



# forest management note

Note No. 6

Northern Forest Research Centre

Edmonton, Alberta

## LARGER CAVITY SIZE AND LONGER REARING TIME IMPROVE CONTAINER SEEDLING FIELD PERFORMANCE

In Alberta and Saskatchewan, container seedlings make up approximately half of the current annual production of 36.5 million tree seedlings. As one means of evaluating the field performance of container seedlings, data collected by the Canadian Forestry Service from several plantations established between 1971 and 1974 (Figure 1) have been analyzed. A comparison of 5-year growth and survival of a variety of plug-type seedlings reared for various greenhouse periods in two types and three sizes of containers is presented in this note.

Survival (based on 29 403 seedlings) was very good, averaging 87% and ranging from 75% to 97%, but wide differences in average height within each species were common (Figure 2).

White spruce seedlings reared in 164-cm<sup>3</sup> containers for 14 weeks in the greenhouse and planted in the Edson Forest District were 84% taller than seedlings reared 4-12 weeks in 40-cm<sup>3</sup> containers and planted in the same district and were 15% taller than seedlings reared for 13 weeks in 40-cm<sup>3</sup> containers and planted in four forest districts (Grande Prairie, Lac la Biche, Footner Lake, and Whitecourt) in Alberta.

Lodgepole pine reared in 164-cm<sup>3</sup> containers for 14 weeks and planted in the Edson Forest District were 106% taller than seedlings reared in 40-cm<sup>3</sup> containers for 4-12 weeks and planted in the same district and were 17% taller than seedlings grown in 40-cm<sup>3</sup> containers for 13 weeks and planted in two forest districts (Bow River-Crowsnest and Whitecourt) in Alberta.

Jack pine reared in 492-cm<sup>3</sup> containers for 18 weeks (over a 2-year period) and planted at Meadow Lake and Candle Lake, Saskatchewan, were 25% taller than seed-

lings reared in 40-cm<sup>3</sup> containers for 10-13 weeks and planted at Candle Lake.

These results show that

1. plantation survival figures, which have been used in the past to indicate immediate success, are not a reliable index because of large differences in subsequent height growth;



Figure 1. Location of container-seedling plantations established between 1971 and 1974.

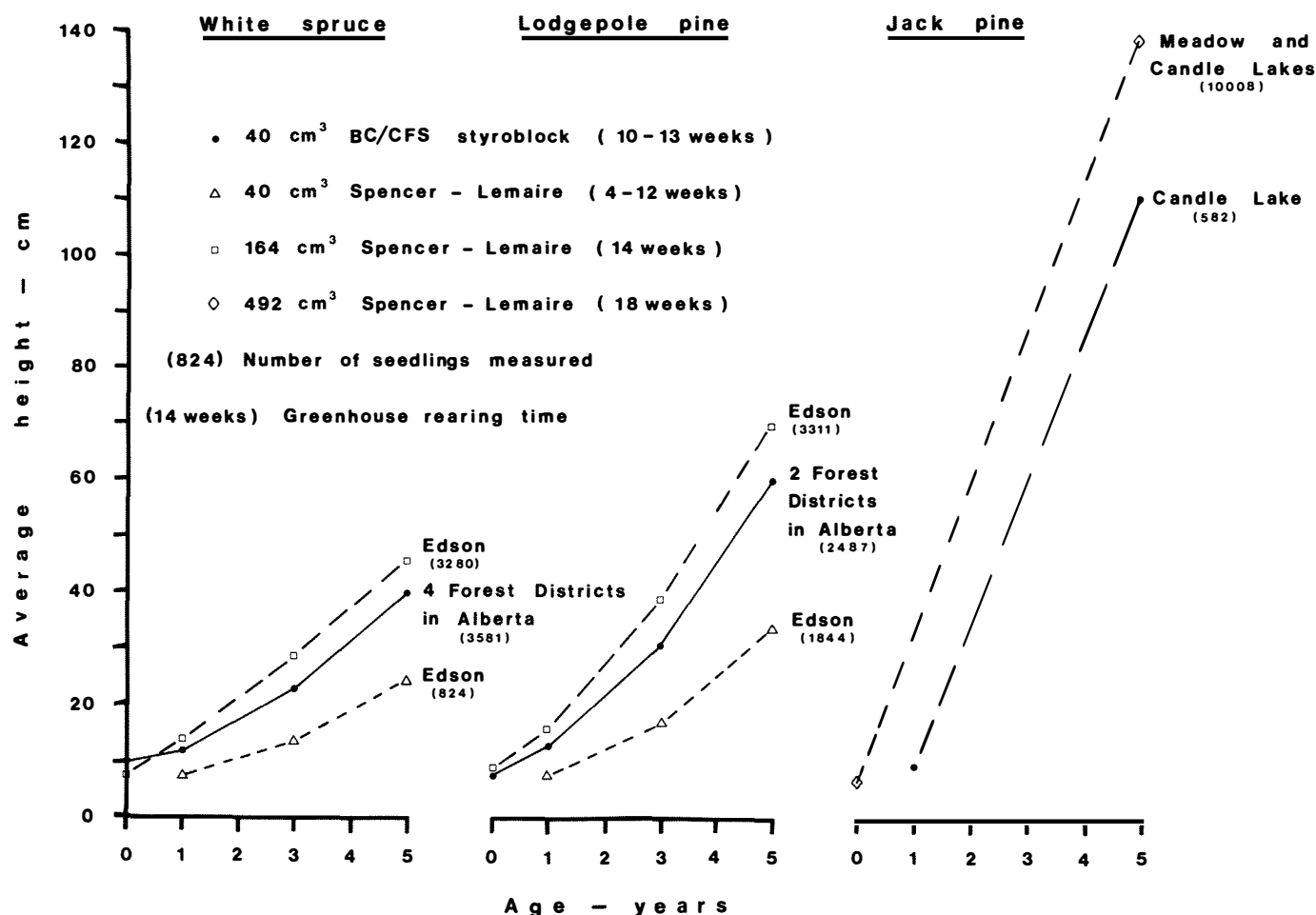


Figure 2. The effects of container size and rearing time on seedling height 1-5 years after planting.

- seedlings grown for short greenhouse periods (4-12 weeks) fail to utilize the capacity of even the smallest container (40 cm<sup>3</sup>) being used today, are undersized when planted, and grow extremely slowly after planting; and
- seedlings grown in containers larger than 40 cm<sup>3</sup> for a minimum 14-week greenhouse rearing period showed the best height growth under field conditions.

It is apparent from these field studies that the hazardous plantation establishment period can be shortened considerably by using larger stock produced using a longer greenhouse rearing period and/or utilizing larger containers.

*N.R. Walker*  
*W.J. Ball*  
*April 1981*