

Pond & Garden

July - August 2001 • Volume 3, Issue 2

Features

A Guide to the Germination & Cultivation of Victoria Waterlilies
from the Victoria Conservancy, courtesy of IWGSp. 31

Eye to Eye with Cruiser: Discovering Victoria's Secrets
by Matthew Johnsonp. 50

Make Your Own New Cultivar! by Kit and Ben Knottsp. 56

The Boss and The Code by Kit Knottsp. 64

The Naming of 'Andre Leu' by Kit Knottsp. 68

Selecting the Right Pump for Your Pond by David A. Decp. 72

Spiranthes cernua odorata 'Chadds Ford' by Barry Glickp. 78

My Pad or Yours? by Paula Bilesp. 82

Readers' Service

All-Iowa Pond Tourp. 11

Retail Source Listingsp. 87

Shopping Martp. 91

Advertiser Indexp. 95

Subscription Order Formp. 96



31



56



78



18



28

c o n t e n t s

July - August 2001 • Volume 3, Issue 2



Cover Photo: A Victoria Invitation
by Povy Kendal Atchison

Departments/Columns/Short

Editorialp. 4

Koivet.com – Dechlorinators

by Dr. Erik Johnsonp. 8

Native Landscaping – Marsh Marigold

by JoAnn Gillespiep. 10

Contributors in This Issuep. 12

You Know, Basil – No Hitchhikers

by Todo Todorskyp. 16

Garden Adventures – Summer Encounters

by Joe Summersp. 18

www.pondandgarden.com “Ask Helen”

Rocks in the pond?p. 20

The Enabled Gardener – Pond Tools

by Josh Specep. 22

www.pondandgarden.com “Ask Helen”

Chloraminep. 24

What is the Victoria Conservancy?

by Nancy & Trey Stylerp. 28

Wow!

This has to be our most special issue yet. The official Cultivation & Germination Guide to *Victoria* Waterlilies; the saga of blooming a *Victoria* in a basement tub under artificial lights, by an 18-year-old, no less; step-by-step directions of how to hybridize a water lily; the formal introduction of two water lilies: *N. mexicana* 'Cape Canaveral' and the Australian tropical, *N.* 'Andre Leu'; meeting two distinguished plantsmen and horticulturists — Piers Trehane and Andre Leu; discovering a hardy bog orchid that grows happily with wet feet; learning to classify water lilies by their leaves alone; and learning how to properly size a pump for a pond; along with special tool-tips for "enabled" water gardeners from our own Josh Spece. A special thanks to all of the contributors to this incredible issue, especially Nancy & Trey Styler, the Victoria Conservancy, and the IWGS. Enjoy! ♡



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Dechlor Solution

by Dr. Erik Johnson

The following formula does not protect against chloramines. Chloramines are increasingly prevalent. When you dechloriate, toxic levels of ammonia can be left behind if chloramines are in use. Ask your local water authority if there are chloramines in your municipal water.

Dechlorinating granules or crystals are sold by weight and look like almost-clear, white rock candy. A specific weight or quantity is dissolved in water to make a stock solution, which

can be kept on-hand in a clearly labeled, closed container.

If you put 130 grams of sodium thiosulfate in a liter jug, then add water quantity sufficient to make 1 liter, your stock solution will contain 130 grams/liter. Each teaspoonful (5 cc) will contain 650 mg active sodium thiosulfate. This is a 13% solution. Simply add 2 drops of the stock solution per 1 gallon of the body of water to be treated. One liter of your solution can treat 10,000 gallons. Overdosage is virtually impossible.

Another method with the same results is to put 500 grams in a gallon

jug, add water sufficient to make 1 gallon, and then you have the same 650 mg per tsp. (13% solution). Add 2 drops of the stock solution per gallon. One gallon can treat 37,850 gallons or more.

Doc lists two sources for sodium thiosulfate: Aquatic Eco Systems: 800-422-3939; and Ken's Fish Farm in Alapaha, GA: 912-532-6135.

Visit Doc Johnson's website, www.koivet.com, for comprehensive and practical information on all aspects of fish keeping.

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NATIVE LANDSCAPING

by JoAnn Gillespie

Caltha palustris, Marsh Marigold

Marsh marigold is one of the few emergent plants which flower early in the spring, gracing your aquatic landscape with a welcome, brilliant yellow in its waxy flowers that cover the low-mounding plant of heart-shaped leaves.

This plant loves swampy, wet ground, but it does best where it is shaded by taller growing aquatics. Without enough shade after it blooms, the plant dies back until the next spring. Like the water hawthorn, *Aponogeton*, marsh marigold essentially goes dor-



mant in summer.

While its early bloom draws many insects, which feed on the pollen and the nectar, the plant entices the spring waterscape to life. The roots, thriving in water-logged soil, create both food and habitat for segmented worms, snails, and the larvae of some aquatic insects. They also harbor beneficial fungi and bacteria that convert organic matter into nutrients. Emerging before other plants have established, the leaves provide safe cover and cooling shade to reawakening frogs, toads, and salamanders.

Although it is only one member of the buttercup family (*Ranunculus*), marsh marigold is my first choice to include in your garden. By including it in your plantings yet this season, you'll be assured of a delightful spring next year!☘

JoAnn Gillespie is a noted wetland expert from Wisconsin.

2001 ALL-IOWA POND TOUR

*Plan to attend every weekend
of the first ever all-state pond tour!*

Weekend #1:

July 7, 2001 - 3:00-8:00 P.M.

The Eastern Iowa Pond Society sponsors their first ever "Sunset Tour" of 13 ponds in the rural communities of Walker, Quasqueton, and Independence. Tickets will be available at all pond sites, and directional signs will be placed at all major highways leading into these towns. All proceeds go to area beautification projects and various scholarship programs. For more info, call Jackie Allsup 319-934-3665. Rain date, Sunday July 8th 11:00-4:00.

Weekend #2: July 14 and 15, 2001

The Central Iowa Water Garden Tour, along with the Story County Master Gardeners are sponsoring the 2nd weekend's tour of 15 ponds in the Ames area on the 14th and 15 ponds in the Des Moines area on the 15th. Tickets are available at nurseries in the area or by calling Jamie Beyer at 515-232-2439.

Weekend #3:

July 22, 2001 - 12:00 noon - 6:00 P.M.

The Cedar Valley Breast Cancer Task Force is hosting the final weekend's tour of 10 ponds in the Waterloo area. Proceeds will be used to help promote Breast Cancer Awareness programs in the Cedar Valley area and to help fund the breast cancer support group. For more info contact Barb Daniels at 319-232-3219.

Email Jackie Allsup at Rafothcrja@aol.com

IN THIS ISSUE OF POND & GARDEN...



Barry Glick

This is Barry's business card! His sense of humor is superceded by only his knowledge of plants. In this issue, Barry introduces us to a hardy, native bog orchid, *Spiranthes cernua odorata* 'Chadds Ford' on p. 78.

Joe Summers

Joe Summers, who writes "Garden Adventures", based on his job at Missouri Botanical Garden, rarely travels for speaking engagements without his beautiful wife, Tanya, and darling Lily by his side. Find Joe's column on p. 18.



Josh Spece

A most admirable young man, 20-year-old Josh has earned his associate degree in horticulture and helps his



mother run a water garden and hosta nursery. In the Country Garden & Gifts, at the family home in Iowa. Josh's regular column, The Enabled Garden is found on p. 22.

Matt Johnson

Matt Johnson of upstate New York is one of those rare young people with endless curiosity and determination to learn and discover.



Before he starts college in the fall, Matt shares his incredible experience of blooming a *Victoria* in a small tub, indoors, under artificial lights on p. 50.

YOU KNOW, BASIL... No Hitchhikers

by *Todo Todorsky*

With my truck atop a lift at the transmission shop, I wandered across the street to the pet store, a familiar place where I know them and they know me. I approached the shopkeeper, his assistant, and a customer huddled together over the counter. The assistant caught my eye and said, “Todo, you’re a goldfish expert; what do you think about this?” Not mentioning I know more about koi than goldfish, I joined the group.



“This lady is having trouble with worms in her aquarium. Do you know anything about them?” he asked, gently tugging a plastic bag on the counter closer to me. Expecting red blood worms (harmless midge fly larvae that show up in our filters) or some other innocuous wiggler, what I saw looked nothing like them. These were black-to-brown worms about an inch long. Actually, they looked more like small slugs without their slime or snails sans shells. Each appeared stuck to the plastic bag with a small round mouth part, their back ends twisting and moving back and forth. A half dozen more slid around in a 5-gallon bucket next to the counter. “Leeches!” I gasped.

The woman’s eyes widened, “How did they get in my aquarium?”

Thinking like a ponder, I asked, “Have you introduced anything new to your aquarium?”

Initially assuring me she had not, she then

recalled purchasing some live anacharis from the shop. The shopkeeper then added that the plants had come from someone who took them directly from the wild. Since neither the customer, the shop, nor the dealer had sterilized the plants, we decided the leeches had probably arrived with the plants.

We talked about sterilizing plants with bleach or potassium permanganate. The shopkeeper said perhaps the store should be doing that with the plants they get. (You may want to ask your plant source where their supply comes from and how the plants are treated before putting them up for sale.)

In the end, the customer went home, without her bucket of leeches, to fully clean her tank and watch her fish so no leeches grabbed them. We all gained a healthy respect for what we put in our aquariums or ponds. To me, it pointed out a fact that is often lost when dealing with otherwise familiar vendors: There is no substitute for quarantine and proper disinfecting practices. In the end, you don’t know where that plant has been or where it came from.

Treating new plants

My first line of defense is to never take plants from the wild. Given the choice, I like sharing plants with other ponders whose ponds I know are healthy. Again, these plants may

not be totally problem-free, but at least they are more likely to be free of disease and unwanted hitchhikers.

I've used two methods of cleaning plants before introducing them to my pond. Both methods start with the same procedure – thoroughly cleaning the plant under a stiff stream of water from the garden hose. I hose away all dirt, loose foliage, and detritus so that the only thing left in my hand is the living plant. I then treat the plant with either bleach or potassium permanganate.

The Bleach Method

Prepare two 5-gallon buckets of water, adding one cup of bleach to one and leaving the other with just clean water.

Dunk the cleaned plant vigorously in the bleach water for no more than 15 seconds and immediately wash it in the clean water for several minutes. I usually follow this with an additional hosing, too.

The Potassium Permanganate Method

Prepare a 5-gallon bucket of water with one tablespoon of potassium permanganate. Though precise dosages of PP are critical for fish treatments, plants are far more tolerant, and a higher concentration can be used. (Submerged aquatics,

however, tend to be highly sensitive to the PP. Monitor them during the process and remove immediately if they start to turn mushy.) Remember PP is a carcinogenic agent: always wear gloves and avoid breathing it.

Submerge the cleaned plant in the bucket for one to two hours. Following treatment, rinse it well with clean water.

While you can handle the plants normally from this point on, I still don't introduce them into my pond without resting them in a separate bog or other quarantine water for a week or so. You know, Basil, we have a "No Hitchhikers" rule in the pond.☺

Todo Todorsky is a high school Math and Physics teacher in Jacksonville, FL. A Naval retiree who has been into ponds and koi for 7 years, he is the past president and the current newsletter editor of the North Florida Koi Club. His other hobbies include fiction writing, woodworking, and motorcycling. Basil is a 12-year-old golden retriever, who was received as a retirement gift. Although he doesn't have the same spring in his step as in his younger days, Basil still owns all the toys in the house and is most happy retrieving three toys at a time or having his ears scratched. Todo can be reached at pondfish@bellsouth.net.

GARDEN ADVENTURES

Summer Encounters

by Joe Summers, Missouri Botanical Garden

The mid-summer heat shimmered in dancing waves across the inner city baseball field where 8-year-old Joe placed his right hand on his right knee and his glove-covered left hand on his left knee. He was ready for the line drive that never seems to come to Little Leaguers.

From the corner of his eye, little Joe spied something looming overhead. Suddenly the monstrous creature attacked Joe's baseball cap. Circling Joe's head, the insect shot past the child's ear with a loud, buzzing warning. Flailing his arms, Joe frantically tried to ward off the attack. When the double-winged bug came in for the final kill, Joe turned tail and ran for the dugout.

"Joe, what are you doing?" Coach yelled.

"Something is getting me!" Joe squealed.

At that, several of the parents chuckled, "It's just a dragonfly."

My first dragonfly encounter was unforgettable. Today I'm ecstatic to find dragonflies hovering in my backyard.

A dragonfly begins its life as an egg in a stream, pond, or any calm, fresh water area. When the egg hatches, the nymph lives in water for a period of time, sometimes as long as two years, depending on species. Strong swimmers, dragonfly nymphs eat anything that will fit into their mouths, including small fish.

The nymph grows in size by shedding its skin in stages, known as molts. After 10-15 molts, the nymph climbs out of the water on a plant stem or a rock. The skin or exoskeleton splits, and the

nymph crawls out, leaving the empty form behind. This usually happens during the morning to allow drying time of the newly unfolded, two pairs of wings. All four wings spread horizontally when the insect is at rest, as opposed to damsel flies which fold their wings vertically over their bodies. A dragonfly's wing-span varies from 1.5 inches to about 4.5 inches. While some adult dragonflies have transparent wings, others may have red wings or wings with spots on them. Abdomens vary in color from yellow,



blue, black, green, and white on adults. The length of an adult ranges from 2 to 3.5 inches.

Although the new dragonfly lives for only a short time, they are predators that control many insects, such as gnats and mosquitoes. Skillful, swift fliers and very alert in defense of their territory, they are difficult to capture.

To encourage dragonfly visitors, place garden stakes in and around the pond. Also, grow tall, stiff reeds inside your pond for the visitor's perching. Mating occurs during the summer, the eggs laid in your pond to begin the cycle all over again.

Eight-year-old Joe's visitor all those years ago was probably dining on the other insects which had come to dine on Joe. Joe says, thanks!☺

Joe Summers is a horticulturist at Missouri Botanic Gardens and the president of the St. Louis Water Garden Society.

FROM WWW.PONDANDGARDEN.COM ASK HELEN... *From Patrick and Rhea:*

Q: Since we both work, we don't have time to put in a pond ourselves. In talking to a couple builders, we are confused. One says not to put rocks in the pond, and the other man says that is the most natural and beautiful way to do it. Since this will cost money, especially if we go the rocks route, we want to do it right. What to do?

A: If you work and don't have time to build a pond, you probably want one that won't require a lot of time to maintain, too, yet you want one that looks natural. First of all, learn as much as you can about ponds and their care. Then you'll have an idea if a design is something you can maintain.

Remember, you are not recreating nature. Nature has natural ways of cleansing and replenishing her waters. Your backyard construction is actually an outdoor aquarium. It depends on you to clean it and to refresh its water. This is critical with fish, since they produce wastes. With my first aquarium, nobody told me to clean the gravel. After about a year, the aquarium smelled badlyand the fish died overnight. Wastes, accumulated within the gravel, had decomposed by anaerobic bacteria and produced a by-product — hydrogen sulfide, a smelly, deadly fish-toxic gas. One whiff, rooting around in the gravel as fish do, was the same as firing a sawed-off shotgun in their little faces.

The man who wants to build your pond with a rock-covered bottom will reassure you

that he has a “sludge-eating” bacteria to add regularly to your pond. Here's where your research will protect you. There are two kinds of bacteria that work in your pond – *aerobic* that require oxygen and *anaerobic* that do not require oxygen. Nitrifying bacteria that make the water chemically safe for your fish are aerobic. Sludge-eating bacteria are also aerobic. They cannot work deep down in gravel and sediment accumulations, but they will work in gravel-lined streams where oxygenated water continually flows.

Parasites and illness-causing bacteria also thrive in the accumulating sediment. While the pond “looks” natural, you could spend major money on sick fish, especially if you or your children have named them. In addition, the rock lining looks good for only a few months, after which, algae growth and bacterial decomposition coat the rocks with a black slime. At this point, the pond begins to smell. *A healthy pond does not smell badly*. Furthermore, vigorously growing aquatic plants quickly jump their pots, knitting their roots throughout the gravel. (Worse yet is to deliberately plant the aquatics directly in the gravel.) Thinning these tangled roots in the presence of fish can release toxic gasses, and sorting roots and rocks in your annual cleaning is a mess.

The bottom line is, yes, you can put rocks inside your pond, but you must be prepared to thoroughly clean it each year with a complete draining of the pond, storing plants and fish in temporary quarters, while you power-



hose the rocks to move the sediment for shop-vac removal. (Your regular submersible pump is not built to endure pumping sediment-filled water.) Of course, you can pay somebody to do it for you. This can cost several hundred dollars ...*if* you can find someone to do the job. Many landscapers and pond maintenance people are now refusing to clean such ponds.

If you like the natural appearance of rocks with your pond, why not include a stream in your design where the rocks can be safely used... or create pocket bogs around the pond's perimeter with cobbles that look natural and minimize maintenance? Naturalize your

pond with its edging treatment, its surrounding landscape, and the aquatic plants grown inside.

Especially if you decide to keep fish in your water garden, you'll find a rock-free pond much easier to tend. The most you may need to do, besides a weekly pruning of dying plant leaves and an occasional filter cleaning, is a five-percent water exchange to keep the water fresh. If you use a pond vacuum with that change, vacuuming only a portion of the pond bottom each time, your weekly pond maintenance may be only an hour a week. Best of all, you may find that you won't need an annual, full drainage to clean your pond.☺

If you have a question for Helen, visit www.pondandgarden.com's Ask Helen page. If you need an immediate answer, fax your question along with your fax and phone numbers to 317-769-3149.



THE ENABLED GARDENER

by Josh Spece

Essential tools

Water gardening is considered a low maintenance form of gardening...no weeding, no watering the plants, and with careful planning, no hauling anything in for the winter. Let's not kid ourselves, though. If we want a beautiful, healthy pond, there are a few chores. Ponders with physical limitations may find some maintenance tasks difficult, but with the right tools and a little practice, most are doable.

The one tool I would never be without is my net. A net has many uses other than catching fish. It's great for skimming the water's surface of tree leaves and other debris that blow into the pond. Keep it handy during feeding time to remove excess fish food that might foul the water. During the summer, a sturdy net is perfect for thinning out water hyacinths and other prolific, floating plants. Turn the net around, and the handle makes a good stick to push floating plants out of the way or to nudge that water lily pot into the right place.

When you buy a net, or any tool, get one that will work for you. If you have weak arms, make sure it is lightweight enough for you to handle. Also, make sure the netting's holes are not too big lest small items fall right through. Find a net that easily reaches halfway across your pond to allow access from any point around shore.

Removing dead leaves and faded flowers is

a constant task. Often a light tug is all that is needed, but some stems are too tough and have to be cut. Also, you may find it easier to cut rather than to pinch or break a stem. Regular pruning shears may work well, but I personally find them heavy and difficult to work. A small, sharp pair of scissors are much easier for me to use. Try a few different designs and sizes to see what works best for you.

A tool my grandmother discovered is a 3-pronged claw that is normally used to weed or hoe between garden plants. It works great to slide large pots into position in the center of the pond. If you pot your plants in nursery containers with handles or lips around the tops, it is easy to hook a tine and pull plants within easy reach for pruning and feeding.

Pond maintenance doesn't have to be difficult. These are just a few ways I've discovered to make it easier. I'm sure you have a few tricks of your own. If you have a technique to make pond care easier for someone with a disability, please share it with me so I can share it with my website and P&G readers!☺

Josh lives with his parents on a dairy farm near Independence, Iowa, where he and his mother run an aquatic and perennial plant nursery and gift shop In the Country Garden and Gifts. Visit Josh's website at www.inthecountrygardenandgifts.com or email him at jspece@sbtek.net.

FROM WWW.PONDANDGARDEN.COM ASK HELEN . . .

From the Great Plains Pond Society in Omaha, Nebraska:

Q: We've just been advised our city water will now have chloramine in it. What does this mean to our pondkeeping efforts?

A: To understand this situation, we need to start at the beginning. How are chloramines created in your water? *By adding ammonia to bond with the chlorine.* Chlorine itself rapidly flashes off by spraying water additions into the pond. Often when municipalities add ammonia to the water to create the longer-lived chloramines, much of the ammonia has not yet bonded when it exits your tap. You can perform an ammonia test on the tap water to see if this presents an initial problem.

While you can add a dechlorinator to the water, you still have a dual problem: the initial presence of ammonia which has not bonded to the chlorine and the bonded ammonia. In dechlorination, you may break that bond and take care of the chlorine, but you are still left with the residual ammonia...often at fish-toxic levels. Without treatment, the chloramine eventually breaks down with the chlorine flashing at the water's surface and the ammonia remaining in the water.

A brief explanation of ammonia is in the May/June 2001 issue of *P&G* from Doc Johnson's website, www.koivet.com. Critical to the chloramine issue is Doc's info:

"Ammonia is capable of ionization below pH 7.4, and, in that ionized state of ammonium, it is

less toxic. Above pH 8.0, most ammonia is NOT ionized, and so it becomes more toxic. Care should be taken not to increase the pH of a system if ammonia is present. The need to drop the pH and to provide oxygenation to tanks of fish to keep pH down is an overrated aberration in the literature. Water that is warm, high in pH, or deprived of oxygen will have an enhanced toxicity when ammonias are accumulating....Water changes and management of the pH near neutral will go a long way to prevent losses from ammonia. Ancillary, less useful modes of ammonia management include the use of various water conditioners that bind ammonia and the application of rechargeable zeolite to the system filter."

From Doc's info, we can see that pond owners (with fish) need to approach chloramine from several angles.

Every pond with fish that is supplied with chloraminated water should have a bio-filter properly sized to handle the ammonia loading.

Ammonia levels should be monitored with a water test kit following any water additions greater than 5% of the pond's volume.

Any water addition greater than 5% of the pond's volume should be treated for chlorine. (This is good also for removing other heavy metals.)

Pond owners should monitor the pond's pH. Accurate assessment of pond pH is determined by a series of tests on subsequent days at two times a day, once in the morning and once in the afternoon. This not only tells you the pH level of



the pond, but it also determines if the pond is properly buffered against pH swings. If the pond water shows signs of fluctuations of more than a few tenths of a point when measured at the same times each day, you need to buffer the water. Small changes are normal and are tolerated by your fish. However, if the swing goes from *below* the ionization point of 7.4 to *above* it, you need to be concerned with ammonia becoming fish-toxic. Careful use of vinegar can lower pH, but you must not lower it by more than a tenth of a point in a 24-hour period. Far better to actually buffer the water and prevent the swings into the danger zone. Use crushed oyster shell, crushed limestone, or products such as SeaChem® Neutral Regulator to buffer the water.

The use of neutralizing chemicals that turn toxic ammonia into a non-ionized form that is not toxic (while still testing positive for the presence of ammonia) may be dependent on the pH level, too, for any long-term solution to be effective. Neutralizing chemicals are not necessary if the water is buffered to remain at a neutral pH level below 7.4.

Basically, chloramine is not a serious concern in the presence of fish so long as you treat the water for chlorine and the water's pH remains consistently in the neutral range of 5.6 to 7.4. Pondkeepers should be aware of their pond's pH and the extent of the pH's swing from morning through the day, especially if aquatic plants are present. (The plants' day and night activities of photosynthesis and respiration directly impact pH levels.)

Beyond this info, pond owners with chloramines should be prepared to deal with ammonia emergencies. Obviously, water exchanges may not be the answer. Using zeolite as part of the filter media or in nylon stocking bags in the water is a solution here. Initially, zeolite may be an expensive option to follow as a daily remedy, although the mineral can be recharged with a pound of salt in a five-gallon bucket overnight several times.

The long-term answer lies in maintaining a safe pH level in the pond around the clock and buffering the pond water, if necessary. Using zeolite in the presence of non-toxic ammonia may be a good safety precaution.

For ponds supplied with chloraminated water:

Know your pond water's pH level around the clock. If it rises above 7.4 at any point during the day, buffer the pond.

In the presence of fish, keep a properly sized bio-filter in operation.

Test regularly for both pH and ammonia.

Emergency treatments involve either lowering the pH to below 7.4 (vinegar) or the use of zeolite to absorb the ammonia.

For new pond installations supplied with chloraminated water:

1. Make sure your water chemistry is under control before adding any fish. Start off with pH and ammonia test monitorings.

2. Make sure your bio-filter is *working* before adding any fish. Even with seeding (adding active bacteria to the pond or filter), it takes one to two weeks for the nitrogen cycle to begin processing ammonia, then another week or two before the bacteria kick in to process the ammonia stage's by-product of nitrite (deadly fish-toxic) into the relatively harmless nitrate. *A properly and fully functioning bio-filter will produce no measure of ammonia or nitrite in the water.* Fish should not be added until that is achieved. Testing will reveal at what stage the bio-filter is performing with first the presence of ammonia, then the presence of nitrite, and finally the presence of nitrate.

3. Don't add too many fish at a time.

If you have a question for Helen, visit

www.pondandgarden.com's Ask Helen page. If you need an immediate answer, fax your question along with your fax and phone numbers to 317-769-3149.

WHAT IS THE VICTORIA CONSERVANCY?

by Nancy and Trey Styler

“**T**he Victoria Conservancy is a group of *Victoria* growers and enthusiasts, operating as a committee of the International Waterlily and Water Gardening Society and dedicated to the conservation of the giant waterlilies of the genus *Victoria*. The Victoria Conservancy exists to develop, acquire, and propagate knowledge about *Victoria* and its horticulture, to preserve *Victoria* in all its variations, and to encourage the display of *Victoria* in order to interest and educate the public.”

This is the official description, or mission statement, of the Victoria Conservancy. Although we strive for both organization and scientific validity, we are actually more informal than the statement implies.

Victoria is not considered endangered, and, in fact, is quite common in its native waters. Outside of South America, however, it has been seldom grown, at least partly due to a lack of both available seeds and information. Why then, you might ask, did we feel *Victoria* needed a Conservancy?

It takes only a single encounter with *Victoria* to understand our dedication to this unique genus. The enormous, floating leaves with their upturned edges, along with large, aromatic, night-blooming flowers that change from white to red over 24 hours, explain why *Victoria* is known as the “Queen of the waterlilies”.

growing the *Victoria* lily came together in 1996 at a meeting of the International Waterlily and Water Gardening Society (I.W.G.S.) to discuss our experiences. We realized that we needed to cooperate in the exchange of information about current practices, development of new data and techniques, and banking and distribution of *Victoria* seed. Since few growers have the facilities to raise more than a small number of *Victoria* per season, comparison of plants and techniques is difficult. Only by sharing our methods and

results could we gather enough data to have scientific meaning.

This group became the Victoria Conservancy, an all-volunteer, non-profit organization operating under the wing of the IWGS. Although partially funded by the sale of *Victoria* seeds, the Conservancy is funded primarily by donations from members and supporting institutions, most notably Longwood Gardens of Pennsylvania, home of the *Victoria* ‘Longwood Hybrid’. Ultimately, the Conservancy depends on the support and advice



A number of people interested in Nancy & Trey Styler with Victoria. Photo by Povy Kendal Atchison

of an expanding network of people and organizations.

The primary functions of the Victoria Conservancy are the production, collection, testing, banking, and distribution of seeds of all types and strains of *Victoria*. The seeds that perform best in our tests are sent, without charge, to botanic and public gardens around the world and, also, are sold to individuals in order to subsidize our work. By the end of the year 2000, the Conservancy had distributed almost 10,000 seeds to Gardens, researchers, and other growers (over 8,000 of which were free).

Although we have received seeds of *Victoria amazonica* and *Victoria cruziana* collected from the wild in South America (with appropriate permits), which we use for research and breeding purposes, most of our seed is donated by a generous and dedicated group of selected growers. While storing and maintaining these accessions, we hope, also, to develop more vigorous lines through breeding programs of controlled crosses. To this end, we study methods of pollen storage to store pollen for shipment to distant breeders. Of course, we maintain a database of detailed records of all

seed lots, their parentage and source, germination rates, inventories, and distribution. We gather as much information as possible about growers' results with each seed lot. We use that data, along with our serial tests of fertility, to select the best lots of each seed type for distribution.

The Conservancy continues to perform and support research in techniques of seed banking, germination, and horticulture. Members of the Conservancy have studied *Victoria* in its native habitats and have collected tissue samples from *Victoria* in both the Amazon and the

Rio Parana basins. These, in addition to samples from the cultivated strains and hybrids of *Victoria*, are used for DNA analysis as part of a project to develop an evolutionary history of *Victoria* and other aquatic plants.

Educating people about *Victoria* is the part of our mission that we most enjoy. Part of this special mission is the new edition of the *Victoria* Conservancy's germination and growing guide for *Victoria* found in the following pages. Whether we are answering questions poolside about *Victoria* or showing slides to a group of third-graders in mid-winter, the astonishment of those seeing and learning about *Victoria* for the first time reminds us of how we, too, fell under *Victoria*'s spell and embarked on our own magical journey into its world.☺

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Nancy displays first- and second-night flowers. *Photo by Trey Styler*