Horticulture has been identified as a leisure activity of over 68 million households nationwide. Since so many people enjoy working with plants, horticulture therapy programs involving plant propagation offer a unique means to meet the special needs of targeted individuals. By determining the differing needs of an individual and using adaptive tools, plant propagation can become an instrumental part of horticulture therapy programs.

Propagating Selected Submerged Aquatic Species of the Chesapeake Bay©

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Submerged aquatic vegetation (SAV), is critical to maintaining coastal ecosystems around the world. It filters water by trapping sediments and nutrients, provides habitat and food for commercially important animal species, and reduces shoreline erosion by slowing wave energy. In areas such as the Chesapeake Bay, declining SAV populations have challenged restoration groups to use transplant sources that do not, or only minimally, disturb existing SAV beds. To support this effort, we investigated simple propagation methods for six SAV species native to the Chesapeake Bay. Our goals were to (1) determine ways to generate a source of transplants appropriate to a commercial nursery-type setting, (2) examine time and effort to produce transplant-ready material, and (3) create stock plants to supply propagules to local volunteer restoration groups.

We grew our SAV in 5130-liter (1350-gal) freshwater tanks in a greenhouse. The tank water was approximately 0.45 m (18 inches) deep and its temperature fluctuated with the surrounding air temperature between 20°C (68°F) during the winter and 25°C (77°F) during the summer. We circulated water within the tank through a two-sponge filter and used a hand skimmer to capture filamentous algae. Our system relied on natural light during the summer, supplemented with four 1000-watt sodium lamps suspended over each tank during fall, winter, and spring to provide a 14-h day length. From mid-April to October, whitewash over the greenhouse provided about 30% shade.

Initially, we tried various types of containers and growing mixtures, but then streamlined our operation to a very simple set-up that could be easily copied by volunteer groups. We used 5-cm (2-inch) wide × 10-cm (4-inch) deep square plastic pots filled with inexpensive topsoil (low organic matter) mixed with 1.2 g of a slow-release fertilizer (18N-6P-8K; 180-day release rate at 25°C). We covered this soil-fertilizer mix with a minimum of 6 mm (1/4 inch) of washed play sand to help reduce algae growth. For the purposes of our work, we considered plants started in this mix as "transplant-ready" when roots had spread throughout the pot and new shoots were visible. With some SAV species, it was difficult to get a firm rootball, because of the plants' delicate roots. We identified more than one way to propagate many of the species, but chose to report the method that we felt would be simplest for large-scale commercial propagation, or the most appropriate for volunteer groups consisting of horticultural novices (Table 1). Wild celery, redhead grass, and water stargrass were very easy to grow, and the fact that wild celery was easily

Table 1. Selected methods for propagating six freshwater Chesapeake Bay submerged aquatic plants.

Species	Propagule type	Date started	Transplant-ready	Notes
American wild celery (*Vallisneria americana*)	seed	February	16 weeks	Seed germination > 80%
redhead grass (*Potamogeton perfoliatus*)	cutting	August	12 weeks	1 cutting per pot; this trial run earlier than other cutting trials, transplant-ready time may be decreased by using 2 cuttings per pot
water stargrass (*Heteranthera dubia*)	cutting	February	5 weeks	2 cuttings per pot
southern naiad (*Najas guadalupensis*)	cutting	January		roots throughout soil2 cuttings per pot; plants off-color for most of trial, (see notes) in 5 weeks not recommended for volunteers until methods refined
common waterweed (*Elodea canadensis*)	cutting	February	7 weeks	2 cuttings/pot; shading with fiberglass screening improved growth and color on transplant-ready material after an additional 4 weeks
sago pondweed (*Stuckenia pectinata*)	tuber	January	4 weeks	5 tubers per pot

produced from seeds meant that propagules could be held in storage by propagators until needed (up to 2 years, after which we found that seed viability declines markedly). Redhead grass seeds did not germinate well (a maximum of 14%, and more commonly 2% germination in our tests), and we did not see seeds on the water stargrass, but both grew vigorously enough from cuttings that they were successfully used in volunteer grower workshops by the Chesapeake Bay Foundation and the Maryland Department of Natural Resources. While sago pondweed was also very easy to grow and a potential species for volunteers, disturbing potted stock plants to dig through the soil for tubers was a messier, slower process than collecting seed or cuttings from the other species. Finally, common waterweed and southern naiad, although readily propagated, were less promising. Plants turned off-color, became fragile, and were quickly fouled by algae that was difficult to remove without damaging plants. Both species require further study before they would be suitable for either production systems or volunteer projects.

Remontant Hydrangeas?©

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NATURE OF WORK

Most gardening texts state that bigleaf hydrangeas, *Hydrangea macrophylla* hortensia types (syn. var. *macrophylla*), *H. macrophylla* lacecap types (syn. var. *normalis*), *H. serrata* (syn. *macrophylla* var. *serrata*), and their hybrids form flower buds the year before flowering. If those buds are destroyed by pruning or freeze injury then plants will not flower because new flower buds will not be formed then develop and open during the current growing season.

Recent research has demonstrated that bigleaf hydrangea cultivars exist that are truly remontant as well as others that will flower in autumn even if they have already flowered earlier in the year. Speculation exists concerning whether the flowers are from lateral buds that were not removed or freeze damaged; or whether new flower buds form during favorable conditions in late summer and early fall then open during an extended period of short days and nonfreezing autumn temperatures (Adkins, 2002; Adkins et al., 2002). To the landscape and gardening trade, it does not matter why these hydrangeas rebloom or continue to bloom into autumn. They want to know which ones will be both summer and fall flowering.

The bloom times of cultivars in an existing hydrangea collection (Adkins et al., 2002) at Mountain Horticultural Crops Research Station (MHCRS), Fletcher, North Carolina, were recorded weekly during the 2001 growing season. Plants that were flowering in July as well as flowering on 1 Oct. 2001 are listed as reblooming in Table 1. Those that flowered during the 2001 season but were not in bloom on 1 Oct. are listed in Table 2. Those that did not flower at all have been reported previously (Bir and Conner, 2000; Reed, 2002).