

## Establishing an Ornamental Aquatic Plant Culture Facility

*Gef Flimlin, Ocean County Marine Extension Agent & Don Schnoor, Ornamental Aquatic Consultant*

Incorporating ornamental ponds and containers of aquatic plants into backyard landscaping has become quite popular over the past ten years and many garden centers and home improvement stores are featuring a variety of equipment for homeowners. Pre-formed ponds as well as dug and lined ponds bring together various segments of landscaping with the use of stones, filters, pumps, lights, fish, and aquatic plants to provide attractive features. There are many varieties of ornamental aquatic plants and the market for these is growing steadily. Aquatic plants have been imported from Florida for years, but now New Jersey growers are starting to raise them to meet market demands.

Aquatic plants in some instances can be considered weeds and can be fouling organisms that need to be removed. Plants such as water hyacinth produce beautiful flowers, but these same plants may cause problems in some natural bodies of water. However,



in a controlled cultured setting they will grow well and propagate themselves with little assistance and serve as a decorative addition to backyard water gardens. Nursery growers in New Jersey have the opportunity to make adjustments to their greenhouses to take advantage of this growing market and add income in the process.

This bulletin outlines the initial steps growers can take to enter into the business of culturing ornamental aquatic plants for use in the landscape.

### Initial Steps:

- Site decision: Pick a place with electricity and a potable water supply. Make sure you have adequate space for construction of greenhouses and a head house or shed for working. Now is the time to plan for future expansion if the business becomes successful.
- Prepare a business plan for the endeavor. *A Business Plan for Aquaculture*, a publication of USDA's Northeastern Regional Aquaculture Center, is available from Rutgers Cooperative Extension offices, and can be used as a model. Start conservatively and allow for growth. Make sure that you have enough time and financial capital to do the job correctly.
- Time commitment will be about 15 to 20 hours per week to maintain the facility and plants, and about 30 hours per week near market time, which includes transporting the plants to market.

Most of the time involved during growing season will be monitoring the facility and keeping the pumps running. Periodic dividing and repotting will be needed. At marketing time, the plants will have to be moved and staged for transportation.

- This will be an aquaculture growing facility and some biosecurity should be planned. Visitors should be kept to a minimum so that potential for disease can be kept low, allowing normal maintenance to keep all systems working cleanly.
- Check local ordinances and zoning regulations for horticultural activities. Aquatic plant culture facilities are not considered as a retail facility, therefore, they may be allowed in zoning that bans retail activity. They should be considered an agricultural facility and may qualify for farmland assessment.

### **Materials for Construction:**

The greenhouse can be made from pipe hoops and inflated double layered plastic or may be constructed with smaller hoop houses used in the nursery industry. The houses should be 50 to 200 feet long, with several raceways in each.

- A headhouse, near or attached to the greenhouse, will be necessary. The headhouse should have raised benches for dividing and repotting, as well as storage areas for growing medium,



Raised raceways will make working with the plants easier.

pots, and supplies. A used cement mixer will help with mixing media for use in repotting.

- Raceways on raised benches will aid in culturing the plants and reduce some of the potential for worker back related stress or injuries. However, other arrays are possible. Raceways on the floor are relatively inexpensive but more labor intensive than ones placed on raised racks. Lumber and other construction materials for the raceways are readily available at any lumberyard or home center. The raceways should be close to level. They form the base for growing the plants and since water will be re-circulated through them they will need to be flat. Maintain a constant level of water in the raceway during the growing season. An inch is fine.
- The raceways at 4' wide are a good size since they can be accessed easily from both sides. This is also the standard size for plywood that is most easily used for raceway construction.
- Good quality rubber liner material for the raceways is more tear resistant and will last longer than sheet plastic.
- Initially, allow about 10' to 15' of raceway space for each variety of plants grown. Some larger plants will need more space, some smaller ones will require less, but on average this spacing will provide enough area to grow the plants until they can be divided and repotted. Remember that space needs increase at least two times with every round of propagation; if plants are put into larger pots space will be used quickly.
- Plants set in the raceways should be configured so that the water moves in an "S" fashion around and through the groupings of plants. In a slow-moving stream in nature, the flowing water brings nutrients to the roots 24 hours a day.
- Situate a 75 to 100 gallon tank at the end of the raceway. From there a pump will send the water to the head of the raceway where it will move along until it drops back into the tank. A simple screen should be placed at the end of the race-

way to catch debris that will float down from the plants. The pump **MUST** be a good, heavy-built pump. You will need the pump to deliver 300 gallons per hour (GPH) at 20 feet of head. This will ensure, with the use of a control valve, that it will deliver 150 to 200 GPH at the raceway head when the hose and pump plug a little, as they will.

- Consider the possibility of incorporating the culture of ornamental fish and snails into the process. The wastewater from this operation will fertilize the aquatic plants. In the beginning, use low-cost but marketable fish such as goldfish. In this way, nutrients can be produced and fish losses, if they happen, will not be devastating. This may not necessarily need to be done initially but should be eventually included to be able to expand your product line and make good use of the fish waste as fertilizer and the plants as bio-filters.

### **Crop Management:**

- Many aquatic plants require 80° to 90°F for optimum growth. Also some plants require more light than others. The specific environmental conditions required for optimum growth of aquatic plants may be obtained from other growers, local specialists, or through web browsing. A certain amount of trial and error will be necessary as each culture facility will possess its own unique features. Shade cloth and/or shade spray on the greenhouse may be needed during very hot summer days to keep the plants from burning in the sun, or the plants can be moved outside into troughs for continued growth, freeing up needed greenhouse space for smaller plants. Fans and vents at the ends of the greenhouses will be necessary on hot days for some plants as well as for workers. During the winter, supplemental heat may be used to keep the raceways from freezing. Separate houses may be used for tropical and hardy plants because the temperature for the tropicals needs to be higher. Heating is expensive and cutting costs pays off at the bottom line. This will give added warmth to the roots of the plants in the winter. Also, moving water will slow ice from forming in the runs.



Plants can be divided to increase profits.

- Plants can be grown in their original pots until they become crowded and are ready to be divided into two pots. Once that occurs, schedule the necessary time for propagation. Discuss the size of the pots that your customer wants in order to plan for pricing and delivery later.
- Fertilization can be done with timed-release fertilizer placed in the pot with the growing medium and plant. For many plants, clay and sandy soils will work well; large amounts of organic material may not be necessary but other types of media can also work. The media should not have any particles in it which can float since the customer will likely place the potted plant under water and the media will float out into the pond. A time-release fertilizer can be incorporated into the mixture when combining the media or sprinkled on top when the plant is split and re-potted.
- The water in the system should be kept at a pH of about 6. This should be monitored weekly and adjusted as needed. Usually, New Jersey water is more acid. Calcium carbonate can be added to the growing medium to raise the pH, if necessary. Remember, some of these plants already thrive in New Jersey waters so they can tolerate varied conditions.
- Crop growth management is a facet of production that needs to be addressed. If all the plants are purchased at once, propagated, and sold at once, then you, the supplier, cannot meet the

needs of other potential customers until an entire new crop gets to marketable size. It would be more beneficial to have marketable plants coming up to size constantly. Staggering production is key, also realizing that all plants of the same or different varieties do not grow at the same rate. If you can supply your customers every week or every other week, the plants will leave you in good condition and will be more likely to be sold at the retail level, ensuring repeat business.

- An ongoing inventory should be kept of the plants. This can be done on paper, with a computerized database, or by using a UPC symbol and scanner to record and inventory product.
- It will be useful to have a digital camera so that problems can be photographed and sent online for diagnosis and corrective suggestions. Also, a digital camera will be useful for sending pictures of your plants to prospective clients.

### **Marketing Considerations:**

Culturing aquatic plants can be a very enjoyable and rewarding occupation. You must balance the time commitment and the financial return in evaluating whether you can afford to devote full-time or part-time to establishing your culture facility. Most established ornamental culture businesses started small, and developed into full-time enterprises as the business grew.

Initially there are a couple of options to consider in developing a market plan for selling the aquatic plants you have cultured. Since you will be starting on a small scale, try to develop a few local retail outlets such as garden centers or hardware stores which are selling pond hardware but could use some plants to fill out their product line. Be sure to

investigate the local prices for plants in your area and price your sales at 50% of the retail price. Your second option when starting is to align yourself with a few landscapers who install ponds. They will probably want larger plants so when they put the ponds in, the final product will look well established with large plants. You can price your plants at a retail level since they will be passing those costs along to their client.



Selling plants at different sizes will serve varied markets.

As your business becomes better established other marketing options may present themselves, but initially it is better to start small and build a local clientele.

And most important, make sure the customer receives quality aquatic plants at a fair price. You can easily judge the quality of your plants by asking yourself if you would buy that plant; if not, it's not a quality plant. Maintaining satisfied customers is an important facet of any business because it leads to more sales and thus to expansion of your business. With the increased interest of homeowners in incorporating ornamental aquatic plants in their landscape, and with the large number of aquatic plants that have unique flowers and leaf shapes, now is the time to consider establishing a culture facility to meet this demand.

© 2004 by Rutgers Cooperative Research & Extension, (NJAES,) Rutgers, The State University of New Jersey.

Desktop publishing by Rutgers–Cook College Resource Center

Published: December 2004

**RUTGERS COOPERATIVE RESEARCH & EXTENSION  
N.J. AGRICULTURAL EXPERIMENT STATION  
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY  
NEW BRUNSWICK**

Distributed in cooperation with U.S. Department of Agriculture in furtherance of the Acts of Congress on May 8 and June 30, 1914. Rutgers Cooperative Research & Extension works in agriculture, family and community health sciences, and 4-H youth development. Dr. Karyn Malinowski, Director of Extension. Rutgers Cooperative Research & Extension provides information and educational services to all people without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Rutgers Cooperative Research & Extension is an Equal Opportunity Program Provider and Employer.