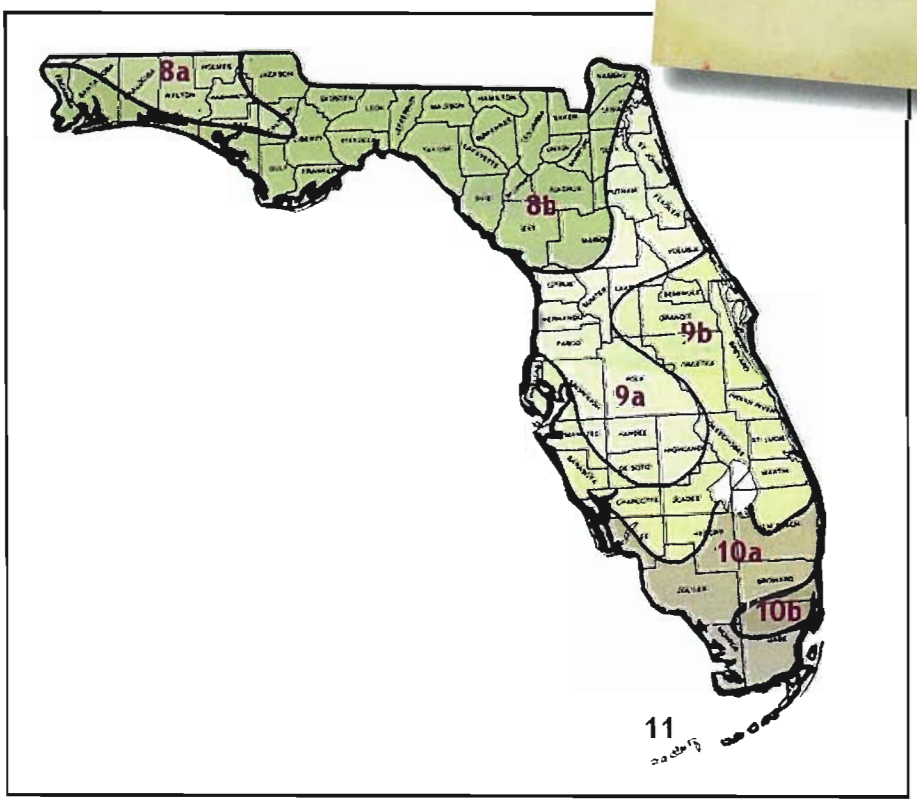
The remaining legumes are grouped into the Mimosa subfamily, which has globose, puff ball-like flowers and the Pea subfamily, which bears flowers that follow their namesake. The introduced and highly invasive Black Mimosa (*Mimosa pigra*) and the White Leadtree (*Leucaena leucocephala*) are examples of species with puff ball-like flowers. Clusters of many

small tubular flowers with long, extensive stamens give the powder puff effect. Not all mimosa-type flowering legumes are nonnative, for example, several spiny acacia shrubs (*Acacia* spp.) are indigenous wildland plants in Florida.

Finally, the Pea subfamily pulls together the third and largest subgrouping of the legumes known for its butterfly-shaped flowers. The lower petal (keel) on these flowers serves as a landing platform for bees, their primary pollinators. The invasive Purple Sesban (*Sesbania punicea*), Chinese Wisteria (*Wisteria sinensis*), and Rosary Pea (*Abrus precatorius*) are common introduced species. Yet, many native beauties, like lupine (*Lupinus* spp), and important crop species, including Peanut (*Arachis hypogaea*) also make up the Pea subfamily species in Florida.

Figure 3. An opened Royal Poinciana pod showing some seed contained within the pod.

Figure 4. USDA Climate Zones in Florida.



The Royal Poinciana, like others in the large Legume family, may potentially escape and reseed. For that reason is recommended by the IFAS Assessment to be managed to prevent escape. Escapes have not been observed by the authors, although reports of such may be registered with the Florida Exotic Pest Plant database (www.fleppc.org/EDDMapS/).

References:

L. H. Bailey and E. Z. Bailey, 1976, Hortus Third. MacMillan Publishing Company, New York.

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Aquatic Plant Management in Cape Coral, Lee County, Florida

By Kenneth G. Sonne, Jr
Aquatic Technician
Lee County Hyacinth Control District, Fort Myers, Florida

Re-created from a presentation that earned Ken Sonne, Jr. second place in the Applicator Paper Contest of the 2007 Florida Aquatic Plant Management Society's (FAPMS) annual conference.

Cape Coral, Florida, contains over 400 miles of fresh and saltwater canals that require aquatic plant management.

Lying within the city limits of Cape Coral, Florida, is a virtual myriad of man-made canals and lakes. With a system consisting of over 400 miles of fresh and saltwater canals and numerous lakes, it is no wonder that Cape Coral has been called the *Venice of America*. Founded in 1960 and incorporated in 1970, the city of Cape Coral is home to over 160,000 residents and occupies more than 150 square miles. The canal and lake systems are a significant draw for the residents of Cape Coral.

Management of the aquatic vegetation in these canals and lakes falls within the purview of the Lee County Hyacinth Control District. The complexity of this task is never-ending and is achieved through sound science practices, consistent evaluation and continual reassessment. The goal of the Lee County Hyacinth Control District, working in conjunction with the Environmental Resources Division of the City of Cape Coral, is to implement a balanced approach of protecting the canals' ecological integrity, establishing an acceptable aesthetic appearance and maintaining navigability.

Lee County Hyacinth Control and the Environmental Resources Division of the City of Cape Coral have developed an aquatic management program for the Cape Coral canal system. A tri-fold informational brochure has been printed and is distributed to homeowners, which explains the goals of this program. These goals include:

Public Education is an important aspect of protecting the aquatic health of the Cape Coral Canal System. All Cape Coral residents are encouraged to participate in the education process by attending meetings, communicating with neighbors and developing community awareness about actions that can be taken to improve and protect the Cape Coral Canal system. Reduced water usage and the use of environmentally friendly landscaping products (fertilizers & pesticides) and native plants around the home are highlighted as ways the homeowners can help.

Maintaining and restoring native vegetation is an essential part of the canals health. Healthy aquatic ecosystems with native vegetation provides many benefits including improved water quality, recreational opportunities and aesthetics. The brochure outlines that native vegetation will only be treated when it reaches levels that interfere with the intended uses of the waterway. It also educates residents on the potential impacts of introducing exotic species into the canal system, such as the practice of dumping exotic plants from personal aquariums.

Operational maintenance of the Cape Coral Canal System is essential. This system is crucial to the public drainage system for ensuring flood protection as well as being an important asset to adjacent homeowner real-estate values.

Water quality and water depth

are two of the many variables that affect aquatic plant growth. Rain, sun, and seasonal variations greatly influences water quality and depth in the canals of the dual water system and are taken into consideration when developing a management plan for the City of Cape Coral. In addition, the city draws 75% of its water from the fresh water canals for the purpose of residential and commercial irrigation. Residential landscaping run-off of pesticides and fertilizers is a factor in producing excess nutrients that fuel macrophyte and algae growth. Consequently, the education and involvement of the homeowners is critical to the district's overall aquatic plant management program.

The canal systems of Cape Coral is habitat for many native and non-native, emergent and submersed aquatic plant species. These plants include Muskgrass (*Chara sp.*), Pondweed (*Potamogeton sp.*), Tapegrass (*Vallisneria sp.*), Bladderwort (*Utricularia sp.),* Parrot's-feather (*Myriophyllum sp.*), Southern Naiad (*Najas sp.*), Coontail (*Ceratophyllum sp.*), Spatterdock (*Nuphar sp.*), Hydrilla (*Hydrilla sp.*), Hygrophilia (*Hygrophilia sp.*), Cabomba (*Cabomba sp.*), Water Hyacinth (*Eichhornia sp.*), Waterlettuce (*Pistia sp.*), Duckweed (*Salvinia sp., Lemna sp., Landoltia sp.*), Cattail (*Typha sp.*), Rush (*Scirpus sp.*), and Torpedograss (*Panicum sp.*).

The aquatic plants that are the most problematic are Hygrophilia and Cabomba. Effective treatment of these plants requires applying herbicide combinations on a regular schedule. A combination of *Reward* and *Hydrothol 191* applied at appropriate rates has been found to provide effective control of both plants. This treatment is applied by truck or airboat, depending on the size of the area to be treated. See further discussion on application methods below.

Chemical control using truck mounted applicator system.

A variety of treatment options are included in the management program developed by Lee County Hyacinth Control District and the City of Cape Coral. These options include:

Herbivorous fish: Using "grass carp" (*Ctenopharyngodon idella)* is a biocontrol option that enables control of both native and non-native submersed aquatic vegetation on a long-term basis, reducing herbicide applications to a minimum. Sterile grass carp are raised at the District and introduced into the affected area as needed.

Chemical control by truck: This option is used for basic residential canal treatment of both emergent and submersed nuisance vegetation. It is utilized to control aquatic vegetation covering one quarter to one half acre. The trucks, owned by the District, are equipped with tanks and spray hoses that can be directed at the area to be treated.

Chemical control by airboat: Used for large-scale canal and lake treatment of both emergent and submersed nuisance vegetation. This option is used to control one acre or more of vegetation or vegetation that can not be reached by truck. The District's airboats are similarly equipped with tanks and spray hoses that can be directed at the area to be treated.

Mechanical control by Harvester: This option is used to physically remove nuisance vegetation out of the water system.

An important role of the aquatic applicator in Cape Coral is public relations. Personal contact with the residents is a daily occurrence and requires a diplomatic and educational approach in discussing and resolving problems. Understanding the needs and interests of the homeowners is imperative, as well as educating them on the importance of aquatic plant management and the role they, as homeowners, play in it.

The typical canal or lakefront homeowners are interested in maintaining the waterway for aesthetics—its recreational and scenic value. But different uses of the canals and lakes can lead to different desired treatments. With the average lot size of 100ft x 150ft, and canal widths less than 100 feet, there are many hom-

Injection rail with weighted hoses for submersed plant treatment.

Educating homeowners on the role they play in aquatic plant management is as important as understanding their needs

eowners within close proximity to each other, all viewing, using, and enjoying the same waters.

Boaters prefer the canals clear of aquatic plants so the motors are not impaired or damaged by submerged or floating vegetation. Fishermen recognize the need for an aquatic plant habitat for good fishing but also want to freely navigate the canals and lakes. Some environmentally concerned homeowners prefer no treatment, wanting wildlife such as ducks, herons, otters, and fish to enjoy a natural habitat. As a result, each aquatic plant treatment in Cape Coral demands very specific and personalized action.

The goals of the District and the City must be balanced with the needs of the individual homeowner, as well as the population of the City as a whole. Experience as proven that aquatic plant management in Cape Coral can be very interesting and that each day can present a new challenge.

Aquatic Applicators Code for Lee County, Florida

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2. **Be Polite**
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3. **Be Prepared to Get the Job Done**
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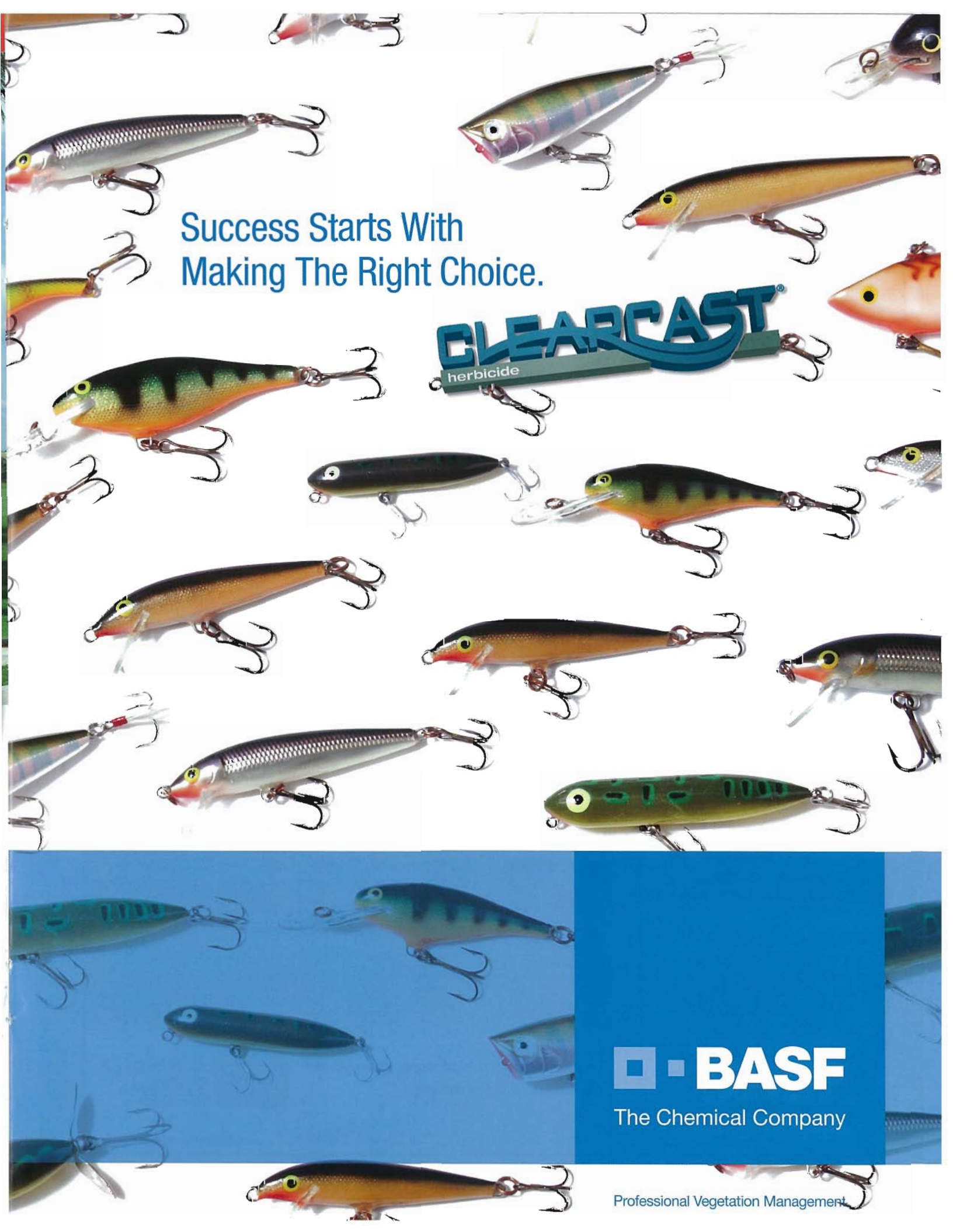
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Applicator Reference Guide:

The following guide is being provided by the UF Department of Agronomy and your Florida Aquatic Plant Management Society. The information was provided by Ken Langeland and Fred Fishel from the University of Florida/IFAS center.

Aquatic Applicator Reference Formulas

Area of a Circle = π (radius)^2 *definitions: π = 3.14; radius = (diameter ÷ 2)*
Surface Acres of a Circular Site = (Area of the Circle) ÷ (Number of Square Feet in 1 Acre)
Acre-Feet = Surface Acres x Average Depth *(feet)*
Travel Speed = (Distance Traveled) ÷ (Time Elapsed)
Acres per Minute (APM) = (Swath Width x Travel Speed) ÷ (Number of Square Feet in 1 Acre)
GPA (Gallons per Acre) = (Gallons Sprayed) ÷ (Acres Treated)
Gallons per Minute (GPM) = (Gallons Sprayed) ÷ (Minutes Elapsed)
Pounds of Active Ingredient Needed = $PPM_{desired}$ x Acre-Feet x 2.7
Herbicide per Tank = (Tank Capacity x Herbicide Rate per Acre) ÷ (Amount of Spray Applied per Acre)
Herbicide per Tank = (Tank Capacity x %Solution Needed) ÷ (100%)

Provided by your Florida Aquatic Plant Management Society, Aquatics magazine *–Fall 2008.*

AQUAVINE

FAPMS Logo Contest Ending Soon!

If you have an idea for a new FAPMS society logo and have not yet submitted it, please consider expediting it as the deadline is soon approaching. All logos must be to the editor by October 8, 2008 so that they may be judged at the 32nd Annual FAPMS training conference in Daytona Beach, Fl. The winner will be selected by majority vote from the FAPMS general membership at the annual training conference. Visit the society's website (www.fapms.org) for more information and contest rules. Contact the editor, Jeff Holland, and submit logo designs at (jholland@rcid.dst.fl.us) (407) 824-7324.

Past Award Winners

Have you ever won a FAPMS award in the Applicator Paper contest, Applicator of the Year contest, Scholarship, or Photo contest? If so, please consider submitting an article to highlight your work. The editors are always looking for articles from applicators and supervisors on "how to" information, equipment set-up, truck or boat rigs, and other helpful information for future magazine articles. Have you have ever won a ribbon in the operational photograph contest? If so, please consider submitting the photograph with notes and the editor will help you publish it in *Aquatics* magazine. You can reach the editor at: Jeff Holland (jholland@rcid.dst.fl.us) (407) 824-7324.

FAPMS Internet Resource Guides

Did you know that your Florida Aquatic Plant Management Society's Internet page is a terrific site for a variety of aquatic plant management resources? Visit the web links page (www.fapms.org/links) for the following sites of interest:

- *Aquaplant* -Pond Manager Diagnostic Tool, Texas Agrilife Extension Service.
- Aquatic Ecosystem Restoration Foundation's BMP handbook.
- Aquatic Weed Control Short Course
- Center for Aquatic and Invasive Plants, University of Florida IFAS.
- Atlas of Florida Vascular Plants, University of South FL.
- Florida Natural Areas Inventory, Florida State University.
- Habitattitude –Aquatic Nuisance Species (ANS) Task Force, USFWS & USGS.
- National Invasive Species Information Center, USDA.
- Plant Management in Florida, University of Florida IFAS.
- Safe Pesticide Use, FDACS.
- TerraServer digital maps, USGS.

Invasive aquatic grass new to North America (*Luziola subintegra*)

An invasive aquatic grass (*Luziola subintegra*) has been concerning aquatic plant managers in Lake Okeechobee since 2007. Mike Bodle and Chuck Hanlon are part of a group of aquatic plant managers that have been closely monitoring and attempting to control this new invasive grass growing at the mouth of Fisheating Bay in Glades County, Florida.

Bodle found fairly good control and lower plant densities in areas formerly treated with imazapyr and glyphosate. Less effective control and higher plant densities were found in areas treated with either

glyphosate alone (which proved inadequate) or the combination of glyphosate and imazamox. While the grass has re-grown, flowers have not been observed since the first control efforts.

Another grass recently found in Lake Okeechobee is native aquatic grass Bearded Sprangletop (*Leptochloa fusca subsp. fascicularis*) was documented for the first in the Okeechobee watershed thanks to work conducted by the USF herbarium team.

Attempting to control Luziola subintegra using aerial applications. Photos by Chuck Hanlon.

New invasive grass (Luziola subintegra) in Lake Okeechobee, Fl., Nov/2007.

Error in Aquatics, Summer 2008 (Vol. 30/ No. 2): There was a mix-up in the plant photos of the article "Feathered mosquito fern comes to Florida" by Mike Bodle. On page 8 the larger photograph was Azolla pinnata, not A. caroliniana as printed. The smaller inset photo on the same page that lacked a caption was A. caroliniana. Lastly, the photo inset on page 9 was Azolla pinnata, not A. caroliniana as printed. We apologize for the confusion.

University of Florida was one of many educator booths set up during the Hydrilla and Hygrophila field day.

Lake Kissimmee Hydrilla and Hygrophila Day

University of Florida's IFAS Osceola County Extension office held an educational event in July 2008 about their Hydrilla and Hygrophila Demonstration Project. Informational booths were setup and aquatic plant managers discussed the challenges they face with controlling hydrilla and hygrophila. Tina Bond and Cindy Rutherford were part of a team of extension office educators who coordinated the one-day event. Dr. Mike Netherland, (USACE), Bruce Jaggers, (FFWCC), and Ed Harris (FDEP) provided guided boat tours and information about plant management activities on Lake Tohopekaliga. If you are interested in finding out more about this demonstration project please contact Tina Bond at the Osceola County Extension office (321-697-3000) tbon@osceola.org or visit the web site: http://plants.ifas.ufl.edu/osceola.

Dr. Mike Netherland providing information about hydrilla and hygrophila management during an airboat tour of Lake Tohopekaliga. Bruce Jaggers boat operator. Note the topped out hydrilla (Hydrilla verticillata) and knotweed (Polygonum sp.) being discussed.

Ed Harris provided information about hydrilla and hygrophila management while onboard the larger tour boat seen here on the shore of Lake Tohopekaliga.

Calendar

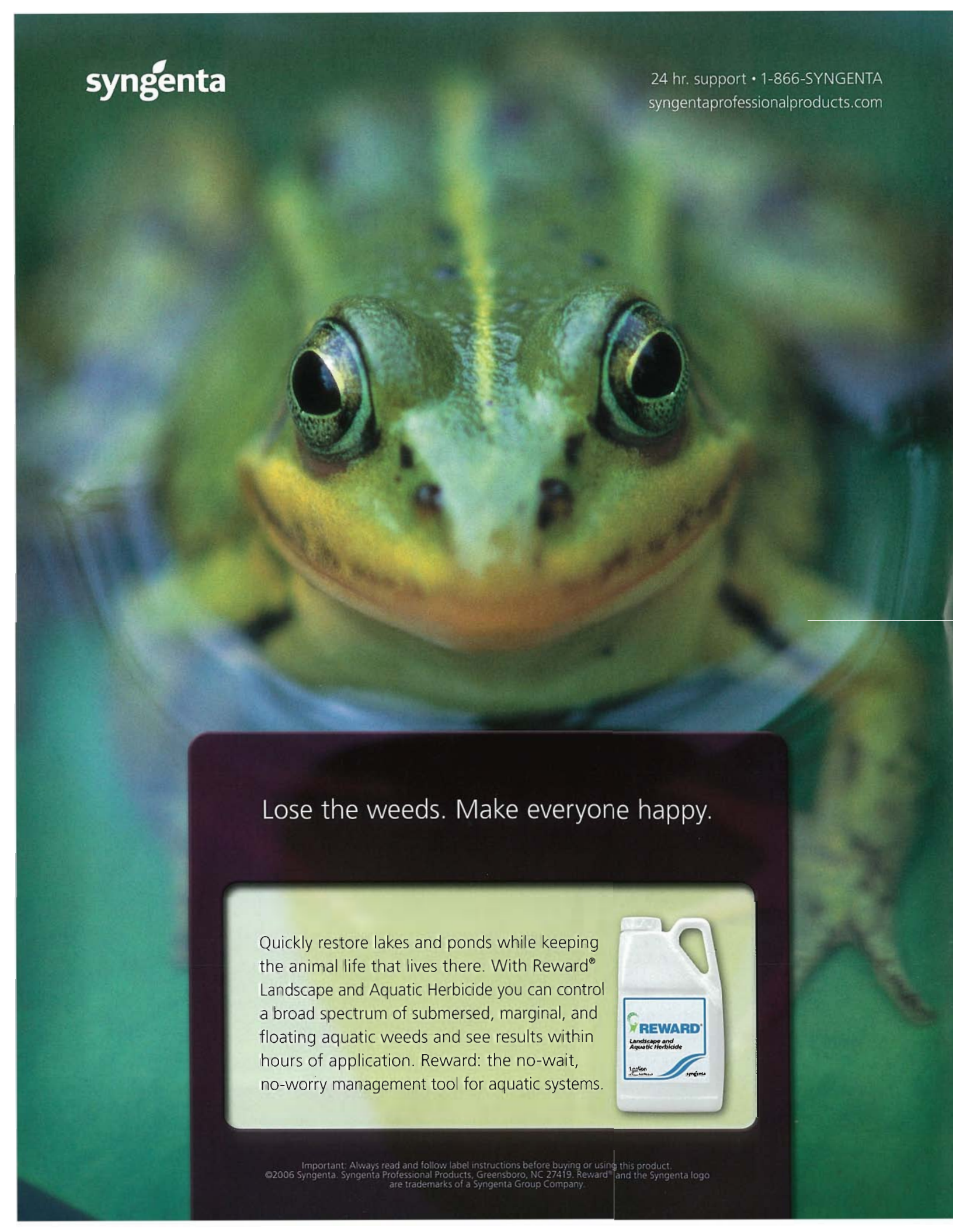
October 13-16, 2008
FAPMS 32nd Annual Training Conference
Hilton Resort Daytona Beach, FL
www.fapms.org/meeting.html

October 14-17, 2008
Natural Areas Conference 2008
Hosted by National Association of Exotic Pest Plant Councils, Nashville, TN
www.naturalarea.org/

December 3-5, 2008
Florida Stormwater Association Winter Conference
Hyatt Regency, Tampa
www.florida-stormwater.org

December 8-10, 2008
Northeast Mosquito Control Association 54th Annual Meeting
Marriott Providence Downtown Hotel, Providence, Rhode Island.www.mosquito.org

January 19-21, 2009
Northeast Aquatic Plant Management Society 10th Annual Conference
Gideon Putnam Resort, NY
www.neapms.net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