Aquatics

Winter 1997

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Letter to the Editor

This is an important year in the evolution of aquatic plant management in Florida. We all generally know the root of the problem but a summary may be in order: the legislatively-mandated Solid Waste Management Trust Fund Review Commission is presently attempting to identify possible funding sources for aquatic plant management. The balance of Florida's Aquatic Plant Trust Fund has repeatedly been spent down to the point where today, it will be nearly depleted by the end of fiscal year 1997-1998. Florida's aquatic plant managers can count only on the roughly $6 million income this fund receives annually. **Important projects, such as the reduction and monitoring of hydrilla infestations around the state, are threatened and virtually all of our past work could be lost in as little as two years.** Available funds for hydrilla control are projected to fall from nearly $12 million in fiscal year 1997-1998 to less than $2 million in 1998-1999. We cannot sit back and silently allow the hard-working efforts of the members of our society to be lost.

I have written a letter to Virginia Wetherell, Secretary, Department of Environmental Protection (DEP), expressing our desire that as DEP develops and implements its legislative agenda for the 1998 session it work with us in attempting to achieve our immediate societal goals: (1) to find a sufficient recurring funding source for aquatic plant management in Florida, and (2) to maintain the Bureau of Aquatic Plant Management within DEP as the state entity coordinating Florida's aquatic plant management efforts.

As we move forward this year there are important external questions to be addressed (see above) and important internal questions as well. This necessarily requires a look at our resource allocation of not only time but money too. I want to begin this examination by addressing the FAPMS Scholarship and Research Foundation.

Obviously, applicators are central to the mission of this society. The Foundation has Applicator Dependent Scholarships and Graduate Student Scholarships available, but only a handful of recipients. Just as we know that one of our major societal concerns (funding for aquatic plant management) gets very little attention, we run that same risk with the work of the Foundation. I raise this issue as an example to remind all of us not to overlook the basics. The mission of FAPMS encompasses more than just the funding issue.

As aquatic plant managers, we have our work cut out for us. I look forward to working with each and every one of you throughout the next year. It's time for the bugle to sound and all members of the society to step to the front and lead the charge.

Francois B. Laroche

Upper St. Johns River in Winter.

Photo by David Girardin

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CONTENTS

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EDITORIAL: Address all correspondence regarding editorial matter to Judy Ludlow *Aquatics* Magazine.

Why Cattails Spread in Florida Waters

by
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Problem Plants

Cattails, *Typha spp.* are the most dominant of the emergent species of aquatic plants in Florida public waters (Schardt, 1997). The plants have a remarkable ability to spread and dominate their environment, and the question arises, why? One point of view for years was that the dominance was a consequence of the mass of material produced by the cattails that would bury other material at the margin of expansion. More recent studies indicate that a better answer is allelopathy. But first, it helps to know about the plant.

Plant Background

Cattails are probably the most familiar of all wetland plants. Their brown flower clusters can be seen at the edges of ponds, rivers, and lakes or just about any place where there is shallow, standing water for at least part of the year. Cattails are tall, erect plants that may grow to 6 to 8 feet tall. They usually grow along the shoreline but may also grow in water 3 to 4 feet deep. They are spread by creeping rootstocks and seeds. Different species of cattail occur commonly in wet soil, marshes, swamps and shallow fresh and brackish waters throughout the United States. Of the ten known cattail species, three can be found in Florida environments (Long and Lakela, 1976). Cattails have their function in the wetland ecosystem, providing places for nesting and protective cover for several animal species.

Cattails are currently being studied by many researchers for their ability to remove pollutants from wastewater, not only phosphorus (DeBusk et al., 1995) and nitrogen (Zhu and Sikora, 1995) but heavy metals as well (Karathanasis and Mitchell, 1995; DeBusk et al., 1996). The use of wetlands for water treatment offers clear advantages over other forms of water purification and cattails seem to be a suitable species for this application.

The plant and its flowers are edible during certain stages of growth. Native Americans used cattails for food products and medicines, as well as for a variety of types of weaving. However, these days none of these uses is widespread and cattails are usually viewed as a nuisance aquatic plant (Smith, 1987). Cattail was the second most abundant aquatic species in Florida (after *Hydrilla verticillata* Royle), according to Schardt and Nall (1988), but now ranks number 1 among the emergent species (Schardt, 1997). The ability of cattails to expand over areas that were previously occupied by other species is well known and has been the subject of many studies over the years. In South Florida, *Typha domingensis* is believed to be a natural component of the Everglades ecosystem, occurring largely in scattered diffuse stands (Davis, 1994), but in many cases it has become the dominant marsh species, out-competing native plants such as sawgrass (Toth, 1988). Its uncontrolled growth can lead to the formation of dense, monotypic stands and even to the clogging of waterways.

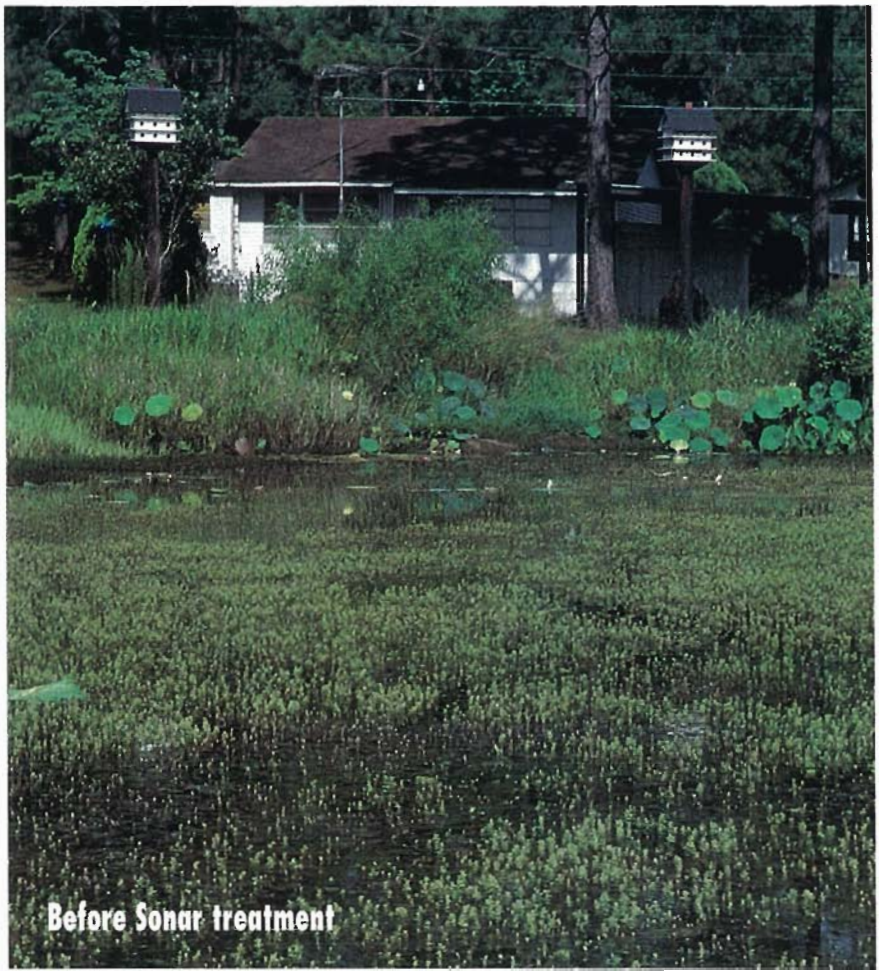
Allelopathy

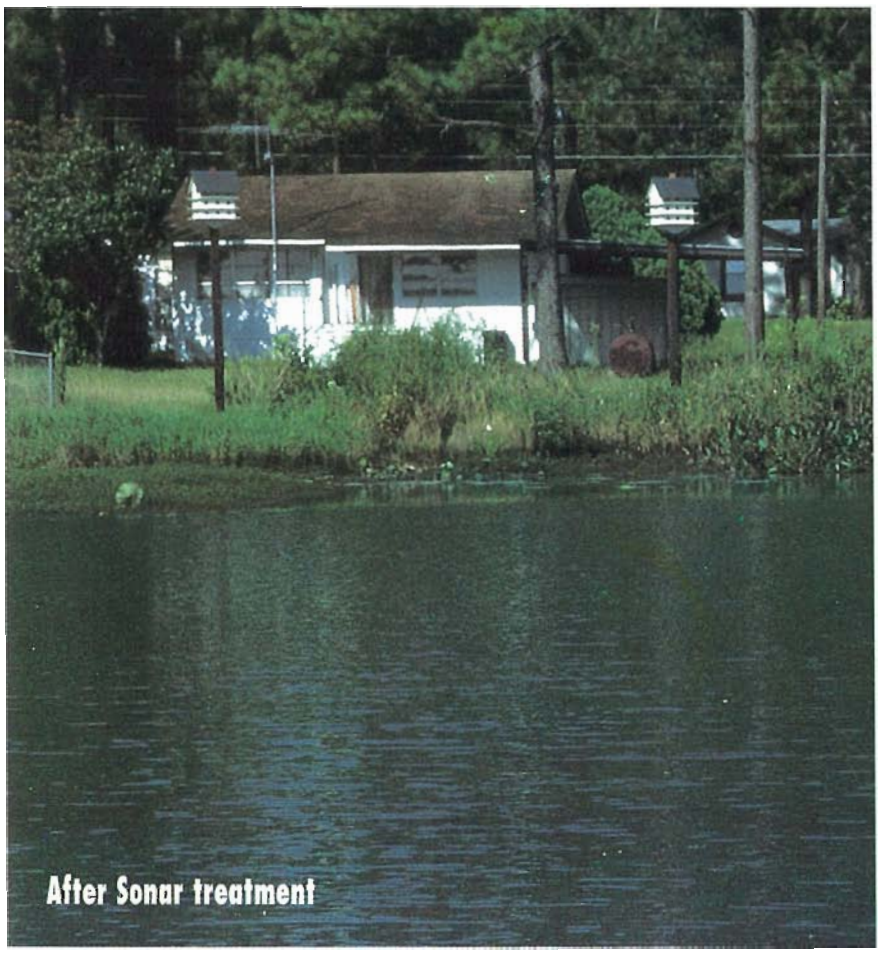
In the expansion of opportunistic cattail, many factors need to be considered, including its size, growth habits, adaptability to changes in the surroundings (nutrient levels, hydroperiod, shade) and the release of compounds that could prevent the growth of other species. This last feature can be considered as the essence of allelopathy, which is defined as "any indirect or direct harmful effect by one plant on another through production of chemical compounds that are released into the environment" (Rice, 1984). An early example of an allelopathic compound was juglone, a compound produced by walnut trees that reduces the probability of crowding.

Most examples of allelopathy have been terrestrial (Thompson, 1984), but we have been interested in aquatic allelopathy as well (Dooris and Martin, 1984; Moon and Martin, 1984).

Specific Compounds

Ether extracts of *T. latifolia* were chromatographically separated by Alliotta and co -workers (1990) . Three steroids as well as three fatty acids were isolated. Bioassays were conducted using crude *T. latifolia* extracts. Different algal strains were used as a subject. The crude extracts as well as the individual components were found to be able to inhibit the growth of





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some microalgae tested and a selective effect on blue-green algae (particularly on T 625 *Synechococcus leopoliensis* and on T 1444 *Anabaena flos-aquae*) was observed.

Bonasera and co-workers (1979) evaluated allelopathic properties of four marsh species: *Ambrosia trifida, Peltandra virginica, Bidens laevis*, and *Typha latifolia* were evaluated using water leachates of different sections of the plant in a bioassay against lettuce, radish, tomato, and cucumber seeds. Cattail extracts were found to be inhibitory to growth of all seeds and to radish germination in the first 24 h. Of the four plants evaluated, however, cattail extracts seemed to be the least inhibitory towards growth and germination. Soil extracts of a cattail marsh were found to enhance cucumber growth at 72 h. and radish growth at 48 h.

Several sterols were isolated from *T.latifolia* by Dellagreca, Monaco, and Previtera (1990). The structure of one sterol isolated from ethereal extracts of *T. latifolia* was determined (Dellagreca, Mangoni, and Molinaro, 1990). The compound was tested in a paper disk bioassay against blue-green algae *Anabaena flos-aquae* and *Chlorella vulgaris* and was found to be effective as a growth inhibitor for these two species.

Aqueous extracts from different portions of *T. domingensis* were found to inhibit the growth of lettuce and radish seeds; the same extracts were also able to inhibit oxygen production of *Lyngbya majuscula* (Prindle and Martin, 1996). The observed allelopathic properties were conserved upon autoclaving. Partial purification using a C_8 column provided fractions containing inhibitory agents. Using gas chromatography/mass spectrometry, 2-chlorophenol and salicylaldehyde were identified as two major components in these extracts (Prindle, Sawyers, Martin, and Martin, 1996). The two substances did not appear to be distributed in sediments at any notable distance from cattails (Albalat DomenPch et al., 1997).

Female flowers of *T. latifolia* were extracted with acetone and subjected to a paper chromatography analysis (Ozawa and Imagawa, 1988). Eleven kinds of phenolic compounds were detected and the compound present in the largest quantity was a natural product called dactilifric acid. Other phenolic substances isolated and identified, but their relative amounts were very low.

Other Examples of Allelopathy

The autotoxic effects of cattail extracts in the germination of cattail seeds have been extensively studied (Grace, 1983; McNaughton, 1968). Autotoxic effects have been found to be a powerful drive in the unidirectional orientation of cattail marshes. However, the autotoxicity could be eliminated by removing the phenolic compounds present in the cattail extracts, a strong indication of the correlation between phenolics and allelopathic properties.

To assess the potential of cattails to replace sawgrass in the Florida Everglades, the germination of two different cattail species (*T. domingensis* and *T. latifolia*) in response to different phosphate levels was studied by Stewart and co-workers (1997). In experiments using field water, the percentage of germination values were very similar for both species under low nutrient-level conditions. In the high nutrient-level range, *T. latifolia* germinated faster. Results indicate that both cattail species are able to germinate under a variety of nutrient levels and pose a threat to sawgrass in the Everglades environment.

Seidel (1975) has been concerned with the allelopathic potential of *T. angustifolia* and its role in marsh succession. The species is well known for its ability to become monospecific when growing in water. When the growth front is in dry land the plant enters the succession cycle, sharing space with other plants and, depending on the environmental conditions, ultimately

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becoming the dominant species. Some of the species that are outcompeted by cattail are: *Mentha aquatica* L., *Epilobium hirsutum* L., *Bidens tripartitus* L., and *Juncus effusus* L.

The work of Szcepanska (1971, 1987) and her collaboration with Szcepanski (1982) has been a very important contribution to the understanding of the allelopathic potential of helophytes ("sun-loving plants") in aquatic environments. By planting mixed cultures of *T. latifolia* and other aquatic weeds (specifically *Phragmites australis),* the interactions between these plants were determined on the basis of growth and production characteristics. It was observed that in mixed cultures, the cattail gained biomass while the reed lost it over time. It was found that the type of soil modifies the growth of the cultures in monotypic stands, and it also influences the character of interrelations among the plants in mixed cultures. It was also found that the growth of reed could be inhibited by the introduction of dead plant material in the growing medium. The competition between the two species was interpreted as a consequence of the allelopathic behavior of the cattail plants.

Szcepanski (1971, 1977) proposes allelopathy as a means of control of aquatic weeds, based on the allelopathic potential of cattails to outcompete other aquatic species. With more research and the characterization of allelopathic compounds, weed control with allelopathic means could become a worthwhile approach.

Other Factors

Grace (1987) has studied the rates of competitive displacement between two cattail species (*T. latifolia* and *T. domingensis*) growing along gradients of water depth. He found that seedling size, as well as initial density, has a strong influence in the early outcome of the competition. Results suggest that if both species survive the initial competition phase and the habitat remains undisturbed, a predictable zonation will occur.

Using soil from the northern Everglade region, Newman and coworkers (1996) subjected experimental mixtures of *T. domingensis, Cladium jamaicense,* and *Eleocharis interstincta* to two levels of nutrient concentration and three contrasting hydroperiods to determine how these variables might affect cattail's ability to displace the other two. It was found that cattail development was enhanced by elevated nutrient concentration and increased flooding. These results are in good agreement with the work of David (1996),who found no dependence in the frequency and coverage of *T. domingensis* with increased hydroperiod, but instead an enhancement associated with nutrient-enriched waters.

Photosynthetic activity and growth responses of cattail and sawgrass plants subjected to a range of soil redox potentials (Eh) were studied by Pezeshki and coworkers (1996). Cattail showed significantly greater net photosynthetic rates as compared with sawgrass at low Eh (or anaerobic) conditions. Also, under low Eh treatments, cattail total biomass reduction was greater than the corresponding sawgrass values. It is suggested that the differences between the two species in terms of site occupancy and competition may be partially explained by differences in their acclimatization to oxygen-deficient environments, with cattails being the species with the greater potential for survival in mixed habitats.

Summary

It is evident that allelopathy of cattails is an important factor in understanding the dominance of these plants. Other factors are, of course, significant, but it seems reasonable to say that a better understanding of the nature of the allelopathic compounds, their activity, and influence will contribute to a better understanding of the ecology of cattails in Florida. In addition, we believe that exploration of plant-plant interactions will lead to reasonable management techniques.

Acknowledgments

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Note: a more technical version of this article is available upon request to the authors

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Pond Apple

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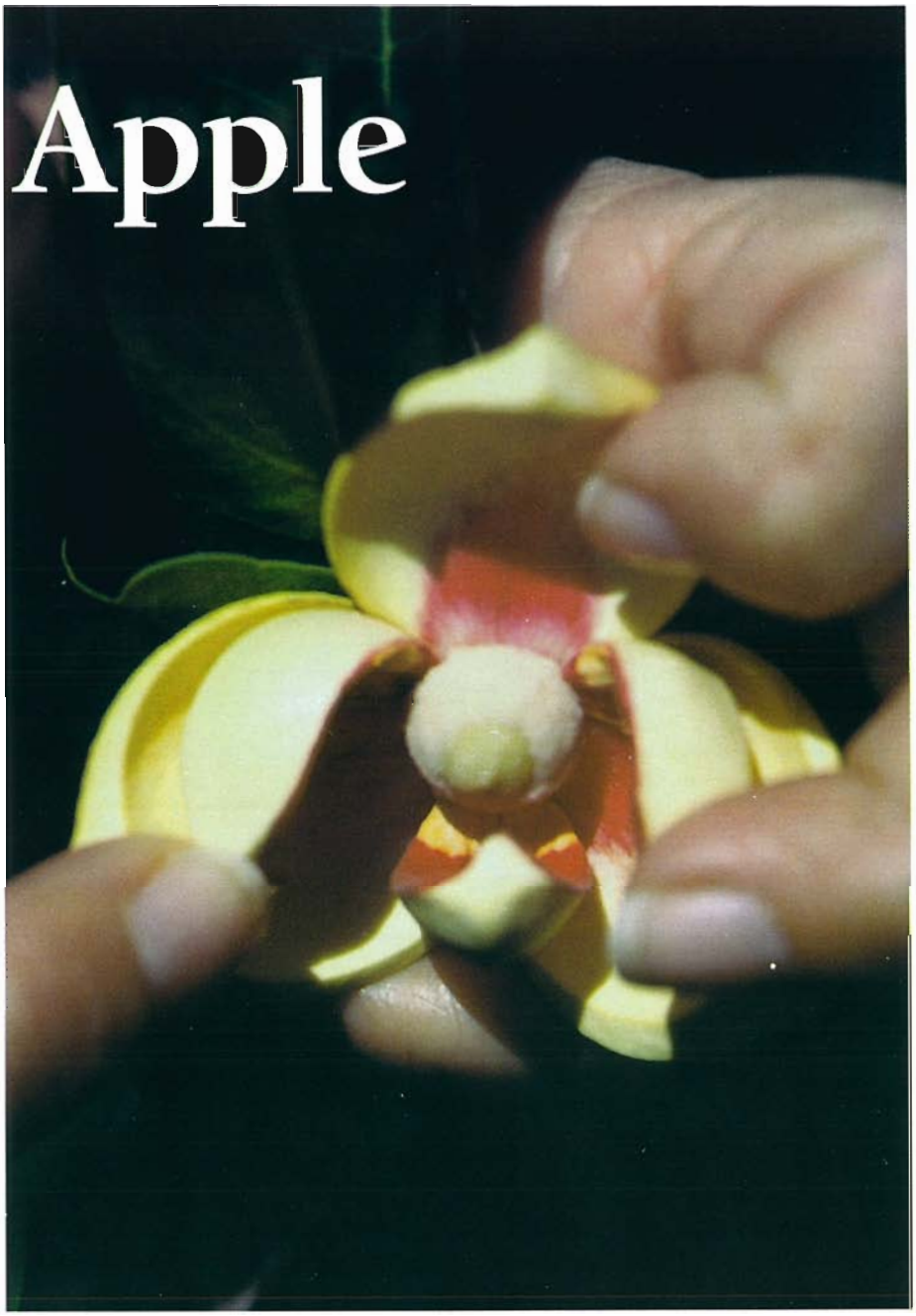

Figure 2: Pond apple flower.

Introduction

Wetland plants are unique in that they tolerate saturated, flooded conditions that mean certain death for terrestrial plants. Wetland plants are especially important in southern Florida since many thousands of acres of land are submerged either year-round or for extended periods of time. Southern Florida's semitropical environment provides ideal growing conditions for many plant species, and this region is home to an abundance of flora. Many exotic species can realize unchecked, rampant growth and can pose a hazard to southern Florida's delicate ecosystems; therefore, their biology and methods for control have been exhaustively studied. However, little is known of many native plants that grow naturally in and around our lakes, rivers, and wetlands.

Pond apple (*Annona glabra* L.), a tree-like member of the custard apple or pawpaw family (Annonaceae) is a native plant of particular interest. Historically this plant was dominant in some wetland systems but is now much less abundant. Little is known of environmental factors influencing growth and distribution of pond apple plants. This article provides information on pond apple in an effort to increase the awareness and appreciation of one of southern Florida's native plants which at one time was an integral component of wetland communities.

Family Characteristics

The Annonaceae is comprised of 132 genera and approximately 2,300 species. The family is almost completely tropical, with only one genus, Asimina (pawpaw), considered temperate. The custard apple or pawpaw family contains several species important for use as ornamental plants, tropical fruit production, and fragrances. Several members of the genus *Annona* are cultivated for their fruit, with many people eagerly anticipating the ripening of cherimoyas (*A. cherimola* L.), sweetsops or sugar apples (*A. squamosa* L.), soursops (*A. muricata* L.), and custard apples (*A. reticulata* L.) for eating out of hand or for use in cooking. Another delectable member of the family is the paw-

paw (*Asimina triloba* L.). Pawpaw trees are cultivated in the northern parts of the United States, and their fruit are savored by many. The ethereal oils produced by ylang-ylang (*Cananga odorata* (Lam.) Hook. f. & Thomson) are responsible for providing Chanel No. 5®'s distinct fragrance. Other genera cultivated for their ornamental qualities include *Annona*, *Cananga*, *Polyalthia*, and *Rollinia*.

Members of the Annonaceae occur as trees, shrubs, or woody vines. All contain ethereal oil cells and may be aromatic, especially when bruised or wounded. Their leaves are simple, entire, pinnately veined and without stipules (small, leaf-like appendages situated at the base of leaf stalks on many plants). Leaves of members of this family are arranged alternately on the stem. Some genera are deciduous, while others are evergreen.

Custard apple or pawpaw family members have perfect, symmetrical, axillary flowers that are usually large and showy. Flowers may be solitary or in small clusters. The calyx of the flower consists of three sepals with edges that meet but don't overlap, and may be distinct or basally fused. The corolla has two whorls of three petals each; the inner whorl is usually smaller than the outer. Flower petals may be maroon, white or yellowish, and may meet or overlap. The flower's androecium is composed of many stamens arranged in a spiral on the short, convex receptacle; the gynoecium has few to many distinct carpels that are also arranged in a spiral.

Fruit of plants in the Annonaceae may be an aggregate of berries or a syncarp (multiple fruit) with large seeds. The seeds often have an aril where the seed was attached, and contain endosperm that is copious, wrinkled, and oily; the embryo contained within is small.

Genus Characteristics

The genus *Annona* boasts approximately 130 species and is represented in virtually all tropical and subtropical parts of the world. Members of this genus grow as trees, shrubs, or woody vines. Their leaves may be smooth, covered with a powdery or waxy coating, or with simple, forked, or stellate-like

Figure 1: Mature pond apple tree.

(arranged in the form of a star) hairs. The leaves may have different colors on the top and bottom of the blade, and exhibit a wide range of shapes. The leaf shape may be acute, elliptic, oblong, ovate, obovate, lanceolate, obtuse, or cuspidate. Flowers may be terminal, subterminal, or internodal. The fruit is a fleshy, globose syncarp that appears obovoid to oblong-ovoid and has a surface that is covered with minute meshes or small spines, or is prickly. Species in the *Annona* family are separated based on their leaf or flower morphology.

Pond Apple Characteristics

Pond apple is a tree that can reach up to 45 feet (15 m) in height. The base of the tree may be swollen or buttressed due to its close proximity to water (Figure 1). Its leaves are smooth and shiny, lanceolate, and grass-green on the lower surface of the blade. The flower of pond apple is large; the outer petals may be up to 1.3 inches (3.5 cm) long and 1.0 inch (2.5 cm) wide, while the inside petals can be 0.6 inch (1.6 cm) by 0.4 inch (1 cm). The flowers are white or yellowish; the outer petals have corrugated maroon tissue at the inner base (Figure 2). The tree produces flowers from winter through late spring (January until June in southern Florida), and produces fruit throughout late spring and summer (from June until September in southern Florida). The fruit of pond apple is heartshaped and is up to 4.7 inches (12 cm) long by 3.15 inches (8 cm) wide (Figure 3). Immature fruit is green with cream-colored flecking; upon maturity the skin becomes yellowish. The pulp of the fruit appears salmon, and tends to be grainy and stringy. Each fruit contains many small, flat, oval seeds that are about 0.6 inch (1.5 cm) long and 0.4 inch (1 cm) broad. The fruit is edible but has an unappealing flavor when eaten raw. Boiling may improve the flavor somewhat, and the fruit is reported to make acceptable jelly.

Figure 3: Ripe pond apple.

Pond apple has been used by people throughout the world for a variety of physical ailments. The people of Curacao in the Antilles Islands have used the plant as a remedy for diarrhea, stomach aches and skin problems, while Mexicans have tried the pond apple as a treatment for jaundice and tuberculosis.

The most frequently used common name of *Annona glabra* L. is "pond apple"; it has also been called "alligator apple", "corkwood", and incorrectly "custard apple". Since common names are colloquial, it is important to use the scientific name along with the common name in order to avoid confusion. For example, Laurence Will in his book "A Cracker History of Okeechobee" uses the common name "Custard Apple" when in all likelihood he is referring to "Pond Apple", since the plant he writes about is growing in wetland areas. Custard apple (*A. reticulata* L.) prefers a terrestrial environment whereas pond apple inhabits swamps and wetland areas.

Distribution of Pond Apple

Pond apple is classified as an obligate wetland species, meaning

its natural habitat is wetlands greater than 99% of the time. In times past, forests of trees could be found near lakes, ponds, and swamps throughout southern Florida, but many of them, along with other native plants, have been destroyed so the land they inhabited could be used for profitable commercial ventures. Pond apple trees were abundant in regions south of Lake Okeechobee until the area was drained and cleared to allow cultivation of commercial crops. The dense hammocks originally created by these trees provided natural trellises for the endangered Okeechobee gourd (*Cucurbita okeechobeensis* (Small) Bailey) and moonvines (*Convolvulus spp.*). Also, native "Florida Crackers" used sections of the roots of pond apple to substitute for cork in their fishing equipment.

Very few pond apples remain in southern Florida because of the destruction of areas where they grew naturally. As the land is stripped of native plants, exotic colonizers often move in to take advantage of the prime growing sites. Ironically, while we struggle with the problems of exotic tree species like melaleuca (*Melaleuca quinquenervia* (Cav.) Blake) invading our wetlands, the folks in Australia are distressed because pond apple trees are crowding out desirable melaleuca trees there!

The importance of restoring our wetlands has become more evident in recent years, and the first step to return the lands to the way they were is to cultivate and re-introduce native plants. Pond apple was an important part of our delicate ecosystem, and efforts need to be made to ensure that it regains its rightful place in southern Florida's wetlands.

Acknowledgments

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References

Literature articles used in the preparation of this article may be obtained by contacting David Sutton. Mailing address: University of Florida - IFAS, Fort Lauderdale Research & Education Center, 3205 College Avenue, Fort Lauderdale, FL 33314; or e-mail: dlsu@icon.ftld.ufl.edu

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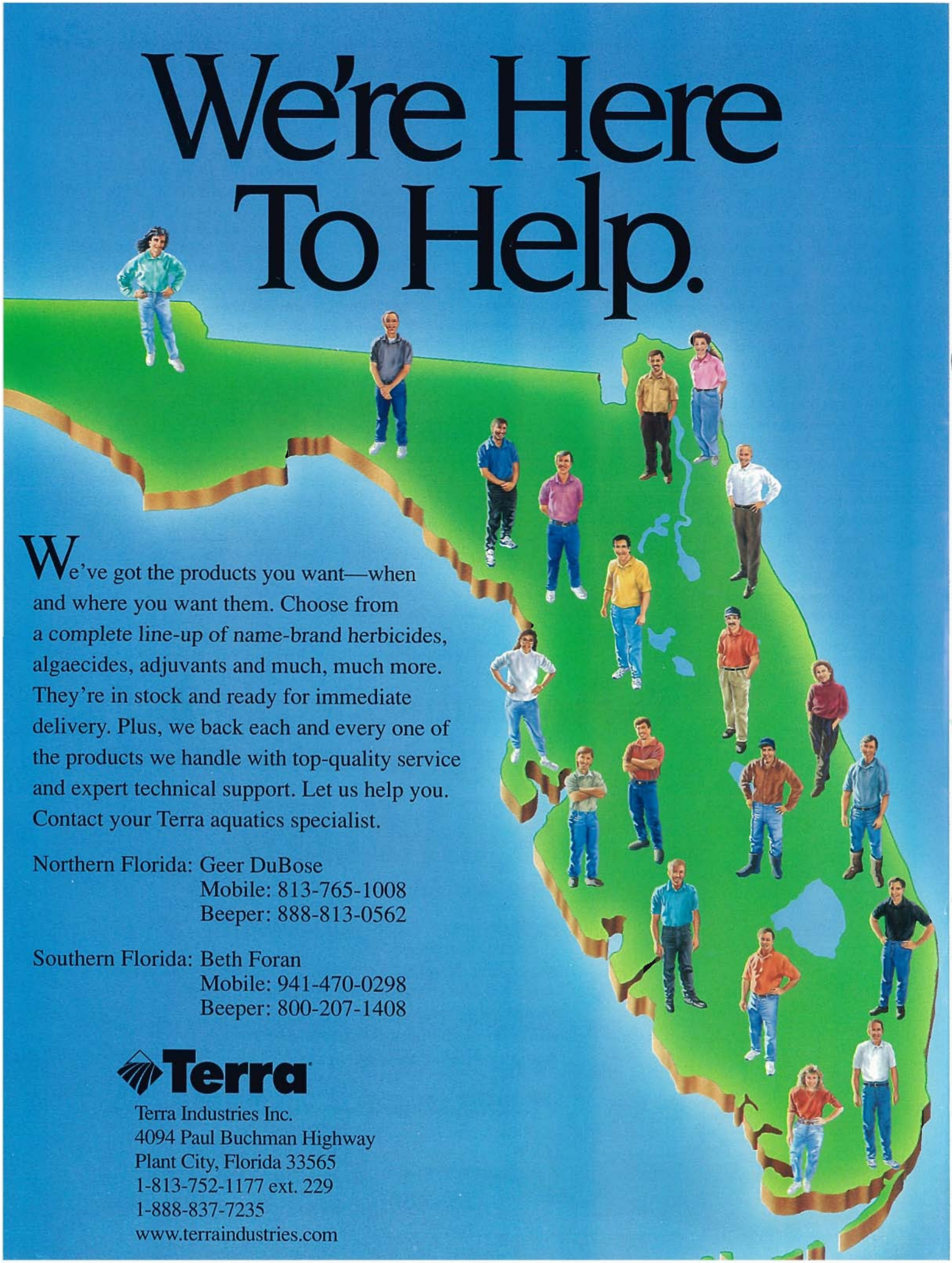

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Hydrilla in Wakulla Springs State Park: The Battle Between Two Non-Indigenous Plants

by
Judy Ludlow and
Scott Savery
Florida Department of
Environmental
Protection

Introduction

Wakulla Springs State Park is located 15 miles south of Tallahassee Florida, and enjoys the notoriety of being home of one of the world's largest, fresh water springs. Approximately 400,000 gallons of water per minute flow from it's cavernous mouth forming the headwaters of the scenic Wakulla River. The park offers glass bottom boat tours of the spring and spring run where visitors are treated to sightings of abundant fish and wildlife, including numerous alligators and a variety of bird life. There is a swimming beach and a diving platform into the 125 foot deep water of the spring. The only entrance to the spring head is through the park. There is no public access to the spring via the Wakulla River, therefore, the only boat traffic in the park are the tour boats.

The aquatic vegetation of Wakulla Springs is diverse (over 40 species), yet has been dominated by the non-native submerged plant, *Egeria densa* since the early 1970's. The egeria covers approximately 50% of the spring run and is manually maintained by park staff. Although egeria is abundant, it generally causes few problems as the activity of swimmers and tour boats keeps the egeria under control in the swimming area and boat trails. The egeria forms surface mats on the edges of the river but not in the faster flowing portions of the spring run. Although having egeria as a major component of Wakulla Springs State Park is by no means an ideal situation, it seems that wildlife and humans have adjusted to it presence.

Hydrilla Moves In

On March 26, 1997 during an aquatic plant survey of Wakulla Springs, Kathy Burks (Botanist, Department of Environmental

Protection ,Bureau of Aquatic Plant Management) and Scott Savery (Biologist, Wakulla Springs State Park) found hydrilla (*Hydrilla verticillata*) growing in small patches by the Wakulla Springs swimming area, tour-boat dock, and spring. The hydrilla has flourished in the nutrient-rich waters of the spring raising concerns not only about environmental impacts, but also about public safety. During the summer, several swimmers complained about the infestation and two swimmers had to be assisted by lifeguards after they became entangled in the hydrilla.

Jess Van Dyke (Biologist, Department of Environmental Protection, Bureau of Aquatic Plant Management) and Scott Savery have since developed a hydrilla management plan for the park. Volunteer divers have been used to hand pull hydrilla with additional surface support staff loading it onto a small barge. Surface support staff also use dip nets to collect floating fragments of hydrilla and seine nets are stretched along the boat docks to prevent additional fragments from floating down river. Multiple dump truck loads have been removed without, unfortunately, much headway. Herbicide treatments using Aquathol Granular began at the swimming area in October, 1997. Areas outside the swimming beach are subject to very high water movement and preclude the use of herbicides. Final results of herbicide treatments at the beach have not yet been determined.

How Was Hydrilla Introduced?

Hydrilla is located in the Wakulla River one mile downstream of the park boundary (4 miles downstream of the spring) but this hydrilla has never spread upstream of its current location. Additionally, since Wakulla Springs State Park is closed to public boat traffic, it seems unlikely that hydrilla was introduced via boat motors or trailers. Fishing is not permitted in the park, so introduction via bait buckets or tackle is also unlikely. While it is possible for hydrilla to have been introduced by wildlife, it is more likely that hydrilla was introduced by swimmers and their gear. Consider the following: Wakulla Springs is visited by swimmers from all over Florida. Often these swimmers visit a number of springs over a few days, and many of Florida's springs already have hydrilla. After learning about the threat of hydrilla from Jess Van Dyke, the owner of Cypress Springs (a private spring run in northwest Florida) began carefully inspecting swim gear before swimmers entered the spring. The owner reported to Jess that 1 of 10 swimmers had hydrilla fragments stuck on their gear. Based on this information it seems plausible that hydrilla was introduced into Wakulla via fragments on swimming gear. The Bureau of Aquatic Plant Management is currently developing educational signs and brochures warning swimmers to thoroughly check their gear before entering spring runs.

The Future

As discussed above, having egeria as a major component of Wakulla springs is by no means an ideal situation, but could hydrilla be worse? Will hydrilla out-compete the egeria,? What impacts will hydrilla have on fish, wildlife, and human use of the park? Only time will tell. Every effort is being made through the current management plan incorporating hand removal, herbicides, and public education, to keep hydrilla in check at Wakulla Springs State Park.

AQUAVINE

MEETINGS

Florida Weed Science Society Annual Meeting, Apopka Florida, February 26-27, 1998. Contact Ken Muzyk, 813-681-3461 for further information

Seventh Annual Southeastern Lakes Management Conference, Hosted by the Florida Lake Management Society, "Integrating Water Resources and Growth Into the 21st Century", April 15-17, 1998, Call Carey Cordell 407-880-6334 for further information.

10th International Symposium on Aquatic Weeds, "Towards an integrated aquatic plant management", Lisben, Portugal, September 22-25, 1998.

PERSONELL CHANGES IN THE US ARMY CORPS OF ENGINEERS (USACE)

Eddie Knight Retires

After 35 years in the field of aquatic plant management, Eddie Knight retired from the Palatka office of the USACE on October 31, 1997. Eddie is recognized as the national expert on airboat certification, and has assisted USACE disaster crews in Puerto Rico, the Virgin Islands, Miami, and California. Eddie has always been actively involved in FAPMS by serving on various committees, giving presentations, and serving as president in 1988. He was honored at the 1997 FAPMS annual meeting with a Lifetime Membership. Eddie will also be remembered for entertaining us with his musical bluegrass talents. His future plans include getting out of Dodge and heading west with the wife and camper. Enjoy!!

Nancy Allen Transfers

On November 3rd Nancy officially became the Aquatic Plant Control Field Unit Manager in Palatka (Eddie Knight's former position) for the USACE. Nancy was the Field Biologist in Crystal River working primarily on the Crystal and Withlacoochee Rivers. She now directs the management of aquatic plants on the St. Johns River. Congratulations Nancy!!

Wayne Jipsen Moves On

Wayne Jipsen has accepted a new position with the USFWS Ecological Services Office in Jacksonville. Wayne had worked for 10 years in the aquatic plant control section of the USACE, starting in Clewiston (learning to drive an airboat on Lake Okeechobee!), and ending up in Jacksonville. Wayne has been actively involved in FAPMS and has served as Director and Treasurer. Good Luck Wayne !!

TO ALL THE MEMBERS AND OFFICERS OF FAPMS,

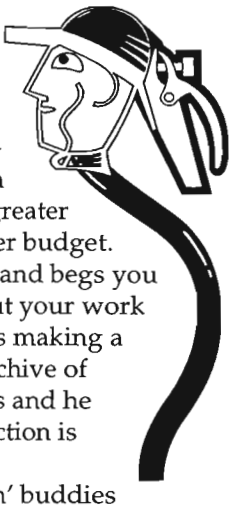
Let me begin by saying a heartfelt thanks for bestowing the honor as Honorary Lifetime Member of the Florida Aquatic Plant Management Society at the 1997 annual meeting. This is no doubt the highest award I have ever received. I think it was plain to see I was speechless with words hard to get past my heart that had jumped up to my throat. I was trying to say that everyone is basically equal in the success of FAPMS and aquatic plant control work. All the money and work that goes into making and labeling a product for use in the aquatic environment depends on a highly diverse group of people for it's subsequent safe and competent use. A managers plan is only as good as the people that implement it, and one of the most important tasks is where the buck stops a the applicator, for he is the one that has last tag for the make or break success of the reputation in this highly visible field of aquatic plant management. Competent and prudent application is the cornerstone of successful management.

We are all defenders of the environment. After 35 years in the aquatic plant field I have seen changes. The most rewarding is the fact that we all share a common goal in protecting and keeping in balance the resources we are blessed with. The Florida Aquatic Plant management Society is without a doubt the leader in this field with a pool of expertise that cannot be matched. What makes this Society great is the fact that no one person, no one agency or group can take full credit for this success. It is a cohesive effort that makes for sincere and dedicated achievements from the manufacturers, managers, researchers, and applicators.

I am proud to have been a part of these efforts. It is with great honor to have served as a Past President of FAPMS, and again (with bulging chest I say this), as a new Lifetime Member I continue to pledge my support and help to the Society. Thank you again and God Bless.

Eddie Knight

You Might Be A Nozzlehead If:



- If your monthly expenditure for sunscreen and chapstick is greater than half your beer budget.
- If Ken Langeland begs you to let him clear out your work truck because he's making a herbicide label archive of canceled products and he knows your collection is complete.
- If your huntin' buddies think you're a real sympathetic husband for spending 3 days each year at A PMS meeting.
- If at 60 mph you can communicate with others on your airboat in three languages and only use your right thumb and middle finger.

** Copyright © and Disclaimer! Hopefully to be considered as light humor by most, this column is written for all the hardworking and caring professionals who dedicate their work afield to excellence in aquatic plant management. David Tarver*

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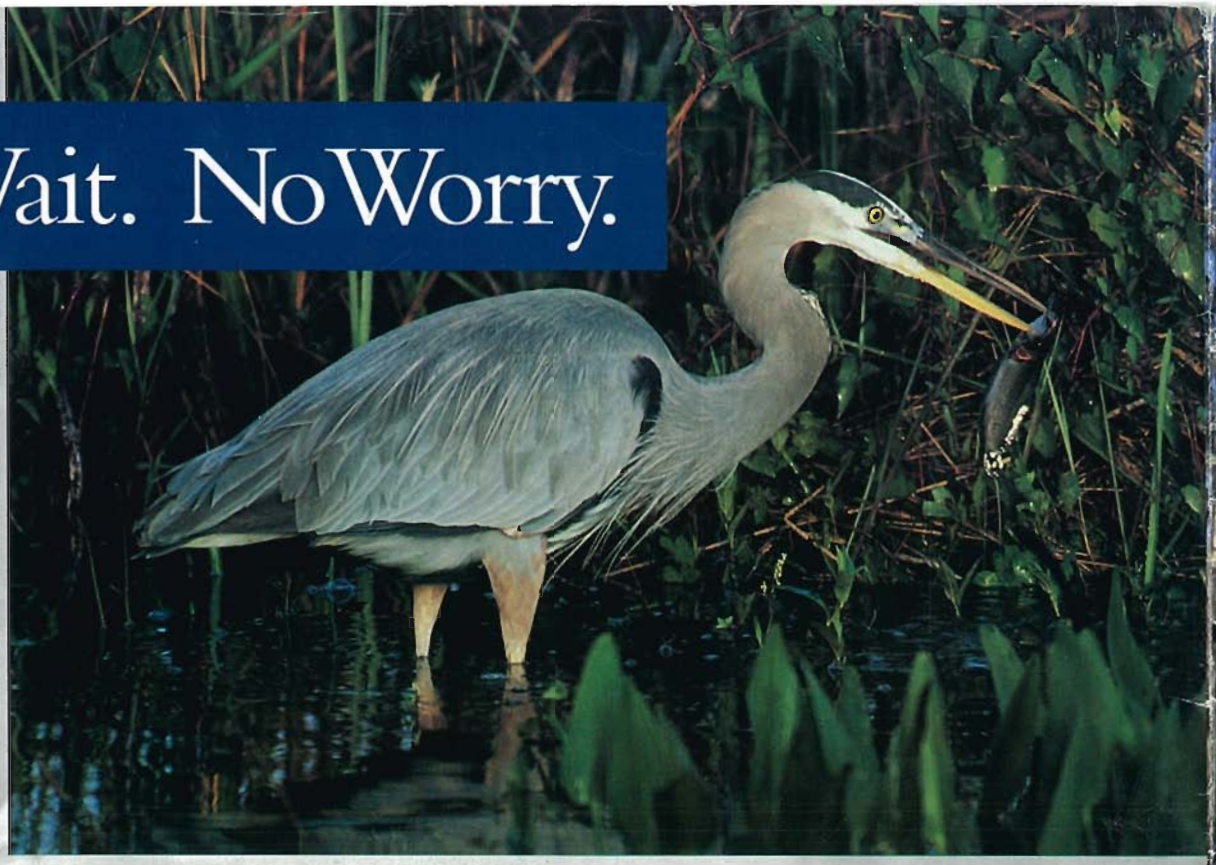

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