

# PROPAGATING WESTERN CANADIAN NATIVE PLANTS IN POLYETHYLENE GREENHOUSES

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The use of native plants in western Canada has increased dramatically over the last five years. Not only has the number of plants being demanded increased but the species that are being asked for has broadened. The increase in the number of species being sought has caused a reassessment of the cultural conditions under which these plants are grown.

We are presently growing in excess of 100 species of native plants. These plants include alpine perennials, xerophytic plants from the dry lands, and species from West Coast rain forests. The variety of plants demands close assessment and control of the cultural conditions under which they are managed in the nursery.

## CULTURAL CONDITIONS

The use of polyethylene greenhouses is the most common method of production of plants in Western Canada. This practice has therefore found its way into the growing of native plant material. Under greenhouse conditions the important cultural conditions to be addressed are: temperature, media, fertilization, water regime, shade requirements, and soil pH.

**Temperature Control.** Most of the polyethylene greenhouses control temperature by the use of side vents that can be manually rolled up and down. A more expensive method is the use of cooling fans on the end of the houses. Unfortunately, it is usually difficult to top vent poly houses therefore convection cooling is difficult.

Due to the sensitivity of some species of natives to high temperatures it is desirable to use automatic cooling fans whenever economically feasible. An example would be the production of *Cornus canadensis*; this species has very negative responses to excessive temperatures that are often experienced for brief periods during partially sunny days. On these days the manual rolling up and down of side vents is impractical and often house temperatures become excessive. However, if fans are used then moderate temperatures can be maintained.

Species, such as *Gaultheria shallon*, show very little rooting unless the temperature is less than 20°C. It is, therefore, imperative to have the ability to either vent or shade houses for the growth of these plants. There are also a number of western Canadian natives that need relatively high heat to enhance their growth. These species come from the hot, dry interior regions of British Columbia

and respond best to relatively hot and dry conditions. Examples of these are *Amelanchier alnifolia*, *Pachistima myrsinites*, *Rosa woodsii*, and many others. These plants need relatively hot temperatures and well drained media to maximize growth.

**Soil Media.** The customizing of soil media is critical for the production of native plants. Native plants have not been selected for their ability to grow under nursery conditions and they react very quickly to foreign media conditions. Since there is such a wide range of conditions that these plants come from there is a need for a wide number of media mixes. In general the plants can be divided into: wetland plants, dryland plants, and moisture-loving, but needing well-drained mixes.

Within the above media requirements there is variations around soil pH and fertilization regimes, but three general mixes will usually suffice. Depending on the availability of material one can vary the quantity of components, such as peat, pumice, perlite, bark, etc. to obtain the appropriate moisture-holding characteristics.

It has been found that if the medium is not suited to the plants there is elevated occurrences of root fungal diseases in those plants requiring dry or well drained mixes. In particular, we have found that *Cornus canadensis*, *Gaultheria shallon*, *Penstemon fruticosus*, and *Paxistima myrsinites* are very prone to root rot.

**Fertilization.** Most native plants in nature grow in relatively low nutrient conditions compared to the normal horticultural practices. They also have inputs of these nutrients at specific times of the year. For these reasons we have found that many native plants are difficult to grow using slow-release fertilizers incorporated into the mix. Also there are very specific nutrient needs by various species of native plants. For this reason it is recommended that the use of liquid fertilizers be considered and that their application be based on a schedule of monitoring and analyses.

A prime example of this is the production of *Gaultheria shallon*. This species has not responded well to slow-release fertilizers, which tend to release at high temperatures and cause severe root burn. Since this plant has its most significant growth at temperatures less than 20°C, we liquid feed when the temperatures are appropriate.

**Shade Requirements.** A large number of the most interesting native plants are shade-requiring plants. Examples of these are *Vaccinium ovatum*, *Vaccinium parvifolium*, *Mahonia nervosa*, *Linnaea borealis*, *Acer circinatum*, and many native ferns. Although these plants will grow under full sun conditions, their growth characteristics and vigor are greatly increased when grown under partial shade. In general one can extrapolate from the natural conditions of shade to the optimum nursery conditions.

**Irrigation Requirements.** Integrated into all the above discus-

sion is the water requirements of native species. Due to the wide variation in species these requirements are extremely varied. It is, however, critical to integrate the watering, fertilization, and temperature control into a functional system. Due to the wide variation in requirements and in the specificity of soil media, irrigation of natives for optimal development is difficult. Our experience has led to the belief that the use of small greenhouses with each having its own water and temperature regime is the most effective means of controlling this variable.

## CONCLUSIONS

The production of native plants under greenhouse conditions does not vary greatly from that of normal horticultural species. The greatest problems are in the lack of good information on the cultural characteristics of many of the species. This is compounded by the fact that there is wide variation, both inter and intra species. Under normal horticultural conditions most of the plants grown have undergone considerable selection procedures that have tended to eliminate most of the variability within species, and most have been selected for some ease of propagation and growth.

With the variation in native plants and rather stringent culture characteristics of many of these plants it is imperative to have very strict control of the greenhouse conditions. In particular, the use of a number of smaller greenhouses each having very specific conditions is recommended. Within each house all plants grown should be in the same soil medium and have the same fertilization, temperature and irrigation requirements.

DON DILLON: A question for Bruce McTavish. You mentioned using a liquid fertilizer. How do you apply it?

BRUCE McTAVISH: We have tried varying the percentages of N P K, depending on the growing season, without getting high quantities of nitrogen late in the season, but increasing the amount of phosphorus. We just have a large bucket we move around in the system to add materials to our movable booms or the overhead sprinklers.

VOICE: There was a question about liverwort control. We found Physan to give good control as a drench. Surflan as an underbed spray will prevent rooting into the gravel.