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# growing guide

## Ponds/ Water Gardening: Algae

Algae, is the number one most frustrating part of pond keeping.

Our most frequently asked question about pond keeping is **"how do I get rid of algae in my pond."** Our typical response to this is that **"you don't, you can only manage it."**

The next question is: **"How do I keep my pond looking good?"** Generally, the response to this question is by **"balancing"** your pond. OK, so what is "balancing?"

Many of us have heard the old saying **"nature abhors a vacuum."** This means that any space or niche in your pond will be filled with a plant, algae or otherwise, if you do not do so first. Algae is simply a very basic form of plant life, it responds to two things in order to grow, light and nutrients. Algae are very diverse, they come in many colors and forms, and they survive anywhere. Here are some practical tips to use to control them.

- String type algae are beneficial, and a sign of a healthy pond. Do not attempt to eradicate them entirely as they are both filter and food for your fish.
- Koi over **10"** will graze greedily on string algae, and possibly your plants as well.
- By not overstocking with fish, you will limit fish waste, which is algae food.
- Do not overfeed your fish; excess food just grows algae. However do fertilize your plants with a pelletized fertilizer.
- Cover at least **70%** of your ponds surface with plants that will provide shade, lilies, lotus, etc.
- Use dry or liquid bacteria, they will clean your pond and compete with algae for nutrients, greatly reducing the

algae's presence.

- Allow your pond no more than 6 to 8 hours of direct sun; plant a small tree nearby for shade if needed.
- Expect algae in early spring and late fall as filter bacteria become dormant
- Stock Japanese trap door snails, they eat algae; not your plants
- Utilize oxygenating plants such as hornwort or cambomba to directly compete with algae for nutrients. Oxygenating plants really do nothing to *oxygenate* the water; they use almost all of the oxygen they produce during photosynthesis in the daytime at night during respiration. A net gain of 1% or less of oxygen may happen during 48 hours.
- A properly functioning filter system is essential. Do not skimp on this part.
- Keep your pond as free as possible from decaying organic matter lying on the bottom, this means more algae food.
- If you must , overstock on plants and not on fish
- Algaecides. We recommend against these. They hurt plants, ruin your balanced pond and make your pond dependent on them. As each generation of algae is killed off, the next generation that appears one week later will be fed by the last, and be even more vigorous.

**Relax.** When implementing all or just one of these strategies you probably will not see instant results, however your patience will be rewarded by a balanced ecosystem that dose not need the constant fussing that another pond may need.





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## Ponds/ Water Gardening: Basics of Water Gardening

### Location

Open area: 6 hours of high levels of sun

1. Full sun is necessary for optimum bloom of lilies and other full sun plants.
2. Provides perfect environment for algae growth unless sufficient filtering, surface cover, and adequate number of submerged plants are included in system.
3. Can lead to low levels of oxygen at times of high temperature unless fountain or waterfall is provided.

### Partially Shaded: Min. 4 hrs sunlight

1. Gives wildlife relief from intense sun.
2. Cuts down on algae growth.
3. Can be susceptible to leaf fall, root damage and organic build-up. More maintenance required; i.e. surface skimmer, more filter cleaning, etc.
4. Provides a cooler place to linger and enjoy your pond.

### Water Conditions

pH levels: Range 6.5 to 8.5; 7.5 optimum It is unnecessary to adjust unless level exceeds 8.5.

#### Ammonia levels:

- Oppm - sign of well balanced system
- Oppm - tolerable, but test frequently
- Oppm - immediate water change of 25% - 50%; check bottom of pond for excess organic build-up.

#### Dissolved Oxygen:

1. Major sources of dissolved oxygen are photosynthesis and diffusion, movement of O from high levels of concentration (air) to low levels of concentration (water)
2. Dissolved oxygen is the leading cause of stress for fish.
3. Maintain levels of 5mg/l or greater for optimum fish health. 2mg/l will result in death of fish.
4. Oxygen levels decrease with higher temps. Remedy: Increase water surface with use of a fountain, waterfall, bubbler, or some kind of upward water movement.

### Dechlorination:

Upon filling your pond either add appropriate amount of dechlorinating agent or let the water set for at least two weeks before adding fish to allow for escape of chorine.

### Materials

Pond liners:

Pre-formed liners:

- Set in sand to resist heaving

edge and resist UV breakdown.

EPDM rubber liner:

- Will accommodate any size and shape
- Sand at base of excavation and underliner required to resist root interference and cushion against puncture from upper side.
- Coping stones to cover edge or liner and give finished look to pond.
- Both are resistant to UV rays, the primary reason for liner failure, as long as the pond is kept filled or shaded, covering all liner surfaces.
- Always use some stones in bottom of pond to increase surface for colonization of beneficial bacteria and to hold liner in place. Avoid use of lime based stones such as flagstone - they will make it impossible to keep the pH level within a safe range.

### Stocking Levels

For every 1-2 Sq. ft. of surface -

2 bunches submerged plants, 6 stems

2 inches of fish up to 6 inches or 1 inch/ 5 gallons of water

For every 3-6 sq. ft of surface area -

One marginal plant and one floater

One water lily

- Number for submerged plants are essential minimum
- Number for fish are absolute MAXIMUM
- Number for floaters and marginals can be adjusted either way by 50%.

Surface coverage: Make adjustments according to your own needs

100 sq. ft. surface areas and less - 60% - 70% cover

1000 sq. ft. surface area - 50% cover

### Calculating Pond Measurements

For size of EPDM pond liner:

Length = max. length + 2(depth) + 4ft.

Width = max. width + 2(depth) + 4ft.

EXAMPLE: 10' X 8'

$10 + 2(2) + 4 = 18$

$8 + 2(2) + 4 = 16$

18' x 16' liner

The 4' measurement refers to a 2' overhang on each edge (ground surface level).

Pond Surface:

Length x width = sq ft of surface (any pond shape but circular)

$3.14 \times (1/2 \text{ diameter} \times 1/2 \text{ diameter}) = \text{sq ft of surface - circular pond}$

For cubic foot volume:

Length x width x depth = cubic feet

Capacity in gallons:

Cubic feet x 7.8 = gallons

The worst attack of green or brown algae a pond faces is the murky period after you first fill and dechlorinate your pond. It begins within a week and grows denser by the day. A pond started in spring usually clears in six to eight weeks, especially if the pond includes the requisite number of plants and a biological filter. A well stocked pond begun in hot weather occasionally stays murky for more than eight weeks. Once the water clears up, it should stay clear except for a brief murky period each spring. Algae respond more quickly to the warmth of spring than do other plants competing with it for nutrients. In established water gardens, the algae gets a head start a week or two after warm weather wakens the pond and lasts a few weeks. Then the submerged plants, water lilies, ornamentals and bacteria colonies outstrip the algae in taking up nutrients and the greenwater algae lose out. Algae are one of nature's contributions to the ecosystem that you have created. Borne on the wind by invisible spores, algae grow wherever they find light, warmth, nutrients and water.

There are three types of algae: The filamentous type that mosses the sides of the pond and the rocks with deep green fuzzy stems - this is beneficial type that provide oxygen, take up nutrients (\*that feed algae) and make the pond look more natural. The second type occur in long strings that may, if not physically removed, clog the filter or die and sink to the bottom, creating an overload of organic mater in the system. The third type, unicellular algae, is the principal maker of murk. Some is visible and some invisible to the naked eye, but it gives the pond a green or brown cast and is unwanted by most pondkeepers. Providing a balanced ecosystem in the pond will keep algae at bay and provide clear water in which your favorite fish and other wildlife — frogs, butterflies, turtles, birds —can make their home and provide endless enjoyment for you.

### **Filtering Your Pond**

Biological filtration:

This brings us to filtering naturally by means of a man-made system. A bit of an oxymoron, but it's possible.

Nature provides all of the components to support life in an aquatic environment and on its surrounding banks. Along with this, the water remains clear, as long as pollutants are not introduced, and the ecosystem thrives on its own.

When we build a pond, we create and maintain an artificial ecosystem. One of the main components of the system is a biological filter. The filter consists of a tank (size suitable to the water capacity of your pond), mounted outside the pond, filled with spun media, rock, brushes, etc., to provide greater surface area for beneficial bacteria

end of the pond by way of flexible plastic tubing into the lower level of the tank and allowed to rise to the top, though the media, spilling back into the pond, to be recycled continuously. The bacteria living in the media change the toxic organic waste (nitrates) for the plants. If enough plants are provided, especially submerged plants, they will consume the nitrates, leaving insufficient amount for algae growth. RESULT:Clear water!

The bacteria occur naturally and increase their colonies as the water warms in the spring and summer. However, you can enhance the number of bacteria by manually seeding your system with commercially available bacteria. Liquid live bacteria held in suspension with a shelf life of one year are readily available. Introduce according to directions on the label.

The biological filter needs cleaning once a year in the fall when it is time to shut down the system for winter.

### *Mechanical Filtration:*

Small ponds (less than 300 gallons) can thrive by means of a submerged filter box attached to the pump that is also at the bottom of the pond. It is either filtered with sponge, media or pea gravel and needs frequent cleaning. Daily cleaning is necessary when algae bloom is at its height. This system can also benefit from manual bacteria addition.

### **Pump Requirements**

#### **Mechanical Filtration Systems**

Water needs to be recycled once per hour. So if you have a 200 gallon pond you would need a pump that has a capacity of 200 gallons per hour.

#### **Biological Filtration System**

Water should be recycled once every 2-3 hours. The slower movement allows the bacteria in the system to do its job.

### **Pump Capacity**

Pump power is measured in amps, but is sold in gallons per hour. Your pump requirements, however, depend on the distance and the height that the water needs to be pumped and the size of the tubing used to attach the pump to the filter, fountain or other water feature. Pay special attention to the specifications printed on the box.

Usually the pump capacity is based on pumping ten horizontal and one vertical foot, using tubing that fits the pump output. If your needs are different than these, the rule of thumb is – ten feet horizontal = one foot vertical. Increase or decrease of either distance, height or size of tubing changes the specs and should be adjusted according to your needs.





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## Ponds/ Water Gardening: Perennials as Water Plants

Here are a few common garden perennials that will thrive in damp, soggy, or wet soil conditions in and around your water garden. All are in our perennial section at Hoerr Nursery. Often times repotting these plants into a suitable media for water gardening may be necessary, as our standard mix for terrestrial perennials is primarily composed of bark (this would float away!) Most pond plants do well in an even mixture of silty clay loam soil, and sand. Be certain to use a pot suitable for water plants as well, these are designed not to leak any soil into your pond like standard pots will.

For fertilizing, fertilizer pellets designed for aquatic plants work very well for most perennials when used once a month.

Be certain to give these plants time to acclimate into their new homes, do this by lowering the plant into the pond until the crown of the plant is just above the water surface, gently lower to desired depth over the next three to four weeks.

### **Chelone lyonii**, Turtle Head

A good choice for the partially shaded border, or background. Don't plant this one very deep in your pond, preferably keep its crowns just at or above the water line.

### **Lobelia spp & hybrids**, Cardinal Flower

Excellent as backdrop plants in the water garden. These plants attract both hummingbirds and butterflies. Try pairing these with Swamp Milkweed to attract more butterflies to your pond. These will tolerate a little bit of water over their crowns, but not much. Beware of snails on these plants, they are every bit as fond of them as terrestrial slugs are!

### **Equisetum hymale & scorpoides**, Horsetail Reed

These plants are renowned for their

vigorous nature. Horsetail can be used in water over its crown, if it is adapted to it very slowly over several seasons. *Equisetum fluviale*, Water Horsetail, is much better adapted to aquatic culture than *E. hymale*. Use *E. scorpoides*, Miniature Horsetail, as an edging plant. It does not tolerate water over its crown either.

### **Physostegia**, Obedient Plant

Can make a good ground cover; apparently took some lessons from the mint family. Prefers damp to wet soil, doesn't like water over its crown.

### **Asclepias incarnata**, Swamp Milkweed

An excellent choice to use for attracting butterflies to your pond. Place plant crowns at water level, or just above it.

### **Lysmachia nummularia**,

Creeping Jenny  
Use this as a groundcover around your pond, happily it roots into the water as well.

### **Iris siberica**, versicolor, ensata, crestata, lavezata, pseudocourus, and all varieties included under the Louisiana group

All of these adapt very well to aquatic culture, and are well suited for bare rooting into your pond as they are not terribly aggressive. These plants can tolerate up to 6" of water over their crowns.

### **Lythrium**, Loosestrife

**Beware of this one!** This plant is the definition of invasiveness. Seedless varieties are available, but don't be lulled into a false sense of security. Be a gardener with a conscience, **AVOID** this plant

### **Houttuynia cordata**,

Hoot'n Annie.  
Plant this in about 1-2" of water and watch out! Makes an excellent

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shallower areas of your pond. Can be rather invasive; do not plant this in any area where it may escape.

**Ranunculus repens 'Buttered Popcorn'**

A great plant for the borders and shallow areas of your pond. Very prolific; may require thinning. Unusually variegated gold and green foliage brightens and adds interest to the garden.

**Annuals:** Ruella, Impatiens, Fiber Optics, Rush, Coleus, Canna and Caladium. Use these for seasonal interest only. Most prefer shallow water, however Canna adapt well to water over 6" deep. When utilizing Canna as a water plant, be certain the type of Canna you choose is adaptable to water as there are several distinct species. The Longwood Hybrids Canna offer the best tolerance to water.

**Ligularia, Golden Ray**

This plant needs constantly wet to damp soil. Use this one in the border or as an accent plant. May need some winter protection in zone 5 and above.



# Ponds/ Water Gardening: Selecting the Right Plants

**Floating Hearts:** Two plants with heart-shaped leaves; water snowflake (*N. indica*) and water fringe (*N. peltata*). The first has 8-inch leaves and fringed white flowers with yellow centers, the second has 4-inch leaves and all-yellow lacy flowers. Planting depth: 6 inches.

**Water Hawthorne:** Four-inch oblong leaves. Spikes of tiny white flowers in winter or spring; fragrant. Takes some shade. Dormant in hot summers. Planting depth: 4 to 18 inches.

**Water Hyacinths:** Unlike familiar water hyacinth (*E. crassipes*) below, this one does not have inflated floating stalks. Flowers are purplish blue with a peacock eye in each center. Planting depth: 6 to 8 inches.

**Water Lilies:** Queens of the water garden. Summer-fall bloomers; waxy flowers in all shades of the rainbow. Hardy kinds will take coldest winters; tropicals are for mildest areas or summers only.

**Duckweed:** Rapid-spreading colonies of tiny bright green leaves. Fish feed on tender young roots. Watch this one-it can easily become a pest.

**Water Fern:** Floating clumps of plants with tiny waffled leaves that turn rusty scarlet in fall. May become a pest in warm areas.

**Water Hyacinth:** Inflated leaf stalks and erect leaves are pale green. Thick clusters of violet flowers with yellow centers on erect spikes. Confine it for best growth and to prevent weediness.

**Water lettuce:** Miniature (6 inches) velvety lettuces for sun or part shade. Long feathery roots.

**Anacharis:** Dark green ferny whorls. Grows vigorously. Plant at least a foot deep, or weight with lead anchors.

**Cabomba:** Glossy green, seemingly frayed fans on green or red stems. Easy.

**Eel Grass:** Long, flowing, ribbon like leaves. Hardy, but dormant in the winter Northwest.

**Miniature Sagittaria:** Dark green ribbon-shaped leaves about a foot long. Good in wide, shallow ponds.

**Parrot's Feather:** Feathery yellow-green leaves rise somewhat above water at tips, take on red cast in fall.

**Arrowheads:** Large arrowhead-shaped leaves reach up to 3 feet. *S. Yagittifolia* 'Flore Pleno' bears spikes of white double flowers all summer. Hardy. Planting depth: 6 inches or more.

**Azure Pickerel Weed:** Three foot stalks with spear headed leaves. Summer flowers are azure to violet blue. Very hardy. Planting depth: 3 - 10 inches.

**Cattails:** Familiar rushes with long, flat, sword shaped leaves, brown "tails" (actually flower heads) borne on stout spikes. Hardy. Planting depth: 1 - 6 inches.

**Cyperus:** Includes papyrus, with giant pom-pom heads on 8 foot stalks, and umbrella plant with graceful canopies atop 4 foot canes. In the Northwest, take cyperus indoor during the winter.

**Horsetail:** Vigorous, spreading plants with crunchy 4-foot stalks that appear leafless. Grow in pots to contain aggressive habit. Many species and varieties of iris for the water garden, mostly sold by color. Some hardy. Planting depth: 0 to 4 inches.

**Lotus:** Huge shield shaped leaves stand above the water; big bowl shaped flowers stand even higher. Planting depth: 2 - 12 inches.

**Marsh-Marigold:** Hardy clumping bog plant with heart-shaped leaves, golden buttercup-like flowers in midspring to early summer; 1 foot or more high. Planting depth: 0 to 1 inch.

**Taro or Elephant's Ears:** Tropical bog plants with huge leathery leaves, golden butter cup like flowers in midspring to early summer; 1 foot high or more. Planting depth: 0 to 1 inch.

**Water Chestnut\*:** Rush like plant with edible tubers (see article on page 236). Planting depth: 2 inches

**Water Poppy\*** Creeping water plant with round, dark green leaves. Bright yellow "poppies" appear from early summer into fall. Good for tub gardens. Planting depth: 2 to 4 inches.

**Perennials**

Iris  
Hosta  
Primrose  
Daylily  
Loosestrife  
Astilbe  
Ferns  
Globeflower  
Mint  
Agapanthus  
Grasses  
Poppies  
Feverfew  
Coralbells  
Canna  
Crocsmia  
Goatsbeard  
Spiderwort  
Watercress

**Landscape Plants****Trees**

Japanese Maple  
Flowering Crabs  
Pine  
Weeping mulberry  
Birch  
Dawn Redwood  
Weeping Higan Cherry  
Canadian Hemlock  
Service Berry  
Redbud

Boxwood  
Mahonia  
Barberry  
Rhododendron/Azalea  
Prunus  
Hydrangea  
Dogwood  
False Cypress  
Contorted Hazelnut  
Burning Bush  
Fothergilla  
Witch Hazel  
St. John's wort  
Juniper  
Weeping Hemlock  
Weeping White Pine or Spruce  
Arborvitae

**Groundcovers**

Ajuga  
Bearberry  
Blue Fescue  
Sweet Woodruff  
Lilyturf  
Wintercreeper  
Ivy  
Creeping Thyme





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## Ponds/ Water Gardening: Watergarden Plants for Shade

Many of us have set up a water garden unaware that we were positioning it in too much shade, then were heartbroken to find out that most of our favorite plants would not thrive in that environment.

Regret no more, here is a list of plants to brighten the gloomiest of puddles!

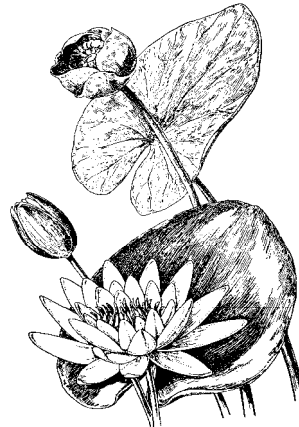
Information in this article was borrowed from an article in **Water Gardening Magazine**.

### Tropical Plants

- Water Leather Fern
- Spider Lily
- Miniature Umbrella Palm
- Water Snowball
- Water Poppy
- Water Snowflake
- Water Lettuce, *Acrostichum danaeifolium*
- Crinum Americanum*
- Cyperus alternifolius* var. *gracillius*
- Gymnocoronum spilanthoides*
- Hydroceleys nymphoides*
- Nymphoides aquatica*
- Pistia stratioides*

### Hardy Plants

- Sweet Flag
- Water Hawthorne
- Elodea
- Horsetail
- Pennywort
- Creeping Jenny
- Water Clover
- Parrots Feather
- Spatterdock
- Flamingo Water Parsley
- Golden Clubs
- Bog Arum
- Lizard's Tail
- Water Parsnip
- Acorous calamus*
- Aponogeton distachyus*
- Elodea
- Equisetum fluvitale*



- Hydrocotyle umbellata*
- Lysmachia nummularia*
- Marselia* spp. (not *mutica*)
- Myrophyllum aquaticum*
- Nuphar* spp.
- Oenanthe javinica* 'Flaming'
- Orontium aquaticum*
- Peltandra virginica*
- Saurus cerrauus*
- Sium suave*

### Lotus & Waterlilies Tolerant of Partial Shade

#### Lotus

- Angel Wings
- Hindu

#### Tropical Lilies

- Albert Greenburg
- Dauben
- Panama Pacific
- Texas Shell Pink

#### Hardy Lilies

- Arc en Ceil
- Carolina Sunset
- Hermine
- Indiana
- James Brydon
- Virginia

Visit the Pond area at Hoerr Nursery to see many varieties of shade tolerant plants as well as other ideas to keep your pond looking its best!

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## Ponds/ Water Gardening: Spring Start-Up Steps

With the onset of spring weather now is the time to get outside and begin to prepare your water garden for another successful season. Your pond has been dormant all winter and needs a little care to make it beautiful again. The following steps may be helpful to you in getting your water garden into shape.

1. Walk around and inspect your pond, make any repairs as needed.
2. Remove dead leaves and debris that have accumulated in the bottom of the pond. A 15% to 25% water change over a few days to eliminate the dissolved organics built up over winter is beneficial.
3. Start up water changes per above (or any water changes), need to be treated with a water conditioner such as Stress Coat or Aqua Safe to remove harmful chlorine or chloramines from the tap water.
4. Clean out and start up the filtration system. Beneficial bacteria can be added to keep the pond naturally balanced.
5. Ammonia and nitrite are the major causes of fish loss in ponds. Pond test kits offer a quick and accurate way to evaluate pond water quality and stop problems before they occur.
6. Check fish for infections, torn fins, ulcers and open wounds that may develop after a rough winter.

7. Your fish may start looking for food as the temperatures warm up. Feed with a low protein, high-carbohydrate, vitamin-enriched diet when water temperatures are about 45° F to 70° F. Pond salt may also be beneficial to provide your fish with essential electrolytes. Pond water can be tested with a salt level test kit.

8. Pond plants should be divided and repotted. Plant food tablets should be added to pots to provide the essential nutrients. Liquid food or tablets can be added when floating plants such as water hyacinths and water lettuce are added to the pond.

A build-up of sludge and dissolved organics reduces the oxygen level and creates a breeding ground for disease-causing bacteria. Keep your water clean and clear!





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## Ponds/ water Gardening: Tropical Marginal Aquatic Plants

A water garden isn't ever quite as striking as it could be if tropical plants aren't present. Most tropical plants are exotic to those of us in the northern hemisphere; often they have just the right look to make your water garden setting more unusual. Here are some suggestions for care and use of these plants, and some info on how many of them can be successfully overwintered.

Tropical marginal plants are not reliably hardy in our area. The term "marginal" refers to the plant's habit of growing along the margins of lakes and streams. Planting depth for these plants is always figured from the crown of the plant to the surface of the water. The crown is the portion of the plant in which the roots and stems divide. Marginal plants as a rule are very tolerant of fluctuating water levels.

For ease of care it is best to leave your tropical plants in their pots when introducing them to your garden pond. This makes it easier to remove them when winter comes and warmer quarters are needed.

Fertilizing your tropical plants is necessary. In fact most tropical plants are actually heavier feeders than their hardy cousins. Feed your tropical plants with pelletized aquatic plant fertilizer every 3 to 4 weeks during the outdoor growing season. You can find this at Hoerr Nursery.

Wintering many tropical plants is very easy. Taro, umbrella palm and most other papyrus species make wonderful, albeit large houseplants. Keep them in an extra deep saucer over winter. Given a sunny south facing window, and plenty of water, they will do fine.

Aquatic canna are also easily overwintered. This is accomplished exactly the same way as terrestrial canna are.

Floating plants such as water hyacinth and lettuce are very difficult to overwinter; it's best to consider these as annuals.

Move tropical aquatic plants outdoors when all danger of frost is gone. To be safe, wait until nighttime temps are at least in the 50s for some sensitive species. Tropical floaters (hyacinth and lettuce) are easily damaged by temperatures below 50°. Plants such as umbrella palm and taro however will come through a cool night unscathed.

Here are some of our favorite tropical water plants.

**Copperleaf**, *Alternanthera renekii*  
Purplish bronze-green leaves make this an outstanding plant to use for contrast. Plant in full sun for the best color. will grow in water up to 3" deep. May spread horizontally over the water. Grows 2 to 6 inches high. Overwinter this plant as a houseplant in a very sunny window.

**Canna**, *Canna x 'Longwood Hybrids'*  
Several striking foliage forms with gorgeous, abundantly produced blooms. Grow these in full sun, in no more than 3 or 4 inches of water. Canna can grow 36 to 72 inches high. Overwinter your aquatic canna as a tuber, just like its terrestrial form.

**Taro**, *Colcasia sp.*  
Huge elephantine-shaped leaves to 3 to 4' long, plant grows 24 to 72 inches high. Available in several different leaf colors. Tolerates shade very well, as well as full sun. Grows in water up to 6" deep. Overwinters as either a tuber or a houseplant. Used by native Hawaiians to make poi.

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**Umbrella palm, *Cyperus alternifolius***

A very popular and easy to grow plant. There are several varieties that will suit any size of pond. This plant grows best in water up to 4" deep, and tolerates shade well. Umbrella palm can grow to be 4 feet tall. Overwinter this as a houseplant, umbrella palm may tolerate cool weather better than some species.

**Dwarf papyrus, *Cyperus Isocladus***

A stunning plant which resembles a fireworks display in shape, but has bright green foliage. Dwarf papyrus grows 18 to 24 inches high, and does best in water no deeper than 4 inches. This plant prefers full sun, but can tolerate partial shade. Overwinter this as a houseplant in a very sunny window.

**Egyptian Papyrus, *Cyperus papyrus***

The 'bulrush' of ancient Egypt, and Biblical reference. The very kind of plant baby Moses was found in on the shores of the Nile river, and the plant the ancient Egyptians used for paper. Egyptian papyrus prefers to grow in water no more than 6 inches deep. Papyrus can grow up to 5 to 12 feet tall if given the room. Give this plant a full sun exposure, and a big pot! Papyrus is best overwintered as a houseplant in a very sunny, warm spot.

**Snowball, *Gymnocoronis spiranthoides variagata***

An unusual water plant with white and green leaves, it produces small, white, snowball-type flowers that are very attractive to butterflies. This plant grows in full sun to full shade, and prefers to grow in water 4 to 6 inches deep. Snowball can reach 24 to 36 inches tall. Overwinter this as a houseplant.

**Bluebell, *Ruella brittoniana 'Katie'***

A charming plant that produces abundant blue or pink flowers. Bluebells maintain a very compact habit, never reaching much above 6 to 10 inches. Plant your bluebells in full sun for the best blooms, and no deeper than 6 inches deep. Overwinter as a houseplant.





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# Winterizing Your Garden Pond

Winterizing your garden pond is a vital annual task that can begin in late September or as soon as leaves begin falling in your area. However, the job is best done at intervals through the late summer and early fall. It is a lot easier to convince yourself to do the bulk of the winterizing then rather than waiting until the water is freezing cold.

Save the last minute, small things for the late fall or very early winter, but whatever you do, try not to put it off too long.

Here are some strategies for proper and easy preparation for cold weather.

Begin by removing as much organic matter from the bottom of your pond as possible, including leaves from pond plants, tree leaves, decaying or live algae, twigs, silt, etc.

Here's the part that will be the most time consuming and messy so leave this job for a nice warm autumn afternoon! Siphon off the bottom of your pond with a simple gravity siphon, straining larger debris with a net. Never remove more than about thirty percent of your pond's volume at a time. (Use the dirty water on your perennials and shrubs; it'll be a treat for them!)

If you have trouble starting your siphon, or have a simply impossible stretch of hose to start by huffing and puffing on it, use a utility pump to start the water flow. Place the pump in the pond and hold the end of the hose over it until gravity takes over. By the way, this may sound like a No-Brainer, but make sure that the hose is pointing downhill so gravity can have an effect!

When the temperature in your pond begins to drop to about 65°, start feeding your koi a low protein, high carbohydrate food. These foods are often sold as 'fall/spring' diets for koi.

Stop feeding koi when the temperature stays at 50° or below for a week or more. A thermometer makes this job much easier!

Stop feeding your water plants about three weeks before the expected first hard frost. September 15th is a good stop date to use in Central Illinois.

As the first few frosts kill back your lotus, lilies and other pond plants, remove the dead foliage before it can decay in the pond. Place the trimmed-back plants in the deepest part of the pond where they will overwinter.

Remove tropical plants before the first frost. Most tropical and marginal plants can be kept as house plants in an oversized deep saucer near a sunny window. Tropical waterlilies require specialized care, see our page on Wintering Tropical Waterlilies.

Most water plants and pond fish must remain

unfrozen to survive winter. Placing a pond heater that is advertised as safe for plastic ponds in your garden pool is the best way to ensure that your pond will not freeze solid.

Plants such as rushes, reeds, horsetails, and cattails can be frozen solid with no problems; leave them at the water surface for decoration. Drop all other plants to the bottom.

Cold water holds much more oxygen than warm water, so do not worry about your fish suffocating. Enough oxygen enters through the opening created by the heater.

Make certain your power outlet is correctly wired for a device such as a pond heater. Most pond heater 'failures' are due to insufficient wiring, which either continuously trips the breaker or the ground fault circuit. This seems to always happen during the coldest weather when the heater is drawing the most electricity. If you choose a heater over 1000 watts we strongly recommend that you have a qualified electrician check the outlet!

Place fruit tree, or pond netting over your pond to prevent more leaves from blowing in and decaying over winter.

Make sure to use a cold water bacteria preparation such as MicrobeLift Autumn Prep™ in your pond to aid in filtering and removal of decaying debris. Use String Algae Buster™ as needed during cooler weather.

Remove all electrical equipment from your pond (such as underwater lights) and store them indoors in a dry place.

Decide whether you want to keep your pond's waterfall running all winter. Depending on your exposure (micro-climate), and the severity of the winter, you may well be able to do this in this area. If you remove your pump(s) keep them in a bucket of water over the winter so that the seals do not dry out and crack.

Never shatter or break ice in a pond when fish are present. The shock from the impact can seriously injure or kill your fish.

Decaying organic matter left in a pond over winter robs precious oxygen from the water, and creates an ideal place for anaerobic bacteria to flourish. This leads to the increased probability of bacterial infections in spring as the pond warms up. You can never be too vigilant in making sure as much of this as possible is removed.



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