

## THE STATUS OF CONTAINER PLANTING PROGRAMS IN CANADA

## 4. MANITOBA

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Abstract.--The Japanese paperpot was selected as the standard container in 1973. The FH 315 paperpot was the preferred container for pine and spruce until 1980, when the FH 408 paperpot was adopted to produce only spruce. Current greenhouse capacity is 875,000 paperpots, grown in two crops. The planting stock production target for 1983 is 1.7 million paperpot and 6.5 million bare-root seedlings.

Résumé.--Au Manitoba, on a commencé à expérimenter les semis de conifères en tubes Ontario en 1969. En 1973, on a opté pour le tube en papier japonais et on a agrandi et modifié les installations de production. Le tube FH 315 est demeuré le récipient préféré pour les semis de pin et d'épinette jusqu'en 1980 lorsque le Manitoba a adopté le tube 408 pour ne produire que des semis d'épinette.

## INTRODUCTION

Interest in and development of a containerized seedling program as an important part of Manitoba's reforestation program began in 1969 with the construction of a small corrugated plastic greenhouse at the Pineland Provincial Forest Nursery. That same year field trials were conducted with white spruce (*Picea glauca* [Moench] Voss), Scots pine (*Pinus sylvestris* L.), jack pine (*P. banksiana* Lamb.), and red pine (*P. resinosa* Ait.) grown in the 13 x 75 mm plastic Ontario tube.

A second small greenhouse was built in 1971 and trials were begun with the Japanese paperpot. On the basis of the field performance of paperpot seedlings and ease of handling, it was decided in 1973 to adopt the Japanese paperpot as the standard container for use in Manitoba. Initially, jack pine seedlings were grown in BH 313 paperpots. However, the container was found to disintegrate too fast in the greenhouse, and this led to excessive inter-rooting between cavities and difficulties in separation. Consequently, in 1976, the more durable FH 315

paperpot was adopted for jack pine production.

## NURSERY CAPACITY

Manitoba has only one nursery, the Pineland Provincial Forest Nursery, located beside the Whitemouth River about 100 km east of Winnipeg on the south side of the Trans-Canada highway. The nursery has a total area of 126.62 ha, of which 29.0 ha, with a total capacity of 23 million seedlings, are used for the production of bare-root planting stock.

The container-growing facilities were expanded in 1973 with the addition of a third greenhouse, 29.3 x 8.3 m, covered with 4.0 oz. (113 g) fibreglass. This greenhouse was constructed to be moveable on rails over a total of four foundation sections. Seeded trays were placed on the ground where germination and early growth took place. The greenhouse was then moved to cover another section where the process was repeated. This was done to avoid the rehandling of trays. However, because of numerous operating problems, this greenhouse was finally made stationary.

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Table 1. Container production in Manitoba, 1969-1980.

Year	Number of containers					
	White spruce	Black spruce	Red pine	Jack pine	Scots pine	Total
1969	62,600			72,000		134,600
1970	75,000		25,000	65,000		165,000
1971	42,700		21,000	53,000		116,700
1972			100,000			148,000 <sup>a</sup>
1973			87,600	130,900		218,500
1974	21,100		371,400	119,600	61,600	573,700
1975	26,400		753,400	726,200	25,200	1,531,200
1976			711,200	554,400		1,265,600
1977	273,980		526,680			800,660
1978	272,900		81,860	279,100		633,860
1979	155,500	107,000	188,900	259,500		710,900
1980	136,718	221,000		144,500		502,218

<sup>a</sup>The balance of 48,000 consisted of unknown species. In 1969 plastic tubes were used; in 1970, 1971 and 1972 both plastic tubes and paperpots were used; from 1973 to 1980 paperpots alone were used.

A fourth greenhouse, 29.3 x 8.3 m, was added in 1975, bringing the total area of heated growing space to 642.1 m<sup>2</sup>. With these four greenhouses, the current container production capacity, with two crops annually, is 1.38 million FH 315 or 875,000 FH 408 paperpot seedlings.

#### CURRENT PROGRAM AND FORECAST

Container production in Manitoba for the period 1969 to 1980 is summarized in Table 1. It will be seen that production has declined in recent years, concurrently with a drop in the level of bare-root production.

In 1973 total nursery stock production at the Pineland Forest Nursery was 4.35 million, of which 4.13 million (95%) were bare-root and 218,500 (5%) were containerized seedlings. Container production reached a peak two years later at 1.53 million seedlings. However, total nursery stock production had declined to 1.22 million trees by 1979, and containerized seedling production, while accounting for 58.4% of the total, amounted to only 710,900 seedlings. This drop in planting stock production has been attributed to a variety of problems as well as to the emphasis placed on scarification for natural regeneration.

Until 1979 all container stock had been produced for government planting. In 1979, under a new Forest Management Licence Agree-

ment with Abitibi-Price Inc., responsibility for forest renewal on its licence area was assigned to the company, with the province providing the seedlings. The company requested FH 408 black spruce paperpot seedlings for planting on its licence area, which was a change from our usual production of FH 315 paperpots.

Planting stock production in 1980 consisted of 1.52 million (75%) bare-root seedlings and 502,218 (25%) paperpot seedlings. These low figures are due to severe drought in the province, which resulted in large quantities of bare-root and containerized stock being carried over until 1981. Of the total paperpot production, 177,400 black spruce seedlings were grown in FH 408 paperpots for the use of Abitibi-Price Inc.

In 1980 approximately 700 ha of bare-root and 400 ha of containerized stock were planted.

Abitibi-Price Inc. has requested 1.1 million paperpot seedlings for the 1981 season and 1.7 million for each year thereafter until 1983, when its new regeneration plan will be submitted to the province. This increased demand has created some immediate problems as the Pineland Forest Nursery has the capacity to produce only 875,000 FH 408 paperpot seedlings. Consequently, because the total production will be going to Abitibi-Price Inc., the remainder of the province must rely on bare-root seedlings.

Current (1981) container stock production therefore amounts to 875,000 FH 408 paperpot black spruce seedlings exclusively for the Abitibi-Price Inc. licence area. It is hoped that with the construction of two more greenhouses an additional 700,000 paperpot seedlings can be produced to meet Abitibi's requirements.

With the increase in greenhouse capacity, planting stock production targets for 1983 are 1.7 million FH 408 paperpot seedlings and 6.5 million bare-root seedlings. This should be sufficient to replant approximately 4,000 to 4,500 ha. The containerized stock will be grown in two crops annually, one of which will be overwintered at the nursery.

It is impossible to predict the extent of our future production as it will depend entirely on the financial support we receive. At present we are dependent on federal/provincial cost-sharing agreements, but no funds are available for Manitoba in 1981.

Our plans are to increase planting activity in northern Manitoba, and our first step will be to establish clonal seed orchards. It is hoped that a nursery will eventually be established in the north as the planting season is approximately three to four weeks behind that of the southern area.

#### MANAGEMENT CONSIDERATIONS

The container program in Manitoba was originally established to supplement the bare-root program during periods of short-fall. This was soon changed when it was realized that the planting season could be extended with the addition of the container program.

With the development of forest activity away from the traditional southern areas of the province, later springs, weather conditions, and inaccessibility posed problems for the normal bare-root planting program. It was soon recognized that container planting solved many of these problems.

The other major concern was the change in soil type from a light sandy soil to the heavier clays with thin duff or humus layer. When these clay soils are exposed by site preparation, excessive drying and hardening of the clay can lead both to difficulties in the planting of bare-root stock and to increased mortality due to opening of the planting slit.

However, experience shows that we can successfully plant the FH 408 in the duff layer without site preparation, provided that the bottom of the container comes into contact with the clay. This is a very promising technique, although it must be followed with some type of post-planting site treatment to reduce the surrounding competition.

In conclusion, we are satisfied with the paperpot container and the results that it has provided to date. We have used the FH 408 paperpot planted into the duff layer for only one season, and the data are limited; however, the results are promising. White and black spruce seedlings grown in FH 315 paperpots have experienced some frost heaving and poor initial growth when planted on site-prepared clay soils.

Jack pine and red pine, the first species used in FH 315 paperpots, had limited success when planted on dry sandy sites that had been site prepared. There were numerous insect and disease problems, and consequently we now restrict these species almost entirely to bare-root planting.