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High Demand Native Plants from Maine®

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INTRODUCTION

Interest in growing native plants has been increasing in recent years due to their countless landscape uses and value in preserving natural ecosystems (Cullina, 2000; Dreyer, 1993). To satisfy the market demand, Western Maine Nurseries, a well-established conifer liner nursery, diversified by adding a woody ornamental liner division in 1997. The initial goal was to grow potted woody liners focused on three perceived needs in the nursery trade: rare, unusual, and new introductions; superior cultivars of standard nursery stock with proven track records in extreme northern climates; and native plants with bio-mitigation applications. Of these three initial goals, native plant production has had, by far, the highest demand, accounting for up to 75% of our sales.

For the last 6 years, Western Maine Nurseries and University of Maine Horticultural Program have teamed up on the research effort on generating these native plants. The nursery is located in Fryeburg, Maine (U.S.D.A. Zone 4b) and the nearby White Mountains of New Hampshire dominates its climate. It is one of extremes with record summer temperature as high as 103 °F and winter low as -40 °F. The University of Maine is situated in Orono, Maine (U.S.D.A. Zone 4b). The temperatures are milder than Fryeburg because of ocean effects.

Maine is the northern-most state in the eastern United States. The region is on the boundary of the Northern Hardwood and the Southern Boreal Forest communities. The region's glacial past has left it with numerous wetlands as well as large deposits of sterile, rocky soils. The native plants of this area have adapted to these conditions and can tolerate extreme cold, short growing seasons, and are often adapted to wetland and or dry-land situations.

The increase in demand for native plants is a national phenomenon that is due in part to increased awareness of invasive plants by the general public. The war against invasive species has reached fanatical proportions in many areas (Pimentel et al., 2000). Numerous native plant demonstration gardens are springing up

across the nation. Many towns, counties, and state agencies now require a percentage of the specified plants for public as well as private landscape projects be of "native" origin. County conservation commissions are voracious consumers of plants like bearberry (*Arctostaphylos uva-ursi*), low-bush blueberry (*Vaccinium angustifolium*), and sweetfern (*Comptonia peregrina*). Large-scale municipal projects like Boston's Big Dig and other national highway projects have propelled native plants from the somewhat obscure to mainstream staples of the nursery trade. Much of the sales are generated by other wholesale nurseries that have specialized in growing and selling finished plants for large projects such as highway projects.

Bio-mitigation is the use of native plants for the rehabilitation or reconstruction of wetland areas that have been negatively impacted by development or other human activities. These plants are used to stabilize wetland soils, purify degraded waters, and to provide habitat for animals. In many areas law mandates this mitigation work. Many nurseries have specialized in the growing and installation of wetland plants. Mitigation work is also done in dry situations such as highway-cuts, old gravel pits, and abandoned mines. Maine's post-glacial soils are often dry, acidic, and exceedingly sterile. Plants that are native to these situations can grow where few others would survive. They tend to be drought tolerant and have the ability to spread rapidly. *Comptonia peregrina* fixes its own nitrogen (Ziegler and Huser, 1963), beginning the process of the soil building needed for these sites.

The purpose of this paper is to give a brief description of fifteen of our highest demand native plants and their propagation. All plants are indigenous to the state of Maine.

MATERIALS AND METHODS

Native plants with commercial potential have been selected and research on seed germination, root cuttings, softwood, semihardwood, and hardwood cuttings has been conducted in both Western Maine Nurseries and the University of Maine in Orono. Treatments on seed cold stratification, type of cuttings, type and concentration of rooting hormones, overwinter temperatures have been investigated (Dirr and Heuser, 1987). A completely randomized block design is applied for the experiment if possible. The propagation methods with more than 90% germination, rooting, and survival rate are reported. Sales of these native plants are recorded for the last 5 years and the data is used to indicate their market demands.

RESULTS AND DISCUSSION

***Arctostaphylos uva-ursi* (bearberry).** Circumpolar plant that is native to dry soils from Canada south through the Appalachians, west to the Rocky Mountains, and the Pacific Northwest. This plant is also found in coastal New England and is hardy in Zones 2–6. It is a groundcover plants with attractive evergreen foliage and white flowers in spring. This species has the ability to spread by stems, which can root into unstable soils. Propagation is by semi-ripe stem cuttings in July or hardwood cuttings from fall through winter. Hormondin #3 or 8000 ppm IBA quick dip should be applied.

***Aronia melanocarpa* (black chokeberry).** It is an adaptable shrub that tolerates a wide range of soil conditions from wetland to drier soils. It reaches 10 ft tall and is native to Eastern North America (U.S.D.A. Zones 3–8). White flowers in May

and black fruits in late summer and fall are attractive features in landscape. Fall color comes in brilliant shades of orange and purple. Fruits are also important food to wildlife. Propagation is from softwood cuttings using Hormondin #2.

***Comptonia peregrina* (sweetfern).** This aromatic shrub is the highest demand plant at Western Nurseries. It thrives in sterile, acidic, dry soils. A member of the Myricaceae family, this species has the ability to fix nitrogen and is an important pioneer taxon after fires and other soil disturbances. Its spreading roots make it a good choice for bank stabilization. Though it is a highly sought re-vegetation plant, its attractive cut-leaf, highly aromatic foliage, and compact habit make it a good garden plant. This plant is native from central Maine south to Georgia and West to Minnesota. It is hardy in U.S.D.A. Zones 4–7. Propagation is from dormant root cuttings collected in the fall or spring (Ruchala, 2002).

***Cornus amomum* (silky dogwood).** This wetland plant is native to Eastern North America and hardy in Zones 4–8. Although a wetland indicator plant in the wild, it seems adaptable to drier soil as well. White flowers in June and white fruits in fall are important for the landscape applications. Fruits are also food for migrating songbirds. Propagation is by softwood cuttings using Hormondin #2.

***Empetrum nigrum* (black crowberry).** A circumpolar plant with wide distribution from Canada down to New England, the Great Lakes region, and the Pacific Northwest. The species grows in a range of habitats ranging from high altitude bogs and rocky outcroppings to coastal situations in Down East Maine (U.S.D.A. Zones 1–6). It is an interesting groundcover, which looks like heath (*Erica* sp.). Flowers are similar to those of heath and are light purplish-pink from snowmelt through July. Edible black fruits in fall. Propagation is by stem cuttings in early fall using Hormondin #3.

***Ilex verticillata* (winterberry).** It is a very high demand plant because of its wetland application as well as its berries used for the winter cut flower market. A deciduous shrub grows 10 ft tall. Both white flowers in June and loaded red fruits in fall and winter attract a lot of attention in the garden. It is native from Canada south to Georgia. Propagation is from softwood cuttings in early summer using Hormondin #3.

***Ledum groenlandicum* (Labrador tea).** An interesting bog plant is native from Canada south to the pinelands of New Jersey and across the Northern Tier to Washington state. It has slender dark green leaves with rusty-red tomentum on the undersides. White umbrella-shaped flowers appear in late May through June. This plant colonizes rapidly through underground rhizomes. Propagation is done from cuttings collected July through winter using Hormondin #3.

***Myrica gale* (sweet gale).** An important wetland plant forms dense thickets on wetland edges. This species is native across Canada, Appalachia, and the Pacific Northwest. Like its cousin bayberry, the plant has highly aromatic foliage. Also, deep-burgundy-colored stems are attractive in the winter. Propagated from summer softwood cuttings using Hormondin #3.

***Myrica pensylvanica* (northern bayberry).** This seashore plant is native from Newfoundland south to the Carolinas. Though it does well in dry, sandy beach conditions, it adapts to and performs well in clay soils. The plant is a low growing shrub

with aromatic foliage and attractive bluish waxy fruits in fall. Propagation is from de-waxed seed that is stratified at 41 °F for 3 months or from summer softwood cuttings using Hormondin #3.

***Salix discolor* (pussywillow).** It is a native willow found in wetlands throughout eastern North America. This species is very popular due to its wetland applications and its use by the cut-flower market. Stem cuttings can root anytime using Hormondin #1 or without hormone.

***Spiraea tomentosa* (steeplebush).** An adaptable shrub is native from Canada west to the Mississippi and is hardy in U.S.D.A. Zones 3–7. The plants tolerates almost any type of soil from wetland to dry. Pink, steeple-shaped flowers from July to September attract butterflies. This plant can be propagated by summer softwood cuttings using Hormondin #2.

***Vaccinium angustifolium* (low-bush blueberry).** This plant is second, behind *Comptonia*, in sales volume. It is an amazingly rugged little ground cover that has drought tolerance and can thrive in dry, sandy acidic soils. Eastern Maine is famous for its blueberry barrens that can stretch for miles. Delicate white to pink flowers in June are followed by small, delicious, fruits. Its fall color is spectacular. The plant is an excellent replacement for turf grasses on poor soil. Its distribution ranges from Labrador west to Manitoba, New England, south through the Appalachians to Virginia (U.S.D.A. Zones 2–6). Propagation is from dormant root cuttings in fall or spring. Dr. Smagula (University of Maine) has done a lot of tissue culture. A full 1-gal container plant can be produced in 3 years from tissue-culture plantlets.

***Vaccinium macrocarpon* (cranberry).** This versatile *Vaccinium* is a trailing woody vine, growing to 8 inches tall in bogs across Maine. Despite its wetland association, it is tolerant of drier soils. Its distribution and hardiness are similar to that of *V. angustifolium*. Propagation is by late fall or early winter stem cuttings using Hormondin #2.

***Viburnum cassinoides* (witherod, northern wild raisin).** This plant can grow virtually anywhere from wetlands to dry and full sun to heavily shaded woodlands. Senior author has even found them growing near timberline in the White Mountains of New Hampshire and Maine. It is hardy in Zones 3–8 with distribution from Quebec south to Georgia and west to Texas. The plant is about 10 ft tall with an upright, arching habit. It produces white, flat-topped flowers in June, followed by spectacular fall fruits that range in color from cream to yellow to bright fuchsia-pink before turning dark blue in winter. This species seems to have resistance to the viburnum leaf beetle, which is devastating native populations of *V. dentatum* and *V. trilobum*. Propagation is by semisoftwood cuttings in mid July using Hormondin #3.

***Viburnum lentago* (nannyberry).** Another versatile *Viburnum* adapts to a range of soils conditions from wetland to drier soils. It is native from New England to Virginia, west to Minnesota (U.S.D.A. Zones 3–8). White flowers appear in May, followed by fruits savored by birds in the fall. No damage from viburnum leaf beetle has been observed and this species may be resistant to this insect. Propagation is by semisoftwood cuttings in July using Hormondin #3.

CONCLUSIONS

Native plants are very important because they are adapted to local environmental conditions, play a vital role in natural ecosystems, and offer numerous ornamental characteristics. Maine nourishes many more native plants with great ornamental potentials. Further research will focus on reproducing these native plants (exploring propagation methods) with commercial feasibility.

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The Green Roof Research Program at Michigan State University®

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INTRODUCTION

As our forests and agricultural lands are replaced with impervious surfaces due to urban development, the necessity to recover green space is becoming increasingly critical for the health of our environment as well as our well being. Vegetated or green roofs are one potential remedy for this problem. Establishing plant material on rooftops provide numerous ecological and economic benefits including storm-water management, energy conservation, mitigation of the urban heat island effect, increased longevity of roofing membranes, as well as providing a more aesthetically pleasing environment to work and live.

The green roof research program at Michigan State University (MSU) was initiated in collaboration with Ford Motor Company during 2000 in an effort to advise them on the installation of a 10.6-acre extensive (shallow) green roof on a new assembly plant in Dearborn, Michigan. The objectives of our ongoing research are to evaluate plant species, propagation and establishment methods, substrates, water and nutrient requirements, and water quality and quantity of runoff. Numerous experiments are currently being conducted on 48 simulated roof platforms at the Horticulture Teaching and Research Center at MSU. The site is equipped with a weather station, thermocouples measuring temperatures at various depths in the