

## The Propagation of Some British Columbian Native Plants

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With approximately 3000 species, British Columbia is fortunate in having a diverse and fascinating flora. The plants come from a wide variety of geographical and climatological locations—from the high rainfall areas of Vancouver Island's west coast and the alpine areas of the province's many mountain ranges, to the arid region of the southeast.

As in many other parts of the world, native plants are becoming increasingly important in the urban and highway landscape, which in turn results in more sophisticated production and marketing strategies to provide plant quality and promote sales. This paper outlines specific propagation methods used to produce some of the important genera for commercial sales.

### NATIVE PLANTS

*Arctostaphylos uva-ursi*. This is an extremely important evergreen ground cover, both for commercial and home garden landscapes. It is widely distributed in British Columbia (B.C.) and other provinces of Canada. However, some seed provenances result in crops being variable in habit and leaf size. This also occurs when growers collect cuttings from plants in the wild. Reid, Collins Nurseries Ltd., Aldergrove, B.C., is one of the leading growers of native plants and has spent a considerable amount of time selecting the best provenances as well as formulating and improving effective presowing treatments of the seed. With its wide distribution, *A. uva-ursi* is a good example of the variability to be found in British Columbian native plants. Seeds collected in the Yukon/northern B.C. border area result in relatively compact small-leaved plants—contrasting with looser, larger-leaved plants from central regions of B.C. or the upright growth from seed collected on Vancouver Island.

An effective pre-sowing treatment is a 2- to 4-h period of concentrated sulphuric acid digestion, followed by 3 to 6 months of cold stratification at 1C. An alternative is 2 to 3 months warm stratification at 21C, followed by 4 to 6 months cold stratification at 1C.

In terms of the number of plants sold by the 42 nurseries in the University of British Columbia's Plant Introduction Scheme (PISBG), the selection *A. uva-ursi* 'Vancouver Jade' is the most successful. Nearly 1 million plants are sold per annum. This clone, from Vancouver Island, was selected because of its vigorous uniform habit, bright-green summer foliage, deeper-pink flowers, and its ability to yield 90% rooting from cuttings. There is considerable clonal variation in the rooting of the species.

Three important rules when propagating this plant are:

- 1) Ensure cuttings are not stressed at the time of collection, preparation, or during their aftercare. Open ground stock plants need to be routinely irrigated during dry weather.

2) Best cuttings are obtained from 3- to 5-year-old plants in the open ground or from a production crop, as long as it has not had high fertilizer applications. It is a mistake to obtain cuttings by regularly heavy pruning plants in the landscape because their vigour will decrease, making them more susceptible to foliar and stem diseases.

3) The rooting mix must be well drained. If not, then the plants succumb to black stem and leaf spot infection caused by species of the pathogen *Exobasidium*.

In B.C., cuttings are best taken in October to February as 10 cm nodal or heel cuttings and treated with 0.8% IBA in talc or 2000 ppm IBA in a 3- to 5-sec quick dip. They are then placed under polyethylene with fog or mist, however, excessive overhead water application should not be given because it leads to stem and leaf rots. Like other *Arctostaphylos*, 'Vancouver Jade' does not like root disturbance, so direct sticking of two to three cuttings per pot is recommended.

***Cornus nuttallii***. Two effective pre-sowing treatments for the native *C. nuttallii* are 3 to 4 months of cold stratification at 1C or 20 to 30 min of concentrated sulphuric acid digestion, followed by the same cold stratification period. Care needs to be taken that the embryo is not damaged by the acid treatment. Unfortunately, demand for this attractive plant is decreasing in urban landscape planting mainly as a result of the increasing incidence of anthracnose caused by species of the pathogen *Discula*. Plants which are under stress are particularly prone to infection.

***Cornus canadensis***. The attractive *C. canadensis*, however, is a ground cover which is in constant demand. Again Reid, Collins Nurseries Ltd. has made some interesting observations in the provenances of this species. For example, seed collected in the Yukon yields compact plants with good resistance to leaf spot disease, while some provenances from Vancouver Island are more evergreen, have glossy thinner foliage but show more susceptibility to leaf spot during the production cycle. Two effective pre-sowing treatments are 3 to 4 months cold stratification at 1C or 15 to 30 min concentrated sulphuric acid digestion, followed by 3 to 4 months cold stratification. Again, correct timing of the acid treatment is vital to prevent seed embryo damage. For small quantities of plants propagation by division is reliable.

**Vaccinium Species**. There are a number of native *Vaccinium* species which are increasing in popularity. These include *V. alaskaense*, *V. membranaceum*, *V. ovalifolium*, *V. parvifolium*, *V. vitis-idaea*, and *V. uliginosum*. Excellent results are achieved by sowing seed in a cold greenhouse during late February/early March, subjecting the seed to a cold/cool-night and warm-day regime. The seed does not require a specific presowing treatment.

Found in many of the southern coastal regions of B.C., *V. ovatum* (evergreen huckleberry) is a variable plant in habit and leaf size, but is becoming increasingly desirable for native landscape planting. Some years ago the Plant Introduction Committee of PISBG selected a clone which was more compact, had outstanding reddish-brown new growth, and produced masses of pink flowers and black berries. This clone was subsequently named 'Thunderbird' and released for sale in 1994. Readily rooted in 6 weeks from nodal cuttings during late summer and autumn using 0.8% IBA in talc, it does present a problem of uneven bud-break the following spring. The shoots which fail to break are those which had flower buds at the time

of propagation. To assist in overcoming this problem, established stock plants should be relatively heavily pruned to encourage vigorous non-flowering shoots.

***Rhododendron macrophyllum***. The native *R. macrophyllum* does not require a pre-sowing treatment. The best procedure is to evenly sow in flats during early spring and then carefully pot.

***Arbutus menziesii***. Noted for its attractive cinnamon-coloured bark and orange-red fruits, *A. menziesii* is another very desirable native plant. It is found on rocky, coastal outcrops of the southwestern B.C. mainland and off-shore islands. This plant does not like root disturbance, high nutritional, or moist regimes. *Arbutus menziesii* likes to be grown in a "harsh mix" with very low nutritional status. Propagation is best achieved by direct sowing in flats or cell trays during early spring in a cold greenhouse. To obtain more even germination, cold stratification at 1 to 3C for 3 months is recommended.

***Penstemon fruticosus* 'Purple Haze'**. British Columbia has some interesting native penstemons. The UBC Botanical Garden selected an improved clone of *P. fruticosus* and subsequently named it 'Purple Haze'. Although easy to root, it is another plant that deteriorates under overhead irrigation and excess nutrition. Growers in B.C. who produce quality plants of this selection appreciate that it does require special requirements compared to the majority of crops grown.

***Paxistima myrsintes* 'Emerald Cascade'**. The UBC selection *P. myrsintes* 'Emerald Cascade' requires similar propagation conditions to our native penstemons, otherwise it becomes susceptible to the soil-borne pathogen *Pythium irregulare*. This low-growing, semi-weeping, broad-leaved evergreen selection is best rooted in September to January using 0.8% IBA in talc under contact polyethylene.

***Rosa woodsii***. The very hardy, pink-flowering *R. woodsii* is becoming increasingly important for highway planting, reclamation, and erosion control. Best propagation results are obtained by sowing the ripened seed during early August in flats and then leaving them outside to allow natural cold stratification during the winter. Between 40% and 50% germination is achieved by giving a 3 month stratification at 21C, followed by 4 months at 1 to 3C. Experience at Reid, Collins Nurseries Ltd. finds the summer sowing procedure to give the best results.

The Botanical Garden has selected a relatively low-growing free-flowering clone which is readily propagated by softwood cuttings. The Garden's research scientist, Dr. Wilf Nicholls, is currently evaluating the performance of this plant in different locations in the province with the B.C. Ministry of Highways.

#### **CONCLUDING REMARKS: THE NATIVE PLANT INTRODUCTION SCHEME**

The B.C. Native Garden at the Botanical Garden is becoming an ever-increasing resource for native plant introductions. Cooperation with the B.C. nursery industry to grow and promote improved native selections is vital to ensure a plant is quality grown and successfully marketed. The plants need to be well trialed in "typical nursery conditions" where irrigation and nutritional programs can often be detrimental to the plants' health. It is important that both sides appreciate the need for some special cultural requirements.

## LITERATURE CITED

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# Woodland and Alpine Plants in the Botanic Gardens and Nurseries of Japan

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## INTRODUCTION

The Great Britain and Ireland Region's Mary Helliard Travel Scholarship contributed funding towards a study tour of the islands of Hokkaido and northern Honshu, Japan. The overall aims were to broaden my horticultural knowledge and understanding of Japanese Botanic Gardens and horticultural techniques, while working within the Living Collections Department of Hokkaido University Botanic Garden and by visiting several commercial nurseries and National Parks. Throughout these areas are some of the most important locations for eastern Asian alpine and woodland plant species.

The geographical position of the areas studied range from 45° 25' N, in the sub-Arctic zone, to 36°N. Average annual rainfall was between 147 mm to 184 mm and 1170 mm to 2000 mm of snow, with temperatures from an average of -8.1C in winter, to 25C in summer.

These general climatic conditions combined with the varied geological and topographical components of the Japanese archipelago have given rise to a diverse range of environs in which alpine and woodland plant species can thrive, with more subtle variations where altitude gives rise to the vertical zonation of vegetation types.

The topography of many of the areas visited renders them unsuitable or impossible to exploit for commercial purposes, more than 65% of Japan's surface slopes with a gradient in excess of 25%. This, together with the fact that large expanses of the areas visited are government owned, has resulted in large tracts of land being preserved by keeping industry and tourism to the peripheries.

## HOKKAIDO UNIVERSITY BOTANIC GARDEN

The scholarship began at Hokkaido University Botanic Garden, Sapporo, where I spent approximately 3 weeks working within the gardens and participating in field work.

The Botanic Garden was established in 1884 by Professor Kingo Miyabe, whose name is commonly found as a specific epithet, e.g. *Acer miyabei* and *Potentilla*

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<sup>1</sup>The Mary Helliard Travel Scholarship Award, 1994.