THE STATUS OF CONTAINER PLANTING PROGRAMS IN CANADA

1. BRITISH COLUMBIA

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Abstract.--In British Columbia, the Ministry of Forests operates under a Five-Year Forest and Range Resource Program. This program calls for the production of 97 million plantable seedlings in 1981-1982 and 150 million seedlings by 1985-1986. About 60% of current production (58 million seedlings) is container stock; by 1985-1986 container stock will account for 63% of production (95 million seedlings). Currently, in British Columbia, the major container type used is the BC/CFS styroblock.

Résumé.--En Colombie-Britannique, le Ministère des Forêts a établi un Programme Quinquennal des Ressources Forestières et des Prairies, selon lequel 97 millions de semis plantables seront produits en 1981-1982 et 150 millions d'ici 1985-1986. À l'heure actuelle, a peu pres 60% (58 millions) des semis sont réservés à la culture en mottes emballées et, d'ici 1985-1986, ce chiffre sera porté à 63% (95 millions). En ce moment, le type de récipient le plus utilisé en Colombie-Britannique est le BC/CFS styroblock.

In British Columbia, the Ministry of Forests operates nine nurseries, eight of which have container growing facilities. The total productive capacity is 100 million trees a year, with individual nursery capacity varying from 1 million to 35 million seedlings.

Reforestation in British Columbia began on an operational basis in 1939; 4,000 ha were planted in 1941 and planting was maintained at this level until 1965. Since 1972, the increase in container planting has been quite rapid: 19,651 ha were planted with container-grown stock in 1980 and this figure will increase to 80,000 ha by 1985. At present, 58 million seedlings are container stock, 97% of which are styroplugs; by 1985, the container seedling program will increase to 95 million seedlings.

The first trial of containerized planting, with seedlings grown in milk cartons, was established in British Columbia in 1957. However, it was Jack Walters (1961) who provided a significant impetus to the container seedling program when he published *The planting gun and bullet: a new tree—planting technique*. Between 1961 and 1967, a number of experimental trials were conducted with Walters bullets, bullet plugs, Ontario tubelings, and standard 2-0 bare—root by the Pacific Forest Research Centre (PFRC) of the Canadian Forestry Service and the Research and Silviculture Branches of the British Columbia Ministry of Forests. PFRC also began growing interior Douglas—fir *(Pseudotsuga menziesii* var. *glauca* [Beissm.] Franco), lodgepole pine *(Pinus contorta* Dougl.) and white spruce *(Picea glauca* [Moench] Voss) for field testing in the central interior of British Columbia (Kinghorn 1972). This work is well documented by Bamford (1974). Out of this trial work there emerged an acceptance of the 'plug' concept and a commitment by the Ministry of Forests to the testing of the container planting concept.

In 1967, a liaison 'container committee' was set up with members from PFRC's Liaison and Development Section and the Ministry of Forests' Silviculture Branch. The Silviculture Branch established a cooperative pilot container facility at Koksilah nursery in

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Duncan, which in 1968 produced 100,000 seedlings grown in 4 1/2 inch (11.25 cm) Walters bullets. The racks of bullets stood in plastic-lined plywood tanks and were watered and fertilized by subirrigation.

In 1969 the capacity of the pilot facility at Koksilah Nursery was doubled to 200,000 bullets and the irrigation system for water and fertilizers was changed to an overhead system of square-pattern sprinklers. The bullets were grown on an asphalt pad under shadecloth (Matthews 1971). Seedlings produced were comparable to those grown in subirrigation tanks.

In 1969-1970, the Liaison and Development Section of PFRC, in cooperation with the Silviculture Branch, designed and started production of the BC/CFS styroblock plug-mould-2, and a joint production model styroblock nursery was prepared at Duncan. In 1970, production of container stock at Duncan increased to one million styroblock cavities, plus 200,000 bullets in subirrigation tanks.

By the fall of 1970, growth and survival rates of styroplug-2 seedlings encouraged the Silviculture Branch to begin production of this stock on an operational basis. A new container production facility was started at the Surrey Nursery in the Lower Fraser Valley where 980,000 seedlings were grown in Walters bullets and 6,420,000 in styroblock-2s.

During the 1970s, a number of significant changes have taken place in forestry in British Columbia. The Pearse Royal Commission on Forest Resources (1976) recommended that the private sector be allowed to engage in forest nursery activities. Subsequently, the Forest Policy and Advisory Committee was appointed to study the Royal Commission recommendations and draft a new Forest Act. This new Forest Act was proclaimed in 1978, and provided for the entry of the private sector into the growing of forest seedlings under Sections 88 and 146. In February, 1979, a white paper on the growing of tree seedlings was issued for discussion purposes, and from submissions made in response to the white paper, a 'Policy Statement Regarding Tree Seedlings' and a 'Private Nurseries Financial Policy' were issued in January, 1980.

The Ministry of Forests Act was also proclaimed in 1978. Section 9 of this Act requires that the Ministry of Forests provide the Lieutenant Governor-in-Council with an annually updated five-year program for restocking forest land. This program sets out projected five-year expenditures and goals, and includes nursery operations.

The 1981 to 1986 Five-Year Program calls for 150 million seedlings to be planted by 1985-1986 (Anon. 1981). The Ministry of Forests nursery program will be maintained at 100 million seedlings, of which 50% will be container stock (Anon. 1979, 1980a). To meet this objective, we shall bring on line three new regional container nursery units of 5 million capacity each in the Nelson, Cariboo and Prince Rupert regions. between 1981 and 1986, the challenge is to increase production

Table 1. Present and projected greenhouse area and container seedling production in the province of British Columbia

	Greenhouse Area (m^2)						Container Production	
	1981			1985			1981	1985
	Heated	Unheated	Shadeframe or open compound	Heated	Unheated	Shadeframe or open compound	(000,000)	
Private nurseries[a]	23,435	3,255	7,085	73,230	0.0	5,970	20[b]	45[b]
Ministry nurseries	27,645	3,660	19,815	55,404	3,660	19,815	38	50
Total	51,080	6,915	26,900	128,634	3,660	25,785	58	95

[a]Includes greenhouse area for private land production
[b]Production for Crown land only

of plantable seedlings from private nurseries to 50 million. The private sector will be developing new nursery capacity in all six regions (Anon. 1980b), and at present, 45 million of the total has been scheduled for styroblock production. Projected production and types of production unit for the container program in British Columbia up to 1985 are summarized in Tables 1 and 2.

Table 2. Container production by species and stock type, spring 1981a

Species	No. of seedlings sown (000)	Percent of total
Spruce[b]	23,093.3	35.0
Lodgepole pine (*Pinus contorta* Dougl.)	12,984.6	19.7
Douglas-fir	11,746.7	17.8
Western hemlock (*Tsuga heterophylla* [Raf.] Sarg.)	8,237.5	12.5
Sitka spruce (*Picea sitchensis* [Bong.] Carr.)	3,559.0	5.3
Western red cedar (*Thuja plicata* Donn.)	2,826.0	4.3
True fir (*Abies* spp.)	1,871.0	2.8
Larch (*Larix* spp.)	958.4	1.4
Yellow cyprus (*Chamaecyparis nootkatensis* [D. Don.])	269.4	.4
Pine - Misc.	253.1	.4
Mountain hemlock (*Tsuga mertensiana* [Bong.] Carr)	241.0	.4
Total	66,040.0	100.0

aIncludes about 8 million trees for private land

bIncludes white and Engelmann spruce (*Picea engelmannii* Parry) and the hybrid of these two species

It is evident from Table 1 that the container program in British Columbia is expanding rapidly. A great many challenges remain to be faced in the implementation of container planting programs. However, there has been wide acceptance of the styroblock system by practising foresters in British Columbia. High survival rates, ease of planting, and good growth performance of seedlings grown with the styroblock system have provided justification for this support. White spruce and lodgepole pine are currently the major components of the production program (Table 2). However, in the period 1975-1979 the Ministry of Forests lost 22 million interior spruce 1-0 bare-root seedlings as a result of frost heaving. Consequently, one of the solutions to this loss is an expansion of the container program for interior spruce.

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