



# THE AQUATIC PLANT MANAGEMENT SOCIETY, INC.

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Newsletter No. 20

## Twenty-Five Years of APMS Celebrated in Vancouver

British Columbia, Canada, was SUPERNATURAL for all who were able to attend the 25th Anniversary Annual meeting of the Aquatic Plant Management Society. The gracious hospitality of our Canadian hosts made our first meeting outside the United States a memorable experience.

Amidst fantastic sightseeing and delightful dining (and shopping for those of us who were accompanied by our spouses — we had a record spouse attendance) we also had time for an extremely informative meeting. The Honorable F.C. Austin Pelton, Minister of Environment for British Columbia kicked the meeting off with an inspiring keynote address. Soon after, our Special Topic Speaker, Professor C. Den Hartog, Laboratory for Aquatic Ecology, Catholic University of Nijmegen, addressed the topic of Acid Rain and Aquatic Macrophytes. Professor Den Hartog is a highly respected scientist in the area of physiological ecology of aquatic macrophytes and it was truly an honor to have him attend the APMS meeting and to have him speak. The international nature of APMS was very evident at the Vancouver meeting with a long list of international speakers including Professor Den Hartog; Professor C.D.K. Cook, Botanical Gardens and Institute for Botany, University of Zurich; Professor David Mitchell, Center for Irrigation Research, Griffith, New South Wales, Australia; Yoko Oki, Institute of Agriculture and Biological Sciences, Okayama University, and many Canadian speakers. We were also honored by a letter from Kunikazu Ueki, President, Waterhyacinth Society of Japan:



John, Clark, and Al relax after the Salmon Barbeque

Dear President:

I am very glad, on behalf of all the members of the Waterhyacinth Society of Japan, to offer the Aquatic Plant Management Society my heartiest congratulations on opening of the Twenty-fifth Anniversary Meeting of 1985 in Vancouver. In this Meeting and International Symposium on Watermilfoil, valuable presentations and knowledge exchange will be made on various aspects of aquatic weeds including the control and utilization.

Our society, the Waterhyacinth Society of Japan was founded in 1982, and has grown presently. The society has over 160 members who are interested in waterhyacinth. In addition to domestic activities, we have a strong wish to make a close relationship with scientists and organizations of various countries. The exchange between the Aquatic Plant Management Society and our society will be mutually beneficial to the advancement of aquatic plant management.

I would like to express the hope for a

great success of your meeting and symposium, and for the prosperity of the Aquatic Plant Management Society.

Sincerely yours,

Kunikazu Ueki  
President  
The Waterhyacinth  
Society of Japan  
Professor of Weed  
Science  
Faculty of Agriculture  
Kyoto University

A broad spectrum of Aquatic Plant Research was reported during the general sessions covering basic botany, ecology and physiology, biological control, herbicide technology, mechanical harvesting, and bottom barriers. In addition to the general sessions, this year's meeting highlighted the "International Symposium on Watermilfoil (*Myriophyllum spicatum*) and Related Halagoraceae Species" — a report on the symposium by Scott Painter appears later in the newsletter.

The highlight of the Vancouver meeting was the Salmon BBQ. The

salmon, trimmings, and refreshments were thoroughly enjoyed by all while we anxiously awaited the presentation of awards. President McGowen's retirement from Lilly Elanco was announced and "Max" was presented with a commemorative Quart of Sonar (empty) by Bill Culpepper for his many devoted years with the company. Max assured us of his continued activity in APMS. As always, the student contest presentations represented some of the best papers of the meeting and all contestants could have been first place winners. Congratulations to the following winners of the 11th Annual Student Paper Contest.

#### FIRST PRIZE

Robin Anderson, Department of Biology, McGill University, Montreal, Quebec, Canada.

R. Anderson and J. Kalff, "Nutrient Limitation of *Myriophyllum spicatum* in situ"

#### SECOND PRIZE

Madeline Ames, Agronomy and Range Science, University of California-Davis, CA

M. Ames and D.W. Rains, "Influence of Temperature and Phosphate Supply on the Growth, Nutrition and Phosphorous Uptake of *Azolla* species"

#### THIRD PRIZE

Scott Bonar, Washington Cooperative Fishery Research Unit, University of Washington, Seattle, WA

S. Bonar, G.L. Thomas, and G.B. Pauley, "Evaluation of Ploidy and Separation Techniques with the Grass Carp (*Ctenopharyngodon idella*), a Potential Biological Control for Aquatic Macrophytes in Washington State"

#### FOURTH PRIZE

Karen Bowers, Washington Cooperative Fishery Research Unit, University of Washington, Seattle, WA

G.B. Pauley, G.L. Thomas, S. Bonar, K. Bowers, and A. Unthank, "Overview of the Use of Triploid Grass Carp (*Ctenopharyngodon idella*) for Macrophytes in Washington State"

Peter Newroth was presented with a gift of fine wines in appreciation for his efforts in making the 25th Anniversary such a success. Thanks again for a terrific job, Peter.

The 26th Annual Meeting will be a long way from Vancouver but the Local Arrangements Committee is already making plans for another enjoyable and informative meeting in Sarasota, Florida. So start making plans now.



"CONGRATULATIONS MAX"



Robin Anderson and friends celebrate First Place Student Paper Contest Award



Madeline Ames Receives Second Place Student Paper Contest Award

# First International Symposium on Milfoil Held at 25th Annual Meeting of APMS

Well, I'm back from Vancouver from a very exciting conference. The 25th meeting of the Aquatic Plant Management Society was extremely useful especially so because the First International Symposium on Milfoil was a special one day event which dealt with our problem plant here in Canada. I saw some of you there but for the rest of you who were unfortunately not able to attend, I thought I would attempt to summarize the highlights.

The Milfoil Symposium dealt with a broad range of topics, from taxonomy of the genus to chemical, mechanical and biological control. There are now 36 species of *Myriophyllum* in the world. Most of the species are concentrated in Australia and New Zealand. Canada has its fair share of milfoil species with approximately 10 or 11. Dr. Richard Couch from Oklahoma has examined over 17,000 herbaria specimens and concluded that *Myriophyllum spicatum* was the first recorded in North America in 1940 rather than the late 1800's as is commonly believed.

*Myriophyllum aquaticum*'s ecology and physiology was also discussed. *Aquaticum* was first imported into North America in the late 1800's into Florida as a decorative plant and then escaped cultivation. It, however, has not become a problem except in very nutrient rich waters. There is no doubt that *aquaticum* could survive in Canada since it has survived in Vancouver in an ornamental pond for several years and been completely froze in ice during the winter. I also have *aquaticum* in my greenhouse in Burlington and it has survived over the winter in the unheated greenhouse. *Aquaticum* is sold in Canada for the water garden

trade so accidental release into Canada is inevitable but perhaps not of concern??

Two new methods of milfoil control were revealed during the symposium. One method utilized ultrasound to disintegrate the plant. BC authorities have great hopes that the ultrasound technique will prove to be useful in beach areas where clean sand bottoms are desired. The inventor is still in the design stage and has tested a prototype which works but he hopes to increase the power in his second generation device to increase the kill zone beyond the current 10 to 20 centimeters.

Another interesting presentation at the symposium was by Dr. H. Gunner from the University of Mass. He has isolated two bacteria and one fungus which selectively attacks *spicatum*. The microbes are cellulolytic and pectinolytic and are natural microbes found in the sediments of most lakes. Dr. Gunner has performed host specificity experiments and found that the bugs only attack *spicatum*. He has EPA approval to inoculate a small lake with the microbes and determine the effectiveness of the microbes in a natural ecosystem. His research and lake trials show great promise for long-term milfoil control. His discovery may explain why milfoil is not a problem in Europe and why milfoil infestations have suddenly declined in America. Our own studies on the decline revolved around the organic nature of the sediments after several years of milfoil leaf litter accumulation. John Barko (US Army Corps of Engineers) and myself have confirmed that organic enrichment of the sediment will inhibit milfoil growth. John presented his findings at the Symposium and

revealed that his current hypothesis centers around nutrient limitation in organic sediments due to diffusional distances.

However, our studies have concentrated on determining if anything toxic is present in the sediments. For example poor sediment can be improved by adding activated charcoal and good sediment can be made poor by adding sawdust. Sawdust added to growing media will inhibit milfoil photosynthesis. We have therefore begun to look at phenolic compounds. A previous contract determined that milfoil had a high phenolic content (7-30% AFDW) and that the common phenolics were ELLAGIC, GALLIC AND TANNIC ACIDS and less common were syringic, gentisic, cinnamic, caffeic, sinapic, ferulic, guinic and protocatechuic acids. Related to several of those compounds is hydroxybenzoic acid which is also a common phenolic.

Photosynthetic experiments with milfoil in culture media with hydroxybenzoic acid and hydroxybenzaldehyde showed that the aldehyde group was highly toxic. All of these phenolics are common in sediments as dissolved organic carbon from humus breakdown.

Interestingly Dr. Gunner mentioned that phenolics stimulate the growth of the microbes he had isolated. Our research will continue to examine the role of organic matter enrichment of sediments as a possible explanation behind the decline and perhaps a long-term control of milfoil by artificially enriching the sediment with organic matter and maybe even bacteria and fungi.

Scott Painter — reprinted from Canadian Chapter Aquatic Plant Management Society 1-2.



## Commemorative T-Shirts Available

Commemorative "International Symposium on Watermilfoil and Related Haloragaceae Species" T-shirts are still available in all sizes. These T-shirts have the APMS logo on the front and the Milfoil Symposium logo on the back — they are very attractive. Don't miss this opportunity — Contact Bill Rushing immediately to place your order!



## From the President

Welcome back from Vancouver! To those of you who were able to attend the first out-of-country APMS ANNUAL MEETING, and those who presented papers, a big **Thanks!** for making it a very productive and enjoyable event. The excellent hotel accommodations and memorable salmon BBQ created a very relaxing and congenial atmosphere. I wish to extend particular appreciation to Peter Newroth who made so many excellent arrangements for the activities and to Bill and Gloria Rushing who orchestrated and carried out the many tasks needed for a smooth registration. **VERY WELL DONE!!**

I am pleased to announce that all the Milfoil Symposium papers are in hand. With some hard work and some luck, the Proceeding will be published within 6 months. Be sure to order your copy if you haven't yet! (You'll find an order form in the next issue of the Newsletter.)

The coming year presents a challenge and an opportunity for the Society. In the past 10 years there has been a tremendous expansion in aquatic plant research and consequently, a real growth in the number of scientists in our field both in the United States and abroad. I believe APMS has a need **and a responsibility** to serve as a focal point for increased scientific communication and as a resource for technical information on aquatic plants and their management. The Society can strengthen its role in monographs on special topics relating to aquatic plant management, and the biology of aquatic plants. There is a critical need for up to date reviews on nutrition, reproduction, ecology,

herbicide action, biocontrol and physiology of aquatic plants. Consider this: The best, overall upper-division/graduate level reference text on flowering aquatic plants was published 20 years ago and is out of print (for the second time!). I refer to Sculthorpe's *Biology of Aquatic Vascular Plants*.

The APMS should also increase its efforts to educate the public on the detriments of unmanaged aquatic weeds and on the need for preventive measures to curb the spread of nuisance weeds. In this regard I will be making a special effort to establish working relationships with the aquaculturists and their respective societies. We need exchanges of ideas on how to best insure that aquatic plant suppliers do not unwittingly disseminate noxious aquatic weeds.

These are just a few of the activities that APMS can be working on. These types of projects require increased participation of all of us. I was very pleased to see the numbers of you who signed up to work on various committees—you will be getting a call soon! For those who have not, please consider helping out. APMS needs your support, skills, ideas and time! Please contact the committee chairpersons and volunteer. Remember, you're really helping yourself when you help APMS.

Finally I invite you to write or call me with your thoughts on enhancing APMS. I'm sure that at one time or another you've wondered "Why don't we do . . .", or "APMS ought to . . .". Well, let's hear it so we can move on it!

My phone number is 916-752-6260 (work); 916-757-2428 (home).

### 1985-86 Committee Chairman

Membership: Ed Theriot	(601) 634-2678
Local Chapters: Joe Zolzynski	(205) 928-1725
Exhibits: Terry Goldsby	(205) 582-8170
Nominations: Max McCowen	(317) 467-4249
International Contacts: Scott Painter	(416) 637-4602
Bylaws-Resolutions: Kurt Getsinger	(601) 634-2678
Past President Advisory: Max McCowen	(317) 467-4249
Meeting Site Selection: Don Lee	(504) 342-5864
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Ken Langeland, Newsletter Editor	(919) 737-2866
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Local Arrangements: Carlton Layne	(813) 683-9767
Publicity: David Spencer	(916) 752-6321
Noxious Weeds: Carlton Layne	(813) 683-9767

## MEETINGS

25th North Central Weed Control Conference. St. Louis, MO — December 10-12, 1985.

Midwest Fish and Wildlife 1985 Conference, Grand Rapids, Michigan — December 14-18, 1985.

Northeast Weed Science Society 1986 Annual Meeting, Sheraton-Boston Hotel, Boston MA — January 7-9, 1986.

Southern Weed Science Society 1986 Annual Meeting, Opryland Hotel, Nashville, TN — January 20-23, 1986.

Weed Science Society of America 1986 Annual Meeting, Hyatt Regency Hotel, Houston, TX — February 5-7, 1986.

Midwest Aquatic Plant Management Society 1986 Annual Meeting. The Abbey, Lake Geneva, WI — March 16-18, 1986.

Western Aquatic Plant Management Society 1986 Annual Meeting, Town and Country Hotel, San Diego, CA — March 20-21, 1986.

### Hydrilla fight to 'lighten up' From wire dispatches

WASHINGTON — The federal government is turning from chemicals to bright lights in its fight against hydrilla, an underwater weed clogging the Potomac River.

The Agriculture Department is installing strings of 500-watt quartz lamps above and below the river's surface at the Belle Haven Marina in Alexandria.

Scientists believe the lights will curb the growth of hydrilla by confusing the weed's sense of night and day.

"This will fool them into thinking it's a short night," said Lars W.J. Anderson of the Department of Agriculture.

Scientists said the hydrilla needs long, uninterrupted periods of darkness to reproduce.

The lights will be tried on an experimental basis for eight or nine weeks, after which their effectiveness will be measured.

The Army Corps of Engineers says that if the hydrilla continues sprouting at its current rate, the fast-growing weed will cover 34,000 acres of the Potomac by 1995.

Hydrilla, which covers much of Alexandria's shoreline waters, has drastically diminished boating activities at the Belle Haven Marina and elsewhere.

Reprinted from the Richmond Times-Dispatch, Richmond, VA, Friday, August 16, 1985, Page B8

## THE AQUATIC PLANT MANAGEMENT SOCIETY, INC.

### Summary of the Meeting of the Board of Directors

Vancouver, British Columbia —  
July 21, 1985

The Board of Directors met in Vancouver British Columbia on Sunday, July 21, 1985 at the 25th annual meeting. Special recognition was made to our new Director, J. Clarke Hudson who was elected to fill the unexpired term of Director William L. Maier who passed away early in the year.

The Secretary-Treasurer reported that the assets of the Society were standing at \$8,612.07 as of June 30, 1985. This is a small increase over the same period of 1984. The membership stands at a total of 580 with 385 active, 147 subscription, 15 commercial sustaining, 5 honorary, and 27 student members. This is a substantial increase over the last reporting at midyear.

Highlight of the meeting were as follows:

President McCowen and the Board expressed sincere thanks for all who had organized and planned the Milfoil Symposium held during the 25th annual meeting. It was a tremendous success.

The situation on liability insurance for the Society was deferred until the Winter Board meeting in order for the Secretary-Treasurer to sort out some details regarding the proposed insurance. Insurance of this type will cost over \$1000.00 per year.

Nine exhibitors rented twelve spaces for the exhibits at this meeting.

The legislative committee reported that the FIFRA is being revised.

Dr. Peter Newroth was especially commended for his outstanding work on local arrangements for this meeting.

The local chapters committee reported that things are working for a Canadian chapter with Scott Painter doing the organizing. It was suggested that more serious contacts be kept up with the local chapters so that the Society membership could benefit more

from their activities. The Florida chapter reported the establishment of a Bill Maier Scholarship Fund.

The Past Presidents Advisory committee has been working hard on formulation of a Code of Ethics, a Policy Statement document and an Operations manual. It was decided not to establish a Code of Ethics at this time due to the possibility of legal problems; the Policy document was deferred until the Operations Manual is finalized. Leon Bates is hard at work on this at the present time.

The program for the current meeting consisted of 22 papers for the Milfoil Symposium and 32 papers for the regular meeting.

APMS tee shirts are available from the Secretary-Treasurer's office for \$10.00 each. They are similar to the ones offered last year with additional notation of the 25th annual meeting and the symposium on the back.

Dr. Ken Langeland will continue his fine work with the APMS Newsletter to be published three times a year.

The proceedings for the Milfoil Symposium will sell for \$15.00 each.

Back issues of the Journal through volume 18 will be made available for \$5.00 per issue year. (Note — Further information on this will be published in the Newsletter.)

APMS involvement in the Council for Agricultural Science and Technology, CAST, will continue with Bill Haller as our representative. APMS is recognized as an important organization supporter of CAST.

The 1986 annual meeting will be held at the Hyatt Sarasota, Sarasota, Florida during July 13-16, 1986.

### New Officers

At the annual business meeting on July 22, 1985, the Society membership elected the following slate of officers to serve during 1985-1986: President-Elect, Dean F. Martin; Vice-president, Richard Comes; Editor, William Haller; Directors, Randall Stocker and Scott Painter. President-Elect Lars Anderson automatically

became President and Secretary-Treasurer Bill Rushing was elected in 1984 for a three year term beginning in 1985. Directors Couch, Goldsby, Hudson, and Joyce are still within their three year terms.

Provided by Bill Rushing

## Where are they now?

A number of student members have become active participants in the Society. This is the first of a series to remind us of what happened to those who participated in Student Paper Contests or were otherwise active as student members (The year in parenthesis indicates the first year of participation).

**Ernest S. Del Fosse** (1975) first winner of the contests, received his doctorate from the University of Florida, became the first Chairman of the Society's Student Affairs Committee. In 1979, he became a Research Scientist with CSIRO in Canberra City, Australia.

**Harold Ornes** (1977) is a faculty member in the Department of Botany, University of South Carolina at Aiken and is a member of the Publications Committee.

**Patricia M. Dooris** (1978) received a doctorate from the University of South Florida. She is now Manager of the Environmental Section, Southwest Florida Water Management District, Brooksville.

**Ken A. Langeland** (1978) received his doctorate from the University of Florida and an extension specialist and faculty member at the North Carolina State University. He is Editor of the Society's Newsletter.

**John R. Cassani** (1978) is an aquatic biologist with Lee County Hyacinth Control District and has been a member of the Student Affairs Committee for several years.

**Dan Thayer** (1980) is a researcher at the Aquatic Weed Center, University of Florida. He is a member of the Student Affairs Committee and is also Editor of *Aquatics*.

Submitted by Dean Martin



## FEDERAL AQUATIC PLANT MANAGEMENT WORKING GROUP

The FAPMWG met in Vancouver BC in July during the APMS 1986 Annual Meeting. A synopsis of the major discussions is presented below.

### Biosonics (hydroacoustics) Study — USCOE

The USCOE is considering a proposal from Biosonics Corporation to investigate the utility of hydroacoustic techniques for determining biomass of submersed aquatic plants. This technique has been used successfully for several years to determine location and relative size of schools of commercial marine fish. Ongoing collaborative field tests using hydroacoustics by the USCOE are scheduled at TVA's Guntersville Reservoir in early September. In this test, correlation of macrophyte biomass (primarily Eurasian watermilfoil) determined by hydroacoustics and densities based on aerial photography will be investigated.

### 2, 4-D Labeling

The latest feedback from EPA on the expanded 2, 4-D label has been negative with indications of additional delays. The data package relating to monitoring projects by the USBR and USCOE was provided to EPA; however, the response from EPA has been a call for more data. Current opinion is that the "political" climate for expanding 2, 4-D use in aquatic sites is unfavorable.

### USDA Studies — Imperial Valley

Current studies of the grass carp in the Imperial Valley and the ARS facility at UC-Davis include: (1) feeding preference of the triploid grass carp, (2) possible state "certification" of triploidy, (3) finishing reports relating to electric barriers and (4) continuing evaluations of grass carp releases in irrigation canals in the Imperial Valley.

A final report summarizing the research on biological control of weeds with spikerush has been issued by the University of California-Davis. This report by Dr. Floyd Ashton entitled "Research on Biological Control of Aquatic Weeds with Competitive Species of Spikerush (*Eleocharis* spp.)" can be obtained from Dr. Lars Anderson, ARS-USDA, Davis, California.

The ARS reported an interest in developing the techniques for producing triploid grass carp; however, Dr. Joe Joyce, Director, Center for

Aquatic Weeds, indicated that Dr. Jerome Shireman is already conducting a project designed to develop a methodology for the production of sterile (triploid) grass carp. A publication detailing this process will reportedly be available within one year.

### Aquatic Weed Program North Carolina State University

Ken Langeland reported on the current research and spread of "monoecious hydrilla" in North Carolina. New hydrilla populations continue to be discovered in proximity and remote to the original area of infestation. The latest, and most important, is a small infestation in Lake Gaston — a 20 thousand acre impoundment of the Roanoke River on the North Carolina-Virginia border. Research is continuing into the extent to which seed production can contribute to dispersal of "monoecious hydrilla." Caryographic studies have revealed that all populations thus far studied are triploid — the ability to produce viable seed is therefore intriguing. Results of field herbicide trials for control of "monoecious hydrilla" are available from the North Carolina Water Resources Research Center.

### Cooperative Herbicide Studies

Two herbicide formulations, Garlon and Casoron, are being examined for aquatic use and/or expanded labels. The USBR, USCOE, and Dow Chemical Company are reviewing the status of Garlon while the USDA, USCOE and TVA have been working with Uniroyal to determine the potential for Casoron in aquatic sites.

### Center for Aquatic Weeds — University of Florida

Dr. Joe Joyce indicated that the Center for Aquatic Weeds issued an annual report summarizing research conducted under the USDA/ARS Center for Aquatic Weeds Cooperative Agreement and copies would be sent to working group members. This cooperative program was initiated to conduct multidisciplinary research on integrated management programs for aquatic plants and most of the fourteen research tasks conducted in 1984 were briefly reviewed. Working group members needing specific data relating to those projects should contact Dr. Joyce. It was also stated that the aquatic plant data base for the aquatic plant library at the Center for Aquatic Weeds is very comprehensive; however, working group members are encouraged to submit recently pub-

lished research reports and publications to Vic Ramey, Center for Aquatic Weeds, to keep the data base current.

### Potomac Hydrilla Infestation

Only limited control efforts were implemented in 1985 in order to reduce the monoecious hydrilla colonization in the Potomac River. Other than placement of bottom barriers in two marina locations, no other control techniques have been used. The states of Maryland and Virginia have opposed the use of registered aquatic herbicides to control the hydrilla populations and their position is not expected to change in the near future. Meanwhile, hydrilla populations expanded to about 500 acres by mid summer and are now found in the Potomac from Woodrow Wilson Bridge downstream to Highway 301 Bridge.

An Environmental Impact Statement (EIS) and a State Design Memorandum presenting the various control alternatives has been completed by the Corps of Engineers Baltimore District and is now in internal Corps review.

Laboratory tests to evaluate the influence of photoperiod on tuber formation at the University of California-Davis, Agricultural Research, had earlier indicated the monoecious hydrilla did not form tubers when photoperiod was altered. Other laboratory studies by Dr. Steven Klaine also indicated that ethylene inhibits tuber formation.

### TVA Aquatic Plant Studies

Cooperative studies are being conducted by TVA and the USCOE concerning the dissipation of herbicides under different flow regimes. The channels or mesocosms at TVA's Aquatic Research Laboratory are being used to conduct flume type flow studies with in situ aquatic macrophytes (Eurasian watermilfoil). It was stated that the 12 aquatic research laboratory channels (360 ft. long x 14 ft. wide x 6.5 ft. deep) were available for additional aquatic studies by other federal or state agencies. A publication describing the facilities and capabilities for applied water resources research can be obtained by contacting TVA.

It was reported that the hydrilla distribution continues to expand in Guntersville Reservoir in northeast Alabama. Herbicide suppression of hy-

drilla has been only moderately successful in reservoir areas subjected to significant flow. Grass carp were successfully stocked in a large enclosed subembayment of Guntersville Reservoir and preliminary evidence, 10 months after stocking, indicated that spinyleaf naiad and hydrilla have been significantly reduced, leaving only Eurasian watermilfoil.

#### **Aquatic Plant Studies — British Columbia**

Dr. Peter Newroth reported on the applied research now underway with the British Columbia, Ministry of Environment. There was an appeal for an international approach in preventing the introduction of hydrilla into the Pacific Northwest with state, federal, and provincial agencies as participants. It was further suggested that support be given to publication of a monograph on monoecious hydrilla.

Two promising technologies for potential control of Eurasian watermilfoil were discussed and included a mechanical underwater ultrasonic device for aquatic plant tissue destruction and further study of the burrowing larvae of a Chironomid (Midge) which appears to stress watermilfoil.

#### **USCOE — Aquatic Plant Control Research Program**

The USCOE Aquatic Plant Control Research Program conference will be held November 19-21 at the Radisson Inn and Conference Center, Atlanta, Georgia. More information can be obtained from Bill Rushing at 601-634-3542.

#### **14th Interagency Research Conference — Chattanooga, Tennessee**

TVA will host the 14th Interagency Research Coordination Conference at the Read House Hotel in Chattanooga, Tennessee on November 5-7, 1985. The Federal Aquatic Plant Management Working Group will meet in conjunction with this conference and report on working group progress to the Water Quality and Ecology Parent Committee. The FAPMWG works under the umbrella of the Interagency Conference primarily to avoid duplication of research and exchange ideas and plans on research subjects of mutual interest. Lewis Decell was elected to serve as chairman of the FAPMWG until 1987 when the USBR co-chairman will assume the chairmanship.

Submitted by:

J.L. Decell, Chairman — FAPMWG  
0056A



Professor C. Den Hartog (left) and Professor W. T. Haller (right) were two of the leading scientists in Aquatic Plant Ecology who attended the 1985 APMS Annual Meeting.

## **Special Inventory Reduction Sale**

The APMS Board of Directors has authorized reduced rates on Complete Sets and back issues of the Hyacinth Control Journal (1962-1975) and the Journal of Aquatic Plant Management (1976-Present). This is an excellent opportunity for libraries, laboratories and people new in the field to complete their holdings of these issues "While they last." These back issues provide an interesting and informative historical background in aquatic plant management.

You may order single volumes to replace lost ones or order the complete set on the form below. Two issues of the Journal were printed for Volume 8 and for Volumes 20-23.

	your order
Volumes 1-18 (1962-1980) at \$5/Volume (\$90)	\$ _____
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## Letters to the Editor<sup>1</sup>

Dear Ken:

After returning from the Aquatic Plant Management meeting and the Workshop on Monoecious Hydrilla, I began thinking about all the concern which has been expressed over the discovery of the monoecious form of hydrilla in several locations in the United States. From what I heard at the workshop, personal observations of the plant, and discussions with various individuals, I am beginning to wonder if it really has the potential to become as serious a pest as the dioecious form of hydrilla.

First, it appears to me that the monoecious hydrilla has invaded and colonized only bodies of water free of submersed plants. It apparently has not only replaced native plants to any great extent in the areas in which it has been found. This does not mean that it doesn't have the potential to be a weed problem in those areas; however, I wonder if it has the ability to cause problems similar to those caused by the dioecious form of hydrilla.

Second, seed production by the monoecious hydrilla has been implicated as a very serious threat by this plant. As is well known for almost all problem aquatic plants, vegetative propagation is the major way these plants gain a foothold in a body of water and their primary means of regrowth when the weed mass is controlled. In fact, one of the intriguing characteristics associated with aquatic plants in general, is their ability to spread and grow primarily through vegetative means. What evidence is available that seeds will be a primary means of spread of monoecious hydrilla? From what I have heard, most populations of monoecious hydrilla probably originated from the planting shoots of this plant.

Third, how can the monoecious form of hydrilla cause problems worse than that already caused by the dioecious form? For example in Florida, hydrilla dominates many bodies of water replacing all submersed plants, blocks water flow, restricts many water use activities, and forms mats so dense that birds and other small animals walk on them. Will the monoecious hydrilla replace these mats of dioecious hydrilla? Will those mats of monoecious hydrilla be any more obnoxious than those already present? The plants of monoecious hydrilla I have seen appear quite fragile as

compared to the dioecious ones.

The restrictions which have been placed on researchers trying to study the monoecious form of hydrilla make it difficult to adequately study the growth potential of this plant. Certainly no one wants to be responsible for placing this plant in a situation which will result in it causing problems. However, I think the monoecious plant has been already placed in the same category as the dioecious form. Monoecious hydrilla may not present as serious a threat as is perceived. I think more research is needed before the verdict is in on the monoecious form of hydrilla. Monoecious hydrilla appears to have the potential to be troublesome in some areas; however, I question its ability to cause problems as serious as that of dioecious form of this plant.

Sincerely yours,

David L. Sutton  
Professor and Acting Center Director

Dear Dave:

I had intended to prepare a report from the Workshop on Monoecious Hydrilla to include in the newsletter but I forgot my tape recorder and as you know I have a very short memory. I will give a very brief account of the meeting to bring the readers up-to-date before addressing your letter.

Lars Anderson presided at the Workshop on Monoecious Hydrilla that was held at the APMS 1985 Annual Meeting. The workshop was held to discuss the potential threat, current knowledge, and research needs related to the recently discovered monoecious hydrilla strain. Lars opened the meeting by suggesting that due to some of the growth habits and reproductive capabilities (seed production)

"monoecious hydrilla" may be more competitive and pose a greater aquatic weed threat than "dioecious hydrilla." After some discussion of current research it was suggested by Dave Sutton that the monoecious strain may not be competitive with other aquatic species, including native aquatic plants; and may pose no aquatic weed threat at all because there is no data to support its replacing other species where it occurs. John Barko suggested that concern may exist only because of the connotation associated with the name "hydrilla." This brought a smile to Bill Haller's face (?) and got Ken Langeland's attention, who explained that they would not be developing a management program for hydrilla in North Carolina (the monoecious strain) without good reason and that one look at the Potomac River proves that Bell Haven Marina has a legitimate complaint. Whitey Holm reminded the attendees that many economically important weeds were not paid attention to until it was too late to contain their spread. Lars brought the meeting to a close with the conclusion that continued research into the biology and ecology of "monoecious hydrilla" is necessary.

With that out of the way I will offer my opinions to the questions that you have raised.

First, it does appear, in some situations, that monoecious hydrilla has colonized niches uninhabited by aquatic macrophytes. The Potomac River is the most visual example. However, based on some observations in North Carolina it appears that monoecious hydrilla has outcompeted slender naiad (*Najas minor*) and elodea (*Elodea nuttallii*). And Roy Miller reports that monoecious hydrilla competes aggressively with Fanwort



Toni, Dave, and Lars "unwind" at the President's Reception



(*Cabomba* sp) in Delaware. I too wonder whether "monoecious hydrilla" has the competitive abilities of "dioecious hydrilla." This will only be determined by "wait and see" or scientific research. Several researchers are attempting to answer this question.

Second, I haven't heard of seed production being implicated as a "very serious threat" but only as a potential means of dispersal. It is basic ecological principal that vegetative reproduction usually serves as a means for local dispersal whereas production of dormant seed that is tolerant of adverse environmental conditions is a means of long distance dispersal. We can often identify the source of hydrilla infestations as vegetative plantings, however, there are also instances where there is no explanation for its occurrence in isolated ponds, and dispersal of seed by waterfowl may be used to explain these populations. At a recent meeting I was criticized, for emphasizing the importance of hydrilla seed production. This person's argument was that it had no practical value. The potential for seed production and dispersal by "monoecious hydrilla" is of basic ecological interest and may have practical implications in the future. Again, only scientific research will answer the questions.

Third, agree, agree, agree. I ask the same questions and have the same doubts as you do.

I made several telephone calls in an attempt to learn of the restrictions that you refer to and there seem to be none. According to the Florida Department of Natural Resources, Bureau of Aquatic Plant Management, any scientist who holds an aquatic plant research permit is legally entitled to conduct research involving hydrilla. Although the Bureau may request some precautions when working with "monoecious hydrilla" there is no legal distinction between strains, varieties or biotypes of the species. I therefore encourage you to help answer our mutual questions by applying your highly respected scientific expertise in aquatic plant research to studying "monoecious hydrilla."

Sincerely,

K.A. Langeland, Editor

Opinions expressed by the Editor are his own and do not necessarily represent those of the Aquatic Plant Management Society. Comments and views, differing or supporting, from readers are encouraged.

## Legislative Report

Bill No.	Description	Status
S 309	Makes it easier to remove from market pesticides with registrations that contain health and safety data gaps and limits EPA's ability to allow emergency use of pesticides.	1/29/85 — referred to subcommittee of committee on Agriculture 4/22/85 — hearing. No Action
S 21	Consolidates all government trade — related responsibilities in the Department of Commerce and renames DOC to the Department of Trade and Commerce.	1/3/85 — referred to committee on Government Affairs. No Action
S 57	Makes R & D tax credit permanent, narrows definition of qualifying research, provides incentives for corporate support of university research.	1/3/85 — referred to Budget Committee and Governmental Affairs Committee. No Action
HR 320	Establishes Department of Department of Trade.	1/3/85 — referred to Governmental Operations Committee. 1/16/85 — referred to subcommittee on Legislation and National Security. No Action
HR 638	Restricts export of goods found to be hazardous to public health.	1/24/85 — referred to Committee on Foreign Affairs. 2/7/85 — referred to Subcommittee on International Economic Policy. No Action
HR 695	Gives Directors of national labs authority to enter into cooperative research agreements with universities and corporations.	1/24/85 — referred to Judicial Committee. 5/19/85 — referred to Subcommittee on Courts, Civil Liberties, and Administration. No Action 1/24/85 — referred to Committee on Science and Technology. Feb., 1985 — referred to Subcommittee on Science Research. 5/21 & 22/85 — Hearing held.
HR 2580	(Similar S 309) Establish and tighten minimum training requirements for RVP applicators, tighten data and labeling requirements for inert ingredients in pesticides. Allow greater disclosure of health and safety information submitted by registrants. Establish a "reregistration" timetable for pesticides registered before 1972. Simplifies EPA cancellation procedures. Prohibits the importation of commodities with residues of cancelled pesticides. Narrows conditions for 24(c) and conditional registrations. Requires states to protect groundwater from pesticide contamination. Repeals FIFRA	5/3/85 — referred to the subcommittee on Department Operations, Research and Foreign Agriculture.

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## Legislative Report continued

requirement that EPA indemnify owners of suspended and cancelled pesticides, and requires imposition of registration fees to pay for the costs of running the registration program.

(Backed by coalition of 39 environmental, health, and labor groups)

HR 2482	Would end indemnity payments, Streamline "special review" process, Give EPA authority to cancel registrations based on false, inaccurate, or misleading data, Tighten and define "under the direct supervision" (for applications of RVPs), Allow EPA to share confidential pesticide data with states, Increase penalties for violations to \$25,000 per day (civil) and two years in jail (criminal), Expand EPA inspection authority, Expand recordkeeping requirements for producers, dealers, users, Clarifies EPA's authority to require labeling of inert ingredients, and allows EPA to share authority with OSAA. (EPA supported Bill)	5/14/85 — referred to Committee on Agriculture. 5/17/85 — referred to Subcommittee on Department Operations, Research and Foreign Agriculture. 5/20 & 21/85 — Hearings
HR 2355	Reauthorizes FIFRA for FY-1986 without amendments.	5/15/85 — reported out of Committee on Agriculture and is on the calendar for a vote (HR Report 99-127)
S 1051	Reauthorizes FIFRA for FY-1986 and 1987 without amendments.	5/1/85 — referred to Agriculture Committee.
S 51	Gives communities a "right to know" what chemicals are being produced nearby. Might make it harder for corporations to keep private certain information EPA now considers confidential business information.	Referred to Finance Committee on 3/18/85. Then sent to Judiciary. Hearings were held and the bill was discharged. Placed on Senate Calendar 6/14/85. Vote to be scheduled (Senate Report 99-73).

This activity reflects a push by environmentalists and certain key members of Congress to overhaul FIFRA and stem what they perceive to be the erosion of the original intent and spirit of the 1972 amendments. There is, however, opposition and some disinterest within the administration the Senate Agricultural Committee. FIFRA's last authorization expired in 1981 and has continued only through stop gap funding.

Other national priorities may take precedence despite the intense lobbying and grass roots campaigns — pro and con. The short term solution may end up being with a one or year authorization without amendments to FIFRA with the hope that regulatory changes might obviate the need for major legislative amendments.

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## Ultrasound technique may eradicate milfoil

VANCOUVER (CP) — All alone in his basement lab, Roger Soar is planning to kill.

He's working on an insidious ultrasound machine which he hopes will quietly destroy hectares and hectares of aquatic weeds.

Soar is after Eurasian milfoil, a "very aggressive and wonderfully adaptive biological specimen" that infests lakes, strangles other plants and clogs boating and swimming areas.

Milfoil, despite rigorous attempts to control it, is gradually spreading through southern Ontario, Quebec and British Columbia since it was discovered in the 1960s. A sprig wound around a boat propeller can move it from one lake to another.

Peter Newroth, milfoil expert with the water management branch of the B.C. Environment Ministry, has given up hope of completely eradicating it. Now he just tries to prevent it from spreading.

Newroth and Soar are featured speakers at the 25th annual meeting of the Aquatic Plant Management Society. The four-day conference begins here Sunday and will bring together 150 water weed management experts.

Soar will describe his experimental high-frequency sound method to kill milfoil which Newroth calls one of the most promising techniques in the field.

"The sound wave travels through the water and causes high and low pressure areas," Soar said. "This vibrates the molecules as it passes, causing disruption of the plant cells" which in turn causes the plant enough stress that it dies.

### TOOK THREE YEARS

Soar, a 29-year old Victoria scientist, came up with the idea when he was working on milfoil with the provincial government's water management branch. The B.C. Science Council has given him \$100,000 in the past three years to develop the technique.

There is no question the principle works, he said. Now he's trying to build a transducer powerful enough that an exposure of just two seconds will be sufficient.

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## Ultrasound continued

"Right now I have it down to about five seconds, so we're getting there," he said.

If the more powerful transducer he is building now succeeds, a prototype could be operating within a year. Several large transducers would be rafted together and towed by boat over weed-infested areas.

The high frequency sound won't harm fish, he said, because they would either leave the area or won't be exposed long enough to cause serious damage. The treatment will also kill other aquatic plants but the ultrasound beam can be focused to limit damage.

Soar says he can hold his hand under the beam for 30 to 40 seconds before it becomes so painful he has to remove it.

British Columbia will spend \$500,000 fighting the weed this year but that's modest compared to the \$4 million spent annually by one small district in Florida where milfoil has been established for decades.

Reprinted from the Vernon News, July 20, 1985, provided by Peter Newroth

## Legislative Report continued

Both the Clean Air Act and the Clean Water Act expired in 1981 and 1982, respectively. They are in the same legislative limbo as FIFRA with further Senate and House activity uncertain (there is the possibility of House floor action in July).

The Legislative Committee respectfully submits this report and requests that the membership be advised and encouraged to notify their Senators and Representatives regarding their position on one, some, or all of these bills. These bills have the potential of affecting all of the members of the APMS professionally and personally. The membership's involvement in the legislative process is necessary for our elected officials to understand the impact of their decisions.

Provided by Carlton R. Layne

## CALL FOR PAPERS 1986 ANNUAL MEETING

### THE AQUATIC PLANT MANAGEMENT SOCIETY, INC.

You are invited to submit a title for a paper to be presented at the 1986 annual meeting of The Aquatic Plant Management Society, Inc., to be held July 13-16, 1986, at the Sarasota Hyatt House, Sarasota, Florida, USA. Type title authors, organization and location, exactly the way they are to appear on the program. If more than one author is listed, place an asterick after the name of the author who is to present the paper. Fifteen minutes will be allowed for each presentation. Projection equipment for 35mm slides will be provided. Special requests for additional time or specialized projection equipment should be directed to the Program Chairman, and will be considered on the merits of the individual request.

(PLEASE DETATCH AND RETURN)

Title \_\_\_\_\_

Author(s) \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

Abstract (75 words or less) \_\_\_\_\_

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Submit titles to: Dr. D.F. Martin  
Department of Chemistry  
University of South Florida  
Tampa, FL 33620

Submit student paper titles to:  
D.N. Riemer  
Cook College  
Dept. of Soils and Crops  
P.O. Box 231  
New Brunswick, NJ 08903

**Deadline for Submission is April 18, 1986**

### Congratulations SCAPMS Graduate Student Paper Contest Winners

**First Prize** — George Pesacreta  
"Die-off of Hydrilla Due to Turbid  
Inflows."  
George Pesacreta and K.A. Lange-  
land, North Carolina State Univer-  
sity, Raleigh, NC.

**Second Prize** — Mark Homer  
"Effects of Devegetating Rice Fields  
on Fish Populations."  
Mark Homer, University of South  
Carolina, Columbia, SC.



**The Aquatic  
Society, Inc.**

The Aquatic Plant Management Society, Inc., is an international organization of scientists, educators, administrators, and concerned individuals interested in the management and control of aquatic plants. The membership reflects a diverse collection of Federal, state, and local agencies; researchers, professors, and students from universities and colleges around the world; corporations; commercial applicators; and others dedicated to promoting research and sharing information about aquatic plants and the technology of aquatic plant management.

Originally called The Hyacinth Control Society, Inc., when founded in 1961, The Aquatic Plant Management Society, Inc., has evolved into a respected source of expertise in the aquatics field. The Society has grown to include several regional or state chapters; and through these affiliates, annual international meetings, newsletters, and the *Journal of Aquatic Plant Management*, members keep abreast of the latest developments in biological, mechanical, chemical, and integrated methods of aquatic plant management and control.

There are three regular classes of membership available upon application made in accordance with the Charter adopted in 1961. These classes are:

- |    |  |         |
|----|--|---------|
| A. | Active Membership .....                | \$25.00 |
| B. | Student Membership .....               | 5.00    |
| C. | Commercial Sustaining Membership ..... | 200.00  |

Name of Applicant \_\_\_\_\_ Spouse's Name \_\_\_\_\_

Home address\* \_\_\_\_\_ Zip Code \_\_\_\_\_

Present title & Employer \_\_\_\_\_

Business Address\* \_\_\_\_\_ Zip Code \_\_\_\_\_

Business Telephone \_\_\_\_\_ Home Telephone \_\_\_\_\_

Amount of Remittance \$ \_\_\_\_\_ Signature of Applicant \_\_\_\_\_

Membership Type: ACTIVE \_\_\_\_\_; COMMERCIAL SUSTAINING \_\_\_\_\_

STUDENT \_\_\_\_\_; SUBSCRIPTION \_\_\_\_\_

\*Please indicate address to be used by our business office.

THE AQUATIC PLANT MANAGEMENT SOCIETY, INC.  
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VICKSBURG, MS 39180