

Aquatics

Fall 1995

Karen Brown
IFAS
3242 N.W. 12th Terr.,
Gainesville, FL 32609-2136
1994

Bulk Rate
U.S. Postage
PAID
Tallahassee, FL
Permit No. 407

QUALITY PRODUCTS FOR WATER QUALITY

Algae and Aquatic Weed Control and Maintenance Products



A patented, concentrated liquid formulation for use in contained lakes and ponds. EPA registered for aquatic plant growth control. Contains a blend of blue and yellow dyes to block out specific light rays critical to photosynthesis. No restrictions on swimming, fishing, irrigation or stock watering. Leaves water a pleasing blue color.



A patented, concentrated liquid algaecide with a wide range of labeled use sites. Contains chelated copper which stays in solution to continue controlling a broad range of algae well after application. No water use restrictions following treatment.



A granular chelated copper algaecide ideally suited for treatment of bottom growing algae and spot treatments along docks, beaches, boat launches and fishing areas. Controls growth before it reaches the surface.



A liquid aquatic herbicide that effectively controls a broad range of underwater, floating and emergent aquatic weeds. Kills quickly on contact. Ideal for small area treatments.



A granular aquatic herbicide which selectively controls some of the most troublesome aquatic plants such as water milfoil, coontail, and spatterdock. Gradual release and systemic action ensures complete kill of the entire plant.



A liquid chelated copper algaecide formula in a concentration suitable for dosing stock water tanks, troughs and small ponds. Treated water can be used immediately for stock watering.



The exact formulation of Cutrine-Plus Liquid, but labeled specifically for use in fish and shrimp aquaculture facilities. Provides use instructions for ponds, tanks and raceway systems.



A dilute Aquashade formulation in 2 oz. and 8 oz. packaging for ornamental applications in garden ponds, fountains and aquariums. Provides algae control at a drop per gallon or one ounce per 1,000 gal.



A silicone defoamer to suppress, eliminate and prevent foaming within a wide variety of systems. Use in pesticide spray mixtures, industrial ponds, fountains and even water park rides.

Available From Quality Distributors Throughout the United States and Worldwide



applied biochemists inc

SURFACE WATER / SPECIALTY PRODUCTS



People and products dedicated to algae control and aquatic weed problems

6120 W. Douglas Ave. • Milwaukee, WI 53218 • 1-800-558-5106

Letter to the Editor

I would like to thank each and everyone who attended and/or helped in any way at our hydrilla workshop/field days in June and July at Camp Mack. Both days were a tremendous success, as we have already had many positive phone calls, newspaper articles, and meetings with key people as a result of your Societies efforts. All airboat drivers deserve a special "THANK YOU" for your dedication and contribution to each field day. We could not have completed these workshops without you. Additionally, thank you to all agencies and private companies who allowed their employees to attend and bring airboats. Also, thank you to Camp Mack, they were great hosts and we appreciate the use their wonderful facilities.

One key meeting, which took place following the workshops, was with lobbyists from two herbicide companies. These interested parties sat down and discussed how we need to approach our legislators and bills in the upcoming 1996 Session. Everyone attending the meeting felt the desperate need to have a lobbyist in place to track important bills, meet key people in Tallahassee, and inform us on what to do and when to attack during the 1996 Session. A lobbyist with the needed credentials will not come cheap and everyone needs to be aware of this. However, there is a chance of splitting the cost between the Society and some herbicide companies. The need to include additional exotic plant funding for control and research was discussed to bring in larger support from other concerned areas for our bill. As current President of your Society I feel that we must support a lobbyist in Tallahassee and expand our efforts to include additional exotic plant management and research funding in 1996. If the Society agrees, now is when we need to start looking for the right person. A decision by the Board of Directors should be made regarding this matter by the 19th Annual Meeting at St.

Continued on page 22



The Great Northwest—We all know hydrilla is not supposed to be here—but the menace does not. Hydrilla was detected in Washington this summer. Photo by David P. Tarver

Aquatics

Fall 1995/Vol. 17, No. 3



CONTENTS

Hygrophila is Replacing Hydrilla in South Florida
by *David L. Sutton* 4

Management of Aquatic Plant Communities in Rodman Reservoir from 1969-1994
by *Judy Ludlow* 11

Evaluation of Herbicides for Control of American Frogbit
by *Ken Langeland, Brian Smith, Neil Hill, Steve Grace, Mathew Cole, Johnny Drew and Ed Meadows* 16

FLORIDA AQUATIC PLANT MANAGEMENT SOCIETY	Editor Ken Langeland IFAS/Center for Aquatic Plants 7922 N.W. 71st Street Gainesville, FL 32653-3071 (904) 392-9614, SC 622-9614, Fax (904) 392-3462	Jeff Schardt, Director (1st Year) DEP Innovation Park, Collins Building 2051 East Dirac Drive Tallahassee, FL 32310 (904) 488-5631, Fax (904) 488-1254	Auditing Steve Weinsier 305/452-0386
OFFICERS AND DIRECTORS, 1995		Vera Gasparini, Director (1st Year) 4169 Leafy Glade Place Casselberry, FL 32707 (407) 376-5073	Awards Ernie Feller 407/847-5067
President Mike Hulon, GFC 600 N. Thacker Ave., Suite A-1 Kissimmee, FL 34741 (407) 846-5304, Fax (407) 846-5310	DIRECTORS-AT-LARGE	Ed Harris, Director DEP 5882 S. Semoran Blvd. Airport Business Center Orlando, FL 32822 (407) 275-4004 or SC 343-4004 Fax 275-4007	By Laws Francois Laroche 407/687-6193
President Elect Don Dogget Lee County Mosquito Control 13060 Indylwild Rd Ft. Myers, FL 33905 (813) 694-2174, Fax (813) 694-6959	Keshav Setaram, Director (2nd Year) Orange Co. Environmental Protection Dept. 2002 E. Michigan St. Orlando, FL 32806 (407) 836-7400, SC 356-7400, Fax (407) 836-7499	Mike Mahler, Director (1st Year) Polk County Environmental Services Box 39 Bartow, FL 33830 (813) 534-7377, Fax (813) 534-3711	Equipment Demonstration Steve Smith 813/763-2197
Secretary Nancy Allen, USACE APCOSC, Crystal River P.O. Box 387 Crystal River, FL 34423 (904) 795-2239, Fax (904) 795-1911	Ron Hyatt, Director (2nd Year) Lake & Pond Maintenance P.O. Box 28087 St. Petersburg, FL 33709 (813) 522-1584	Steve Smith, Director (1st Year) South Florida Water Management District Okeechobee Field Station 1000 NE 40th Ave Okeechobee, FL 33472 (813) 763-2197, Fax (813) 467-9086	Governmental Affairs Dan Thayer 407/687-6129
Treasurer Catherine Johnson 688 Andover Circle, Winter Springs, FL 32708 (407) 275-4004	Mike Bodle, Director (2nd Year) South Florida Water Management District P.O. Box 24680 West Palm Beach, FL 33416 (407) 687-6132, SC 229-6132, Fax (407) 687-6436	William Christian, Director (2nd Year) East Volusia Mosquito Control District 600 South Street New Smyrna Beach, FL 32168 (904) 428-2871, Fax (904) 423-3857	Historical Bill Haller 904/392-9615
Past President Wendy Andrew Walt Disney World Parks Pest Control P.O. Box 10,000 Lake Buena Vista, FL 32830 (407) 824-5484, Fax (407) 824-7054		COMMITTEE CHAIRS	Local Arrangements (1st Year) Vera Gasparini 407/257-8704
		Advisory Committee Representative, Ken Langeland 904/392-9614	Merchandising Jan Frye 813/597-1505
			Nominating Wendy Andrew 407/824-5484
			Program Alison Fox 904/392-1808
			Publicity Don Dogget 813/694-6959
			Scholarship Joe Joyce 904/392-1971

The Florida Aquatic Plant Management Society, Inc. has not tested any of the products advertised or referred to in this publication, nor has it verified any of the statements made in any of the advertisements or articles. The Society does not warrant, expressly or implied, the fitness of any product advertised or the suitability of any advice or statements contained herein.
1993 FAPMS, Inc. All rights reserved. Reproduction in whole or in part without permission is prohibited.
AQUATICS: Published quarterly as the official publication of the Florida Aquatic Plant Management Society Registration No. 1,579,647. This publication is intended to keep all interested parties informed on matters as they relate to aquatic plant management particularly in Florida. To become a member of FAPMS and receive the Society newsletter and Aquatics magazine, send \$20.00 plus your mailing address to the Treasurer.
EDITORIAL: Address all correspondence regarding editorial matter to Ken Langeland *Aquatics* Magazine.

Introduction

Hydrilla (*Hydrilla verticillata* (L.f.) Royle) has been a serious submersed weed problem in canals and other bodies of water in the southern part of Florida ever since its introduction in the 1950's. In some locations in this part of the state Hydrilla continues to be a problem. During the past few years however, East Indian Hygrophila (*Hygrophila polysperma* (Roxb.) T. Anderson), is replacing Hydrilla as a major aquatic weed problem in South Florida.

Control of Hydrilla and the resistance of East Indian Hygrophila to registered aquatic herbicides are major reasons for the increase in populations of East Indian Hygrophila in South Florida. As Hydrilla has been brought under control with herbicides, open areas in the water column provide space for other plants to grow. East Indian Hygrophila now occupies many areas formerly populated with Hydrilla.

East Indian Hygrophila was introduced in Florida about the same time as Hydrilla. It is not known when East Indian Hygrophila

Hygrophila is Replacing Hydrilla in South Florida

by
David L. Sutton
Fort Lauderdale Research and
Education Center
University of Florida - IFAS



Figure 1. Flower of East Indian Hygrophila.

naturalized in Florida, but it began creating problems around 1980 in several locations in Miramar and the City of Margate in South Florida. During the last few years East Indian Hygrophila has increased to the point where it is now causing serious weed problems in many locations. Little information is available on causes for the increase in growth of East Indian Hygrophila. This article will examine characteristics of East Indian Hygrophila and attempts to control its growth.

Hygrophila is in the Family Acanthaceae

The genus *Hygrophila* is in the family Acanthaceae. This family is a large pantropical group of herbaceous plants of 256 genera and more than 2,700 species. Plants in the family typically contain cystoliths that are evident as short, raised lines or dots in their leaves and stems. Cystoliths are accumulations of calcium carbonates formed in modified epidermal cell walls. Other family characteristics include conspicuous subtending floral bracts; two-lipped corollas (petals) associated with ovaries divided into two compart-

Algae control we can all live with... thanks to HYDROTHOL 191.

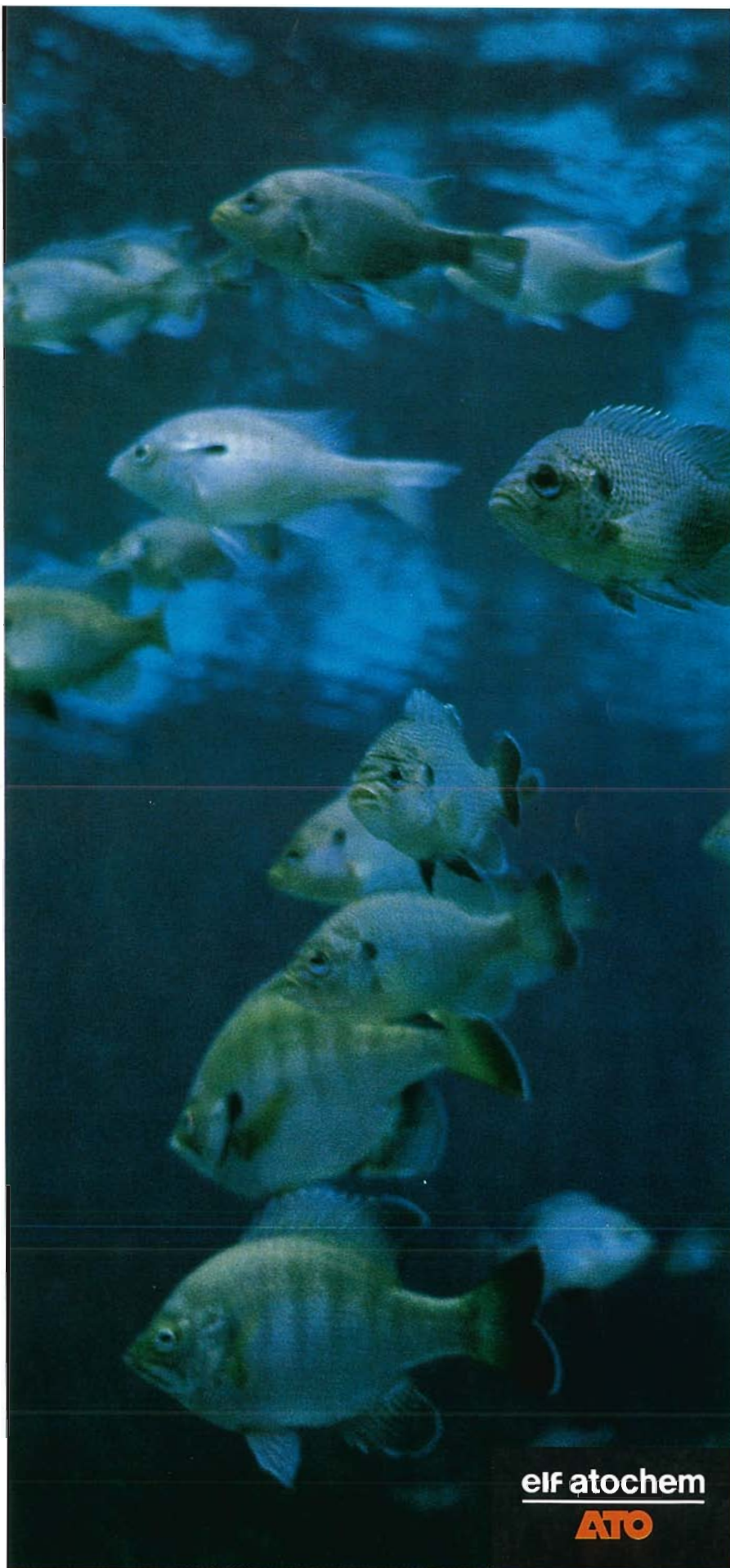
When you need to control algae in your lake, pond or canal, you want an algicide that's effective without being hazardous to fish or other aquatic life forms. That's why you should rely on HYDROTHOL® 191 Aquatic Algicide and Herbicide.

HYDROTHOL 191 works quickly on contact against Cladophora, Pithophora, Spirogyra and Chara. In both still and moving water. And, when applied at the recommended 0.2 ppm, HYDROTHOL 191 won't kill fish.

HYDROTHOL 191 is broken down by microorganisms into naturally occurring by-products based on the elements carbon, hydrogen and oxygen. It won't leave residues, accumulate in the hydrosol or the food chain, or discolor your water.

As with any chemical product, you should read and follow label instructions carefully. Application by a certified applicator is recommended. We've taken great care to provide the information needed to help you enjoy algae free water in an environmentally compatible way. Talk to your distributor or Elf Atochem Representative today about HYDROTHOL 191.

Elf Atochem North America, Inc.
Three Parkway, Philadelphia, PA 19102.
215-587-7219.



elf atochem
ATO

ments; bisexual flowers; two-valved, elastically dehiscent capsules; and mucilaginous seeds with a specialized curved supporting stalk.

The aquatic genera in the Acanthaceae family are *Hygrophila* and *Justicia*. Little information is available about these aquatic genera, and no monograph has been written on *Hygrophila*. Estimates for the number of species of *Hygrophila* range from 25 to 80. More information is needed to determine the exact number of species associated with the various genera in the Acanthaceae family.

Hygrophila is derived from Greek 'hygros' and Latin '-phila' which literally means plants attracted to, or living in, or growing by preference in wet areas.

Hygrophila in Florida

Two species of *Hygrophila* occur in Florida. Lake *Hygrophila* (*Hygrophila lacustris* (Schlecht & Cham.)) is native to North America and occurs sporadically from northeast Florida west to east Texas. East Indian *Hygrophila* is native to the East Indies and was introduced into Florida around 1950 for use in the aquatic ornamental industry.

Naturalized populations of East Indian *Hygrophila* occur in many canals and static bodies of water in South Florida. Also, it is well established in riverine habits in Lee County on the west coast of Florida. East Indian *Hygrophila* appears to be sensitive to cold weather and may not survive the cool winter temperatures of central and northern Florida. However, East Indian *Hygrophila* has been reported to grow as far north as Virginia, but little information is available as to whether it has naturalized there or in other locations with cold winter temperatures.

Characteristics of Lake and East Indian *Hygrophila*

Lake *Hygrophila* and East Indian *Hygrophila* can be easily distinguished from each other by growth habit and size. Lake *Hygrophila* grows primarily as a marsh herb, and is an erect emergent plant

frequently reaching more than 20 inches (50 cm) in height. East Indian *Hygrophila* on the other hand prefers riverine habits and grows primarily as a rooted submersed plant, but it also produces emergent shoots that rarely grow more than 4 inches (10 cm) in height. Emergent shoots of East Indian *Hygrophila* may be present on plants growing near or on shore, and on plants in floating mats.

Both Lake *Hygrophila* and East Indian *Hygrophila* exhibit similar anatomical characteristics such as glabrous or sparsely pubescent and mostly quadrangular stems with abundant cystoliths. The stems are

bluish white and dries to a yellowish color. Each flower may produce 20 to 30 seeds, but it is unknown whether the seeds are a major factor in the reproduction and spread of either species.

Growth Characteristics of East Indian *Hygrophila*

East Indian *Hygrophila* forms dense stands that occupy the entire water column (Figure 2), but it does not produce the extensive branching just below the surface of the water like *Hydrilla*. The stems of East Indian *Hygrophila* are brittle and fragment easily. These fragments form large floating mats that collect at culverts, pump stations, and

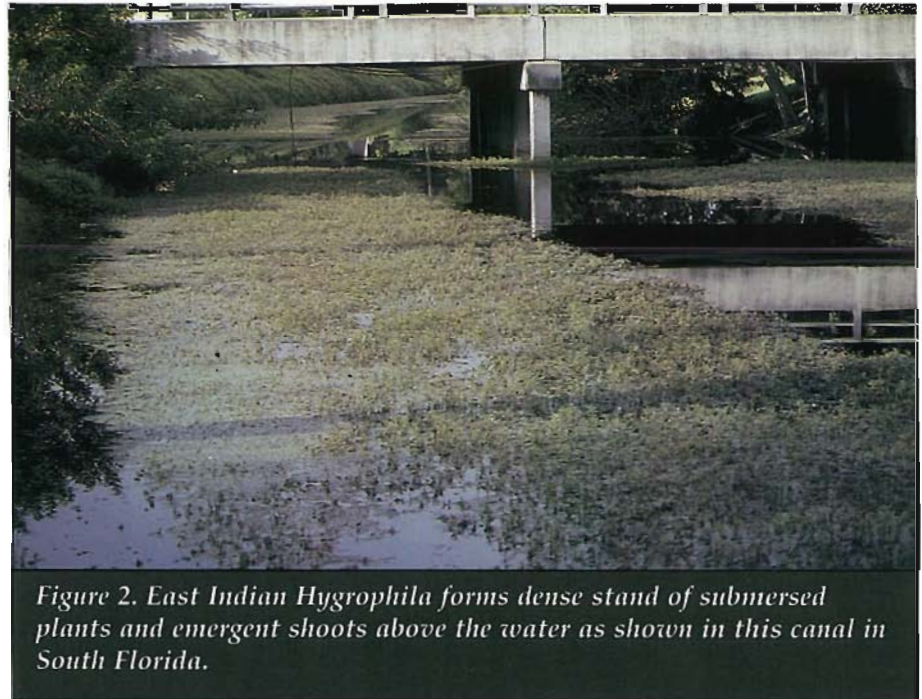


Figure 2. East Indian *Hygrophila* forms dense stand of submersed plants and emergent shoots above the water as shown in this canal in South Florida.

decumbent below the surface and root at the nodes. Their leaves are lanceolate or lance-elliptic and elongate-narrowed to a petiolelike base with an acute apex. The leaves of Lake *Hygrophila* are 2 to 4.7 inches (5 to 12 cm) in length while the leaves of East Indian *Hygrophila* are 0.8 to 3.1 inches (2 to 8 cm) in length.

Flowers of East Indian *Hygrophila* are mostly hidden in crowded apical leaf axils (Figure 1) while those of Lake *Hygrophila* are well distributed in distinct axillary clusters. The corolla for both species, which detaches easily, is

other water control structures, and interfere with their function. Also, these fragments may be a major source of vegetative material to infest an area.

Adventitious roots form readily at the nodes of East Indian *Hygrophila* which aids in the rooting of fragments. Also there are reports even the leaves may root and produce new plants, but it is unknown to what extent this form of vegetative reproduction plays in the spread of this plant.

Leaves of East Indian *Hygrophila* above or below the surface are

**Guaranteed
Duckweed
Control!**

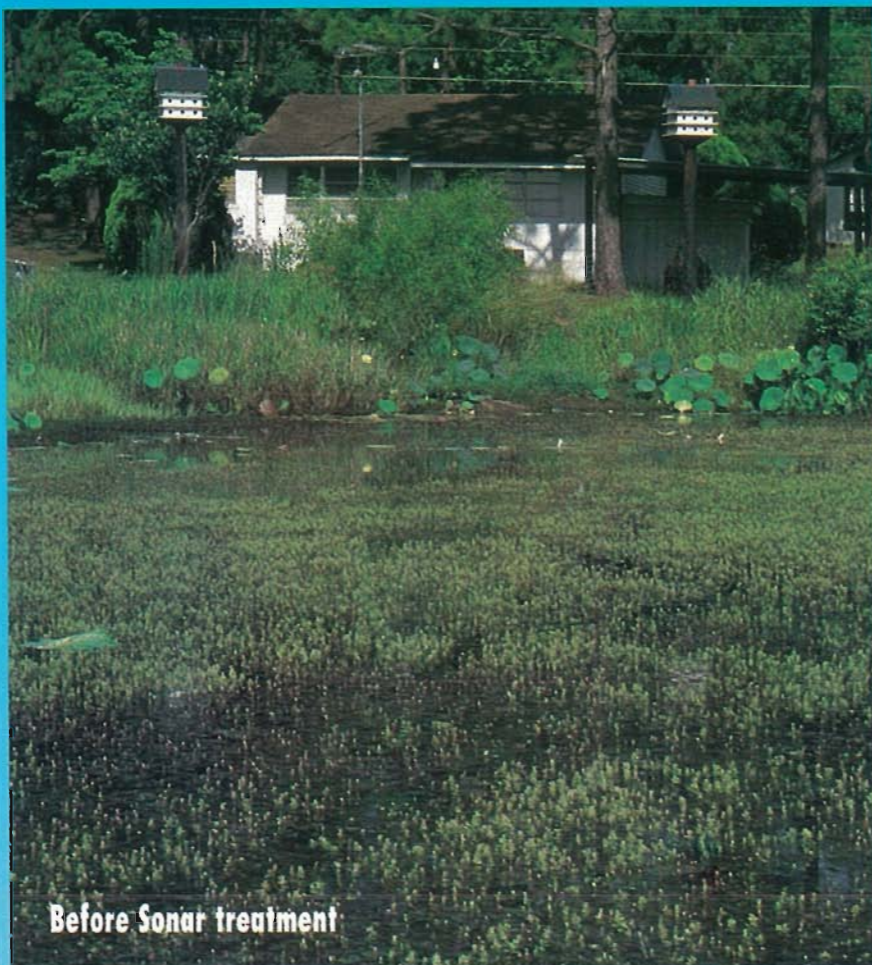
Sonar. Because you want to live on the water. Not in the weeds.

You love how the water shimmers in the afternoon sun. Somehow, it makes everything right with the world. That's the reason you live here.

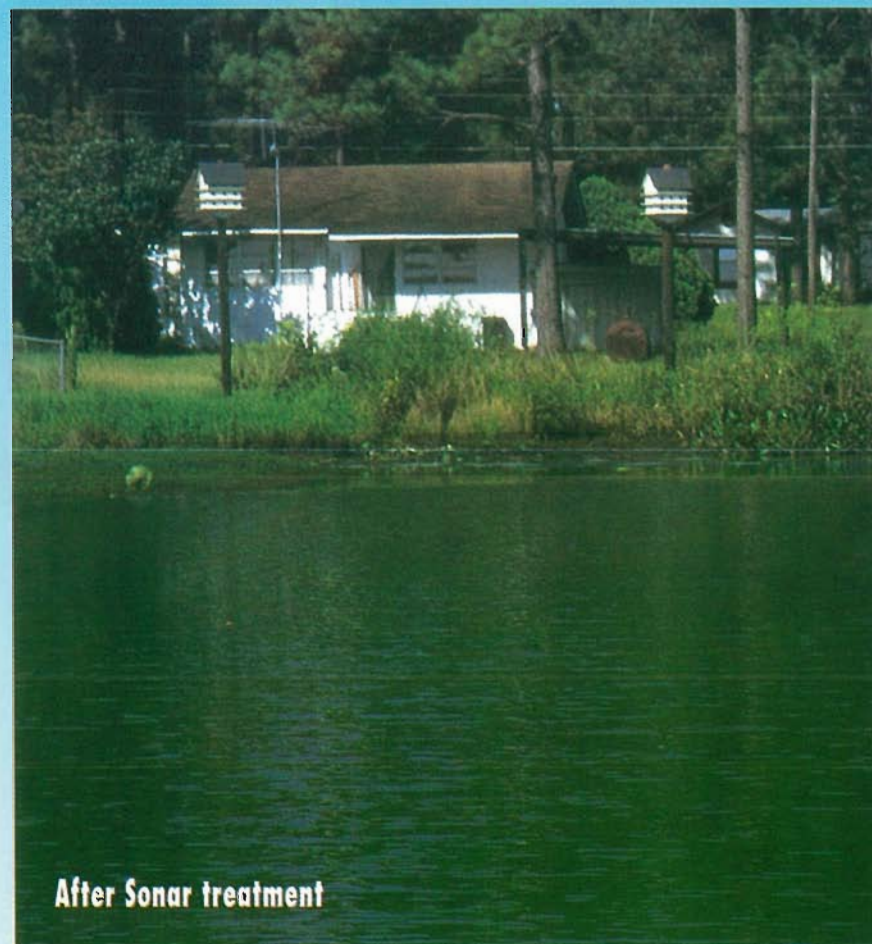
But now, something's invading this tranquil place of yours. Aquatic weeds, growing in excess. Normally, they're important to water ecology, but too much Eurasian watermilfoil, Hydrilla, Duckweed and other weeds will start taking away the natural beauty you love so much. Not to mention all your recreational activities.

With Sonar,* however, you can make things right again. Sonar has been used for years by professional aquatic weed managers in public lakes and waterways. It's the most effective and cost-efficient treatment available because it offers selective, long-term control of the weeds you don't want, with only one application a year. Unlike other products, Sonar has very few restrictions. It's also convenient to use, and it allows you to enjoy the recreational activities you love.

You live here
for the water,
not the weeds.
So, take back
what you love,
with Sonar.



Before Sonar treatment



After Sonar treatment

For a **FREE 24-Page Sonar Brochure and Information** about where you can purchase Sonar call:

1-800-419-7779 ext. W09A

Clip this coupon and mail or fax to:



*Trademark of SePRO Corporation
11550 North Meridian Street
Suite 200, Carmel, IN 46032
Fax 1-317-580-8290



Name _____

Address _____

City _____

State/Zip _____

Daytime Phone (____) _____

Pond Lake Size in Acres _____

similar in shape but leaves under the water are generally larger than the emergent ones. Some aquatic plants have differently shaped leaves on the same plant depending on whether the leaves are submersed or emersed. When a plant has two or more distinct leaf shapes present on a single individual, these leaves are termed "heterophyllous." Heterophyllous leaves may differ markedly in shape, yet have similar gross anatomical organization. For East Indian Hygrophila, the significance of the similar shape of leaves above and below water on growth and development of these plants are unknown.

Flowers may be found on emersed stems of East Indian Hygrophila starting in late October and continuing on until late February. The flowers are probably self-pollinating because most set seed. The role seeds play in the spread and regrowth of East Indian Hygrophila is not known.

Water flow may play a major role in growth of East Indian

Hygrophila. Studies in small tanks in Gainesville showed that turn over rates of 1 to 5 hours produced a 3- to 5-fold increase in growth of East Indian Hygrophila. Physiological studies suggest that East Indian Hygrophila grows best at a pH of 5 to 7, and begins to photosynthesize at low light levels similar to Hydrilla.

Control of East Indian Hygrophila

East Indian Hygrophila is more resistant to currently registered aquatic herbicides than Hydrilla, and is difficult to control in canals. Summer applications of endothall at label rates to control East Indian Hygrophila in a canal in South Florida resulted in control in portions of the treatment plots for up to 12 weeks after application of herbicide, but in other areas of the canal, the plants quickly regrew to pretreatment levels within this time. The cause for this difference in plant response to application of herbicide was not readily apparent in the

study. Because endothall is rapidly degraded by microbial activity at high water temperatures of 30 C (86 F), a winter treatment with endothall was conducted to determine if control could be achieved during the cooler months of the year when a lower microbial activity would be expected.

Results from a winter application of endothall at label rates were essentially the same as for the summer application. However, dissolved oxygen was less affected by the winter treatment than the summer treatment. In both the summer and winter treatment, endothall resulted in excellent control of East Indian Hygrophila for 4 to 8 weeks followed by rapid regrowth. Additional applications approximately 8 to 10 weeks after the initial application of endothall may be required to keep East Indian Hygrophila under control.

Grass carp (*Ctenopharyngodon idella* Val.) have been used to control East Indian Hygrophila. Effective use of grass carp to control this plant

Fatal Beauty

The water hyacinth is as insidious as it is beautiful. Left to its own devices, this proud beauty will continue to spread—eventually choking out waterways and making them unusable to man and uninhabitable to fish.

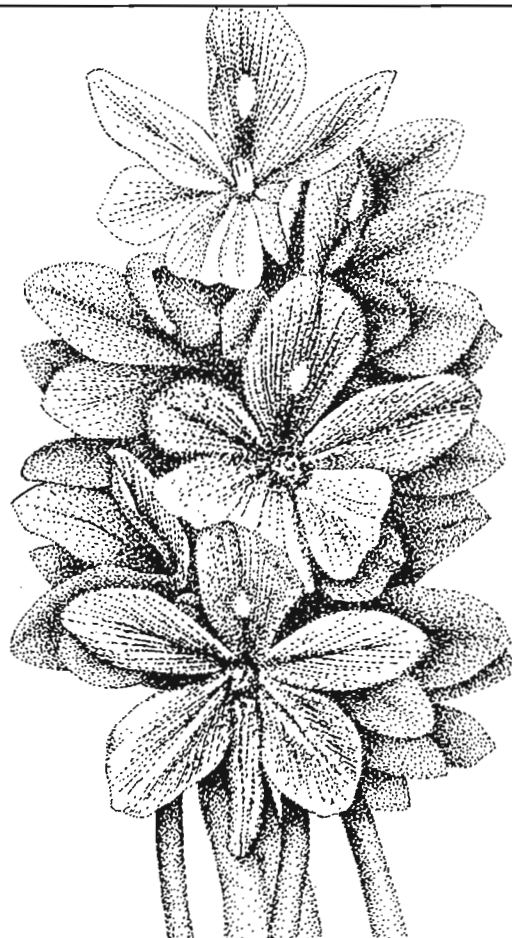
But you need not yield to this charming beauty. Reach for WEEDAR® brand 64 herbicide. WEEDAR 64 effectively controls water hyacinth, resulting in clean, usable waterways. Apply by surface or air when plants are actively growing and repeat applications as necessary to control regrowth.

You might say—WEEDAR 64 is fatal, to the fatal beauty. Ask your chemical supplier for WEEDAR® 64 herbicide.

Weedar®
Brand Herbicide
RHONE-POULENC

RHONE-POULENC AG COMPANY
P.O. Box 12014, 2 T.W. Alexander Drive
Research Triangle Park, NC 27709
800/334-9745

WEEDAR is a registered trademark of Rhone-Poulenc.



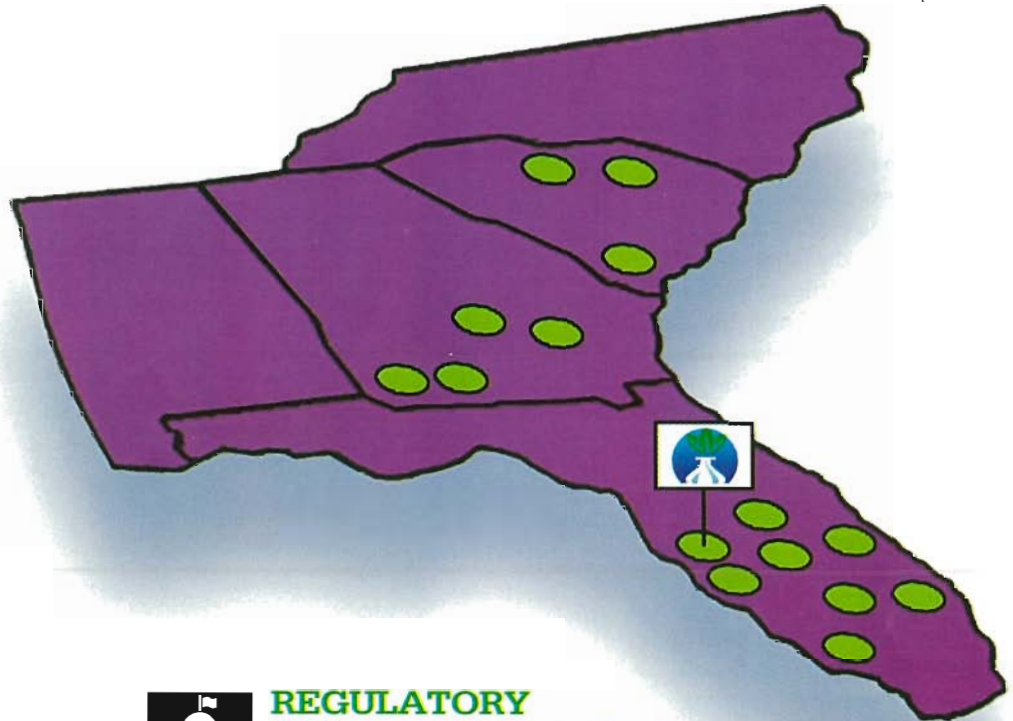
Providing Aquatic Weed Control Products and Services to the Aquatic Industry

FEATURING

REWARD
AQUATHOL K
AQUA-KLEEN
RODEO
K-TEA
KOMEEN
HYDROTHOL
AMINE 4

NALCOTROL
NALCOTROL II
NALQUATIC
UNFOAMER
X-77
LI-700
SILWET
BOND

Plus a complete line of herbicides and adjuvants to serve your needs



REGULATORY

UHS employs a staff who specialize in state and federal regulations, EPA mandates and environmental and transportation issues.



CONTAINER RECYCLING

Participate in our container recycling program. UHS will recycle all plastic chemical containers at your business location.



DISTRIBUTION

Take advantage of our many convenient locations for pickup or delivery of quality UHS products.



United
Horticultural Supply
GULF STATES DIVISION

For additional information call:

Toll free: (800) 457-0415
Fax: (813) 664-0371

3632 Queen Palm Drive ■ Suite 306
Tampa, Florida 33619

appears to involve use of fish larger than 1.0 lb (0.45 kg) in weight, stocking rates higher than for most other weed problems, and lack of preferred plants. An aquatic weed management program using herbicides and grass carp may provide effective control of East Indian Hygrophila.

Control of East Indian Hygrophila must also take into account emerged plants on the shore. Applications of Aquathol®K liquid at a rate of 5 ounces per gallon (39 ml per 1.0 liter) will control shoreline emerged plants. However, emerged plants on floating mats are difficult to control.

Mechanical control may be useful in removing floating mats of East Indian Hygrophila. However, since the stems fragment easily, mechanical control methods need to take into account the possibility of an increase in number of these fragments that may serve as a possible source of vegetative material to infest new areas.

Solutions for long term control of East Indian Hygrophila in South Florida are not readily apparent. Effective methods are needed to prevent the spread and rapid regrowth of these plants. Aquatic plant managers need additional information to help with the control of this aquatic weed problem in South Florida.

Acknowledgments

Contribution of the University of Florida's Fort Lauderdale Research and Education Center. Published as Journal Series Number N-01093 of the Florida Agric. Exp. Sta. Mention of a trademark or a proprietary product does not constitute a guarantee or warranty of the product by the University of Florida and does not imply its approval to the exclusion of other products that also may be suitable. The author would like to thank the U. S. Department of Agriculture, ARS, Cooperative Agreement 58-6629-4-008, for their partial financial support of studies on life history and control of East Indian Hygrophila.

VEGETATION SEDIMENTS SAND SLUDGE



VERSI-DREDGE®

The Proven Value.

Designed specifically for cleaning lakes, ponds, lagoons, marinas, waterways, etc., the VERSI-DREDGE transportable hydraulic dredge will remove submerged sediments with less water than traditional heavy equipment. The VERSI-DREDGE is a cost-effective and efficient approach to underwater solids removal.

Job proven in aquatic vegetation, sludge, sand, fly ash, coal fines and most other sediments, the VERSI-DREDGE excavates to 22 feet and can pump up to 1 mile without a booster, depending on material and elevation.

The VERSI-DREDGE is portable, and can be towed behind a truck.

For further information on the VERSI-DREDGE and our complete line of technical and customer support services, please call

1-800-800-4010 or FAX us at
1-913-829-2989.

Financing and rental available.



IMS

INNOVATIVE MATERIAL SYSTEMS, INC.
Dredges, Pumps & Pumping Systems
Olathe, Kansas, U.S.A.

* Patent Pending

NEW!
The IMS WEEDMASTER*
cutterhead for removing cattail,
floating weed masses,
milfoil & hydranth.

Management of Aquatic Plant Communities in Rodman Reservoir from 1969-1994

by

Judy Ludlow

Department of Environmental Protection
Bureau of Aquatic Plant Management

Introduction

Rodman Reservoir (Lake Ocklawaha) was created in 1968 as part of the Cross Florida Barge Canal Project (CFBC). Since the deauthorization of the CFBC in 1991, there has been heated debate over whether Rodman should be maintained as a reservoir, or drained to facilitate restoration of the Ocklawaha River. Regardless of this debate's outcome, aquatic plant management has been, and probably will continue to be, an integral component of this system. Rodman Reservoir is presently one of only a few water bodies in Florida where effective drawdowns can occur on a regular basis, and the ability to conduct drawdowns in Rodman Reservoir has been an important aquatic plant management tool.

The Aquatic Plant Community of Rodman Reservoir

The fertile, shallow waters of this flooded timber reservoir support a diverse assemblage of aquatic plant species. Until 1973, the dominant submerged plant species on Rodman Reservoir were southern naiad (*Najas guadalupensis*), Brazilian elodea (*Egeria densa*), and coontail (*Ceratophyllum demersum*), and the dominant floating plant on the reservoir was waterhyacinth (*Eichhornia crassipes*).

Hydrilla (*Hydrilla verticillata*) was first noted in the reservoir in 1971, and by 1974 had become the dominant submerged species (U.S. Army Corps of Engineers, Jacksonville District, Jacksonville 1989). By 1972, species such as waterlettuce (*Pistia stratiotes*), water hemlock (*Cicuta mexicana*), water pennywort (*Hydrocotyle spp.*), and others began to create a more diverse floating plant community (USACE Jacksonville District, Jacksonville 1989).

Department of Environmental Protection aquatic plant surveys have been conducted annually on Rodman

Reservoir since 1982. Up to 50 species of aquatic plants have been recorded on Rodman, covering over 60 percent of the Reservoir between 1982 and 1994. Many variables such as water quality, water levels, and watershed characteristics influence aquatic plant communities. On Rodman Reservoir, some of the variables that effect submerged aquatic plants include drawdowns, control with herbicides, and the degree of water column light attenuation, which is influenced by water color (clear during drought years, tannin-stained during periods of rain).

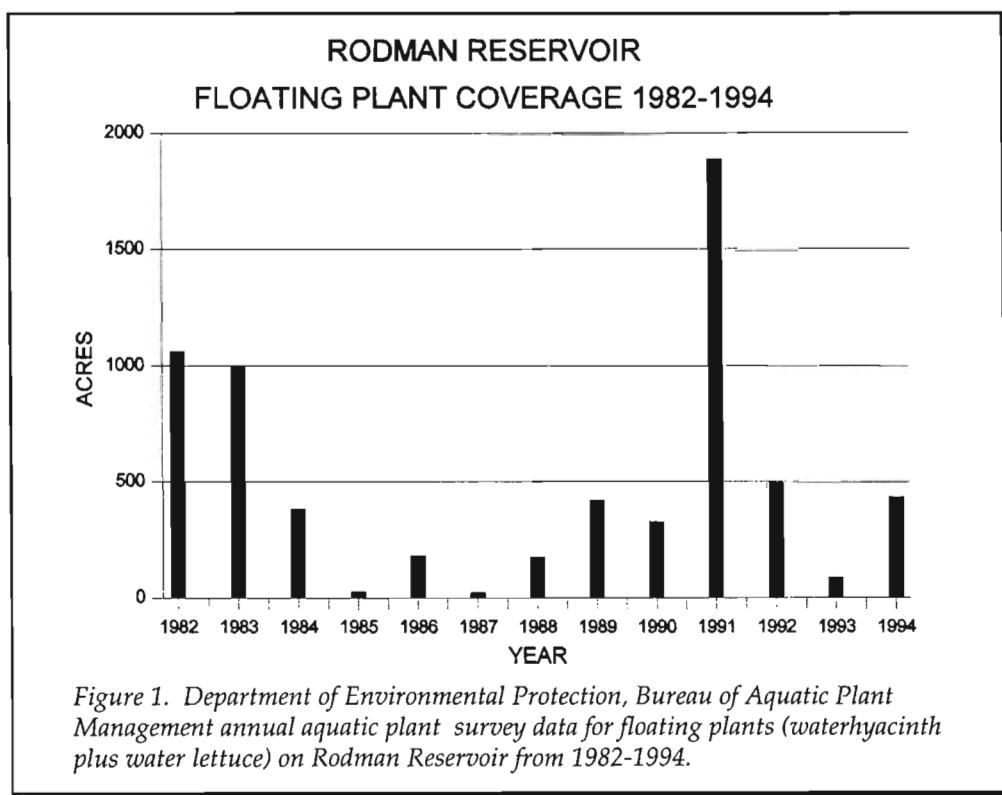


Figure 1. Department of Environmental Protection, Bureau of Aquatic Plant Management annual aquatic plant survey data for floating plants (waterhyacinth plus water lettuce) on Rodman Reservoir from 1982-1994.

We're Here To Help.

We've got the products you want—when and where you want them. Choose from a complete line-up of name-brand herbicides, algaecides, adjuvants and much, much more. They're in stock and ready for immediate delivery. Plus, we back each and every one of the products we handle with top-quality service and expert technical support. Let us help you. Contact your nearest location or one of the following aquatics specialists:

• **Alec Sheffer**
Regional Sales Manager
Plant City
(813) 752-1177

• **Vera Gasparini**
North & Central Florida
Beeper (800) 207-1440

• **Tammy Kovar**
South Florida
Beeper (800) 207-1408

 **Terra**[®]
ASGROW
FLORIDA



Call Us.

- **Alachua**
Highway 441
(904) 462-1242
- **Arcadia**
122-A N. 11th Ave.
(813) 494-4400
- **Belle Glade**
1033 NW 16th St.
(407) 992-4004
- **Boynton Beach**
9293 State Road 7
(407) 737-1200
- **Ellenton**
3202 US Hwy 301 NE
(813) 722-4564
- **Ft. Pierce**
7361 Commercial Circle
(407) 466-6607
- **Hastings**
8520 Highway 207
(904) 692-1502
- **Homestead**
790 NW 10th Ave.
(305) 247-1521
- **Immokalee**
800 E. Main St.
(813) 657-8374
- **Lake Hamilton**
51D Highway
27 South
(813) 439-1140
- **Plant City**
103 S. Alexander St.
(813) 752-6351
- **Plymouth**
2975 West Orange
Blossom Trail
(407) 886-4744
- **Quincy**
Rt. 1, Box 378
(904) 442-9000
- **Tavares**
13539 Southridge
Industrial Dr.
(904) 343-5577
- **Vero Beach**
9035 17th Place
(407) 562-2142
- **Wauchula**
804 S. 6th Ave.
(813) 773-4543

Aquatic Plant Management in Rodman Reservoir 1969-1994

Management of aquatic plants in Rodman Reservoir has generally followed the recommendations of the Cross Florida National Conservation Area Operational Management Plan (USACE Jacksonville District, Jacksonville 1989). These recommendations are 1: "Floating aquatic plants will be kept to the lowest level compatible with desirable management goals and past experience with other controlling factors." and 2. "In general, the aquatic plant community should be managed for maximum diversity and dominance by native species. The Lake Ocklawaha management plan encourages native flora and fauna by managing near-natural hydroperiod regimen for water levels."

Many aquatic plant management programs typically use a combination of herbicides, drawdowns, and mechanical and biological controls. Although that is true for aquatic plant management in Rodman

Reservoir, herbicides and draw-downs have been the most commonly used methods. On Rodman Reservoir, drawdowns have usually occurred in late summer to early fall, dropping water levels in the reservoir by 3 to 8 feet, and lasting throughout the winter. Stranded aquatic plants are killed by desiccation and also by winter frosts.

Waterhyacinth and Waterlettuce

Waterhyacinth and waterlettuce, are managed in Rodman Reservoir using the herbicides, 2,4-D and/or diquat, and reservoir drawdowns (Table 1). Floating plant populations have covered as much as 1800 acres of the reservoir, but have generally remained below 500 acres since 1982 (Figure 1).

Hydrilla

In Rodman Reservoir hydrilla is difficult to manage, but has generally remained below 3500 acres since 1982 (Figure 2). The number of submerged obstructions in this

RODMAN RESERVOIR HYDRILLA COVERAGE

1982-1994

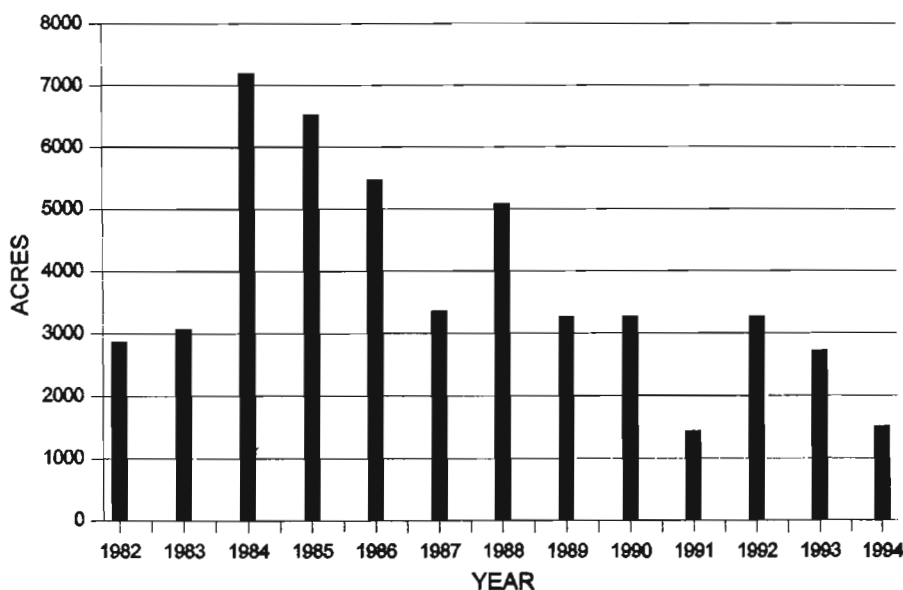


Figure 2. Department of Environmental Protection, Bureau of Aquatic Plant Management annual aquatic plant survey data for hydrilla in Rodman Reservoir, 1982-1994. Data from 1982-1992 are adjusted for a 18 ft. NGVD reservoir size of 9,600 acres.

submerged obstructions in this flooded timber reservoir make mechanical harvesting extremely difficult. Hydrilla was managed using the herbicide fluridone in 1988 and 1990 (Table 1), but because flow rates average over 1600 cubic feet per second (Rao et al. 1994), the cost effective use of herbicides is limited to protected shorelines and cove areas. Draw-downs have been used in Rodman Reservoir, with some degree of success, to control hydrilla (Haller and Shireman 1984). Also, observations from reservoir biologists indicate that during rainy years the inflow of dark, tannin-stained water suppresses the growth of hydrilla in Rodman Reservoir (Dean Barber DEP, Jim Kelley DEP, Dave Bowman USACE pers comm.)

Funding Aquatic Plant Management in Rodman Reservoir 1969-1994

Until the deauthorization of the Cross Florida Barge Canal in 1991, Rodman Reservoir was managed directly by the U.S. Army Corps of Engineers (Corps). From October 1992 to the present, aquatic plants on Rodman Reservoir have been managed through the Department of Environmental Protection, by the St. Johns River Water Management District, under the Cooperative Aquatic Plant Control Program. The Cooperative Aquatic Plant Control Program is funded by the department and the Corps for plant control in public waters.

Based on data from the Corps, Jacksonville District, and the Department of Environmental Protection, the 25 year average cost of controlling waterhyacinth, waterlettuce, and hydrilla on Rodman Reservoir from 1969 -1994 is approximately \$31,000 (Table 1). The highest costs to date were in 1970 (\$235,700) and 1971 (\$217,600) when aircraft were used to control over 4,000 acres of waterhyacinth on the reservoir. After waterhyacinth was brought under control in the early 1970's, draw-downs and herbicides have been

used to manage floating plants and hydrilla for a 22 year average annual cost of \$14,000.

Summary

The management of aquatic plants in Rodman Reservoir is somewhat unique in Florida in that drawdowns have often been used as a management tool. The draw-downs which have occurred on the reservoir have demonstrated that, in combination with other aquatic plant management techniques, temporary control of hydrilla, waterhyacinth, and waterlettuce can be achieved while, at the same time, enhancing fish and wildlife habitat (Haller and Shireman 1984). Regardless of the outcome of the Rodman Reservoir debate, aquatic plant control will likely continue to be an important component of the management of this system.

Literature Cited

Florida Department of Environmental Protection. 1982-1994.

Florida Aquatic Plant Survey Reports. Bureau of Aquatic Plant Management. Tallahassee, Florida

Haller, W.T. and J.V. Shireman. 1984. Monitoring Study for Lake Ocklawaha-Lake Management Plan. Report to U.S. Army Corps of Engineers. Jacksonville District. Jacksonville, Florida.

Rao, D.V., A.S. Karama, R.J. Freeman. 1994. Hydraulic and Hydrologic Evaluations for Various Restoration Alternatives of the Rodman Reservoir, Marion and Putnam Counties, Florida. St Johns River Water Management District, Palatka, Florida.

U.S. Army Corps of Engineers. 1989. Cross Florida National Conservation Area Operational Management Plan (Authorized Portion), Jacksonville District, Jacksonville, Florida.

INTRODUCING SunWet™ NONIONIC SPRAY ADJUVANT

SunWet is a new generation, natural spray adjuvant that's kind to the environment while still doing a terrific job enhancing performance of postemergence herbicides. SunWet increases wetting and penetration of herbicides so you get better control of aquatic weeds, nuisance vegetation and undesirable brush.

Call your local distributor or

800-228-1833

 **BREWER International**

P.O. Box 6006 • Vero Beach, FL 32961
Toll-Free: 800-228-1833 • Fax: 407-778-2490

Made from a 100% blend
of Methylated Sunflower Oil
and Emulsifiers

Table 1. Summary of floating plant (waterhyacinth and waterlettuce) and hydrilla management on Rodman Reservoir from 1969 to October 1994. Data are from U.S. Army Corps of Engineers, Jacksonville District, Jacksonville (1969-1993) and Department of Environmental Protection (1993-1994). "na" = not available.

FISCAL YEAR	ACRES TREATED		METHOD OF CONTROL	APPROXIMATE COST	
	FLOATING	HYDRILLA		FLOATING	HYDRILLA
1969-1970	144		Herbicides	\$ 7,200	
1970-1971	4714		Herbicides by Aircraft	\$ 235,700	
1971-1972	4352		Herbicides by Aircraft	\$ 217,600	
1972-1973	64		Herbicides & Drawdown	\$ 3,200	
1973-1974	138		Herbicides	\$ 6,900	
1974-1975	358		Drawdown	\$ 17,900	
1975-1976	594		Herbicides	\$ 29,700	
1976-1977	356		Herbicides	\$ 17,800	
1977-1978	17		Herbicides	\$ 850	
1978-1979	26	6	Herbicides	\$ 1,300	na
1979-1980	0		Drawdown	\$ 0	
1980-1981	12		Drawdown	\$ 600	
1981-1982	0	2	Drawdown	\$ 0	\$ 0
1982-1983	0	6	Experimental	\$ 0	na
1983-1984	0			\$ 0	
1984-1985	0			\$ 0	
1985-1986	0		Drawdown	\$ 0	
1986-1987	0	6	Herbicides	\$ 0	\$ 1,200
1987-1988	71		Herbicides	\$ 10,650	
1988-1989	40	222	Herbicides & Drawdown	\$ 6,000	\$ 87,600
1989-1990	184		Herbicides	\$ 27,450	
1990-1991	225	63	Herbicides	\$ 33,750	\$ 36,400
1991-1992	176		Herbicides & Drawdown	\$ 26,400	
1992-1993	33		Herbicides	\$ 4,950	
1993-1994	14	3	Herbicides	\$ 2,100	\$ 1,800
TOTAL FLOATING PLANT MANAGEMENT COSTS 1969-1994				\$ 650,050	
TOTAL HYDRILLA MANAGEMENT COSTS 1969-1994					\$ 127,000

1995 FAPMS Annual Meeting

The Florida Aquatic Plant Management Society will hold it's 1995 Annual Meeting at the St. Petersburg Hilton, which is located at 333 1st Street South, St. Petersburg. The Society has blocked 200 rooms on the evenings of October 17, 18, and 19. The contract rate for the rooms is \$59.00 single or double per night. The room block will be held until 30 days prior to the meeting, or until September 16, 1995. The hotel offers us a large parking lot next to the building for our equipment demonstration. St. Petersburg is a lovely town and the hotel is located on the bay very near to the municipal pier, so there will be shopping and restaurants close by.

Meet in St. Pete!

For registration information contact
Nancy Allen, Secretary 904/795-2239, FAX 904/795-1911.



Evaluation of Herbicides for Control of American Frogbit

by

Ken Langeland, Brian Smith, Neil Hill, Steve Grace

University of Florida

IFAS, Agronomy, Center for Aquatic Plants

Gainesville, Florida

Mathew Cole, Johnny Drew, Ed Meadows

St. Johns River Water Management District

Palatka, Florida

Introduction

American frogbit (*Limnobium spongia*) is a native rooted or floating aquatic plant found in still or slow moving waterways such as ponds, lakes and canals. Because American frogbit is a native plant, it is often considered a non-target species or of minor importance in aquatic plant management programs. However, frogbit populations can become expansive, and cause problems similar to other floating plants, such as waterhyacinth and waterlettuce. For example, during June through July 1992, large floating mats of American frogbit, mixed with hydrilla, broke loose from Lakes Sawgrass, Little Sawgrass, and Hell'n Blazes, in the upper St. Johns River, and caused severe blockages at the SR 192 bridge (Figure 1). Removal of these blockages by mechanical means was necessary at a cost of over \$60,000. Similarly, floating mats of American frogbit, when allowed to reach large population levels in Upper Myakka Lake, have broken loose during high flows and required costly mechanical removal at bridges, by the Southwest Florida Water Management District (Figure 2).

American frogbit has been reported as difficult to control with herbicides, and aquatic plant



Figure 1. South Florida Water Management District towboats assist the St., Johns River Water Management District in removing a jam of American frogbit and hydrilla from the SR 192 bridge over the St. Johns River (photo by Wayne Corbin).

managers in Florida differ in their opinions on the best control method. Eddie Knight said that "Frog's-bit is probably the most difficult emergent plant to control," but could be controlled with a tank-mix of four quarts of 2,4-D, two quarts of diquat, and 3/4 pint X-77® per acre, as long as coverage is thorough (*Aquatics*, March 1985). Others say (personal communications) they use two quarts of diquat with one pint of 2,4-D, while some say they use two quarts or less of diquat alone (along with an appropriate surfactant). It has been reported that regrowth occurs after any of these applications.

The following studies were

conducted to 1) evaluate efficacy of diquat, 2,4-D amine, and tank-mixes of the two herbicides 2) determine the importance of diluent volume with diquat and 2,4-D, and 3) evaluate glyphosate in combination with two different surfactants (Kinetic® and Induce®) for American frogbit control.

Materials and Methods

Evaluation of 2,4-D amine and diquat on the control of American frogbit. American frogbit plants, collected from a local lake, were placed uniformly in 100 ft² (9.5 m²) floating PVC quadrats in three 0.24 acre (0.1 ha) ponds (replicates). Plants were allowed to acclimate for

Looking for a better solution to aquatic weed and algae control?

It seems as if you've tried it all. You've sprayed. You've scooped. You've pulled them out by hand. Now take a whack at these nuisances with Komeen® aquatic herbicide and K-Tea™ algaecide.

Both Komeen and K-Tea now have new, expanded labels to include more weeds and algae. Komeen controls weeds such as Hydrilla, Water Hyacinth, Pondweed, Coontail, and Southern and Northern Naiads. K-Tea controls both planktonic and filamentous algae. And both are highly effective in virtually any type of water, even if it's hard or alkaline.

And not only do Komeen and K-Tea mow down aquatic weeds and algae, they require no re-entry or set-back restrictions, buffer zones or holding periods. After treatment you can use your water immediately for fishing, swimming, watering livestock and drinking.

See for yourself why Komeen and K-Tea are a cut above the rest. Contact Griffin Corporation, Rocky Ford Road, Valdosta, GA 31601, (912) 242-8635.

© 1994 Griffin Corporation. Komeen® is a registered trademark and K-Tea™ is a trademark of Griffin Corporation. Always read and follow label directions.

Griffin



four weeks, after which foliar applications of 2,4-D amine (3.8 lb ae/gal) and diquat (2.0 lb cation/gal) were applied at 0.25, 1.0, 2.0, and 4.0 qt/ac and 0.25, 1.0, and 2.0 qt/ac, respectively, and in combination. An organosilicone surfactant (Kinetic®) was added to the diluent volume at 0.25% v/v. Treatments were applied May 18, 1993 using a portable electric sprayer calibrated to deliver 200 GPA (1890 l ha⁻¹). Well water was used as the diluent.

Visual evaluations (not reported) were made once a week for four weeks and biomass was evaluated from a 1/4-m quadrat four weeks post treatment. Control was evaluated as reduction in biomass compared to untreated checks and expressed as a percent.

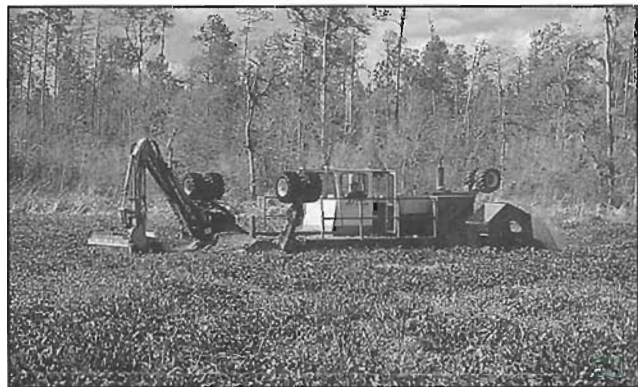
Influence of diluent volume on diquat and 2,4-D amine efficacy on American frogbit. Research was conducted in conjunction with the St. Johns River Water Management District on a natural population of American frogbit growing in



Figure 2. Floating mats of American frogbit and associated vegetation, such as this one, when allowed to reach large population levels in Upper Myakka Lake, have broken loose during high flows and required costly mechanical removal at bridges, by the Southwest Florida Water Management District.

the littoral zone of Lake Lochloosa, Alachua County, Florida. Floating PVC quadrats, of 25 ft² (2.4 m²), were placed over actively growing plants in an arrangement for three replicates of each herbicide/diluent treatment. Foliar applications of diquat (2.0 lb cation/gal) were applied at 1.0 and 2.0 qt/ac and

tank-mixed with 0 or 2.0 qt/ac 2,4-D amine. An organosilicone surfactant (Kinetic®) was added to the diluent volume at 0.25% v/v. Diluent volume was calibrated at 100 or 200 GPA (945 or 1890 l/ha, respectively) using a portable electric sprayer. Lake water was used as the diluent.



AQUAMOG PRX 163

- BUCKET DREDGING
- HYDRAULIC DREDGING, AUGER/CUTTER HEADS
- 5,000 FOOT PUMPING CAPACITY
- SUBMERGED/EMERGENT AQUATIC PLANT CONTROL
- INTERCHANGEABLE TOOLS
- MUD ISLAND REMOVAL



AQUATIC WEED HARVESTER

- 4-10 FOOT CUTTING WIDTHS
- 100-800 CUBIC FOOT STORAGE CAPACITY
- HYDRAULICALLY RETRACTABLE PADDLE WHEELS
- IMPACT ABSORBING HARVESTING HEAD
- COMPACT AND TRAILERABLE



AQUATICS UNLIMITED

2150 Franklin Canyon Road • Martinez, California 94553 • USA
Phone (510) 370-9175 • 1-800-243-8664 • Fax (510) 370-9179

RODEO® HELPS PROTECT NATIVE HABITATS AGAINST INVASIVE WEEDS.

Throughout the U.S., invasive species are closing in on some of our most valuable natural resources. In fact, non-native plants destroy more wildlife habitat each year than construction and development.* Rodeo® herbicide can help.

From Brazilian pepper in Florida to salt cedar in the Southwest, Rodeo has been used successfully to control invasive weeds and restore wildlife habitats. Rodeo offers lasting control against more than 170 different species of emerged grasses, broadleaf weeds and brush. It's also fully labeled for use in aquatic and wetland areas, including estuaries.

To find out more about how Rodeo can restore native habitats, we're offering a FREE video and information package. For your copy, call 1-800-332-3111 today.



*Source: The Exotic Pest Plant Council
ALWAYS READ AND FOLLOW LABEL DIRECTIONS
FOR RODEO HERBICIDE.
Rodeo® is a registered trademark of Monsanto Company.
© Monsanto Company 1994 3/94 ROD-46980B

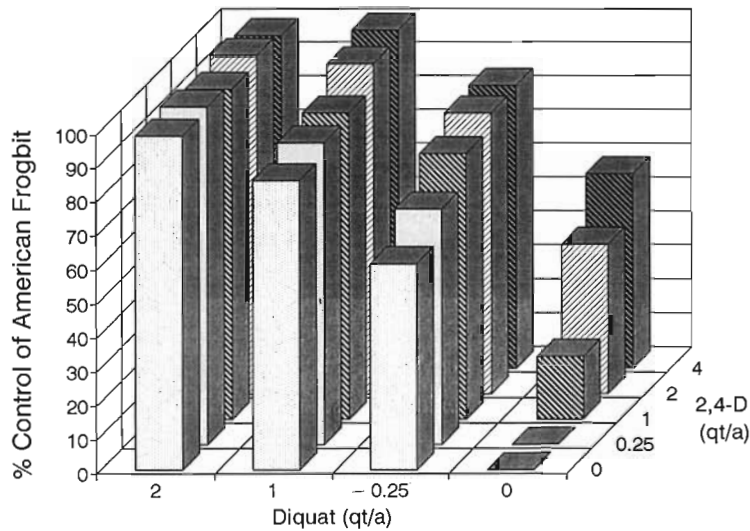


Figure 3. Control (% reduction in biomass compared to untreated checks) of American frogbit observed four weeks after application of various rates of diquat, 2,4-D, or combinations of the two herbicides.

Visual evaluations, which compared discoloration and necrosis of treated plants to untreated checks, were made weekly for four weeks. A scale of 0% to 100%, with 0% representing no discoloration or necrosis and 100% meaning that all plants were dead was used.

Evaluation of glyphosate for American frogbit control. This experiment was conducted on a natural population of American frogbit, which had entirely covered the surface of a small lake in Suwanee County, Florida. Floating PVC quadrats, of 100 ft² (9.5 m²), were placed over actively growing plants in an arrangement for three replicates of each herbicide/surfactant treatment. After placement, the PVC quadrats were anchored in place. Glyphosate (4.0 lb ae/gal) was applied to the foliage at 0, 1.0, 2.0, and 4.0 qts/ac in combination with either an organosilicone surfactant (Kinetic[®]) at 0.25% v/v or a nonionic surfactant (Induce[®]) at 0.5% v/v. All treatments were applied July 6, 1992 using a portable electric sprayer calibrated to deliver 150 GPA (1420 l ha⁻¹). Lake water was used as the diluent.

Visual evaluations were used to compare treatments as described for the spray volume study.

Results and Discussion

Evaluation of 2,4-D amine and diquat on the control of American frogbit. Diquat at 1 or 2 qt/ac,

either alone or in combination with any rate of 2,4-D, provided excellent control (88-95%) of American frogbit (Figure 3). Therefore, addition of 2,4-D when using these rates of diquat in 200 GPA spray volume does not appear to provide a control advantage. 2,4-D alone provided less than 60% control at any of the rates tested. Tank-mixing 2,4-D with the lowest diquat rate (0.25 qts/ac) increased activity, but did not provide as good control as the higher rates of diquat alone.

The influence of diluent volume on diquat and 2,4-D efficacy on American frogbit. When diquat was applied at 1 qt/ac, doubling the

diluent volume from 100 to 200 GPA markedly improved frogbit control from <40% to >90% (Figure 4). Likewise, when 2 qts/ac 2,4-D was tank-mixed with 1 qt/ac diquat, doubling the diluent volume from 100 to 200 GPA improved frogbit control from <50% to >90%. Increasing the diluent volume when diquat was applied at 2 qts/ac alone or tank-mixed with 2,4-D did not statistically improve frogbit control. Tank-mixing 2,4-D with diquat did not significantly improve frogbit control at comparable diquat rates.

Evaluation of glyphosate for American frogbit control. Plants treated with glyphosate and Kinetic[®] demonstrated greater discoloration than plants treated with Induce[®] and glyphosate at equivalent glyphosate rates (Figure 5). However, glyphosate did not provide adequate control of American frogbit at any of the rates tested or with either of the surfactants tested (Figure 5). Discoloration or patchy necrotic lesions were observed, but plants were observed to be fully recovered on site visits two and three months post treatment.

Summary

Results of these studies agree with aquatic plant managers who have reported control of American frogbit with diquat or diquat and 2,4-D combinations. The control observed in this study with the combination of 0.25 qt/ac diquat

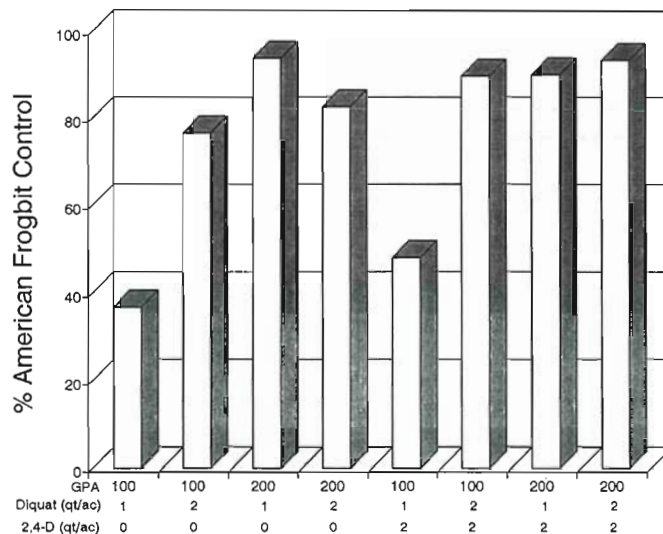


Figure 4. Control (visual evaluations) of American frogbit four weeks after application of diquat, 2,4-D, and both herbicides together, at two different diluent volumes.

and 2.0 qt/ac 2,4-D suggest that less diquat may be necessary when combined with 2,4-D, but this interpretation requires further field testing. A benefit was not observed of adding 2,4-D when 1.0 or more qt/ac diquat was used. However, under conditions that were not tested in this study, addition of 2,4-D may enhance control.

Adequate coverage of foliage is necessary when using a contact type of herbicide such as diquat. Inadequate control of American frogbit with diquat or diquat and 2,4-D reported by some aquatic plant managers may be related to poor coverage. When recommending 2,4-D and diquat for American frogbit control, Eddie Knight cautioned that “—good coverage of the solution is important. The extra time spent soaking the plants normally insures a good kill—.” Our data supports Mr. Knight’s contention because we found 200 gallons per acre of spray-volume necessary for adequate coverage. We recommend using spray vol-

umes in this range to expect comparable results in the field.

Acknowledgements

This material is based upon research supported in part by IFAS/ARS cooperative agreement No. 58-XY-9-001 and IFAS/SJRWMD cooperative agreement No. 94D270.

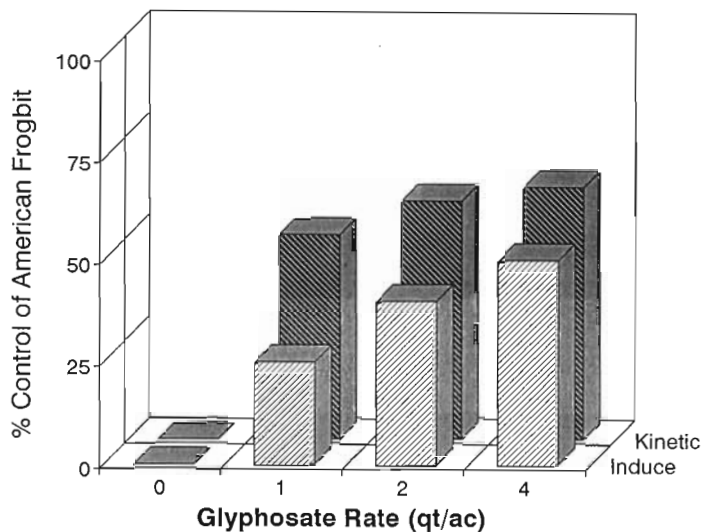
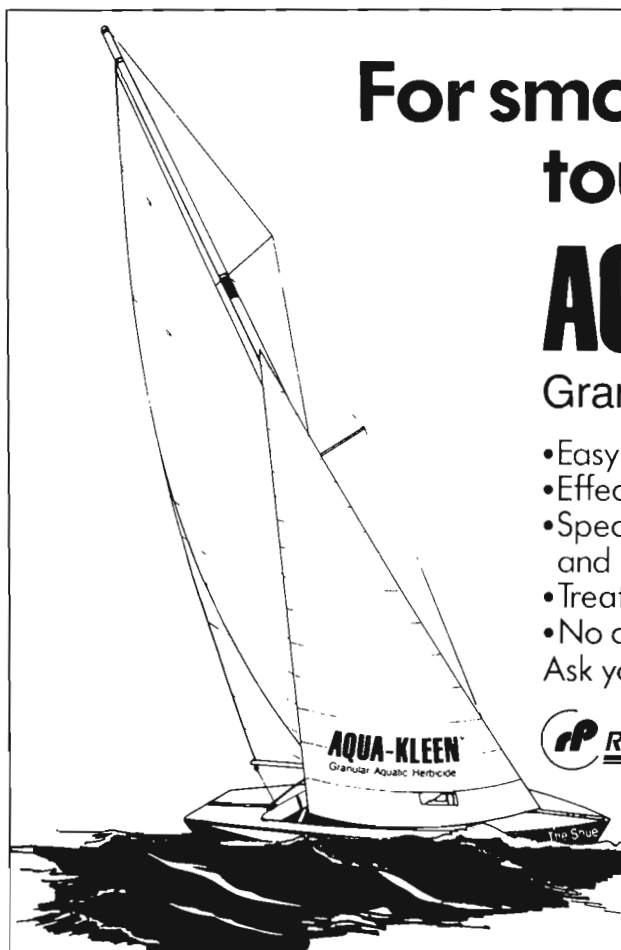


Figure 5. Control (visual observations) of American frogbit observed four weeks after application of various rates of glyphosate with two different surfactants.

We appreciate the support of the following companies for providing herbicide formulations or adjuvants for the studies: DowElanco, Helena Chemical Company, Monsanto Company, Rhone-Poulenc Ag Company, Valent U.S.A, Zeneca Professional Products Corporation. Published as IFAS Circular 1158.



For smooth sailing through tough aquatic weeds

AQUA-KLEEN®

Granular Aquatic Herbicide

- Easy-to-use, needs no special equipment.
- Effective and economical.
- Specially designed granules quickly sink to the bottom and release chemical into critical root zone.
- Treat large or small areas.
- No chemical buildup in bottom sediment.

Ask your chemicals supplier for AQUA-KLEEN® or write:



RHONE-POULENC AG COMPANY
P.O. Box 12014, 2 T.W. Alexander Drive
Research Triangle Park, NC 27709

AQUA-KLEEN is a registered trademark of Rhone-Poulenc.

AQUAVINE



Yeah We're Moving Up

Mathew Cole, former Technician Supervisor for the SJRWMD in Palatka, has accepted a position with Environmental Waterways, Inc. Matt will be reunited with his former St. Johns boat partner, Darryl Blackall, who is the office manager of the Orange Park Office. Johnnie Drew, 6-year veteran of the hydrilla wars with St. Johns, has been appointed interim supervisor. Johnnie's first comment was, "Hey Wayne how do you calibrate this 486 DX —?"

Welcome Randall Stocker

Randall Stocker is now the

Director for the UF/IFAS Center for Aquatic Plants in Gainesville. Randall will be wanting to get out and about to meet everyone, so give him a call at 904/392-6841 and invite him to your place.

Meetings

South Carolina Aquatic Plant Management Society Annual Meeting, Springmaid Beach Recreation and Conference Center in Myrtle Beach, October 4-6, 1995 (postponed due to Felix). Contact Larry McCord 803/761-8000 ext. 5735.

Florida Aquatic Plant Management Society Annual Meeting, St. Petersburg Hilton, October 17-19, 1995. Contact Mike Hulon, President 407/846-5304.

Southern Weed Science Society Annual Meeting, Adams Mark Hotel, Charlotte, NC. January 15-17, 1996. Contact Barry Sims 901 / 855-1472.

Weed Science Society of America 1996 Annual Meeting, Norfolk,

Virginia Marriot and Omni Hotels, February 6-9, 1996. Contact Dr. Henry P. Wilson 804/442-6411.

Weed Science Society of America 1997 Annual Meeting, Orlando, FL, Clarion Hotel, February 2-6, 1997.

Letter

Continued from page 3

Petersburg in October. We will announce our decision at the annual meeting.

The Department of Environmental Protection funding for hydrilla control in fiscal Year 1995-96 was increased by our State Legislators and totals 5.8 million dollars. This money is greatly appreciated; however, it runs out in FY 1996-97 and all that remains for statewide hydrilla control is \$300,000. Everything we have done to date will be lost if there is not a dedicated funding source found soon for hydrilla management.

For more information or to express your opinion on these issues, please contact me at 407-846-5300.

Thank you,

Mike Hulon, President

AQUATIC WEED CONTROL PRODUCTS FROM HELENA CHEMICAL COMPANY

Complete line of herbicides including:
 Sonar® Rodeo® Aqua-Kleen®
 Weedar® K-Tea™ Komeen® Reward®

Complete line of adjuvants including:

Kinetic™ Agri-Dex®
 Induce™ Foamer™
 More™ Exact-Trol™



HELENA CHEMICAL COMPANY

Sonar® is a registered trademark of DowElanco Products Co.
 Rodeo® is a registered trademark of Monsanto Agricultural Products Co.
 Aqua-Kleen® and Weedar® are registered trademarks of Rhone-Poulenc Ag Co.
 Reward® is a registered trademark of Zeneca Professional Products, a business unit of Zeneca Inc.
 K-Tea™ is a trademark and Komeen® is a registered trademark of Griffin Corporation

Alachua, FL
904/462-4157
Frank Frye
Jason Ward

Mt. Dora, FL
904/383-8139
Richard Royal
Bonnie Figliolia*

Ft. Pierce, FL
407/464-8660
Jerry Selph
Bob Harwell

Dundee, FL
813/439-1551
Scott Ratley
David Hitchcock

Tampa, FL
813/626-5121
Tom McPherson*
Jeff Welsh*

Palmetto, FL
813/722-3253
Dale Willis
Keith Foster

Wauchula, FL
813/773-3187
John Baxter

Immokalee, FL
813/657-3141
William Horne
Shaun Yule

Belle Glade, FL
407/996-2011
U.B. Gray
Carlos Tabermilla

Homestead, FL
305/245-0433
Danny Daniels
Paul Gray

Delray Beach, FL
407/499-0486
Tim Garmon
F.E. "Chil" Rossbach*

*Aquatic & Industrial Specialist



Next time, use Rodeo.[®]

You can try mowing weeds. Or pulling them out by hand. You can even put up fences and barbed wire. But you won't keep weeds from coming back — unless you use Rodeo[®] herbicide.

Rodeo controls more than 170 species of emerged grasses, broadleaf weeds and brush. It works by moving throughout plant tissues... roots and all. So you'll get complete control, and long-lasting results.

And because Rodeo is fully labeled for aquatic areas, you can use it almost anywhere. Including lakes, rivers, ponds, estuaries, reservoirs, and, of course, ditchbanks. In fact, conservationists around the world count on Rodeo to control invasive weeds in sensitive wildlife habitats.

For more info on the link between Rodeo and better vegetation management, and a FREE subscription to our *Road Talk* newsletter, call: 1-800-332-3111.

RODEO[®]
EMERGED AQUATIC WEED AND BRUSH HERBICIDE
BY **Monsanto**

ALWAYS READ AND FOLLOW LABEL
DIRECTIONS FOR RODEO HERBICIDE.
Rodeo[®] is a registered trademark of Monsanto
Company. ©Monsanto Company 1995
ROD-56980 2/95

REWARD® for aquatic weed control is the one herbicide that doesn't make you wait.

Once applied, REWARD spreads quickly through the water, making fast contact with all unwanted vegetation. Absorbed by plants within minutes, REWARD controls unsightly emerged weeds within 10 days and submersed weeds in about 30. Unlike other aquatic herbicides REWARD controls both floating and submersed weeds. All without worry about toxicity to fish or other wildlife.



REWARD herbicide. For broad-spectrum aquatic weed control without the wait — and without the worry.

NO WAIT. NO WORRY.

For more information, contact your distributor or call Zeneca at 1-800-759-2500.

ZENECA
Professional Products

Always read and follow label directions.
REWARD® is a trademark of a Zeneca Group Company.
©1995. Zeneca Inc. A business unit of Zeneca Inc.