ON THE EDGE

with Anthony Archer-Wills

p. 40
»A clear view into your pond«

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The Lady of the Lake

Owning a pond can spoil a person. So when a customer decides to move, they often insist on bringing their pond with them. That’s the challenge Jason Heller tackled when he recreated a massive pond at his customer’s new out-of-town abode.

All Aboard!

You’ve heard of a tour of homes, but what about a tour of ponds? Jason Turpin and his company have been hosting local pond tours in his community for more than a decade, and his tips and tricks could make you think about the benefits of hosting your own.

Better Testing Through Chemistry

Do you know what ORP means and how to test for it? What about the difference between nitrate and nitrite? Check your answers on pg. 23, where Noah Gillespie has an all-encompassing guide on water chemistry that is worth saving and keeping on hand.

Step on It!

What good is a water garden if you can’t get close enough to enjoy it? Take Kelly Billing’s advice and invest in some “walkable” flora for your waterscape, creating unique patches of beauty that won’t be damaged or destroyed by a little foot traffic.

2018 IWGS Symposium

For the first time since 2010, the International Waterlily & Water Gardening Society’s annual symposium returns to San Angelo, Texas this September. If you’re considering attending this year, Anita Nelson offers a warm Texas welcome and a detailed preview of this year’s agenda and activities.

Building on the Edge

A body of water is defined entirely by its edges, writes world-renowned pond builder and television personality Anthony Archer-Wills. His personal journey along the leading edge of waterscape design lends new meaning and significance to where the land meets the water.

Mixing Koi Populations

In the May/June 2018 issue, Ben Plonski laid out the chief considerations to make when accepting new koi shipments and integrating them into your existing populations. In Part Two of this series, Ben shares his two-week quarantine protocol and provides more guidance on what to look out for in your new shipments of swimmers.

Tangled in the Food Web

Aquaponics refers to systems that leverage water as the medium for cultivating both plants and fish life. Think hydroponics meets aquaculture. Intrigued? Field expert Ken Rust explains the basics of these systems and takes a look at where this technology could be headed.

Buddha’s Desert Escape

Kent Wallace recounts all the considerations and precautions he took when he designed a filtration system for an arid, formal pond environment near Las Vegas. A smiling Buddha statue smiles down upon this low-maintenance, mirage-like desert waterscape.
Living on the Edge

Anthony Archer-Wills is in the house!

I met Anthony and his lovely wife Pauline last year at the IWGS symposium in Pennsylvania. I sat next to them at dinner, and I went out on a limb and asked him if he would be willing to write an article for us. To my delight, his answer was yes! Yay!

If you’ve heard anything about Anthony, you know he really knows his stuff when it comes to pond design and water gardening. If you’re somehow not familiar with Animal Planet’s “The Pond Master” or the contractor whom The Telegraph once called “the man who gave us pond life,” well, Anthony is a bit of a celebrity when it comes to the water gardening industry.

That’s why I was honored when Anthony agreed to write for us, and boy, he didn’t disappoint. If the beautiful photo on the cover didn’t already lure you in to the point of skipping ahead, make sure you check out his article on pg. 40. He has a way of explaining his evolved vision of pond building in a captivating way, and it certainly made me think outside the pond when it comes to how to treat the water’s edge.

That’s not the only fascinating article in this jam-packed summer issue. On pg. 58, Ken Rust provides an update on aquaponics technology, which is the combination of aquaculture (raising aquatic animals in tanks) and hydroponics (growing plants in water). If you haven’t heard of this before, you’ll be pretty surprised at the latest developments in this space.

Jason Turpin highlights his company’s long history of providing community pond tours on pg. 14, and his experience might inspire you to think about organizing a tour in your area. Not only can these events lead to more sales for your company, but they can also positively benefit your community and introduce new audiences to the wonderful world of water gardening.

As promised, Ben Plonksi is back this issue with part two of his Language of Koi feature about safely integrating new koi populations (see pg. 50). For our pond plant lovers, and especially those who like to tread close to the water, Kelly Billing introduces some of her favorite species that don’t mind a little foot traffic. Read about these “STEPABLES” and other varieties on pg. 32.
When a longtime client moves out of town to a lake community, and the new, roughly landscaped property is already equipped with a pondless waterfall and bubbler, what more could he possibly need? A pond, of course! This particular client had always had koi ponds on his property, and he said he missed sitting next to it and feeding his fish at the end of every day, a habit he had created for himself over the years to decompress. As an entrepreneur and owner of several landscape and property management businesses, he led a very high-paced, busy lifestyle. After his sons moved off to college, he decided it was time to build a retreat that he could retire to — that is, if he ever decided to retire. The pond that we envisioned for him would become the centerpiece of his backyard entertaining area.

Heads & Tails
As a collector for many years, he had accumulated many bronze and statuary pieces that would need a new home. The most significant piece was a large, bronze mermaid that had been a focal feature at his two previous residences. We decided that rather than creating a basin for her to live and operate from elsewhere, we would instead reconfigure the existing pondless waterfall to accommodate her and the fountain. This required removing the preexisting weathered-limestone bubbling boulder to level out a pad for the fountain. This would not only accommodate the changes in plumbing and add the valves necessary to keep the waterfall flowing at its previous volume, but it would also connect the mermaid’s base and make sure she received enough water volume and pressure to operate the several incorporated spitting features.

We also had to make adjustments to the rock work in the upper portion of the pondless waterfall so that the streams coming from the fountain could be caught in such a way that would minimize splashing on the surrounding concrete patio, the stone steps and bridge leading down to the beach. After a little trial and error, we were able to reduce the splash as much as possible, making the areas around the fountain safe and not slippery. LED lighting was added around the base of the mermaid and through the waterfall to accent her at night, since she is the first thing you see at the end of the driveway, welcoming you as you pull in.

Filling in the Landscape
With the mermaid in place and complete, we were ready to begin discussing the remainder of the landscape. We decided to reconfigure the existing pondless waterfall to accommodate her and the fountain. This required removing the preexisting weathered-limestone bubbling boulder to level out a pad for the fountain. This would not only accommodate the changes in plumbing and add the valves necessary to keep the waterfall flowing at its previous volume, but it would also connect the mermaid’s base and make sure she received enough water volume and pressure to operate the several incorporated spitting features.

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add plantings to the existing beds and find materials that would complement the design elements already found on the house and in the existing beds. The landscaping already had some existing granite-boulder retaining walls and a Black Hills flagstone patio that served as a midpoint between the steps from the house and the steps of the soon-to-be-added boat dock. This patio would serve as a relaxation point, a place to entertain and the home of the pond that was to be built. It would surely provide a visually stunning feature as you move through the landscape.

To provide a spot to relax and to work with the existing slope, the round, granite boulder work was removed, and a Black Hills flagstone sitting wall was constructed. This wall would provide a place to rest at the base of the main stairs and create the height needed to set the waterfall in the main pond. It would also level out the upper stream portion to provide a nice, deep, relaxing, meandering stream. Weathered limestone boulders would then blend into the wall to provide the outcropping for the main waterfall going into the pond, mimicking the types of waterfalls found in this part of Nebraska. The weathered limestone waterfalls that would become the starting point of the water feature were built 20 inches above grade to keep the scale and look consistent. We didn’t want it to look as if we had piled up a bunch of rocks along the wall to create an unnatural waterfall. It was important to the client and to me that we created a beautiful, artistic feature, but kept from going overboard. This was a challenge as we continued through the design and installation process.

I had a vision in my head of how all of this should look, but trying to explain my vision to the client initially was a challenge. Since we had worked together for so many years, he trusted my artistic style. But, I still needed to explain and demonstrate how a bare patch of turf was supposed to become the main focal point of the backyard.

Enacting the Vision

We started using the garden hose and marking paint technique, using different colors to indicate the water, stonework and bed lines. Then, I took a photograph of the space, and using pen and marker, I created an image that was very similar to how the final project was to be:

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completed. We started by preparing and building the seating wall, since that was going to be the anchor of the space. We also needed to work our way out while we built everything.

On an almost daily basis, I would meet with the client in the morning for coffee and use more marking paint to indicate what was going where next. Inevitably, the changes started coming, and we ended up doubling the size of the pond to around 20 by 20 feet and 3 feet deep. The upper stream ended up being 30 feet long by roughly 4 feet wide, and the depth of the stream averaged 8 inches.

The stone bubbler that was removed from the pondless waterfall was incorporated into the far side of the pond, creating visual interest as you look out from inside the house, since the waterfalls face away from the house. Drainage coming off the roof needed to be redirected around the space, so much care was taken to ensure the drainage pipe would exit under the new dock planks, thus eliminating erosion on the beach. Sadly, this was not a design consideration of the builder on any of the other homes on the street, as they all were experiencing erosion and runoff issues after the rains.

Upon changing the size of the pond, the filtration systems and pumps were adjusted to the most appropriate sizes. Two Aquascape 2500 Biofalls act as the primary filtration system starting off the main set of falls. One AquaSurge 4000-8000 pump would feed the two filters, and a series of valves were installed to balance the flow. The boulder bubbler and a small planted wetland area are fed by an AquaSurge 4000, with valves installed to shut off the wetland feed in the winter-time while continuing to use the boulder bubbler as an aerator and a beautiful ice sculpture once the north winds begin to blow. These pumps are contained in a pump vault with a constructed skimming cove to help reduce the daily maintenance and keep a natural look.

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A small mag-drive pump was later installed in the vault to supply the spitting fountains with water. An inline irrigation filter was modified with filter material to restrict the flow as little as possible and keep the larger debris from clogging the lines.

Construction took place utilizing Neptune’s Water Gardens’ two-person crew and yours truly. We used a Bobcat MT52 to move materials, excavate soil and place boulders. Having a small crew allowed us to work at a comfortable pace while efficiently dealing with all the daily changes and surprises.

**Finishing Touches**

Since there was already an existing landscape, including irrigation, electrical outlets for the boat dock, pondless waterfall and low-voltage lighting, we had to find these items in the excavation area, remove them around the excavation and coordinate with electricians to tap into the power. We also had to ensure there were plenty of circuits available for the pumps, the winter aerator for the boat dock and any other electrical needs associated with the landscape. Low-voltage lighting cable was staged throughout the pond area, making future connections to the entire lighting system much simpler. We were able to lay our plumbing along with some of the drain- age pipe in the same trenches, saving us time once it came to finishing the drainage system toward the lake.

A simple planting scheme was designed around the pond and stream to soften the edges and provide accents and buffers between the house and the upper stream. The remaining landscape consists of native-type perennial plantings to support the birds and butterflies around the garden. The plantings provide a mix of color and texture through the seasons, and it will not require a tremendous amount of care or water. It also covers the entire ground space, eliminating the need for yearly mulching.

Overall, it was challenging trying to blend into the existing landscape while also giving the space a character of its own. Staying within a reasonable budget and utilizing our time wisely on-site despite the constant design changes was a challenge in its own right. The client kept telling me to be an artist and build something I would want in my own yard.

This did cause the project overall to exceed the original budget, but the client and I agree that the results are subtle, yet spectacular. The pond and waterfall are very simple, but the details in how we cut boulders into the wall and used other natural elements, such as driftwood from the lake edge just down the way, make the pond feel as if it had always occupied this space, with the patio and house built around it. Sitting by the pond and facing west at sunset provides a beautiful view over the lake, and the LED lighting creates a magical ambiance and experience. As time goes on and the water-lilies and other accent plants mature, this dynamic landscape feature will subtly change and delight over time.

The whimsical bronze, which we added last, provides some fun in an otherwise very natural setting. The addition of the koi was the finishing touch, reuniting our client with his relaxation ritual — feeding his fish in the evening, taking in a deep breath, experiencing the sounds of water and its inhabitants in the surrounding area and gaining a sense of peace and calm in an otherwise chaotic, digital world.

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**About the Author**

Jason Heller is an award-winning land and water-scape designer and owner of Neptune’s Water Gardens, which specializes in the design, installation and maintenance of water features. Jason has a bachelor’s degree in horticulture from the University of Nebraska at Lincoln and 20 years of experience in the nursery business. He is a Nebraska Certified Nurseryman, Certified Aquascape Contractor, Certified RainXchange Professional and NCMA-certified Segmental Retaining Wall Installer. Jason was named one of POND Trade Magazine’s “Water Artisans of the Year” for 2017. He lives in Omaha with his wife Jessica and their two children.
ALL ABOARD!

The purpose & perks of hosting your community water garden tours

by Jason Turpin, Turpin landscaping

Over the last 10 years, we have been offering pond tours during the summer months. Our calling to start organizing these tours was clear. Raised on a dairy farm in southern Chester County, Pennsylvania, my brother Chad and I learned a lot about the land and the value of hard work. Always comfortable with the outdoors, Chad and I went from cutting lawns in our teenage years to installing beautiful outdoor living spaces in the Chester County area.

Once the business was in place and we had started families of our own, we decided we wanted to start thinking about giving back. Although there are many worthy causes that could use a helping hand, we decided to stay close to our roots. With 300 or so ponds installed, we decided to start hosting pond tours. They started as most things do—small, with about 20 to 30 attendees. Equipped with individual maps, our attendees would spend an idyllic day in Chester County, visiting a series of homes with ponds. At the end of the day, we would host a big barbecue.

Memories of growing up on a farm and needing to feed three hungry boys made the choice to partner with the Chester County Food Bank an easy decision. Today, all our proceeds from ticket and barbecue sales go toward this organization.

If you’re considering starting or participating in a pond or water garden tour in your community, there are quite a few things to take into consideration.

Plan Early!

Planning for these tours usually starts in early February, but it’s best to keep the tours in mind all year long. We take into consideration how busy the summer and fall months are for many people, so we keep the tours on the same weekends every year, allowing our employees, families and guests to easily plan around these events well in advance.

These tours are held rain or shine, and we can say confidently that every tour has been a success, even when the weather didn’t cooperate. We had a few tours that should have been washouts, but we heard after the fact that they were some of the most memorable and fun-filled tours to date!

Garden Tour

Our garden tour is a guided bus tour held on the last Saturday of June. The bus runs from 10 a.m. to 5 p.m. and includes a catered lunch at one of the residential stops. This is a truly unique adventure that takes visitors to some of the most beautiful and creative residential gardens around the county. We always start the morning meeting with coffee and a light morning snack. Then, Becky Turpin shares her personal knowledge and true passion for plants, walking the attendees through the process of creating a garden, including what specifically was planted and how to care for the plants. She also shares some of her favorite varieties. We wrap up the day with cocktails and appetizers at the end of the tour. These tours generally accommodate about 80 people.
Water Garden Tour

Our weekend water garden tour is held on the last full weekend in July. Saturday goes from 9 a.m. to 5 p.m. and concludes with a country barbecue with a D.J., raffle and silent auction. Then, we host visitors Sunday evening at our office from 5 p.m. to 8 p.m.

We offer self-guided tickets and a guided bus tour; each ticket gives you access to the barbecue and allows you to tour more than 40 residential locations in and around Chester County. This two-day tour is our biggest event, with more than 400 attendees every year.

Evening Pond Tour

My favorite tour is our evening water garden tour, which is held on the last Saturday of September. It runs from 5 p.m. to 11 p.m. and includes bus transportation, a progressive dinner and dessert. This tour is growing steadily and has about 100 attendees each year.

On all tours, we provide snacks, water and a knowledgeable host who shares interesting information about properties, like specific pond sizes and the year they were built.

As the tours grow, so do the duties involved. Traffic control is needed on some properties for safety reasons. Speaking of safety, make sure you have a first-aid kit and access to an alternate vehicle in case you have to make special accommodations for guests who need extra assistance.

We have found that selling tickets online is the easiest and most accessible way to provide guests with all the information that will need; however, when we started these tours, we sold them at our local garden stores.

Sponsorships

Also keep in mind that sponsors can help offset costs. Working with local restaurants and caterers to donate food and drink items for the tour can save a lot of money. Having a committee to help with the tour is a wonderful way to get pond owners involved and can take some of the workload off the organizer.

Provide folders with information on sponsorship opportunities at varying levels, and include tax deduction information. Consider including an infographic with pertinent information about the charity being sponsored. This gives potential donors a sense of the project’s worthiness and intentions. The folders can be dropped off at
local restaurants and businesses throughout the year, especially entities that your company supports. Keeping sponsorship folders in company vehicles helps to remind your employees to ask about donations while purchasing at a vendor’s store.

Donated items can be packaged into beautiful baskets, especially when you combine a restaurant gift certificate with a bottle of wine. Raffles are always popular and can even be done on the bus as you travel from property to property.

Pay it Forward

When we began this journey of building fun and successful pond tours, word spread quickly throughout the area. This led to a partnership with the Brandywine Valley Water Garden Association, which is managed and operated by a committee of dedicated volunteers from Chester County who organize, schedule and help run the pond tours. We are humbled by all the pond and garden owners who join us to give back to the community. To date, we have raised more than $122,000 for the Chester County Food Bank. But it didn’t happen overnight; it took a lot of hard work and outreach by the area’s pond and garden devotees.

So much effort goes into our tours, but the enthusiasm from the attendees and the ability to give back to our community help encourage us to continue planning them year after year. A welcome side effect of these tours is how great they have impacted our business. We typically land five to seven new water feature clients from the tours every year. So, we definitely feel that dedicating three weekends a year to pond tours has created a win-win situation for everyone involved.

About the Author

Jason Turpin was born on a dairy farm in Chester County, Pennsylvania, where he grew to love the land. After attending a “Ponds for Kids” project in high school, Jason knew he had found his life’s work. After convincing his grandparents to let him build his first pond in their backyard, Jason was hooked. Fifteen years later, with more than 400 ponds and hundreds of outdoor living projects built, Jason, his brother Chad and their mother Becky run a team of 24 employees. When he’s not working, Jason and his wife Sarah are raising three energetic boys, Joe, Kyle and Logan. For more information on Turpin Landscaping Design/Build, call 610/380-1119 or visit www.turpinlandscapedesign.com.

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Evolution Aqua USA, Inc. becomes exclusive importer for award-winning British aquatics company Evolution Aqua, Ltd. From April 2018, Evolution Aqua USA, Inc. now has exclusive U.S. distribution rights for the Evolution Aqua product line manufactured in England.

Brian Fitzsimmons, owner of Fitz’s Fish Ponds in Bound Brook, NJ, announced the introduction of this new company to make the Evolution Aqua product line available to the U.S. market through its dealers and distributors.

“There are many quality products from Evolution Aqua including the Nexus Filtration System, K1 and Micro Media, the Catus Sieve, evolv/EasyPod, Pond Bomb, Pure Pond, and Koi,” said owner Brian. “National Sales Manager Don Schnoor and I are looking forward to supplying these products to both familiar customers and as exciting new items to the rest of the koi and water gardening enthusiasts in the U.S.,”

Don Schnoor will be spearheading the Evolution Aqua USA team as National Sales Manager, and believes the U.S. aquatics channel will benefit from this agreement, enabling seamless access to Evolution Aqua’s award-winning products. “Our team is focused on bringing Evolution Aqua’s superior technology to distributors, retailers, contractors and consumers to enjoy the best possible experience with their water features,”

As the exclusive importer for Evolution Aqua from April 2018, Evolution Aqua USA, Inc. will offer sales and customer service support for the U.S. market.

“We are delighted to welcome Evolution Aqua USA, Inc. as our U.S. partner,” said Evolution Aqua Sales Director Phil Jolly. “The partnership will mean increased product availability, customer support and presence for Evolution Aqua products across the U.S. and much more opportunity for pond owners to use and try out our unique, award-winning products.”

Evolution Aqua USA, Inc. becomes exclusive importer for award-winning British aquatics company Evolution Aqua, Ltd.

Evolution Aqua, Ltd. is a British manufacturer that is famous worldwide for their award-winning pond products and now their increasing indoor aquarium offering. Since their inception, they have built a vast dealer base and are a trusted supplier for pond filtration equipment in more than 50 countries worldwide. The company prides itself on its in-house innovation, research and development, which have brought amazing products from England and koi and goldfish from Israel, to the United States, enabling overseas for hardware product and live goods acquisition.

In addition to co-owning and working with his family at Aquatic Gardens & Koi Co., he has worked as the U.S. Sales & Marketing Representative setting up distribution of Israel Koi & Goldfish and waterlilies, as a Sales Manager for one of the largest manufacturers of water feature products in North America, and now continues his passion in this business as the National Sales Manager for Evolution Aqua USA, Inc.

With over 30 years of industry experience, Don has been a speaker offering seminars at retailers and distributors throughout the country. By teaching and promoting every aspect of water features, he has been able to spread his passion enabling others to enjoy their pond and water feature experience. Don plans on continuing to spread his passion and knowledge about koi and water features by implementing the same high level of customer service with Evolution Aqua USA, Inc.

Other key team members include Sheila Lawther, Accounting and Order Entry, Mike Cecole, Warehouse Operations, and Paul Madigan, in Marketing. Each of these team members has corporate experience in their respective fields and are valued members of both the Fitz’s Fish Ponds and Evolution Aqua USA team.

MEET THE TEAM

Brian Fitzsimmons’ interesting journey in water gardening began at the age of 13. While his parents were away on vacation, he built something special in their backyard—Imagine his parents’ surprise when they arrived home to find a beautiful water feature! Their family had a water feature to enjoy and this created the foundation for Brian to open Fitz’s Fish Ponds.

Ever since building his first water feature, Brian has been focused on building a business creating amazing outdoor environmental experiences for clients all over the Northeast. His vision for Fitz’s Fish Ponds is to focus on bringing the highest quality Koi fish from Japan, building amazing landscaped ponds and water features, and utilizing cutting-edge technology for clients and customers. Since the beginning, Brian has focused on building a strong team for the continued growth of his business ventures. Brian plans on continuing his strong values of leadership as he moves forward, growing his business with the addition of Evolution Aqua USA, Inc.

Don Schnoor started in the water garden and koi industry by working in his family’s pond business located in Central New Jersey in 1986. While working in the retail store during the first year, he quickly fell in love with koi and building water features. As his family began expanding the business into distribution, including importing products from England and koi and goldfish from Israel, he worked to grow sales, frequently traveling overseas for hardware product and live goods acquisition.

ABOUT EVOLUTION AQUA, LTD

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Evolution Aqua USA, Inc. becomes exclusive importer for award-winning British aquatics company Evolution Aqua, Ltd.

Brian Fitzsimmons, CEO 888-417-5837
www.EvolutionAquaUsa.com
Most people believe that if their pond’s water is clear, it is also clean and viable. However, this is not always the case. It’s important to know that biological and chemical changes in water are often not visible. Only through proper testing can the true quality of water be determined. Poor water quality leads to stress and health problems that can be avoided with proper care.

When a pond first opens, it should be tested weekly for the first four to six weeks, regardless of what kind of aquatic life might be present. It is especially important to test for ammonia, nitrite and nitrate during this period, because the pond needs to establish a natural biofilter. After this initial period, water parameters are established so that the pond can be tested monthly, provided there are no widespread external influences on the pond.

If you notice unusual odors, aquatic sickness or death of aquatic life, test your water immediately. When testing, always take a water sample about 12 inches below the surface and be sure to complete testing within 30 minutes of collection.

Twelve Common Test Parameters

Here’s an alphabetical guide to some of the most common test parameters you’ll need to deal with in and around the pond.

Alkalinity, often referred to as carbonate hardness, German carbonate hardness or KH, is the measure of carbonate and bicarbonate...
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Concentrations in your water. Essentially, it is the measure of the ability of water to resist rapid changes in pH. It is not the same as pH, because water does not need a high pH to have high alkalinity. Measurements in an established pond can range from 50 ppm to 200 ppm as CaCO₃, with 100 ppm being ideal. Over time, alkalinity is naturally decreased through bacterial action. If the alkalinity level is high, perform a routine water change with lower-alkalinity water, or add a mild acid. To raise alkalinity, calcium carbonate (baking soda) can be added.

Ammonia is typically introduced through waste released by fish gills. It can also form from decaying plant material in the pond or uneaten food left in the water. Ammonia can exist as free ammonia, which is poisonous to fish, or as ionized ammonia, which is less harmful. It can have detrimental effects on fish by hindering the absorption of oxygen from the water. If the water becomes polluted with ammonia, regular water changes need to take place to reduce the concentration. In the early stages of establishing a pond, it could take several weeks before the ammonia level in the water begins to drop. The level of ammonia should be zero, but up to 0.5 ppm NH₃ is acceptable. Ammonia is much more toxic if the pH of the water is above 8.0.

Chlorine (free and combined) is widely used in the disinfection process of city tap water. The acceptable concentration in a pond is zero, but even at low levels of 0.05 ppm, it can be harmful for aquatic life, causing skin and eye irritation, gill agitation or death. Chlorine is known to react with organics in water to form trihalomethane (THM), which is a suspected carcinogen. It is also used as an oxidizing agent for manganese, iron and hydrogen sulfide.

Dissolved oxygen is a measure of oxygen in water, which is crucial for fish and other pond life. Water temperature controls the maximum amount of oxygen that can be dissolved. Warm water holds less dissolved oxygen than cold water. Levels of dissolved oxygen below 6 mg/L can have harmful effects on aquatic life. Lack of dissolved oxygen will cause fish death, but it can be controlled by...
Higher levels typically do not affect the health of a pond. Green water refers to the algae blooms present in pond water. This can affect the pH of the water in the presence of plants. Plants produce nutrients directly from carbon dioxide dissolved in the water. They consume carbon dioxide during the day, thus removing it from the water and causing alkalinity to raise the pH. Major algae blooms can cause a pond’s pH to fluctuate tremendously during a 24-hour period.

Nitrates are the primary breakdown product of ammonia, and as it increases, it is very poisonous to fish. It is a skin irritant and will prevent fish from absorbing oxygen from the water.

Nitrite is the primary breakdown product of ammonia, and as it increases, it is very poisonous to fish. It is a skin irritant and will prevent fish from absorbing oxygen from the water. Nitrite is not especially harmful to freshwater fish, but it is a strong plant fertilizer and can cause the growth of algae. The levels of nitrite should be controlled to help reduce algae blooms. The optimal level of nitrite in water should be between 20 to 60 ppm NO2, and this can be controlled through partial water changes. It is eventually broken down into nitrogen. Nitrate is the primary breakdown product of ammonia. Water above a pH of 7.01 with increased water temperatures causes the presence of free ammonia. The higher the pH and water temperature, the greater the percentage of free ammonia. The ideal pH range is 6.8 to 7.8 for pond water.

Phosphates are needed by both plants and fish to stay healthy. However, high levels of phosphate cause algal blooms and can also be an indication of pollution from fertilizers. The higher the phosphate levels are, the more aggressively the algae tend to bloom. Phosphates cause weed proliferation and muck. There are chemical and nonchemical methods for removing phosphates from pond water. The ideal level is less than 0.3 ppm. Salinity, the presence of sodium chloride (NaCl), is important for health care and maintenance of fish, and it can also be helpful in treating parasites. Salt concentrations between 3 to 5 ppt will dehydrate and upset parasites’ cells. Nitrite can be detoxified at a salt concentration of 3 ppt, and algae can be controlled at concentrations of 25 ppt and higher. Plant damage may occur as the concentration of salt increases, so you’ll want to be mindful of this as you refine the chemistry of your pond.

Testing Equipment

There are two common testing methods used in the pond industry: electrochemical and colorimetric. Electrical measurements can be used to detect a water sample to measure an electrical potential (voltage) or a current related to the concentration of a specific analyte. This method can be used in the field, but frequent calibrations using multiple standard solutions and special handling are required. Lab-quality, handheld portable probes are suitable for field use if cared for properly. Electrochemical testing is limited to a small number of tests, which include total dissolved solids (TDS), pH, temperature, conductivity, salinity, oxidation reduction potential (ORP) and dissolved oxygen. To determine the concentration of chemical elements and compounds with the aid of a color reagent is known as colorimetric analysis. There are four

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basic methods of colorimetric analysis used in water testing: colorimeters and photometers, titrations, a reagent with a color chart comparator and visual test strips. Testing with a photometer accompanied by reagent is the most sensitive and accurate of all the colorimetric testing methods. This method involves photometers using colorimetric or precipitation chemistries to measure color intensity (or precipitate) by an electronic instrument. The instrument measures transmission of light at a given wavelength through the water sample after reacting with reagent. It then produces a result through algorithms based on the color change. It’s quick and accurate, and there’s no visual color matching or digital reading, so it’s great for field use. However, it can be costly, and powders and tablets don’t dissolve fully in colder waters. Also, forgetting to zero it out correctly may produce false results.

Titration analysis includes colorimetric chemistries that require visual color-change interpretations. Test procedures consist of adding drops and swirling until a color change is visible. All results are determined by the color changes. The results are generally accurate, and this method is portable. But, this test is extremely technique-driven, with an emphasis on counting drops, calculations and visual color reading. Furthermore, liquids need to have good visual judgment to interpret the results.

About the Author
Noah Gillespie earned his bachelor’s degree in chemistry from the University of North Carolina at Asheville. While in college, Noah performed research on a known EPA superfund site pertaining to water quality and water contamination for four years. Upon graduation, Noah managed and performed testing at a water quality lab. He is experienced in many forms of testing in water quality, drinking and wastewater. Noah has also managed a large-scale freshwater fish culture of fathead minnows.

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Step on It!

Natural welcome mats bring harmony to plants, rocks & water

by Kelly Billing,

Water Becomes A Garden

There’s a lot to be said for all the phone calls and thank-you letters that tell the stories of how much clients love their pond. But nothing says, “I completed my task and built something my client is totally engaged in,” quite like the flurry of activity around a pond’s perimeter.

Most ponds are encompassed in areas of high foot traffic, and that stands as a testament to the success of the contractor and the garden they created. Even the smallest bodies of water can attract all kinds of visitors. Before I built my large pond, my children were enamored by a simple, 36-inch tub of lotus. It became not only a television replacement in the evenings, as we pondered how such a small body of water could attract and cultivate such a plethora of life, but it also became a destination just outside the back door. The constant activity that surrounded that little pool included birds, bees, beetles, butterflies, dragon and damselflies, water boatmen, water skates, tadpoles, frogs and toads, as well as the cat who loved chasing them all within the lotus garden. There is no greater assurance that your pond life is prospering than witnessing these little residences getting established.

As the water feature gets bigger, the level of activity increases and perpetuates as children, families, friends, pets and others gather around the water supply that is home to its own inhabitants, like fish. This open invitation for activity means you should definitely consider some rough and tumble plantings around the perimeter. Make selections that are sturdy and attractive. Not only do they add to the charm of the water feature, but they can also help stabilize the edge and soften the sometimes harsh look of stonework. It is also important not to be too aggressive with plant selection, and make sure your choices don’t have troublesome habits or characteristics, like heaving stones or poking through pond liner. The goal is to create a harmonious relationship between plants, rocks and water, because high foot traffic is encouraged.

Friends of Foot Traffic

Lindernia grandiflora, or Blue Moneywort, is a very low-profile creeper with dainty purple and white flowers. It has more of a tendency to go around rocks rather than over them. Although it’s often noted that it is not a fan of wet places, it seems perfectly at home with water. Pratia pedunculata is extremely low profile and perfectly suited between low, flat stones. Golden creeping jenny has a dense growth habit that deters weed growth. Hens and chicks, a perennial favorite, cover a broad range of climate zones and require little, if any care.
Lysimachia nummularia, or creeping jenny, and its golden variety, ‘Aurata’, are well known for their ability to adapt from growing conditions that are wet or dry. The bright foliage of ‘Aurata’ is best used in part shade to brighten up the area. Plant them on the outside perimeter of any pond, and they will make their way over rocks and into wet margins of any water body. They are especially fond of streams and are easy to maintain in the water if they are pruned on a regular basis. It should be noted that they can get a foot hold and cover a lot of ground quickly. Make very low to the ground, it sends its needle-thin stems on a direct mission around rocks, where the soil stays relatively moist. It has cultivars that offer blue, yellow, copper, or bronze. Many have a heavy flow-ering ability, with colors that include white, yellow and red. They are rough and tumble enough so that when small pieces get broken off, they root where they fall, so they end up migrating around the garden.

Semiaquatica is a traditional favorite that is often referred to as “carts and kittens” or “hens and chicks,” among other things. The hardy varieties are tolerant of the most extreme temperatures, while the tropical varieties are equal tolerant of the sometimes brutal summer heat. The array of colors, shapes and sizes allows you to create a mosaic art piece at the pond’s edge, around rocks that have drained the soil around them.

Thyme is also an adaptable ground cover that can drape over stones and even hang down the face of a wall. They emit a gentle fragrance when the foliage is broken, so they offer another distinct element to the garden. They must be planted in well-drained soil in full sun, never in wet areas where splash or overflow might alter the soil moisture. Thymus pseudolanuginosus, or wooly thyme, may be the best known creeper, with 2-to-3-inch silver-gray foliage. Thymus praecox ‘Pink Chintz’ peaks at just 2 inches tall with heavy blooming from May to July. For something even lower, Thymus serpyllum ‘Ellin’ forms a tight evergreen carpet 1 inch in height with summer lavender flowers.

More Footstep Foliage
Moss and ground covers cohabit nicely. They often grow in a push-me-pull-you type of existence. As weather patterns and moisture levels fluctuate, the conditions allow them to compensate for the other’s likes and dislikes. After all, it’s here to pair lovers with slightly different preferences so they can compensate for each other. Most mosses prefer damp, shaded areas, while others will tolerate sun and drier conditions. Roofs and walls can become extensions of the moss garden, allowing the pond area to engage, surrounding outside buildings like sheds, gazebos and pavilions.

Thelypteris palustris, or marsh fern, is not quite designed for walking on, but it’s worth mentioning. Marsh fern is a deciduous hardy plant native to North America and, as the name implies, it prefers a consistently damp growing area. The vivid leaves of spring are infused with copper, bronze and apricot, maturing to green. Both are excellent ground-cover ferns that are sturdy enough to be stepped on occasionally.

Many aquatic plant growers and pond shops carry plants that are suitable for outside the pond, and some compañía es specialize in it. Because stone and ground covers are often combined on garden pathways and around ponds, there are two brands that concentrate on just that. Treadwell Plants is a collection of plants especially selected by Dr. Allan Armitage, an internationally-acclaimed horticulturist, for their suitability for being walked on. Additionally, STEPABLES from Under a Foot Plant Company has spent 25 years dedicated to finding plants that are durable and dependable enough to be top performers under your feet and in your yard.

I’ve personally planted all the plants I listed here, and they have been a welcome addition to our garden pond. I look forward to growing more of them.

About the Author
Kelly Billing has more than 30 years of experience in the watergardening industry wholesale trade. Currently she is an industry consultant with a focus on improving water quality and achieving “Plant Greatness,” or the use of plants in the most effective way possible to exceed expectations. Additionally, she partnered with Splash Supply to form Splash Plants (www. splashplants.com), which is focused on producing perennial favorites and new and underutilized aquatic plants. As a sales representative for Nulity America, she promotes the use of natural processes over chemical means to improve water quality. She compiled and maintains the Aquatic Plant Invasive Species List for the nursery trade in the United States. Kelly is a Maryland Certified Professional Horticulturist and writes regularly for various trade magazines and water gardening publications. She has co-written “The Lotus, Know It and Grow It” with Paula Biles and “Water Gardener’s Bible” with Ben Helm. She serves on the board of directors for the International Waterlily and Water Gardening Society (IWGS). For more information: www.waterbecomesagarden.com

Top left: Combining ground covers provides an ever-changing mosaic of color and texture. Photo courtesy of Treadwell. Bottom left: Lysimachia ‘Goldi’ is an improved variety of golden creeping jenny. Above: Lysimachia japonica var. minuta photo shows more sturdy and evergreen, the spring flowers are a welcome mat of pure color. Varieties include blue, pink, violet, white and various bicolour combinations.

Top photo: Lindernia grandiflora is delicate in color and habit. Middle photos: Creeping sedums are adaptable to some of the most extreme conditions, sandwiched between hot rocks. Bottom photo: Green creeping jenny offers rich, green color and abundant flowers. Photos courtesy of STEPABLES.
All are invited to the friendly state of Texas for this year’s International Waterlily & Water Gardening Society (IWGS) Symposium from Sept. 13–16, 2018.

If you find yourself wondering why this year’s symposium is being held in a somewhat remote town in West Texas, you’re not alone. It’s an area better known for cowboys, ranching and wool production. However, there is a jewel hidden in this town — the International Waterlily Collection.

Yes, that’s right! Texas is the place to go if you want to see lily species collected from all over the world, including many of the current hybrids, such as intersubgeneric hybrids (ISGs). There are literally hundreds of lilies all in one place, easily accessible and photographable.

The last time the society visited San Angelo was in 2010, and it was a great success. We look forward to making more fond memories this year.

Your Daily Outlook

After arriving and registering, we will travel to the Visitors Center, which sits on a bluff above the Concho River. We will attempt to replicate the fabulous opening reception we had in 2010, complete with the same amazing Tex-Mex appetizers, live music and breathtaking backdrop of soothing waterfalls.

The second day will be devoted to education, with lectures and discussion panels moderated by well-known water-garden professionals.

After a morning of learning, we will travel to the International Waterlily Collection. If you attended the 2010 symposium, you will be happy to hear that we are repeating the Night at the Ponds event. As you watch the day bloomers close and the night bloomers open, you will be served a meal prepared by an authentic chuck wagon. As darkness settles in, you will be treated to an exclusive fireworks display created by famed waterlily collector Ken Landon.

Day Three will kick off at the collection, with plenty of time for photography before it gets too hot. We will then head to downtown San Angelo for lunch at Miss Hattie’s, which is located in a former bordello. After lunch, you can stroll around town, shop and visit a boot factory, where you can have your feet measured for a new pair of custom boots, which they export all over the world. We will have more presentations and panel discussions in the afternoon before the Hall of Fame banquet in the evening.

Traditionally, the Hall of Fame banquet is the conclusion of the symposium — but not this year. On an extended fourth day, you will have the option of returning to the International Waterlily Collection and getting into the ponds. Yes, that’s right — this is a rare opportunity to get close to these lilies. Please note that no one will be allowed into the ponds without shoes on, so bring a pair of old shoes and a plastic bag to put them in afterward.

For more information about the 2018 IWGS Symposium in San Angelo, Texas, visit www.iwgs.org.
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Anyone who has a love for water in the garden will be aware of the many ways it can enhance the property and the quality of life of the beholder. Although a pond is technically a hole in the ground filled with water, it is so much more than that.

Evolution of a Pond Builder

When I first became interested in water gardening in the early 1960s, contractors would frequently bandy about the statement, "I'll dig you a pond!" This led one to suppose that there was little to it. Dig a hole in the ground. Make it hold water one way or another, and presto — you have your pond.

At the age of 17, my first attempt at building a pond was frankly ludicrous. Concrete mixed by hand on the garage floor and plastered over a hole in the lawn...
served as my personal introduction to water gardening. Yes, it held water, and it was to me a magical underwater garden full of life and movement. However, the uneven concrete edges were such an eyesore, protruding as they did and glaring at me in the sunlight.

Various attempts were made to disguise these rough edges, and my second pond boasted pieces of rock set into the concrete. This did little to improve the aesthetics or make the pond appear more natural. Quite to the contrary — it resembled a row of teeth set in concrete gums.

As I drifted into my career of water gardening, I would observe the methods adopted by other builders. It seemed that most of the effort went into construction, and then attempts were made, almost as an afterthought, to hide the edges by placing rocks to overhang the rim. However carefully executed, the naturalistic effect was completely destroyed by the thin, telltale rim of concrete showing beneath the rockwork.

The plants were the saving grace. I had a passion for water plants and loved their habits — the way a waterlily bud would rise closer to the surface each day, or how a candelabra primula would unfurl its unblemished, bright green leaves out of the blackest ooze.

A very simple observation taught me that the nature of a body of water is entirely defined by its edges. Without seeing the shoreline, it could be almost any shape — a formal pool, a natural pond or even a sewage plant. Despite visible aquatics or reflections to give us clues, one still cannot be sure.

The edge is the key.

Formal ponds were far easier, as they were obviously constructed by the hand of man. A well-executed edge in brick, stone or even concrete or stainless steel could be precise and most pleasing to the eye. Naturalistic ponds, however, left so much to be desired.

Eureka!

Having struggled for several years to disguise pond edges, my eureka moment hit me in the bath. (After all, most of my best ideas come when I am immersed in water.) I had been working on a series of carefully shaped rock pools for a customer and attempting to follow the inside edges with rocks. It had soon become a nightmarish task spent and a hemorrhage of money — my money, since it was a fixed-price job.

I thought to myself, “What am I actually trying so hard to achieve?” I was trying to create ponds that permanently held water and then place the rocks where they dictated they should go. In order to match rocks next to each other in a realistic manner, they need to be joggled and adjusted in different directions. Therefore, flexibility of movement is essential. The pond should be, simply put, a waterproof bag into which everything else is placed.

Once this was fully understood, I could set about adapting the concept to formal or naturalistic ponds, streams and waterfalls alike.

The shape of the outside rim was now far less important. Now I could make a simple excavation, which should include the deep part of the pond at the maximum proposed depth with a wide, level ledge.
around the perimeter. The size and depth depend on the proposed design. However, using concrete or a flexible liner, this ledge can now accommodate the desired edging material and be arranged in any way necessary.

The Rock Edge

With the rocks sitting on the ledge and partly submerged, the inside edges will be visible. Any construction material showing beneath a rock would instantly give the game away, so to speak. Furthermore, with the freedom of expression that this technique affords, one can create rocky outcrops to accentuate the promontories and bays for emergent planting. Having established the rock placement as creatively and naturalistically as possible, one can address the back of the rocks and planting areas.

For ponds and streams using a flexible liner, this has merely to be lifted up and secured behind the rocks. However, with a concrete shell, the voids between the back of the rocks and the walls need to be filled with gravel. To create hydric planting areas, use soil instead. It is essential to bring whatever medium is used right up to, and slightly over the tops of the rocks. They need to appear to protrude out of the ground as though they are exposed by the lapping of the water. Again, if any of the back is exposed, the rock is seen as a finite size and not part of the surrounding geology. In any rock placement, one needs to create the “tip-of-the-iceberg” effect. By burying a portion and leaving the most suitable part exposed, the rock will seem larger.

Between the rocks, sloping beach areas can be formed using pebbles or pea gravel. On large ponds, extensive beaches are suitable for children to play or just for sunbathing. These are very easy to construct and are a simple and cost-effective way to hide a liner or concrete shell.

The Hard Edge

A solid architectural edge can be applied
to any pond, whether formal or natu-
ralistic. With formal ponds, it is likely
that the entire perimeter will be made of
solid materials. There are too many to
list here, but whatever is used, there are
certain aspects to bear in mind. A brick
or stone edge, for example, will be faith-
fully reflected in the water. Therefore, the
image will be doubled. The edge must be
precisely level.

With a straight-sided pond, if an edge
is even slightly off level, one would get a
hideous chevron effect. Rounded shapes
are almost as bad. (My first pond resem-
bled a lop-sided birdbath). Be careful
with low walls of 6 inches or less; they
could appear to be a foot high, visually
overpowering a small pond.

Whatever material is used, it must be
suitably installed to suit the climate of the
region. This may involve foundations 2
feet or more below the water surface.
Sometimes in areas subject to extreme
cold, I have avoided the risk of damage
by frost heaving or cracking and kept
the whole construction flexible. This is
simple with a liner, as one can lay heavy
blocks of stone or concrete on a suit-
ably protected, level base; then, the flex-
ible pond liner is brought up behind it
and backfilled with fine pea gravel. The
whole assembly can heave about, and no
damage will occur.

I am very partial to extend the lawn
to the water’s edge in at least one part
of a naturalistic pond, and sometimes
completely around a formal one. This
could be achieved using hollow concrete
or engineering bricks set within the water-
proof membrane. It makes for solid, firm
ground right up to the edge, and yet the
grass can still drink, with its roots down
into soil within the hydraulic blocks. They
are laid down in the same manner as any
other hard edging. It is good to be able
to come right up to a pond without getting
bogged down or wet feet. It also enables
changing the way Water Becomes a Garden

**Whatever material is used, it must be suitably installed to suit the climate of the region.**

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the lawnmower to get closer. Eventually, the edge will form a lovely, mossy nose and be almost maintenance-free.

**The Planted Edge**

Formal ponds call for formal planting, and it is best to create ledges specifically for this wherever emergent planting is planned. A low wall can be constructed for soil containment, or well-designed planters can be placed where desired. Strong, architectural foliage like iris works best and will complement the structure. Try to avoid creeping plants that like to roam, such as Menyanthes trifoliata (bog bean).

For informal and all naturalistic ponds, this is where aquatic planting comes into its own. Apart from rocky outcropping or glacial boulders, most natural ponds will have extensive shorelines of native plants. I love to see mass plantings, as they read well when seen from the opposite shore. One can try to emulate nature by planting bold clumps, and their reflections will reward you greatly. Aim for good foliage contrasts, but they must be in large masses, or it will just look spotty. You could try Acorus calamus (sweet flag) beside Caltha polypetala (giant marsh marigold), and for striking contrast you could add Colocasia esculenta ‘Black Magic’ (elephant ear). Make sure the combinations you choose are suitable for your temperature zone.

The soil can be extended up from the planting ledge along a gentle slope to meet the surrounding ground. Water losses through the capillary action of wet soil wicking into dry surroundings can be minimized by including an inconspicuous coating of gravel along the apex of the pond rim. This seamless transition from water to dry land allows for a huge range of aquatic plants, from deep-water emergent to bog and moisture-loving subjects. The water’s edge can then become a magical place to explore. New shoots will rise pristine from the mud with successions of flowers throughout the season.

The pond will be enhanced with dragonflies, butterflies and amphibians. Great biodiversity in both flora and fauna will have been created.

**The Rule of Three**

Finally, when designing pond edges, try not to exceed three different types around the same pond. Just one type of edge would be fine for a formal pond, and it could be lawn, paving or even timber decking. However, with informal water shapes, many combinations are possible. Again, the combination of rock, lawn and pebble beach is effective. Timber deck, bog planting and wildflower meadow is also beautiful. Just two can work well, but don’t exceed three, or it will look fussy and more like a garden center exhibit!

A mossy log trailing down into the water can add a touch of realism and beauty, while providing a safe launching ramp for small creatures. Close your eyes, bring to mind what you have seen in nature and use your imagination to create the perfect pond edge for your yard.

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**About the Author**

Anthony Archer-Wills is among the world’s foremost authorities on water gardening and is responsible for developing many of the techniques now frequently used in the construction of ponds and waterfalls. He launched his own pond and waterfall construction business and aquatic plant nursery in the mid-1960s. After completing several large rock and water projects for Wild Animal Safari Parks, Anthony progressed into teaching. He was subsequently invited by the Agricultural Training Board and British Association of Landscape Industries to train companies in all aspects of design, construction and aquatic plant management. Anthony went on to lecture at Kew Gardens, New York Botanic Garden, Chelsea Physic Garden, The Royal Horticultural Society and universities and training facilities in Europe and the United States. Besides taking part in several radio and television programs, including Animal Planet’s ‘The Pool Master,’ Anthony has written numerous scholarly books and magazine articles. His work spans Europe, Asia, North and South America, the Caribbean and the West Indies.

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This koi pond is incorporated around the architecture of the house, with a wide flagstone bridge leading to the front door. French windows lead out to small viewing terraces, enabling one to view the pond from different angles and tend the fish. Although seemingly complex, there are still only three edging types — rock, flagstone and plants. All the rocks and stones are set within the liner, which is right up against the walls of the house.

Caltha palustris (giant marsh marigold), and for striking contrast you could add Colocasia esculenta ‘Black Magic’ (elephant ear). Make sure the combinations you choose are suitable for your temperature zone.

The soil can be extended up from the planting ledge along a gentle slope to meet the surrounding ground. Water losses through the capillary action of wet soil wicking into dry surroundings can be minimized by including an inconspicuous coating of gravel along the apex of the pond rim. This seamless transition from water to dry land allows for a huge range of aquatic plants, from deep-water emergent to bog and moisture-loving subjects. The water’s edge can then become a magical place to explore. New shoots will rise pristine from the mud with successions of flowers throughout the season.

The pond will be enhanced with dragonflies, butterflies and amphibians. Great biodiversity in both flora and fauna will have been created.

**The Rule of Three**

Finally, when designing pond edges, try not to exceed three different types around the same pond. Just one type of edge would be fine for a formal pond, and it could be lawn, paving or even timber decking. However, with informal water shapes, many combinations are possible. Again, the combination of rock, lawn and pebble beach is effective. Timber deck, bog planting and wildflower meadow is also beautiful. Just two can work well, but don’t exceed three, or it will look fussy and more like a garden center exhibit!

A mossy log trailing down into the water can add a touch of realism and beauty, while providing a safe launching ramp for small creatures. Close your eyes, bring to mind what you have seen in nature and use your imagination to create the perfect pond edge for your yard.

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**About the Author**

Anthony Archer-Wills is among the world’s foremost authorities on water gardening and is responsible for developing many of the techniques now frequently used in the construction of ponds and waterfalls. He launched his own pond and waterfall construction business and aquatic plant nursery in the mid-1960s. After completing several large rock and water projects for Wild Animal Safari Parks, Anthony progressed into teaching. He was subsequently invited by the Agricultural Training Board and British Association of Landscape Industries to train companies in all aspects of design, construction and aquatic plant management. Anthony went on to lecture at Kew Gardens, New York Botanic Garden, Chelsea Physic Garden, The Royal Horticultural Society and universities and training facilities in Europe and the United States. Besides taking part in several radio and television programs, including Animal Planet’s ‘The Pool Master,’ Anthony has written numerous scholarly books and magazine articles. His work spans Europe, Asia, North and South America, the Caribbean and the West Indies.
In the May/June 2018 issue, I wrote about how pond fish carry various good and bad “bugs” at all times. As I discussed, we cannot sterilize a fish or a pond to rid them of these bugs. Our efforts in pond health management should be focused on building the strength of the pond fish so that their natural immune system can deal with potential pathogens. Maintaining a clean pond and filter system with routine water changes results in a lower bug count in the pond. Likewise, any medicine we use is also an attempt to lower the bug count to a level where the fish can acquire natural immunity.

An established population of pond fish will acquire natural immunity to its own world of bugs. It is prudent to make sure the pond and filter are clean before adding new fish. Always treat the whole pond preventively with a good parasite-type medicine upon the introduction of new fish. This preventive medicine keeps the bugs in check and gives the fish a chance to develop a natural immunity to a low bug count. This hobbyist protocol should be followed regardless of any previous quarantine, no matter how thorough the quarantine might have been.

The aim of quarantining is to confirm and build the strength of new arrivals while treating for potential pathogens at the same time. A proper quarantine can take two to four weeks or more, depending on the temperature of the water. The quarantine tank needs to be sufficiently sized with established biological filtration so the fish are not exposed to the additional stressors of overcrowding and poor water quality. An inadequate quarantine tank can actually cause more weakness and stress instead of building the fish’s strength. That being said, proper quarantine should be the goal of every fish dealer before selling to the hobbyist.

Salt Strategies

We have been importing Japanese koi for almost 30 years. We occasionally bring in domestic butterfly koi and have previously imported Israeli koi. In our facility, all new koi are kept separate from established koi and are housed in 900-gallon stock tanks with 150-gallon filter tanks. Koi are ideally stocked at three to five shipping boxes per 1,000 gallons. Koi from different farms are kept separate for two to three months. These tanks do not have any aquatic plants, and algae growth is minimal. One to two days before receiving the new koi, we remove all previous koi, clean the filters and make a 25 to 50 percent water change. We always add rock salt to between 0.5 to 0.6 percent, or 4 to 5 pounds per 100 gallons. The fish will remain in this salt level for a full two weeks, at which point we gradually reduce the salt back to zero with water changes.
Salt at 0.5 to 0.6 percent is the magic number. Maintaining this level of salt two weeks directly prevents the occurrence of parasites like Ichthyophthirius (“Ich”) and Chilodonella. But the main benefit of salt at this concentration is its role as a huge stress reliever. It helps the gills regain normal function. Excess mucus production in the gills is common in new arrivals due to the stress of shipping. This excessive mucus can interfere with the fish’s ability to respire and osmoregulate. Excess mucus in the gills is also a breeding ground for parasites like Trichodina and Costia and pathogenic bacteria, which feed on the mucus. The salt basically dries out the excess mucus, which helps to control some of these parasites.

During times of stress, the gills’ ability to osmoregulate is also impaired. The salt reduces the osmotic differential at the gills, which helps the fish to regain strength. Salt is not a cure-all, but it is a wonderful tool that, when used correctly, can be a great help to dealers in the controlled environment of their shops. This level of salt in a hobbyist’s pond could be disastrous if filled with aquatic plants and algae. Salt levels in ponds with aquatic plants or excess algae should never exceed 0.15 percent.

You will find that a 0.5 percent salt level is recommended in most Japanese books about koi disease. It must be noted that in the first few weeks of quarantine, we are using salt at 0.5 percent instead of a formalin-malachite green mixture, because the salt by itself treats many of the same parasites that the formalin-malachite green will treat. During the first 10 to 14 days, I am more concerned with the stress level of the koi and the function of the gills. It is not recommended to mix salt with formalin, because this combination can be too harsh. Keep in mind that neither the salt nor the formalin-malachite green will treat every possible bug, such as flukes. We always treat for flukes with a specific fluke medicine. As with most things, you must decide which treatment is the most appropriate to use at the time.

Quarantine Protocol

The day of the new shipment, we adjust the pH to 7.0 before adding the fish. It should also be noted that the water temperature should be above 60 degrees, and preferably 65 to 75 degrees. For the first two days, the koi are kept covered, with lighting subdued. Just let them rest; do not feed them. Observe their behavior and check for mortalities.

On the third day, inspect the koi more closely for outward signs of disease or pathogens, like raised scales, sunken eyes, listlessness, jumping or flipping, head or tail standing and fast gill movements. Typically we do not see many problems within the first three days, assuming the shipper did their part in preventive treatment. The koi are usually really hungry at this point, but I suggest light feeding. Odds are, they have gone without food since a few days before shipping, so their guts cannot take on a big load of food just yet.

On the fourth and fifth days, we dose with Chloramine-T at 10 ppm. The dose depends on pH and hardness. Chloramine-T works well with the salt and will further reduce excess mucus on the body and in the gills. This helps bring down the bacteria count in the water and acts as a bit of a sanitizer. This treatment is optional, but it can be very helpful, and it helps enhance subsequent treatments.

On Days 5 to 6, we dose with a fluke medicine. Gill and body flukes are very common and are resistant to medications. The mucus is so thick that it is nearly impossible to get a sample from the gills. Praziquantel and flubendazole both work well. Light feedings should continue.

Between the seventh and 10th days, feeding can increase. Look over all the fish for disease. It’s extremely important to take mucus samples from several

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Quarantine tanks should be established and stable ecosystems that are large enough to hold your new arrivals safely.

### Doses of Chloramine-T with Respect to Water pH and Hardness

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<tr>
<th>pH</th>
<th>Soft Water Dose (mg/l)</th>
<th>Hard Water Dose (mg/l)</th>
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Modified from Debuf, 1991
koi and study them under a microscope. By this time, a parasite that avoided the salt, Chloramine-T and fluke medicine will show up on the scope. If your salt was maintained between 0.5 and 0.6 percent, you should not see Ich or Chilodonella. However, you may still find flukes. Flukes will require a second dose during this period. If possible, take blood samples from each batch of koi and run a KHV ELISA test.

Note that parasites like Costia or Trichodina can be resistant to these medicines. These two potential pathogens are often considered commensal, meaning they are always present on fish but held in check by clean, stable conditions. They can grow out of control, especially in water temperatures below 65 degrees and in crowded, dirty water with low oxygen. If these parasites show up, correct any environmental problems and control this issue with potassium permanganate at 2 to 5 ppm.

Finally, during the last four days of the two-week period, treat with another dose of fluke medicine. If your koi look good at this point, the preventive quarantine treatment is finished. Wait for the KHV tests to come back, and assuming the results are negative, you can release the fish for sale. The total quarantine period is typically three to four weeks.

Tips to Remember

If you choose to use a formalin-malachite green medicine instead of salt during the quarantine process, you must treat every two to three days, for a total of five treatments over the 10-to-15 day period. This will take care of the life cycle of Ich, which is very common. Both fluke medicines mix very well together with formalin-malachite green and create a “double whammy,” which can be very effective. You only need to dose twice with the fluke medicine (five to seven days apart) for prevention. If you have a bad fluke infestation, you can dose up to four times every three to five days, depending on temperature. Always know your gallons within 10 percent to treat effectively.

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Never just assume your quarantine protocol is working. Always base your decisions on the condition of the fish and microscopic evaluation after daily observations. For example, if the fish are acting sick between the seventh and 10th days, you could have a fungal infection or a bacterial infection like columnaris. Either of these may be difficult to identify with the microscope, and symptoms can be confusing. The formalin-malachite green combination can be very helpful at treating bacteria and fungi.

These treatments and procedures have been very successful for me over the last 20 years. Rarely do we encounter problems with new fish, but we always stick to the protocol, no matter what. There may be no one best way to quarantine your new pond fish, so develop a protocol that works for you and stick to it every single time. You can still make changes based on daily observations and your findings using your microscope. A good microscope will save you lots of money over time. If you don’t have one, get one. It does not have to be expensive to be useful.

Don’t let being too busy get in the way of your trusted protocol. The one time you let your guard down and hope everything will be OK is usually when you end up running into trouble. Never just go on luck. As I always say, “Fifty-percent odds are great in Vegas, but not with koi!”

One of the problems when you are thinking about introducing fish into your pond is that you need to quarantine the fish to make sure they are healthy. There are many ways to do this, but the best way is by using a quarantine pond. A quarantine pond is a smaller pond that is separate from your main pond. This way, you can keep the fish in the quarantine pond until you are sure they are healthy, and then you can safely add them to your main pond.

Sunlight, warm temperatures and nutrients can combine to form the “perfect storm” of algae and clarity issues. Instead of enjoying your beautiful water feature, you may end up spending just as much time trying to keep water clear. One way to keep water looking pristine is to understand the variables that influence certain conditions.

The first is sunlight. All living organisms, especially plants and algae, need sunlight to survive and grow. If you keep fish in your pond, a good rule of thumb is 10 gallons of water for every inch in length of fish. If you get younger fish, they will grow quickly. You should have an aerator or a waterfall to provide circulation and to add oxygen into the water.

The second variable is temperature. Temperature naturally encourages growth and increases aquatic life activity. Once temperature raises, algae and bacteria come out of dormancy and begin growing. A good threshold for water temperature is 50°F. Warmer water does not hold as much oxygen as cooler water and can be concerning if algae begins to form the “perfect storm” of algae and clarity issues.

Using beneficial bacteria is very important for water quality. Nutrients come from several different sources, most from dead organic material (leaves, dead plants, dead algae) and from fish waste, uneaten fish food and lawn fertilizer run-off after rain.

If you find yourself in a never-ending battle with algae chances are one of these variables mentioned are out of balance. Keep your water feature as pristine as possible. Do regular “clean-outs” when the seasons change. Remove leaves, muck and other organic debris that collect at the bottom. Also remove algae that builds up and gets stuck onto rocks and the side/bottom of the pond. GreenClean® Granular or GreenClean®FX Liquid Algaecide are ideal. Both are organic and safe for fish and plants. Make preemptive treatments using smaller doses once or twice a week leading up to those times when algae is normally an issue.

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Using beneficial bacteria is very important for water quality. Beneficial bacteria are essential for consuming organic debris (leaves, muck, fish waste) and keeping a balanced ecosystem. Beneficial bacteria occur naturally in water, but it’s recommended to periodically “boost” their numbers. This can be done with GreenClean® Granular Liquid Bacteria® or GreenClean® Bacteria Tablets®.

For more information on a complete pond program, call BioSafe at 1.888.273.3088.

Three Factors for Improving Water Quality

By: Matt Larose, BioSafe Technical Representative

Sunlight, warm temperatures and nutrients can combine to form the “perfect storm” of algae and clarity issues. Instead of enjoying your beautiful water feature, you may end up spending just as much time trying to keep water clear. The best way to keep water looking pristine is to understand the variables that influence certain conditions.

The first is sunlight. All living organisms, especially plants and algae, need sunlight to survive and grow. Even if your pond is considerably shaded, algae can still grow and reproduce, even rapidly at times.

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Aquaponics refers to a system that grows fish and plants together. Plants use fish waste as fertilizer, and in most instances, they filter the water to provide good water quality for the fish.

This system is fascinating to a variety of people and groups — professional gardeners, aquaculturists, aquarium keepers, water gardeners, organic gardeners, tinkerers, engineers and anybody simply interested in using a safe source of homegrown food for their family. It is a system of choice for educators, as it covers all aspects of STEM education and holds the attention of practically any student. As a water-garden professional, you are probably intrigued as well.

The Skinny on the Systems

There are two basic types of plant culture systems: media beds and deep water culture. Media beds are just that — beds of gravel or clay pebbles where seedlings are planted directly. Water floods and drains in cycles, allowing the roots to experience a dry cycle with plenty of access to oxygen. Deep water culture consists of floating rafts with a grid of planting sites in constructed tanks approximately 12 inches deep. Aerated water flows through the tanks, and the plant roots dangling under the rafts pick up nutrients directly from the water. Deep water culture cannot tolerate the buildup of solids and must have filtration components to remove them before water enters the plant side of the system.

A well-functioning aquaponics system with a 300-gallon fish tank, filter and two 4-by-8-foot deep water culture plant beds should be able to produce 150 to 200 pounds of fish and 1,500 to 2,000 heads of lettuce annually. The seed-to-harvest time for the lettuce is in the 45-day range. A system with only clarifiers for filtration should be able to support 1 square meter of plant production for every 60 grams of feed, or about 2 ounces of feed for every 11 square feet of plant production. This ratio can be as low as 15 grams per square meter if you add a professional solids and nitrifying filter.

The Water Gardening Connection

In a similar approach to water gardeners, the aquaponic gardener often begins with a DIY project with cut barrels or a modified aquarium. After the fascination overflows, an investment is made in a larger scale of production. This familiar approach allows a hobbyist to learn the principles and management of aquaponics without getting too confused with technology.

We filter the water with plants, and the fish provide the nutrients. After all, gravel-filled bogs have been around much longer than skimmers and biofalls for effective filtration. While the water gardener grows an ornamental plant with a low-nutrient water source, the aquaponic gardener grows an edible product and aims toward much more nutrient-rich water. While water quality for our koi and ornamental goldfish may be the focus of our efforts with plant-based filtration, the focus is primarily on vegetable production in aquaponics, with fish serving as a nutrient generator.

Aeration

Aeration is a necessity, not a luxury. It drives the production of your plants and fish and serves as the oxidizing energy that transforms the fish waste into usable nutrients, keeping them safe for plants and fish in the system. In past years, aquaponics has depended on the circulation pump to...
provide aeration. Keep in mind, this is not a waterfall pump — it’s a smaller pump operating with a much slower rate of turnover. The latest technology partially or completely eliminates the pumps from the system, using airlifts to transfer the water, creating more thoroughly in the process. However, up sizing the air pump and providing air for deep water plant culture tanks can be a cost-effective upgrade from outfitting the system with airlifts.

Several new, clever adaptations have emerged to more efficiently use airlifts, with combinations of check valves and a low-head water pump. Bell siphons are a great piece of simple engineering that can rapidly drain media bed tanks after they fill to a maximum level, creating an automatic drain and fill cycle. It requires no electricity or pump, just good simple engineering.

### Decoupling Systems

The addition of a good filter can easily allow the two systems to operate separately as a filtered recirculating fish system and a hydroponic plant system. This has several advantages, but some enthusiasts will initially see it as a loss of magic in the system. Even though I think the magic is still there and just as dynamic, it does increase the chance of success dramatically.

Removing the wastewater from the recirculating fish system and transferring it to a completely different water system for the plants allows for several improvements. If you need to treat your fish with salt, for example, it will not be acceptable for your plant system and could never be used in a coupled system. Likewise, if you need to treat your plants for a pest, the contaminated water should not return to the fish tanks.

Fish and hydroponic plants desire different pH levels. To date, aquaponics has not produced much in the way of fruiting vegetables, because nutrient concentration has been kept low to accommodate healthy conditions for fish. Split the systems, and you can concentrate the waste from the fish tanks and adjust the pH for the ideal conditions for the

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plant roots, providing enough nutrients to produce fruiting vegetables.
Where does the water go? By transferring smaller amounts of concentrated filter water to the plant system, the entire volume of that water is completely consumed by evaporation and transpiration through the plant leaves. The only water that enters the system is added to the fish tank.

System Management

What about the solids in the media bed systems? Don’t they overwhelm them?
The answer is yes, unless you add red worms to the system to eat the sludge. They won’t drown as long as the system has enough oxygen in it. You commonly see this in streams and water gardens alike — earthworms active in the stream pockets or in a low biofilter, eating sludge. Aquaponics entrepreneurs have added these friends to media filters and discovered that not only do they consume sludge, but the castings left behind are also beneficial to plant production and do not degrade the water quality for the fish.

Quality aquaculture and koi feeds are made to be digestible and well balanced with respect to a variety of nutritional components, from protein to minerals. Specialized feeds have been designed to supply more than enough mineral components in the correct proportions to support quality fish growth. There will also be enough left over to supply to the aquaponic plant component of your system.

Configurations & Additions

Vertical towers are quite popular, despite some difficulties. Various designs include modified PVC with pockets and stackable, formed Styrofoam on a pole. Others produce plants in pockets as water trickles down from the top. Construction can be a hassle or expensive, with commercial units coming with a price tag of $8 per planting site. The latest in commercial towers provides a single tower with 100 planting sites, a practical installation and a dry-filled weight of 30 pounds, which costs about $3 per planting site.

Containment of the fish is relatively straightforward, with a few interesting adaptations. Drain and flow configurations are designed to remove solids. Since algae are not desired in any of the varieties of systems, keeping fish tanks covered or shielded from the sun is preferable. Sometimes the tanks have grates on top, acting as the floor in a greenhouse. This allows the space above for plant culture or other workspace.

If you plant to grow plants in a building without natural sunlight, or if you want to grow them in the winter, you will need artificial light. Before my latest research, I was quick to assume that LED fixtures were the last development in lighting. They do have a
A few months ago, I got a call from a gentleman named Roger who had just bought a house and wanted a pond in his backyard. He had kept fish before, but it was some time ago. Roger also wanted an in-ground spa next to the pond. His friend Jeff had created a dimensional drawing, and I turned it into a 3-D sketch-up drawing they could use for acquiring bids. He contacted some pool contractors, but he wasn’t satisfied with the results. The spa portion turned out to be more expensive than he had imagined, so he decided to eliminate the spa, install additional decking and spend money on making the koi pond as nice as possible. The pond needed to reflect the quality of his high-end neighborhood as well as maintain a high resale value down the road. Jeff, who was already in charge of the backyard landscape, decided to handle the pond construction.

Prepping the Design

The pond was going to be solid-filled block and rebar with polyurea as the waterproof coating. This changed the design from free form to one of two combined rectangles. The solid-filled block could be easily constructed, and the polyurea would ensure a long, leak-proof life. Wood decking isn’t very common in the desert because of the high level of maintenance necessary for it to survive the heat, but they wanted to use Ipe decking. I’ve seen Ipe on several jobs here in the desert, and it works well.

The main section of the pond is approximately 8 by 10
feet with a 3-by-4-foot area under the waterfall. At an average of 3½ feet deep including filtration, the volume should be just below 3,000 gallons. So a flow rate of 4,000 to 6,000 gph is a good range for the desert environment. We decided to use a 3-inch aerated bottom drain to a 55-gallon drum prefilter, a skimmer and a midwater drain as the suction components. The yard had limited space, so two 55-gallon drum upflow sand and gravel filters are hidden inside the waterfall near the back corner of the property.

The system is powered by a Wlim Wave 1 ¼-Horsepower pump, which flows approximately 6,000 gph at 9 feet of head. The sand and gravel filters use approximately ¼ feet of head to operate, making this pump more than adequate for the job. I used my 3-inch aerated bottom drain with the flush-mounted, 5-inch air diffuser fed by a Pentair Aquatic Eco-Systems V-301 air pump. This is a great setup for small ponds, and the flush-mounted air disc doesn’t protrude above the bottom drain dome.

Two sides of the pond are edged by the deck with a short overhang. The side opposite the house is landscaped with a Buddha statue, so an edge-mounted skimmer would not have been very attractive in the small space. I mounted one of my Aqua Niche skimmers just inside the decking in the corner, and the midwater drain is directly opposite, about 1 foot off the floor.

Drumming it Down

A 3-inch bottom drain will operate with a 55-gallon drum chamber for the prefilter. I would regularly spec one of my static prefilter kits, because there isn’t much else out there in terms of prefilters for smaller ponds. In this case, I tried something different. I’ve had great results with my radial separators with the 9-inch floating weirs on larger ponds. The larger, 500-gallon versions can flow up to 20,000 gallons per hour but aren’t practical for small projects, so I developed a smaller, 55-gallon drum version. The radial separator also eliminates the need for a buried knife valve. An old-school standpipe is used for water shut-off from inside the tank.

Water enters from the pond bottom drain through the side of the tank and is diverted upward as it travels to the top of a smaller cylinder in the center of the larger radial separators. The circular weir outlets surround the center cylinder on the larger versions. For the 55-gallon drum version, the inner cylinder is offset to one side to allow enough room for one circular weir outlet. The inner cylinder is open at both ends and reaches 1 or 2 inches above the water level at its top. Water entering in an upward direction in the inner cylinder reverses its flow near the top and slows down as it travels downward. When the water reaches the lower edge of the inner cylinder, it reverses again and flows upward toward the outlet. With each reversal of flow, the water slows down significantly, shearing the heavier particles off and allowing them to fall to the bottom of the main tank. This action pulls them out of suspension passively with no moving parts.

The cleanest water exits the

Top to bottom: The block shell was sealed with polyurea. The 3-inch drain line to the 55-gallon radial separator was installed. The 55-gallon biofilters are positioned on the slab. Finally, the block shell and floor are prepped with Bond-Kote.
Kent Wallace was born and raised in Las Vegas. Kent spent most of his adult life in the automobile industry at independent shops and dealerships, including his own shop as a racecar fabricator at age 24. Then in 2001, a neighbor asked Kent if he could build her a koi pond like the one Kent’s father had. From that point on, pond building became his new passion. That first pond he built was submitted to Better Homes & Gardens magazine and won Best Courtyard Nationwide in their special-interest publication.

Ease of Maintenance

The outlet side of the plumbing in this system is divided into four runs. Two 1 ½-inch lines connect to the upflow sand and gravel filters. At 22 ½ inches in diameter, these filters should not flow more than 1,800 gph for optimum trapping ability. Above that, the sand layer will start to fluidize, so the balance of 6,000 gph will be returned to the pond through one 1 ½-inch current jet near the pond floor below the Buddha, and one ¾-inch return in the small pool below the Buddha. This allows the filter flows to be easily adjusted, and the return jets can operate as a diversion for water when cleaning the filters without shutting off the pump.

When laying out a set of filtration equipment for a client, my goal is water quality and ease of maintenance. This prefilter has a 3,500-gph discharge pump that sends water to a 2-inch drainage line around the garden. The biofilters have discharge lines that connect to the garden drain line and are cleaned with an air blower that churns up the media and dislodges the collected detritus. Other than cleaning the skimmer basket, there is no reason to get wet or pull anything out during maintenance.

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Matala Ez-Air (MEA) Lake Pro Kits

Matala Ez-Air (MEA) Lake Pro Kits are the ideal solution for aerating your lake or deep pond. These kits come with all the accessories required to completely aerate any sized lake, ranging from 1/4 acre to 4 acres. Eight sizes are available for deep ponds, from 5 to 40 feet deep.

For more information on the MEA Lake Pro Kits, visit www.matalusa.com.

Airmax Announces Pond Logic WipeOut Herbicide

Airmax is pleased to introduce the newest addition to its Pond Logic pond and lake treatment line, Pond Logic WipeOut. EPA-registered WipeOut is an easy-to-apply, fish-safe, systemic herbicide used to control persistent pond weeds all season.

WipeOut can control even the most persistent pond weeds all season long. It controls floating, submerged and immersed pond weeds, including duckweed, lily pads, hydrlillas, watermilfoils, coontails and many more. WipeOut works by slowly starving plants of nutrients, ultimately preventing rapid oxygen depletion and fish kills. Just 7.7 ounces of WipeOut™ will treat up to ¼ acre with a single application.

Applications are easy with WipeOut. Just shake before use, mix WipeOut™ with water in the included mixing container and pour the mixture into the pond. No sprayer is required. Also, there are no restrictions for swimming, fishing, boating or livestock use.

Since the product’s introduction last month, the industry has been buzzing about WipeOut. “I’m thrilled that Airmax has finally come out with a whole-pond, easy-to-use, aquatic herbicide that is profitable for my customers,” said Randy Stewart at Unit Liner. “I think we’ll sell a ton of it.”

WipeOut™ is available in two sizes; 4 and 8 ounces.

For more information about Pond Logic WipeOut or Airmax Inc., visit www.airmaxco.com or call 866/624-7629.

Clear Pond Products Makes a Move

Since 1978, Clear Pond Products has been developing mixtures and solutions to help clear your pond of unwanted debris, algae and unappealing water colors. The company recently underwent a management change and moved its headquarters to Wheeling, Illinois. However, its products and formulas have not changed in the slightest.

Clear Pond Products has continually strived to improve its impressive line of products made up of natural microbes. Whether you are a koi pond hobbyist, a water gardener, a breeder or a farmer with a two-acre pond, Clear Pond has the right product for you. Depending on your pond’s needs, the company’s variety of products has the common goal of making your pond clean and clear. Whether you are using “Quick Fix” to clear the unwanted debris off your rocks and waterfalls or “Beneficial Bacteria” to jump-start your pond’s ecosystem, Clear Pond offers an affordable line of products to clean out your ponds—no matter your walks! All products are safe for aquatic life, pets and humans, and have always been proudly made in the United States.

For more information, contact Jordan@clearpond.com, or call 224/735-7528.

Blue Thumb Introduces the Sunrise Onyx Fountain

These hand-sculpted fountains are lit from within and are a beautiful addition to any landscape project. They are available in a triple set and come complete with the molded basin reservoir and everything you need for professional installation. Stand out by offering professional-grade fountains from Blue Thumb.

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EasyPro’s Pond Tents Redesigned

EasyPro Pond Products of Grant, Michigan, has redesigned its pond tents to offer a larger size and a zipper for easy access. The larger, 13-by-17-foot tent will cover your pond as well as any landscape or garden area that needs to be protected. A zipper has also been added based on customer feedback for an easy access point to the inside. This tent is marketable to pond or garden owners who need extra protection from wildlife or mother nature. It can be easily set up in a few minutes with just two people.

For more information or to request a full-color catalog, contact us at 800/448-3873 or easypro.com.

New WaterWall Spillways from Atlantic Water Gardens

Atlantic Water Gardens has finally simplified the design and installation of water walls and water curtains. The WaterWall Spillway is an attractive, enclosed weir that distributes water onto any vertical fascia. Set the WaterWall on top of any masonry or wood-framed wall and plumb it to a pipe hidden inside the wall. With enough clearance between the inlet and outlet to handle any fascia up to 2 inches thick, the WaterWall Spillway delivers a smooth, evenly distributed sheet of water across 24 inches of drooped or vertical wall. Set multiple units end to end to create water walls of any width in 2-foot increments.

For more information, contact Atlantic Water Gardens at 330/274-8317 or info@atlanticwatergardens.com. Also feel free to visit www.atlanticwatergardens.com for a full list of product offerings.

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For more information, contact Jordan@clearpond.com, or call 224/735-7528.
Scotts Water Fountains provide the aesthetics and sounds of cascading water as attractive additions to any pond or lake. Beautify your pond while stimulating a healthy environment.

Scotts also offers multiple lighting packages to illuminate your water feature at night, including high-quality, underwater LED and halogen lighting systems. All lighting systems are energy-efficient and designed for years of carefree enjoyment.

UltraClear specializes in products for treating farm ponds, lakes and decorative goldfish and koi ponds. It features biological solutions that are safe for fish and wildlife, along with chemical treatments designed to safely clean and clear ponds and waterfalls.

The UltraClear Muck Digger is a convenient, cost-effective solution for treating sludge and muck in all pond sizes. Its easy-to-apply tablets restore water clarity and quality. Oxy is an effective, oxygen-based solution for cleaning and removing debris from rocks, waterfalls and fountains. Watch as it oxidizes unsightly debris on contact. The UltraClear Pond Clarifier naturally improves water clarity and quality, reduces organic waste and seeds biological filters. This is ideal for pond startups and maintenance.

For more information, visit www.universalpondsupply.com or call 888/236-8621.
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Turtles and tortoises are the planet’s most endangered vertebrates, and the Turtle Survival Center is the last hope for some of the rarest species. Our goal is zero extinctions, so we try to simulate their natural habitat. To do so, we need water pumps that can handle the murkiness of the job. The Little Giant® F-Series pumps meet all my needs. They are energy efficient, ideal in almost any application, easy to clean, and environmentally safe.

Nathan Haislip
Facilities Manager and Lead Keeper
Turtle Survival Center