The species that form somewhat "woody crowns", such as *E.* ×*youngianum* 'Niveum' and 'Roseum', are divided in a manner similar to that described for the center body of the above types. A Felco-type pruner is used to cut sections of the mother plant about the size of a large thumb leaving all roots on the division attached.

This form of division can be expected to yield 6 to 13 divisions from a 1-gal plant of the rhizomatous types and 3 to 5 divisions of the *E.* ×*youngianum* types. I cannot stress enough the need for fresh divisions that are not allowed to dry excessively as is often the case in plants imported and or stored in a cooler for extended periods, as well as, a polymer water retention agent to accomplish this somewhat daunting task.

Native Herbaceous Wetland Plants Used for Wetland Mitigation

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INTRODUCTION

A growing awareness of the value and sensitivity of our wetlands prompted requests for low-cost, native, herbaceous plants for the mitigation, restoration, and enhancement of impacted wetlands. As the demand became apparent we looked at the potential for growing particular plants in areas that were unsuitable for conventional nursery production.

What follows is a look at the ongoing process of keeping production cost low and meeting the constantly changing demands in the market for this narrow group of plant materials.

METHODS

Our intent was to market bareroot, herbaceous wetland plants to the growing mitigation market. We identified and harvested existing plant materials on the site to be developed. This enabled us to keep the startup cost of plant material low. The first site used for production was a runoff ditch from an existing container facility with overhead irrigation. This required no additional application of water, and helped deal with runoff and nutrient issues.

At the end of 1 year we reviewed the results of our first attempt and modified the size of the swale to a width of 8 to 10 ft with length limited only by the individual site. Native loam was used in the base of the swale as a planting medium.

In an area where there was no irrigation runoff, a spring was tiled and allowed to run continuously into an enlarged roadside ditch. A silt growing medium was used in place of the native soil to ease the harvesting process. It did not limit growth of most taxa.

After grading the bottom of a swale and seeding any disturbed areas the base is planted with one or more taxa of plant material conducive to the hydrology of that specific site. The swale would remain for one growing season and could be harvested

for the next 2 to 4 years with 1 to 2 weedings per season.

After a complete harvest or when undesirable growth occurred the swale is harrowed, graded, and replanted. Several species of saltwater marsh plants are grown in the same manner.

Since some taxa are extremely difficult to harvest due to the nature of their root system, a fabric has been added in some swales to restrict root growth and allow for a more efficient harvest and processing procedure.

When an order is received or there is need for divisions for a new planting, plants are harvested and brought to the root cellar. They are processed on a six-person work bench with counting bays and pallet box for removal of unwanted soil and top growth. They are stored on shelving until shipping or planting.

Containerized plants, ranging from 1.5 inches to 2 gal are contract grown. Bareroot plants are harvested, processed, potted, and placed in a stone-dust lined depression in the existing container facility.

Several of our species are now also being grown from seed. As the demand for particular plants increases seed can be collected from the swales to be used in seed propagation to supplement plant propagation from division.

In order to extend the shipping season some plants, such as *Typha latifolia*, can be harvested, processed, and stored in a holding swale or the root cellar for shipment to customers with a longer planting season.

In another attempt to extend the planting season, plants grown from a late seeding are lined out in a swale and covered with used poly to encourage extra rooting before going dormant.

SOME OF THE PLANTS WE HAVE UNDER PRODUCTION

Carex lupulina	hop sedge
C. vulpinoidea	fox sedge
Juncus canadensis	Canadian rush
J. effusus	soft rush
Peltandra virginica	arrow arum
Pontederia cordata	pickerelweed
Scirpus cyperinus	woolgrass
S. microcarpus	redtinged bulrush
S. lacustris subsp. *tabernaemontani*	softstem bulrush
Sparganium (syn. *S. angustifolium*)	American bur reed
Sparganium eurycarpum	giant bur reed

PLANTS UNDER EVALUATION FOR CHANGES IN PRODUCTION TECHNIQUES

We are amending our approach to the production of *Sagitaria latifolia*. It emerges late and can only be harvested as a live plant from early June to late July. It must not be disturbed later or the corms that are produced for next year's plants will not have time to grow and harden off. In mid October the corms can be harvested and

sold or overwintered for spring sales. The size of the plant's leaves and corms varies greatly. Currently demand outweighs supply and for us production cost are at or above the market price. In the spring of 1998 we will move all of the plants in production to a fabric-lined swale with a compost-based planting medium. It is our hope that this will give maximum production and ease of harvest of the corms.

Typha latifolia demand varies widely from season to season. In order to maintain a cost-effective production method we are seeding into plugs that help to slow the aggressive growth of this plant and enable us to have a stable supply. After 1 full year any remaining plants can be composted before they become too large.

Peltandra virginica has a very deep root system. In order to be able to harvest it we are seeding into plug trays and growing on for one season. The following year we will plant into a fabric-lined swale with a compost medium. It is our hope this will allow us to produce a healthy, cost-effective plant.

CONCLUSION

The line of native herbaceous wetland plants we currently produce is a low-end product. In order for it to be successful for us it is imperative that we keep cost low. Our swales enable us to increase quantities of plants for several years while waiting for the right opportunity to market the crop. This helps us weather the plant of the month syndrome that we all are subject to. Each year several new species are added in an effort to adapt to the market needs and expand our product line.

Micropropagation of Native Plants or Multiplying Some of Mother Nature's Really Good Stuff

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What do I consider to be native plants? By my definition, and I will grant you it is very narrow by design, native plants are herbaceous perennials that are indigenous to the northeastern United States. How do I select the native plants I work with? I make plant lists based on talking with people who propagate, grow, and sell plants for a living. I also talk with people who love plants and gardening in general and have a special interest/knowledge in native plants. I compare the two lists and see what plants come up as "double" hits and then I research these plants. There also has to be some "chemistry" between the plant and me for me to work with it. There has to be a need for the plant to be micropropagated, and there must be a problem using conventional propagation techniques. Chemistry takes the form of leaf color or shape, unique seasonal interest, flower size, shape, or color. Part of the chemistry is the ease with which the plant can be reestablished in urban settings, if the plant has very narrow, specific environmental needs, then there is a good chance I will not work with it.

Micropropagation is propagation on a very small scale. Conventional propagators obtain cuttings and divisions from stock plants grown and maintained outdoors. Micropropagation relies on stock plants too; however, the stock plants are diminutive and maintained in glass or plastic containers under sterile conditions in a