Pond & Garden

March - April 2001 • Volume 2, Issue 6


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Features

Readers' Service

c o n t e n t s

March - April 2001 • Volume 2, Issue 6

Cover Photo: Koi pond of Steve Cannon, President of the North Texas Koi and Water Garden Club in Dallas, TX. *Photo by H Nash.*

Departments/Columns/Short

BP (before ponding)

I used to welcome the sunshine of Forsythia and daffodils as the sign spring was finally shooing away winter. AP (after ponding), it's the frogs and toads that bring spring smiles to my days…and nights. The chirping of spring peepers and the trills of chorus frogs and toads are the beacon that pulls me into the crisp glow of morning to greet the returning red-wing blackbirds, the cruising fish, and the green spikes erupting from barren pots in the water. It's time to tuck away the winter quilting and see if geraniums will still grow under my fingernails. Now, if I can convince Dave to dig me just one more hole….happy spring!

Helen

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Pond & Garden is published bi-monthly.

Post Office of Origination: Zionsville, Indiana 46077.

Postmaster: Send address changes to *Pond & Garden,* 1670 S 900 E, Zionsville, IN 46077.

Subscription Rates: US: one year (6 issues) $20.00; 2 years (12 issues) $35.00. Canada and U.K., payable in U.S. funds, base rates plus $7.00 per year.

Address all correspondence regarding subscriptions, distribution, and editorial matters to:
Pond & Garden, 1670 S 900 E, Zionsville, IN 46077;
phone: 317-769-3278; fax: 317-769-3149.
www.pondandgarden.com

SEASONAL PONDKEEPING

by Scott Bates

Finally, spring!

With only the memories of ice and snow, we can now prepare for the new season. Monitor the water temperatures, as it changes from day to night in the early spring. After the soil warms up, the temperature stabilizes. When the water temperature rises above 50 degrees you can resume feeding your fish. Begin by feeding leafy vegetables and high carb floating food. With small appetites, their digestive systems are still sluggish. Feed them as much as they will eat in 5-10 minutes once a day, and not even every day at first.

Now is the time to transplant aquatic plants that had filled their pots at the end of last season. Remove the hardy plants from the pond and set them aside while you tend to pond cleaning chores. Use a swimming pool skimmer net to remove any leaves and debris that settled into the pond over the winter. Folks with gravel or stone in the bottom of the pond may need to drain the pond and wash the gravel to remove the silt, if this wasn't done in the autumn. Built-up silt on the pond bottom, especially silt trapped between and under rocks, is a haven for anaerobic bacteria that produce fish- and bacteria-toxic sulfides. Disease and parasites also hide out in this muck to attack your winter-weakened fish. With the pond bottom clean, do a partial water change. 15-25% is normally sufficient to dump some nutrients and replenish vital minerals that have been depleted over the winter.

You can now divide and repot the plants. Clean all plants of old foliage that will only add to the water's nutrient level. Fertilize all plants, whether repotted or not, and return them to the pond. They can be placed at their appropriate depths or set in shallow water to encourage quicker growth, sinking them as growth returns and the water warms. Be patient with lotuses as they require a lot of heat and light to get motivated. If I saw a lotus leaf up before the first of April in Michigan, I would either check my calendar or consider it a heat wave. Don't rush the return of tropical plants to the pond until the danger of frost is past and the water has warmed to seventy degrees.

Your last pond-opening chore is to fire up the pump and inoculate the biological filter with a good biological culture. A bacterial activator helps the bacteria to establish.

Be patient if you notice a touch of string algae followed by some green water. If the pond is not over-stocked with fish, the condition is temporary. Summer is just around the corner – time to drag out the lawn furniture!

Scott Bates and parents, Gary and Rosemary, own Grass Roots Nursery in New Boston, Michigan. Scott can be reached at 734-753-9200. Visit their website at www.grassrootsnursery.com.

Dividing Plants

CLUMP GROWERS – SCIRPUS

Growing in a dense clump, the *Scirpus* family is easily divided.

Aquatic plants are tough. Don't be afraid to use a strong hosing to wash away soil and reveal the roots you will divide.

Removed from its pot, wiry feeder roots wind around the outer soil.

With the soil hosed away, the roots are finger-combed to clearly reveal the clump.

Use a sharp knife to cut the clump into squares of roots and top-growth. The squares are planted in the centers of their new pots.

Dividing Plants

RUNNING GROWERS – CATTAILS AND PICKEREL

Cattails (*Typha* spp.) and Pickerel (*Pontederia* spp.) send up growth along shallow-soil running roots. So long as roots have developed to support the emergent growth, each growing point can be potted as a new plant.

Dividing Cattails

Because of their running habit, cattail rhizomes circle close to the soil's surface within their pot. After removing the plant from its pot and hosing away the soil, the plant is pulled apart.

Dividing Pickerel

Removed from its old pot and hosed free of soil, the pickerel root mass displays a dead mass of last year's root growth in the center, with fresh growth emerging from the live portion of the running rhizome.

Use a sharp knife to cut segments of emergent growth with their accompanying root support. Each can be potted in the center of its new container.

Potted in a squat mum-type, no-hole container, the soil is covered with gravel to prevent the soil from leaching into the pond's water.

Fish-Toxic Plants

Nurseries and garden centers are virtual candy stores in the spring. Starved for anything green and flowering, it's hard not to buy one of everything in sight. Landscaping around the fish pond, however, should consider fish-toxic plants. Plant the following somewhere else *away* from the pond. While the aquatic plants on the list are commonly grown in water gardens with fish, take the precautions of keeping the plants pruned and well-potted and monitoring fish for signs of stress that might warrant moving the plants to another pond.

Azalea and *Rhododendron*, leaves
Baneberry, berries (*Actaea*)
Bird of Paradise, seeds (*Strelitzia*)
Black Locust, bark, sprouts, & foliage (*Robinia*)
Boxwood, leaves and stems (*Buxus*)
Buttercup, sap (*Ranunculus*)
Calla lily, leaves
Caladium, leaves
Castor bean, leaves and beans (*Ricinus communis*)
Cherry tree, bark, twigs, leaves, pits (*Prunus*)
Daphne, berries
Datura, berries
Delphinium, all parts
Elephant's ear, leaves, stem (*Alocasia macrorrhiza*)
English ivy (*Hedera helix*)
Holly, berries, leaves (*Ilex*)
Foxglove, leaves, seeds (*Digitalis*)
Water Hemlock, all parts (*Cicuta maculata*)
Horse Chestnut, nuts, twigs (*Aesculus*)
Hydrangea, flower buds
Blue Flag Iris, bulbs (*Iris versicolor*)
Juniper, needles, stems, berries (*Juniperus virginiana*)
Lantana, immature berries
Lily of the Valley, all parts (*Convallaria*)
Lobelia, all parts
Mayapple, all parts except fruit (*Podophyllum peltatum*)
Mock orange, fruit (*Philadelphus*)
Monkshood, leaves, roots (*Aconitum*)
Morning glory, all parts (*Ipomoea*)
Mountain Laurel, all parts (*Kalmia*)
Narcissus, bulbs
Oak, acorns, foliage (*Quercus*)
Oleander, leaves, branches nectar (*Nerium oleander*)
Philodendron leaves, stem
Privet, all parts (*Ligustrum vulgare*)
Skunk cabbage, all parts (*Lysichium americanus*)
Snow-on-the-Mountain, all parts (*Euphorbia marginata*)
Sweet Pea, seeds and fruit (*Lathyrus odoratus*)
Virginia Creeper, sap (*Parthenocissus quinquefolia*)
Wisteria, all parts
Yew, needles and seeds (*Taxus*)

Source: See KOI USA's Practical Koi Keeping, Volumes 2 & 3. The Practical Koi Keeping books are compilations of articles published in KOI USA over its 25 years of publication. Call 888-660-2073 for subscription and book information.

Potting a Lotus

Lotus blooms are spectacular in the August pond. Until they bloom, elegant dinner-plate leaves provide texture and design interest. Lotuses are perennials, available bare-root only in the early spring. They bloom well in full sun within 70 to 90 degree temperatures. Bloom is inhibited by higher temps.

Lotuses grow from running rhizomes, often called "banana shaped", with growing nodes spaced along the runner. Handle with great care as they are brittle and easily broken (producing death of the plant). Divisions should include two growing points for success.

Another method is to place the lotus tuber on top of dry soil and then hold it in place with a flat rock, again kept free of the growing tips.

Give this vigorous grower as large a pot as you can handle. One method moistens the shallow layer of soil first, gently lays the tuber on the surface, and carefully scoops a shallow layer of mud over the tuber, keeping the growing tips free of soil.

Fill the lotus tub with water so that 2 or 3 inches of water covers the rhizome and cover the pot with plastic. This creates a mini-greenhouse to supply necessary heat for speedier growth. Keep the pot in a sunny location outside the pond until growth has established.

Within three weeks, the lotus displays ample growth and is ready for moving into the pond. So long as you monitor the water level within the lotus tub, it can also be kept outside the pond as a mini-lotus pond.

Dividing Plants

SWEET FLAG, ACORUS SPP.

Both the green and the variegated forms of sweet flag display a surface-to-very-shallow soil running habit with new growth emerging oppositely along the rhizome. The dwarf form, *Acorus gramineus*, grows similarly but in a tighter, fanlike habit.

A standard one-gallon nursery pot proves inadequate for a season's growth of sweet flag. The plant's running surface habit allows it to easily jump from the pot. If set closely to another potted plant, the wandering sweet flag will move in to complicate your maintenance and possibly overpower the neighboring plant.

Each side shoot along the rhizome can be severed with a sharp knife as a plant division. Be sure the severed shoots have supporting root growth. Exposing the rhizome to water for several days encourages roots to develop, if necessary, before you divide the plant.

Use a wide-mouth, shallow container for the sweet flag division. Set the division close to the pot wall to allow maximum growing room across the pot. Anchor the roots within tamped soil, allowing the rhizome to sit at the soil's surface. Cover the soil with gravel and place the new plant in the pond with an inch or two of water over its crown.

Ask the Plant Man

by Steve Stroupe

Cannas, water lettuce, and fertilizing

Q: Should I fertilize my plant divisions at the time I repot, or should I wait a few weeks before feeding them?

A: No big deal either way. It's more convenient to fertilize when potting, and you can distribute the fertilizer more evenly than when fertilizing after a few weeks. The downside is that a lot of fertilizer will be released and not be utilized by the plant until feeder roots have regrown. Ideally, you could fertilize when potting with a sustained release tablet or granules such as Aquatic Tabs ™ ; after the plant is actively growing, you could hit it with fast release tablets such as Highland Rim ® or Pondtabbs ®. When we grow specimen show plants, we employ a fertilizer combination similar to what I've just described.

Q: I've had trouble growing water lettuce. It always turns yellow and dies. What can I do?

A: Water lettuce can be temperamental. Some folk report success by placing the lettuce in some shade. I've found that lettuce displays some nutrient sensitivity with chemical fertilizers; it prefers a sustained release fertilizer with micronutrients rather than a straight NPK formula. Use a test kit to determine pH and hardness. Also, try potting a few and see if this helps.

Q: What's the difference between 'water canna' and the cannas sold in nurseries for my terrestrial beds?

A: It depends on what you mean by water canna. In our industry, the ambiguous term is applied loosely to any member of the genus *Canna* which can be persuaded to grow in aquatic environs. Some cannas are true aquatics, such as our only native, *Canna flaccida,* and the Longwood Cannas hybridized using *Canna glauca*.

Terrestrial or garden cannas sold by Dutch bulb companies, but usually grown in Oklahoma, can be successfully grown as aquatics using the following process:

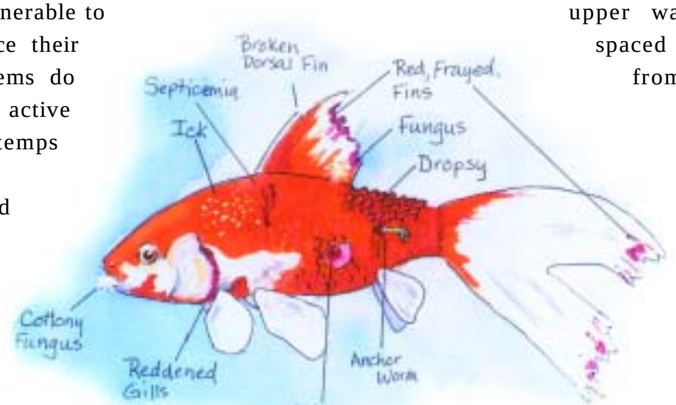
Plant the dormant rhizome in standard potting media, keeping it in a warm, sunny location. Late spring is the best time of year to do this. When 6 or 8 leaves appear, gently shake the potting soil off the roots and transplant to an aquatic pot. The water temperature of the pond needs to be at least 70 degrees or higher, or the canna will not grow and may even rot. Cannas grown in this manner should be treated as annuals as they seldom over-winter successfully.

Steve Stroupe is co-author of Aquatic Plants & Their Cultivation (Water Plants for Ponds, in soft-cover) and now handles outside sales for Maryland Aquatic Nurseries and represents the Americo company, manufacturers of filter media.

SPRING FISH HEALTH PROBLEMS

With several parasites and bacteria active in water between 45 and 55 degrees, awakening fish in spring are vulnerable to problems since their immune systems do not become active again until temps rise over 50.

In cold water, fish huddle together on the bottom. If the pond bottom is covered with a parasite- and disease-harboring layer of silt or organic debris, the fish are sleeping with the enemy. This is especially true with rock-bottomed ponds that were not thoroughly cleaned in the fall. Parasites and disease quickly spread under these conditions.



Stress increases your fish's vulnerability. Do not handle or disturb your fish in temperatures below 50 degrees. Avoid intestinal irritation by not resuming feeding until the water temperature has read above 45 degrees for a full week before introducing leafy vegetables and soaked grain-based feed. Do not feed protein foods until the water has stabilized above fifty degrees.

Since early treatment can save the fish, watch your fish closely for signs of problems: flashing, shaking or quivering of fins, hanging at the surface, floating with head or tail down, awkward swimming, clamped fins, gathering at water inlets, accelerated breathing, a fish remaining by itself, fish resting in upper water levels and spaced equidistance from one another, white or bluish coating on skin, reddish or yellow color to normally white skin, patches of white fur-like growth on skin, opaque white lumps, and slightly protruding eyes or distended abdomen.

BACTERIAL PROBLEMS

Aeromonas bacteria cause hole-in-the-side disease. Ever-present in the pond, the bacteria live in the fish's intestines and multiply during the fish's winter dormancy. Intestinal irritations allow the bacteria to spread through the fish and damage vital organs. Usually fatal dropsey or pine cone disease may occur as the fish becomes boated, displaying protruding eyeballs and raised scales.

Bacterial gill disease is like viral pneumonia in humans. Often death is the only "symptom." Ammonia presence and over-crowding encourage the disease. A clean pond can prevent this—no suspended solids in the water, no muck on the pond bottom. The most common indication of the disease is the equidistant stationary spacing of a group of fish in the upper water levels with rapid breathing, frayed gills, and excessive mucous production by some. You may need to disinfect the pond with Chloramine-T followed by antiobiotics added directly to the water (25 grams of active ingredient per 1000 gallons). In the past two years, LymnoZyme™, a blend of naturally occurring beneficial bacteria, enzymes and micro-nutrients has proven effective in reducing gram negative and gram positive bacteria to non-threatening levels. Some fish keepers routinely start the season with medicated food such as Terramycin, Furazolidone or Parazan as a precaution.

PARASITES

Parasites often cause problems in early spring. *Costia* is a free-swimming protozoa which feeds on the skin and gill cells, thriving in water between 45 and 55 degrees. *Chilodonella* is another protozoa that multiplies during the winter. Not free-swimming, it spreads by contact and generally is most prevalent in March. Another protozoa, *Trichodina*, is weakly free swimming, attacking the gills and skin. Although not usually fatal, its irritation can result in bruising that incur secondary infections, often fatal. All of these protozoans cause death by destroying or suffocating the gill cells and through secondary bacterial and *saprolegnia* (fungus) infections.

Barely visible gill flukes or *dactylogyrus* can cause extensive damage to gills, promoting bacterial gill disease. Larvae hatching from eggs in winter and spring are free swimming until they find a host. Infected fish display rapid breathing, listlessness, clamped fins, often gathering near waterfalls where oxygen levels are higher.

ABRASIONS AND INJURIES

Usually, a fish with an open wound or abrasion is removed from the pond for a topical treatment. Sedation of up to ten drops of oil of clove in a gallon of water, the fish then being "walked" back to full alert may be required. A sedated fish is not rendered unconscious but merely lists to its side. Tincture of Iodine cauterizes and sterilizes an ulcer, the seven percent solution recommended to cauterize sores and ulcers. Because iodine is caustic, make only one swab at the wound. Panolog®, available from your vet, is a topical antibiotic like Neosporin that is swabbed onto wounds 1-2 times daily. MelaFix, a proprietary mix of tea tree oil, seems to speed healing of wounds and abrasions within the pond itself.

MEDICATING SICK FISH

Whether you treat within small tanks or within the pond itself, accurate measurement of the water's volume is critical. Overdoses can be fatal and underdoses ineffective.

Gallons in a pond for square or rectangular ponds: L x W x D x 7.48 = gallons

For circular ponds: R x R x 3.14 x 7.48 = gallons

For free form designs, divide the pond into several calculable sections and add them together.

The most accurate measurement is rendered by using a water meter when the pond is filled.

Many dosages are given in parts per million (ppm). This equals one unit of weight in one million units of solution by weight (1 lb per 999,999 lbs of water = 1 ppm)

One part per million (1ppm) = 3.8 mg/gal
=0.0038 gm/cubic foot
=1 oz/1000 cubic feet of water

TREATMENTS

Salt – A .3% salt solution can be used to treat *Trichodina* (Japanese Trich requires 0.6%),

Costia, *Chilodinella*, and Ich. (Ich requires three days' treatment at 78 degrees.) The salt solution also inhibits the uptake of nitrites by fish and reduces water influx into stressed fish. Always use non-iodized salt and add the salt one-third at a time for three consecutive days. Adding one teaspoon per gallon in each treatment equals a total dose of three teaspoons per gallon. One pound per one hundred gallons over three days equals a total dose of three pounds per hundred gallons. Dissolve the day's dose of salt in a bucket of pond water and pour it evenly around the pond or into an area where the fish are not swimming. (Dumping the salt dose to dissolve on the pond bottom can burn the fishes' tummies.) Protozoan infections require 2 to 3 weeks of treatment.

Allowing your fish to live in dirty water or with accumulations of organic debris on the pond bottom or in the filter can result in parasitic attacks or disease. It will take more than a year for this fish to regrow its tail, if it lives through treatment for tail rot.

Methylene Blue – Used to treat fungus and external protozoa in doses of 1.5 to 2.5 ppm daily for one week. If a 10% solution (13.5 oz of crystal in 1 gallon of water) is prepared, dose with one drop per gallon or 2.5 fluid ounces per 1000 gallons. The blue color indicates the chemical's activity. Chemical kills filter bacteria.

Malachite green – Used to treat external protozoa and parasites, bacteria, and fungus in a dosage of 0.15 ppm 3 times, 3 days apart; 66 ppm for 10 to 30 second dip; 100,000 ppm applied topically bi-weekly for 2 weeks for fungus. 1 ppm can be fish-toxic.

Victoria Update

by Kit Knotts

Lean & Mean

Bringing Victorias through the seedling stage is something many of us have struggled with for years. If they don't damp off at the hastate stage, we've lost them after the first floating leaves, usually to a malady we refer to as "melting." Otherwise healthy looking leaves just seem to disintegrate.

Since last year's seedling season, we have drastically changed our thinking about their cultivation. Problems with our adult plants last year made us really look at our soil/nutrient/water conditions which now carries over to seedlings. As non-scientists, looking too deeply into soil and water chemistry is frankly beyond us, but we've read everything we could understand.

In the past, we tried every combination of potting media and nutrients we could dream up, convinced that our just-better-than-beach-sand was inappropriate for Victoria seedlings since it lacks nutrients and, we assumed, is alkaline. It does lack nutrients but, washed once, is nearly neutral in pH. And out soil chemistry lessons have taught us that sand doesn't bind nutrients – we think it allows them to go straight to the plants, in our case probably at toxic levels.

We now join Nancy Styler who grows babies in pure clay (at the other end of the soil spectrum in that it binds nutrients) who has always kept them "lean and mean" – no fertilizer at all in the early going. We are now growing in sand dug from a hole on the dune on our ocean side, washed once with tap water and with no additives. We have had NO damping off in the hastate stage and are losing many fewer older seedlings than in the past.

Even here in Florida, there are several months that are just too cold for young Vic seedlings to be outside, even heated and covered, so we have aquaria in our sunny southern windows. In past years, we have lost seedlings with floating leaves to melting, especially in aquaria. We now think this was due to the fertilizer we added to various potting media since it isn't happening this year. And we don't have an algae problem.

We still feel that while the plants are in the aquarium, a product called Cycle, multiple types of beneficial bacteria, helps stabilize water quality when added regularly. Addition of a dechlorplus product protects against chlorine, chloramines, and heavy metals that may be present in tap water, and we do adjust the high pH of our water with a little vinegar.

The bottom line is, to borrow the term from Trey Styler, that Victoria seedlings seem to do best in a "bland" medium, whether sand, clay, or something else, with no additives. When we recently losst several seedlings to another sort of problem, we were really impressed with their strong root growth and the amount of endosperm remaining in the seed. It seems that nature has provided a food source far safer for the little plants than what might be provided by anxious foster parents.

Having now achieved an aquarium full of seedlings with healthy first floating leaves (a luxury we haven't had in the past), we are faced with another problem – how to assure that the next leaves are equally healthy. The first aquarium we set up in the window had an opaque lid with lights and we decided to try it, both to prevent evaporation and to supplement the natural light. The seedlings became unhappy.

Some second and third floating leaves were smaller than the first and many grew right up above the surface to blacken and die off. We really don't know what combination of factors caused this but suspect that humidity levels in the aquarium need to be balanced and that the opacity of the lid and supplemental light were somehow involved. What we are trying now with seemingly more success are hinged glass lids over about 75% of the tops.

Having just found a mini-hygrometer in a catalog and after having dropped it in the aquarium before we could read it the first time, it shows a humidity level of 75% in the partially lidded aquaria as compared with 50%in the house and 77% outside with a seabreeze. This is a whole new factor in the equation that may or may not be relevant.

Only when the seedlings are ready to be boosted to larger pots (pads more rounded than pointed and increasing in size) are we starting to feed them, also the practice of the Stylers. We are putting one Pondtabb Junior in the corner of our 4" second pots with another Junior at three to four weeks if the plant is growing well. If the seedling is struggling, we don't feed it.

Though we think we're on the right track for our conditions, much more investigation is needed. We are feeling our way toward the best regimen for adult plants as well as seedlings, thinking at the moment that less is more. We welcome ideas and input from everyone.

THE ENABLED GARDENER

by Josh Spece

Wow…talk about jumping right into something! I never imagined I'd end up with my own column after just one article!

Those of you who read my article in the last issue know that I was born with a form of Muscular Dystrophy and use a wheelchair to get around. My passion for plants started when I was very young by helping my mother in the vegetable garden. Soon I had my own raised veggie garden that gradually became mostly annual flowers. As my interests expanded, I began designing beds around our house and yard, discovered the wonderful world of hostas, and installed our first water garden. Now, ten years, close to 300 hosta varieties, and three ponds later, I've completed my AAS in Horticulture and my mom and I have opened a garden and gift shop specializing in, what else…hostas and water gardens!

Obviously, being in a wheelchair poses certain obstacles when it comes to gardening. Millions of people, both young and old, have physical limitations due to aging, injuries, or as in my case, diseases, but there is no reason why they can't enjoy gardening in one form or another. Whether it's a single African violet on the windowsill or an elaborate raised pond in the back yard, with a little creativity, the possibilities are endless.

When I first took an interest in gardening, a lot of trial and error went into figuring out ways for me to do things that most gardeners take for granted – things as simple as digging a small hole or watering a new planting. As common as both disabilities and gardening are, you would think there would be more information available on handicap-accessible gardening. Even today, aside from a few sites on the Internet, resources on accessible gardening are few and far between and on water gardening in particular are almost non-existent.

I am by no means an expert when it comes to water gardening and making it more accessible, but I do have a few tricks to share, and if you have an idea to share or a topic you would like me to cover, let me know. Hopefully, this column will help everyone, regardless of physical ability, enjoy the relaxing world of water gardening to the fullest extent possible.

Internet Websites of Interest to the Physically Challenged:

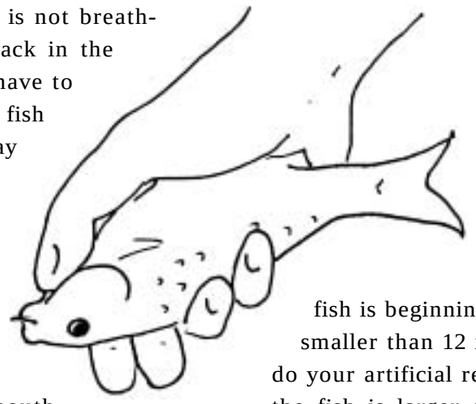
www.newhomemaker.com/family/elders/gardening.html
www.nwf.org/nwf/natlwild/1997/yardjj7.html
www.mdausa.org/publications/quest/q31garden.html
www.gardening.about.com/homegarden/gardening/cs/msub119/
www.gardenguides.com/articles/tools.html
www.aota.org/featured/area6/links/link02c.asp
www.ag.ohio-state.edu/~ohioline/hyg-fact/1000/1642.html
www.gardenforever.com/pages/artenabled.html
www.hort.vt.edu/human/pub426020d.html
www.bergen.com/home/horticult199909020.html
All of these sites can be found at Josh's web site at www.inthecountrygardenandgifts.com/jspece/gardening/accessible.html

Josh Spece lives with his family on a dairy farm near Independence, Iowa.
He can be reached by E-mail at jspece@sbtek.net.
His website is www.inthecountrygardenandgifts.com.

Artificial Respiration for Fish

During spring spawning, it's not unusual for one of your fish to end up pondside. Even if the fish doesn't seem to be alive, so long as it's not dried out, you can try to revive it. Should the fish still be moist, do not wash off the slime coat; it protects the fish and is produced in greater quantity during times of stress. (Belly-up-out-of-water = instant stress in fish.)

Especially if the fish is not breathing, do not "toss" it back in the pond. You're going to have to play EMT. Yes, get the fish into water asap, but stay with the finned one. Due to shock, even a breathing fish may experience a disruption of its equilibrium. Proper swimming, upright with water flowing into the mouth and out the gills is essential.



Gently loosen your hand around the fish to see if it can swim properly. If it has trouble, cup your hands loosely around its body and guide it forward through the water. This forces water into the mouth and out the gills. Within a few minutes, the fish should recover and can be released.

So long as the pet hasn't turned into fish-jerky, even if it is not breathing, you might still be able to save the fish. Time to dig out the Red Cross Life-Saving Badge and administer CPR! Return the fish to water immediately and turn it upside down in the palm of your hand with your fingers folded around it. You will see a small spot on the lower part of its head where the gills come together. Place your thumb on that spot and press gently and slightly forward to force the fish's mouth open, accepting water, and forcing it, in turn, out the gills. Relax the thumb and then press again. The fish will release a few bubbles from its mouth if you are doing it correctly. Continue with a rhythmic pace until the fish begins breathing on its own. Continue your gentle administration, timing your assistance to the rate of breathing the fish is beginning to display. If the fish is smaller than 12 inches, you can probably do your artificial respiration one-handed. If the fish is larger and requires two hands, you'll still adminster the respiration with one thumb. Be careful not to bruise or injure the patient! If the fish can be saved, it won't take more than a few minutes before it starts breathing on its own.

Don't release the fish yet. Lightly hold the fish upright in the water and guide its swimming until it has recovered its equilibrium and equanimity. Because it is more difficult for the fish to breathe in deeper water, you want to be sure it is strong enough to take off into the pond.

Pond Splash

by Steve Katona

Thinking spring…

Now that the winter blahs are almost over, it's time to start up your water garden. Many people have successfully run their pumps through the winter with careful monitoring of ice buildup. I used to argue this but have learned of the success of continual operation. The pond re-establishes a working, warm-season ecosystem as soon as temperatures allow if the pump was never shut off. I have noticed dormant biological bacteria becoming active early on in the spring, leading to an earlier balanced pond. If your pump was shut down in the winter, start re-circulating the water through your filter by fifty-degree water temperature. Add a beneficial bacteria culture to "beef up" the biological activity in the pond. Since this bacteria break down the pond's poisons or wastes and turn them into plant food, you need lots of plants to use this food and keep it from nourishing algae.

When planting or replanting a water garden, consider arrangements just like you do with cut flowers or in a landscape. Work with height differences, textures, and colors. The pond is your canvas and you hold the palette. During the season, potted plants can be moved around to paint a picture. They need only maintain the same proper planting depth. There is a perfect book available today to help you learn about and choose your water plants: Aquatic Plants and Their Cultivation (Water Plants for Ponds in paperback), written by our own Helen Nash with Steve Stroupe.

Don't forget about the area surrounding your water garden. Landscaping tucks the pond into a natural setting. One area I always focus on is the pond's perimeter. Sometimes it takes a couple years, but ground covering plants between and over the perimeter rocks soften the edge and break up the pearl necklace effect. Mosses, lichens, and perennial ground plants are excellent gap-fillers. These plants lead to taller and taller plants surrounding the pond, but site the tallest plants on the far side to keep from obstructing your view of the pond. Again, work with height, texture, and color. Picture a dark leaf canna in the pond set off by a backdrop of cattails and green leaf canna in the surrounding landscape, the structure of the canna leaves tying together the design. Don't forget terrestrial, ornamental grasses blend beautifully with aquatic plants, also stitching together your design. Likewise, extending rocks outward in outcrops or a large boulder away from the pond breaks up the linear line of the pond's edge and anchors the pond within its setting.

Detailing your pond brings it to life and reflects your personal interests. Add a frog fountain, or how about an art piece? A bronze sculpture adds a classy perch for a songbird to sing along with your new wind chimes. Relax on your new garden bench and enjoy the peace and serenity of your creation.

Steve Katona is an owner of North Hills Water Gardens at 1615 Babcock Blvd. in Pittsburgh, Pennsylvania. He can be reached at 412-821-6525.

Algae Remedies
DEALING WITH THE PONDKEEPER'S BANE

Algae is a green plant, albeit microscopic, that needs sunlight and nutrients to survive. Controlling this pondkeeper's bane requires deprivation of either light or food, or both.

Be Patient…

Even if your pond is not overstocked with fish, spring often brings a touch of string algae followed by green water…*until the pond's plants have fully reawakened*. Patience is the key; wait it out as the pond balances on its own. Of course, performing a partial water exchange may temporarily alleviate the algae bloom, but until the pond plants are awake and out-competing the algae for the pond's nutrients, the algae bloom will return.

A Clean Pond

If fish wastes and particulate organic matter, commonly known as silt or muck, accumulate on the pond bottom or in gravel pockets within the pond, you may as well incorporate your own algae business. These organic wastes, through their decomposition and role in the Nitrogen Cycle, supply a continual source of nutrients to the water…fostering continual algae blooms and slimy, string algae. Regularly vacuuming the pond bottom in conjunction with partial water exchanges prevents such build-ups and their resultant algae problems, as does the use of bottom-drain systems.

Eco-Balance

Although many sources cite a list of quantities of various types of aquatic plants to be stocked in the pond to achieve 'eco-balance,' even a full-sun pond can remain free of algae with only enough submerged grasses or floating hyacinths to out-compete for the nutrients. One bunch per square foot of water surface of submerged anacharis, *Elodea*, or coontail (free-floating-but-submerged *Ceratophyllum demersum*) will keep the pond water free of algae as long as the pond is not over-stocked with fish. Northern ponds should use *Elodea canadensis* which is more tolerant of cold water than the South American native, anacharis. *Elodea* often breaks dormancy and begins removing nutrients from the water at the same time as traditional algae blooms. It is possible with the proper amount of *Elodea* to not experience an algae bloom at all.

Water Wych®

Another way to remove excess nutrients from the pond water is the new Water Wyche ®. Its natural media absorbs the water's nutrients so long as the water's pH is in a neutral range below 8.0 pH. Remaining effective for 3 to 4 months, the Water Wyche ® naturally removes nutrients created by fish that nibble away your submerged aquatics.

Barley Straw

An effective prevention of algae growth is the use of barley straw. Generally most effective at prevention when used from November through spring, it seems to keep the algae at bay during the season with the assistance of aquatic plants. The straw should be removed from the pond before it starts to decompose and begins adding nutrients to the water. Many people include barley straw as a media layer in the bio-filter where it is out of sight.

Shading the Water

Many botanical gardens attack algae by depriving it of sunlight with water dyes. These dyes shade the water in either blue or black. Especially in the early spring, such shading inhibits the growth of aquatic plants. Move them closer to the water's surface until they are established and can survive at normal depths.

Shade can also be supplied with surface-covering plants such as water lily leaves and floating plants like water hyacinth. Remember, however, that the pond's primary source of oxygen is at the water's surface. Too much surface coverage can result in low oxygen levels, your fish advising you of the fact by gasping or gathering at the surface and at waterfall entries. You'll need to provide additional aeration and/or reduce the amount of fish in the pond, if you maintaining extensive surface coverage.

Yet another way to shade the pond surface is with a canopy of shadecloth or lattice. Koi pondkeepers often use this method that also protects the koi's colors and shields them from view of overflying predators. Northern water gardens find this method inhibits the growth of many flowering aquatics, while Southern water gardeners find the partial shade of lattices protects flowering aquatics from excessive heat and oppressive sunlight.

Mechanical Algae Removal

Twirling a stick or brush in the water is the best way to rid the pond of string algae. Shutting down the waterfall and using a scrub brush (with no soap or chemicals) satisfies fastidious pondkeepers.

Ultra-Violet light kills free-floating, green water algae as the cycling pond water flows past it. The algae cells are damaged by the light and die within the pond. Cleaning their debris from the pond bottom prevents it from feeding future algae blooms. UV lights also kill the free-swimming stage of many parasites, as well as any bacteria in the flowing water. To protect the beneficial bacteria in the pond, the UV light is set up *after* the bio-filter in the pond's plumbing scheme.

Chemical Controls?

Do not use chemicals to kill the algae since most algicides are based on one of two chemicals: copper sulfate or simazine. Copper sulfate also affects other aquatic plants in the pond, particularly submerged grasses, floating aquatics, and more sensitive water lilies. Simazine is not recommended in the presence of fish.

HOT-SELLING AQUATIC PLANTS TO BUY EARLY

Unless you have access to a dedicated water garden nursery, you may discover that by mid-June the plants you most want to buy for your pond are already "sold-out." In checking with Linda Siler, manager of O'Quinn's Orchids and Water Gardens in Springfield, Missouri, we came up with a list of the hottest selling plants – ones that should be purchased early in the season if you want them this year.

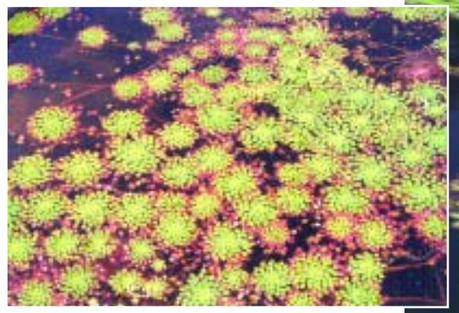
Two plants that sell out very quickly are the tropical mosaic plant and, surprisingly, water hyacinths. "Anything variegated!" Linda advised, along with water forget-me-not and black taro. Blue water lilies, especially the ones with variegated foliage are difficult to find by mid-season, as are dwarf hardies such as 'Little Sue' and 'Helvola.' Dwarf lotus, too, especially 'Momo Botan,' 'Chawan Basu,' and the diminutive 'Angel Wings,' are all but impossible to find. A new plant introduced by Suwanee Laboratories in Florida is sure to sell out immediately; it's a multi-colored taro, *Alocasia araceae*, featuring splashes of lavender, yellow, white, and pink in its leaves. Since many *Alocasia* are not aquatic, this plant could be a gem if Florida's cold winter doesn't limit the quantity available.

For many people, dwarf lotuses are the only ones manageable into and out of the pond. 'Momo Botan' has long been a favorite for its four-day blooms, double petals, long hours of daily openings, and charming dwarf seedpod used in dried flower arrangements. Although not blooming until August, you'll have trouble finding one in a nursery in June.

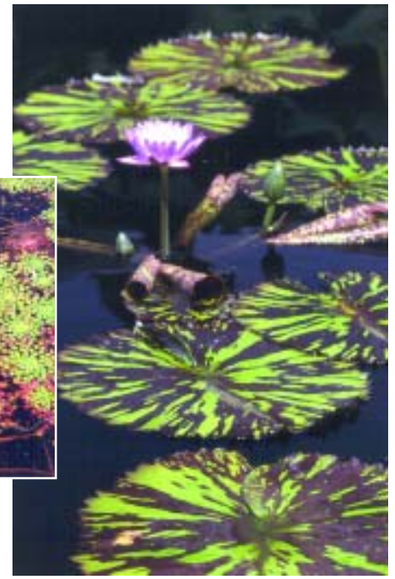
The *Colocasia* family offers several lush varieties in hot demand – *Colocasia antiquorum*, the Imperial Taro, with dark green foliage overlaid with velvety black between the veins and *Colocasia esculenta* 'Black Magic,' shown above. 'Fontanesia' is the violet-stemmed taro, and 'Rubra' the red-stemmed taro. All are tropical plants.

Now is the time to call nurseries and place your name on a waiting list for the special plants you want.

Commonly known as dwarf sweet flag or Japanese sweet flag, growing to 18 inches, *Acorus gramineus* offers a white variegated form and this striking 'Ogon' with yellow variegation. Reliably hardy to zone 6, it needs protection in zone 5 during hard winters.



Linda Siler says the mosaic plant was the hottest selling aquatic plant in 2000. Nurseries were virtually begging each other for starts. Potted and grown at water-lily depth, the brittle stems produce a colonizing mosaic of red and green across the water's surface. Difficult to winter over, most people simply replace the tropical plant each year.



Unlike hardy water lilies, day-blooming tropical lilies offer a full range of blue and purple blooms. Many varieties offer maroon-splashed leaves that add color when the flowers are not in bloom. Shown here is *N.* 'Leopardess.'

NATIVE AQUATIC PLANTS FOR WILDLIFE GARDENS

by JoAnn Gillespie

Nymphaea odorata, white water lily

The delicate balance of life in a wildlife garden depends largely upon the plants. The pH of the water and soil, the nutrients in the water and soil, and the climate determine which plants will survive and thrive in a given area. All these factors in turn determine which animals, birds, insects and amphibians will be attracted to the plant life. This balance is an ever-changing process. Observing these changes allows us to decide which plants we might choose for our wildlife garden. Also, we change our perspective when looking at a plant for wildlife. We look at the plant as one which will live in our garden year round.

We begin by choosing plants for the various zones in the water garden. Our first choice then should certainly be a water lily. The native water lily *Nymphaea odorata* is white in color. It lives in fairly deep water, usually two to three feet deep. The root of this plant strongly resembles a submarine. It must be firmly anchored in the bed of the water garden. This interesting plant attracts all forms of wildlife, as well as the gardener. He enjoys the plant for its sweet, pungent scent. Since the plant is a perennial and is winter-hardy, it is planted only one time.

Beginning with the large root, anchored firmly in the soil, to the large circular leaves and waxy flower, each part of the plant serves a function for wildlife. The white, scented flower of *Nymphaea odorata* is pollinated

by flies, beetles, and other small insects. Some feed upon the nectar.

Its leaves are useful to many creatures in the water garden. They provide shade on sunny days. Most leaves serve as a platform for frogs or dragon flies to rest upon as they go about their daily lives in a water garden. Fish can hide under them. Some small insects attach themselves to the leaves' undersides, while others use them as a surface on which to deposit eggs. Some insects chew on them for food.

As with most perennial, native aquatic plants, the plant dies back in autumn, storing its food reserves in the root for another season. The dead, decaying parts of the plant are acted upon by microscopic insect life. Thus each part of the plant is used by some species of wildlife.

Perhaps *Nymphaea odorata* will be your first choice of an aquatic plant for your wildlife garden. Its selection brings many wildlife guests to your aquatic landscape.

JoAnn Gillespie is a respected wetland and native plant consultant from Wisconsin.

FREQUENT WATER CHANGES

Newcomers to water gardening may think the only time water is added to the pond during the season is to compensate for water evaporation. Koi keepers know differently. If our water gardens include fish, whether goldfish or koi, we can learn some lessons from koi keepers. Goldfish, after all, produce wastes in the pond, and goldfish benefit from healthy water conditions.

When we talk about frequent water changes, we're not talking a full pond draining – just a five to twenty percent freshening. The water change is so small that conditioning chemicals may not be needed, especially if the addition involves less than 10% of the pond's water. Performing this exchange benefits the pond and its inhabitants in several ways.

Nutrients (nitrates) are diluted. Fish wastes and organic debris join in the Nitrogen Cycle with the end-product being nitrate… and nitrates feed algae. (*See Nitrogen chart on p.* 48.) Several solutions may resolve the problem: reducing the number of fish in the pond, increasing your filter's capacity, and using more plants in the pond to remove the excess nutrients. (*See Algae Remedies on p. 28.*) The conditions creating excess nutrients also create unhealthy conditions for your fish, as well as make the pond smell badly.

If the water exchange is performed as part of a bit-by-bit pond vacuuming routine, particulate matter is removed on a regular basis, keeping the pond clean and healthy for the fish, as well as sweet-smelling for you. Removing this sediment as it is deposited prevents stagnant and toxic, anaerobic conditions from developing on the pond bottom. If you've built your pond with a bottom drain, much of your pond cleaning is performed automatically.

Depending on how much fish mass is in the pond, how much and what you feed them, and what sort of pump/filtration system you have operating, you may wish to exchange a small percentage of the water once every 7 to 14 days. Particularly if your filter foam requires frequent cleaning, the more frequent exchange removes particulates the fish are stirring into the water. (A lighter fish load and/or a larger filter might be necessary if the cleaning and water exchanges do not decrease the filter's work.)

In the heat of the summer, playing with the pond is cooling and refreshing…and it just might save you a lot of work in the fall when the water turns cold!

Construction Idea
MAKING A TREE WELL

Whether by design as a woodland stream or as a compromise to install a pond without harming existing trees, a tree well construction allows both trees and water features in the landscape.

Photos by Carolyn Wiese, courtesy of Suburban Water Gardens. See their article on construction of a woodland stream on page 62.

Trucked-in topsoil allows terrain variation for the winding woodland stream. Spread and rake the soil as desired.

Build a retaining wall to keep the soil away from the tree's trunk. Use wood treated to prevent rotting.

Excavate a well back down to the original soil level around the tree. The well should be wide enough to keep the mature tree trunk free of soil contact.

Backfill soil against the boxed tree well and landscape to hide the well.

GARDEN ADVENTURES

by Joe Summers

Bringing Your Tropical Water Lilies Out of Storage

If you followed the steps for wintering your tropical water lilies that I gave you in *P&G*'s September/October 2000 issue, then you are now ready to bring your lilies out of storage.

Start your water lilies 6-8 weeks prior to the date when you plan to move them into the pond. Of course, the actual date to begin sprouting your lilies varies by where you live. You won't set tropical lilies into the pond until you are certain the water's temperature will not fall below 72 degrees. At Missouri Botanical Garden in St. Louis, this usually occurs the first week in June.

Step One

Use a 10% bleach solution to disinfect your sprouting tank, which can be a 10-gallon aquarium. If you have lots of tubers, you'll probably need more than one aquarium or an even larger sprouting tank. Rinse the tank with plenty of water after cleaning. Place the tank in a greenhouse or very bright window, and fill it with water to within a few inches of the top. Place an aquarium heater into the water, setting the thermostat no lower than 72 degrees. I prefer eighty degrees. Allow your tank to sit overnight to raise the temperature to the proper level. This also allows chlorine in the water to dissipate. (Plan to include grow-lights over the tank, if you don't have a greenhouse.)

Step Two

Select tubers of the varieties you wish to display in your pond this summer. They should be very firm. Discard any soft or rotting tubers. Gather old flower pots or other plastic containers that are 5 times as large as the tubers. For example, if the tuber is one-inch across, you need a five-inch container. Plan for one container per tuber. I like containers without holes to keep my work area and the sprouting tank cleaner. Disinfect the containers, again using the 10% bleach solution.

Step Three

To plant your tubers, start by placing several inches of sand in the bottom of each container. Place each tuber on the sand, growing-side up. The smooth side of the tuber is the bottom, while the pointed or rough end is the top. Continue filling the container with sand around and over the tuber. Ideally, the top of the tuber will be about one inch below the surface of the sand. Plant only one tuber per container and write a label for each. I have found a pencil lasts the longest under water.

Step Four

Place the planted containers into the sprouting tank holding at least 72-degree water.

Three weeks is about the longest for a viable tuber to begin to grow. Usually, the new plant spouts within ten days.

Step Five

When there are two to three floating leaves, use your thumb and forefinger to locate the root-like growth connecting the young plant to the tuber. Follow this growth down and carefully pinch it off just above the tuber. Remove the plant with its attached roots, but leave the propagating tuber in the container. Think of this process as cutting the umbilical cord.

Step Six

Plant the young plant immediately to prevent it from drying out. Pick any size container that you want, but I use a six-inch container for each lily. A heavy clay loam soil is best for your transplant. Fill the container with soil, and gently separate the roots of the plantlet. Set the plant in the soil, covering its roots and matching the soil level in the new container to that of the original. The original depth of the transplant can be checked visually, making certain the lighter, discolored area where the root zone joins the base of leaves is at the same level after being planted as it was while still growing from the tuber. Lastly, add a thin layer of sand to the top of the new container to keep soil from floating out.

Step Seven

Return the newly transplanted container to the sprouting tank, if space permits. You may need to set up another tank, following the original procedure and assuring a water temperature of at least 72 degrees

Usually, within two weeks the original tuber will send up another plant, which can also be removed and transplanted. You can repeat the transplanting process up to five times before the tuber is allowed to retain the last plant. Repeat the process for each tuber.

Step Eight

Add fertilizer tablets every 21 days at a rate of five grams per every six inches of container. As leaves fade, trim them off at the soil surface.

Step Nine

Once your pond water has risen above 72 degrees, move your lily to the pond.

Step Ten

Enjoy and share the wealth. After you have successfully wintered and sprouted your tropical water lilies, you will enjoy them even more. Probably, you will now have too many plants! Share them with family and friends. Take extras to your local water garden club and trade them for new varieties to add to your collection. Now that you know how easy it is to winter these tropical beauties, they'll become the queens of your water garden.

Share your success stories with Joe. Write him at Missouri Botanical Garden, PO Box 299, St Louis, MO 63166. Joe is a horticulturist at MBG and president of the St. Louis Water Garden Society.