
KINGMAN IS GROWING! Column

Water Gardens

By *Marjorie Grimes*, Kingman Area Master Gardener

Think water. Think plants. Think fish. Think of an oasis in the desert. The soothing sounds of moving water, cooling breezes from evaporation, and soft aromas from blooming flowers will enchant you as you relax in by your water garden.

If you are ready for a different challenge, try water gardening instead of soil gardening. Water gardens and/or fish ponds have been popular for centuries. Maintaining these in the desert is not simple, but it is achievable.

Concerns over breeding of disease-transmitting mosquitoes, importation of invasive plants and fish, and the conservative use of water and electricity make things complicated. But with proper planning, design, construction, and operation, you can have an environmentally acceptable system at a reasonable cost.

There are several basics that must be addressed. The pond must have a sealed bottom or container. You must be careful that the mix of plants and water do not evaporate so quickly that the plants die. You must also plan ahead that any aquatic plants or animals will not harm the environment if they escape.

A water garden can be assembled from something as simple as a whiskey barrel cut in half or a plastic lined pool dug into a flower bed. Home improvement stores have plastic pools that can be placed into a hole in the ground. Some do-it-yourself kits include: pumps, filters, waterfall features, and instruction manuals. Fish and plants are available at these stores and plant

nurseries. There are water garden clubs and koi clubs active in Arizona. This is a perfect resource to new water gardeners.

The Arizona Department of Agriculture bans several species of aquatic plants as invasive. These plants can and do cause significant harm to the environment. Water hyacinth (*Eichornia crassipes*) and giant salvinia (*Salvinia molesta*) are considered noxious weeds. It is also illegal to collect wild aquatic animals (fish, frogs, turtles, salamanders, crayfish) and transfer them to private ponds without permits issued by the Arizona Game and Fish Department.

Getting started

The first thing you must decide is how large a water garden you want to maintain. I did not say how large a water garden you want. There is work involved in having a water garden. Very small systems (a barrel or pond less than 50 gallons) and very large systems (swimming pool size fish ponds of 20,000 + gallons) will each require daily maintenance. Systems in between can be maintenance-free for several days even in the heat of summer. Small ponds will evaporate so much from dry conditions that the plants will be continually stressed. In winter, small ponds may freeze solid. A barrel system will hold only a few goldfish or a frog.

Determine if electricity is available. Water motion is necessary to support anything more than one or two fish and to reduce the opportunity for mosquitoes to breed. It is imperative if you want to run a fountain or a water fall.

If you decide you want a medium-sized pond, you have the option of purchasing a pre-made pool, digging the pool and lining it with plastic or concrete, or building above ground with cement blocks, stones, and a liner.

After the pond is constructed

You have your pond built and you are ready to get it up and running. It is a good idea to fill and change the water in the container at least twice. Plastics, concrete, and galvanized metal will leach compounds. A couple of water changes will remove the possibility of substances

which may be toxic to aquatic plants and animals. This water can be used for irrigation of outdoor landscape plants.

If you want fish and plants in your pond, it is best that rooted plants be placed in pots with the soil covered by rocks. In this way, the fish will not pull the soil out looking for food or nest spots. Floating plants are fine in water gardens but fish will often eat the roots. This will limit their growth but this is not a problem as these plants tend to grow rapidly in the desert sun and heat.

Pumps and filters

Water motion is important in water gardens for practical as well as aesthetic reasons. Moving water transfers oxygen, carbon dioxide, nitrogen and phosphorus between the parts of the pond that produce and need the compounds. For example, fish and bacteria produce carbon dioxide that plants need for photosynthesis and growth. The plants produce oxygen and organic matter that the fish and bacteria need for respiration and growth.

A submersible pump is usually the best to use because it is less likely to run dry. A garden with plants but no animals can be operated without a pump, but careful attention is required to ensure proper nutrition and control of mosquitoes.

Two types of filters are used in ponds and water gardens. Mechanical filters trap and remove large and small particles, such as leaves and individual algae. Biological filters trap and transform very small particles and dissolved compounds. Biological filters are most important in converting wastes from fish and other animals into the forms of nitrogen and phosphorus that plants use for growth. Biological filters also support beneficial bacteria that turn wastes into fertilizers.

Stocking plants

Aquatic plants are categorized as floating, emergent, or submerged. Floating and emergent plants seem to be the most popular for water gardens. Water lilies, duckweeds, rushes, reeds, and other popular plants can be purchased at nurseries.

Careful inspection of plants is important to insure you do not import pests. If fish are part of your plan, the plants should be planted in clay or plastic pots that are submerged. The soil surface should be covered with stones that are too big for the fish to disturb. A good potting soil mixed with sand is sufficient for several years of growth.

Fish

Gold fish and koi are the most popular because they are very hardy and colorful. These fish can be obtained from most pet stores and plant nurseries. They can normally survive cold winter temperatures and summer heat. A common problem with fish is overfeeding. In winter the fish will eat very little; in summer they will eat a lot. Any food introduced to the pond must be processed, either as digested food from the fish or as decomposed pellets by the bacteria. These will become nutrients that must be taken up by algae or plants. Feed lightly when you start your pond and increase very gradually as you determine how your water garden becomes a working ecological unit.

Enjoy

Your pond will quickly become your private refuge. You may find you are sharing it with birds, butterflies, neighbors, and family members. It will surely become a labor of love.

Kingman Area Master Gardeners are holding a “Ins & Outs of a Garden Pond” workshop, Saturday, May 31, 2008 from 9:00 AM to 11:00 AM. This is a free workshop and open to the public, no reservations required. For location and more information contact The University of Arizona Mohave County Cooperative Extension at 101 E. Beale Street, Suite A, Kingman or telephone 928-753-3788.

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