The Water Garden

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The CWGS meets monthly, April, May, August and September, usually at the Denver Botanic Gardens (DBG). The dates and specific locations of the meetings will be announced in The Water Garden. The 1st Sunday in June, at the Morrison Center at DBG, is a fund raising event with the sale of tropical and hardy waterlilies, as well as other water plants. This sale is open to the public. The 2nd Sunday in July is reserved for the CWGS members' pond tour and picnic. The 1st Saturday in December is the annual Holiday Party.

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Your comments on the quality, and suggestions for improvement for this newsletter are welcome and should be sent to the editor.

VISIT THE CWGS WEB SITE
http://members.xoom.com/cwgs
See page 2 for more interesting Web Sites

MARK YOUR CALENDAR FOR SUNDAY, APRIL 11, 1999

WHEN: Sunday, April 11 @ 2PM
WHERE: The Inn at Hudson Gardens
6115 S. Santa Fe Dr, Littleton
GUEST SPEAKER: Charles B. Thomas
TOPIC: "Trends in Water Gardening"
ADMISSION: Free entrance to the Inn and the Program
DOOR PRIZES: Compliments of Tetra

CWGS is starting the year with a special speaker from the Tetra Speakers Program, Charles B. Thomas. Charles is Chairman of Liliesons Water Gardens in Maryland: founder and past president of the International Water Garden and Waterlily Society; author of Water Gardens: How to Plan and Plant a Backyard Pond; and a honorary member of CWGS.

THIS MEETING AND PROGRAM SHOULD NOT BE MISSED!!

Call Carla Littlefield, Program Chair for additional information 303 399-7946

Officers and Committee Chairs for 1999
President
Bill Bitman 303 420-7595
Vice President
Cyndie Thomas 303 755-1885
Secretary
Nancy Jewett 303 671-7964
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Committees
Membership
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DBG May Plant & Book Sale
Ron Bice 303 427-6323
CWGS June Plant Sale
Cyndie Thomas 303 755-1885
Stan Skinger 303 237-0071
July Pond Tour & Picnic
Volunteer Needed
Volunteer Coordinator
Lynn Jewett 303 671-7964
Publicity
Nancy Styler 303 850-7150
Historian
Lois Mayerchak 303 798-1779
Newsletter Editor
Pam Maxwell 303 722-1923

1999 MEMBERSHIP RENEWAL
It is time to renew your CWGS membership now. Many Garden Centers give discounts to Garden Societies members. Remember to show your 1999 membership card when shopping at Garden Centers.
IMPORTANT NOTICES
HELP!

POND TOUR & PICNIC
The pond tour, scheduled for July 11th, will focus on the southeast area this year. We need a chairman for this event. We also need members who would like to have their pond included on the tour. Please contact Carla Littlefield, Program Chair @ 303 399-7946 to volunteer to help with this event.

EDUCATIONAL OPPORTUNITY
April is when the water plants at the Denver Botanic Gardens go back into the ponds. Beginning mid-April, CWGS members meet Sunday mornings to pot the waterlilies and other water plants. This is an excellent opportunity to learn about water plants, make friends with other water-gardeners, and to ask the members who are there everything you wanted to know about water gardening (but were afraid to ask before - sound familiar?). Interested? Call Lynn Jewett @ 303-671-7964 and ask about volunteering!

LOTUS ORDERS
The 1999 Lotus Sale was a great success. Members who preordered their lotus will be able to pick them up at the April 11th meeting, beginning at 12 noon. There will be a very limited number of extra lotus available for purchase, at the pick-up table. Varied sizes of pots will also be available for purchase, for planting your lotus. Sizes and prices will be posted. For those individuals who purchased our new “Chinese Miniature” Lotus, please read the information sheet that will be attached on “How to Grow Miniature Lotus”, as there are a few differences from regular lotus culture. We will be contacting you this fall to determine your level of success.

EDUCATIONAL BROCHURES
CWGS has a set of nine educational brochures, with information provided by CWGS members John Mirgon, Mary Mirgon, Cyndie Thomas, Nancy Styler and Stan Skinger. The titles of the brochures are: “Pond Care, Spring, Summer, Fall and Winter”; “Lotus”; “Tropical Lilies”; “Pond Design & Construction”; “Preserving Water Lilies”; “Green Water, The Ecology of the Pond”; “Hardy Lilies”; “Water Plants”, and “Container Water Gardens”. These brochures will be available to members at all regular meetings, at no cost. If you are unable to attend meetings, these brochures can be ordered for a cost of $1.50 to cover handling and mailing, from Cyndie Thomas, 1023 S. Kittredge Way, Aurora, CO 80017.

WE SAY THANK YOU
In our December issue of “The Water Garden” we recognized three of our outgoing Board members. Ron Bice is the fourth outgoing Board member in 1998, and he deserves our recognition. Ron has lived in the Denver Area for 25 years, coming here from St. Louis, MO. He has been a member of CWGS for at least six years, and held the office of Vice President from 1994-1998. He has served as the CWGS chairman of the water plant section of DBG’s Plant & Book Sale for 5 years. This is a big job that entails selecting and buying all of the water plants and supplies for the sale; contacting Water Garden Centers and ordering waterlilies, 20-25 varieties of marginal plants, and assorted floating plants, and arranging for volunteers to help label plants, set up for the sale, and assist customers during the sale. At home, Ron enjoys his own pond which displays various waterlilies, and some interesting bog plants, including some newer miniatures. Thanks Ron, for your service to CWGS. And thanks to Ron’s wife, Kathy, who has assisted Ron with the sale.
Natural Filtration

The following article was written by Karen Fiske and printed in "REFLECTIONS", a monthly publication of the Water Garden Society of Greater Kansas City, from a program given by Kelly Billing.

Kelly Billing, the nursery manager of Maryland Aquatic Nurseries (MAN) in Jarretsville, MD, gave the January program (Water Garden Society of Greater Kansas City). MAN is a large wholesale nursery supplying garden centers and landscapers. She is also a contributing editor of Pondkeeper magazine.

The first water garden products that MAN developed were container gardens using nature as the model. The first containers did not have moving water and they did not sell because people thought the water would get stagnant and stink. So, they added a pump and a spitter, but people wanted a filter too. (A spitter is a small edge-of-the-pond fountain). Through a series of experiments, they determined that a balanced environment needed both plants and fish. Containers with only fish developed pea soup algae. Containers with only plants had string algae. Containers with both plants and fish had a crystal clear water with neither type of algae. Especially with container gardens, fish do not need supplemental food. The fish will eat the string algae that develops. A lot of the food is fillet and it increases the amount of muck produced. Some people do not want to be bothered with the fish, but they may have water quality problems that are easily solved by adding a few fish.

Container gardens are gaining acceptance. They can be placed very near the house, on a deck, etc. They also make a good place to store excess plants from the pond.

When MAN started to sell fish, they had a good bio-filter system using traditional water hyacinths, but they had green water until the end of May or June. They experimented with plants that would work in the colder season beginning in February and March. Iris and giant papyrus are a good combination for both cold and hot season filtration. They both have a huge root mass with a lot of surface area for nutrient uptake.

Papyrus (tropical) is one of the very best fillers and will clear almost any pond, but is tropical, so some people do not want to take care of it during the winter. Even a small piece will grow to a large mass in 6-8 weeks in a biofilter, when it is in flowing water. (Mexican Papyrus is more upright than the Egyptian Papyrus.) August is the start of the second pea soup algae growth period, when the warm season filtering plants, such as water hyacinth may start to turn yellow, because there is not enough food for them to stay healthy.

Aquatic Mint and Celery (hardy) have minimal roots, but grow like wildfire. A small handful of mint in a 2'x4' filter will make a 9" mound by the end of the season. Celery and Iris (Pseudocorus, etc.) are both good cool season filtering plants. Water Hyacinth and Papyrus are warm season filtering plants. They do not plant these in pots because these plants form a large root mass that rapidly anchors them in place. Even if the plants just float when introduced into the filter, they will start to grow up and the roots will grow down into the lava rock. If you plant these filtering plants in a pot, use an undersized one to temporarily anchor the plant until it can grow its own root mass outside of the pot.

A biofilter that makes use of these plants should be relatively small. The ideal size is 1/10 of the surface area of the larger pond and the water needs to flow up through the roots, or out through the entire root mass. (This is called the 10% solution.) There should be a space in the bottom for particles to settle, a layer of lava rock, and plants on the top. Plant roots actually attract the sediment particles by a difference in electrical charges. The roots use the food and then releases the sediment, which falls to the bottom of the filter. This also reduces the amount of cleaning necessary in the larger pond. The small biofilter collects a lot of the muck and is a lot easier to clean. Although a biofilter can be constructed using a small piece of liner to channel the water flow, MAN had to produce a specific product that costs more money, before the concept was accepted in the industry.

Papyrus needs sunlight, so needs to be wintered in a sunny window. Umbrella Palm (also tropical) does as good a job as a filter and needs less light, so often lasts through the winter better.

Water Celery is one of the most efficient plants to use for filtration. However, it spreads rapidly, including outside the pond. It will also grow around and under the rocks in the pond construction and is almost impossible to remove completely. Water Mint is the same. If you use these plants, be sure to keep them under control.

If you do not have room to add on to the pond, heavily plant the area directly in front of the waterfall. One of the best plants for this is the 2-leaf water clover. It has very shiny leaves. The water droplets from the waterfall bead up on the leaves, and is very attractive. It will grow out into the flowing current from the waterfall. It is not as effective as a biofilter, but it will help. Also, it is not hardy in this zone (zone 5), so if it gets out of the pond it will die out over the winter. It is not very expensive to replace yearly.

You do not have to have an entire sophisticated filtration system in place at the time a pond is built. Filtration can be added as needed. Therefore, you can afford a larger liner to begin with. Use (Continued P. 4)
good fast growing, inexpensive plants in the beginning, that will provide surface cover and filtration. If there are not too many fish, and they are not over fed, this will probably be adequate for a year or two. Then a biofilter can be added, a pre-filter and ultimately maybe a UV filter. One of the formulas for deciding how may fish to stock in a pond is 1” of fish for every square foot of surface area. However, ten 1” fish produce significantly less waste than one 10” fish. For every additional inch of body length, a fish produces 10 times as much waste.

It is also possible to build, inside the pond filtration, bogs filled with pea gravel and heavily planted with filtering plants. The water has to flow through or up through the gravel and the roots at a good rate to provide the desired filtration. This technique has been used for wastewater filtration for factories and towns. Some places are beginning to allow experimentation, using ornamental plants for water treatment plants.

Kelly is concerned that people consider all aspects of this technique before using it. Some of the plants commonly used as filtering plants may have roots that will bind so thoroughly with the gravel, that it may be almost impossible to separate the plants and the gravel for cleaning in a few years. On a small scale, a gravel filter may work fine, if the plants are carefully selected. Do not use plants with a large, dense root mass, such as Acorus, in gravel, especially dwarf Acorus that will even grow into the walls of plastic pots. Other plants to avoid are the bulrush family, horsetails, irises, etc. Some plants that would be easily removed from a gravel substrate are pickerel rush, dwarf bamboo, pennywort, golden moneywort (creeping jenny), lemon bacopa, star grass, taro, eanwa (remove for winter), and other plants with shallow roots. The flow rate through the filter should be ½ the volume up to the full volume of the pond plus stream, per hour. If oxygen is being added into the backyard pond, the oxygen level is not going to vary much from one part of the system to another, unless there are pockets that do not circulate well. Therefore, it is not necessary to add oxygen immediately before the water flows into the biofilter.

Plants and water can be used together in almost any size of system. There is even a bird bath with re-circulating water. If small water plants are added, the water will remain clean all summer.

Kelly recommends that plant shelves be wide enough to hold larger pots of masses of small pots, rather than a single row of plants around the entire edge of the pond. Another suggestion for concealing the pond edge or extending the garden is to plant some irises both in and out of the pond to make a larger mass, tying the two environments together. Wider shelves also make it possible to plant varying heights of plants, to give a more natural transition between the plants, the water level and the surrounding terrestrial area.

Even the best-balanced ponds experience algae growth until the plants grow to a level to provide shade, reducing sunlight that encourages algae growth, and until nutrients in the water are absorbed by the growing plants. A little effort now can decrease water “greening” that may be unhealthy to pond life and unpleasant to the onlooker.

Using a pump or siphon, remove 25-20% of the pond water. Move potted plants from the pond to a shady area or, in sun, cover with wet newspaper. Try not to stir up dirt and debris any more than necessary so the pond bottom remains visible.

Using a fine mesh net, scoop along the bottom and edges to remove leaves, debris and dirt and have blown and fallen into the pond, creating a layer of muck. This process is called “mucking” (Continued P. 4).
the pond. Origins of this term are the Middle English-Norse word “mykí”, meaning dung, and the Indo-European word “meukí”, meaning slippery.

This blackened “soil” containing excess fish food, fish excrement, and decaying matter has a very unpleasant odor. Remove as much of this matter as possible, as this contributes to the growth of algae and deprives fish of needed oxygen. Add the muck to the compost pile (or vegetable & flower garden, Ed.). Leave the moss-like algae growth on the pond sides, as this has beneficial microorganisms that help balance the pond ecosystem.

Look closely at the fish for any unusual behavior, injuries, swollen abdomens, or white or red flecks on the fins or bodies. If any problems are apparent, consult your fish supplier for treatment options.

Inspect mechanical equipment such as filters, pumps, and tubing for damage or wear; clean and replace as needed. Assess the condition of the liner or preformed pond for possible deterioration from sun or punctures. Check the electric circuit and make sure the GFCI (Ground Fault Circuit Interrupter) is working properly. If all is well, resufilling the pond can commence. Water should be trickled from the garden hose; this will decrease any rapid temperature change that could affect the fish. A dechlorinator and chloramine remover should be used at the rate specified.

When the pond resufills, filtration and circulation can be started. If a waterfall or stream is included in the circulation, watch the pond water level for several days. If the water level drops, it is likely that ground freezing and thawing has created a problem that allows water leakage.

If there is a considerable amount of suspended dirt and algae in the water, adding a “Mirgon” filter can help speed up the water-clearing process. This simple, quick filter is named for its originator, a founder of the Colorado Water Garden Society, John Mirgon.

Using a bucket with a sturdy handle, place a submersible pump in the bottom and put a few rocks or pebbles around the pump base inlet. Place polyester fiberfill (pillow stuffing) around and on top of the pump and another rock or two to hold it in place.

Put the filter in the pond where it can be easily reached. Tubing from the pump outlet should be placed above the pond surface to increase aeration. Clean and replace the fiberfill frequently. Remove when sufficient clarity is reached.

Check hardy marginal (bog) plants, trim away any remaining dead foliage, divide and repot as needed. Heavy garden soil should be used to pot all water plants. Potting soil, compost, vermiculite or perlite should not be used, as they float out and foul the water. Soil should be added to a level one inch below the pot rim, then topped with one-half to one inch clean gravel to discourage fish from digging in pots.

Hardy Nymphaea (waterlilies) that have grown out of their pots should be repotted. Turn the pot upside down to remove the plant and dirt. Remove dirt from the rhizome and roots by flushing with water. Using a sharp knife on a hard surface, cut off any brown and black roots and rotted (mushy) areas from the rhizome.

If water temperatures are in the 40-degree F range, fresh cuts on the rhizome can be rubbed with powdered charcoal to discourage rot. Separate side growth “eyes” from the primary rhizome for propagation. Hardy lilies grow horizontally and should be placed against one side of the pot at a 45-degree angle, with the growth tip (crown) above the soil so it has room to grow across the pot.

Fertilize plants using aquatic plant tablets and return them to their growing spots in the pond. Sink repotted plants into the water slowly to prevent release of soil into the water.

When water temperature reaches 50 degrees F, fish feeding can resume using an easily-digestible, wheat-germ based food. Regular and growth food can be introduced when water temperature reaches 65 degrees F. Another test to see if fish are ready to resume eating is to drop in a sinking pellet of food. If fish rush to consume it before it gets to the bottom, they are totally awake and can digest food. Fish wintered inside in an unheated quarter can be returned to the pond. Water temperature differences should be less than five degrees F to reduce any stress to fish.

NOTE: To obtain all of the information on seasonal pond care, and other water gardening information, be sure to collect all of the Educational Brochures available at meetings, or by mail order. See notice on page 2.
USEFUL TOOLS
Nancy Jewett

Have you seen those expensive lily pruners and fertilizer tools that allow you to work with your water plants, without getting into the water? Now you can make your own for a fraction of the price they cost off the shelf, or by mail order.

LILY PRUNER

You will need two pieces of PVC pipe, one ½ inch in diameter, and one 3/4 inch in diameter. The smaller pipe must fit snugly inside the larger pipe, and be about 6 inches longer than the larger diameter pipe. Cut a notch in the 3/4 inch pipe as shown in the diagram below. The notch goes right through the pipe. Sharpen the indicated edges of the notch. The technique is to place the small pipe inside the larger pipe, then trap the flower or leaf stalk in the notch, and simply push or tap the smaller pipe. As it slides through, it will trim the leaf or flower off, and usually hold it on the trimmer, so it is easy to take out of the pond.

FERTILIZER TOOL

You will need two pieces of PVC pipe, one ½ inch in diameter, and one 3/4 inch in diameter. The smaller pipe must fit snugly inside the larger pipe, and be about 6 inches longer. Glue an “end plug” into the smaller diameter pipe. Poke the large pipe end into garden soil, and add the fertilizer tab, then push the loaded end into the plant pot and push the fertilizer tab into the soil, by pushing down on the inside pipe. The soil in the pipe will fill the hole.

The idea and information for making these tools were found on the Internet. For further information, another type of fertilizer tool and pictures, check out “Garden Endeavors” @ http://www.perigee.net/~jrjohns/web20.html Thanks to John R Johns of North Carolina for this very informative Web Site!

INTERESTING WEB SITES
Nancy Jewett

We contacted the North Texas WGS members through their Web Site, and were able to visit some private water gardens in the Dallas area. The Garden Center and Magazine Sites are not meant to be endorsements, but are listed because they have interesting information and links.

WATER GARDEN SOCIETIES
Colorado Water Garden Society-
http://members.xoom.com/cwgs
International Water Garden & Waterlily Society-
www.iwg.org/index.htm
North Texas WGS- www.ntwgs.org/
Koi & Water Garden Club of North Texas-
/www.flash.net/~ins/KWGCNT/
Wabash Valley WGS-
web.indstate.edu/wvgs/home.html
WGS of Greater Kansas City-
www.kenet.com/~wgskc/index.html
WGS of Oklahoma-
members.xoom.com/WGSO/
Austin Pond Society- www.eesi.com/~sgray/austin.pond.society/upshome.html
Florida West Coast Koi & WG Club-
www.geocities.com/TheTropics/Shores/8015/index.html
Santa Fe Pond Society-
www.rt66.com/~dragonfly/Koi.html
WATER GARDEN INFORMATION SITES
Garden Pond Forum-
www.watergardening.com/forums.html
Internet Pond Society-
w3.oke.net/~rzutti/index.html
Aquatic Plant Exchange-
www.gardenweb.com/forums/expands/
Pond & Aquatic Plant Forum-
www.gardenweb.com/forums/ponds/
Pond Project Calculator-
www.dallas.net/~crush/uscalc/uscalc.html
Virtual Waterlily Collection-
www.eagle.cu/~wlgmh/virtwo.html
Water Gardening Magazine-
www.watergardening.com/
Pondkeeper Magazine-
www.pondkeeper.com/
Crystal Palace Perennials-
www.crystalpalaceperennials.com/
Maryland Aquatic Nurseries-
www.marylandaquatic.com/
Paradise Water Gardens-
www.paradisewatergardens.com/
Waterford Gardens-
www.waterford-gardens.com/

More to come next month. Send your favorite water garden Web Sites to the editor.