

## WHEN DO PLANTATIONS START TO PRODUCE MERCHANTABLE VOLUME

by William M. Glen, 1995

### Introduction

The Prince Edward Forestry Service has been establishing plantations since 1951. The early plantings were limited to a few hectares per year and the efforts were usually most appreciated by the landowners and often went unnoticed by the general public. Since the early 1980s planting numbers have increased dramatically and now many young plantations are 'appearing' in old cutovers and old fields. The early growth of plantations was not documented in P.E.I. This report is a first effort to compile growth data for the species planted.

The provincial wood supply faces a deficit in approximately 20-30 years. The early merchantable growth of plantations will have a major impact on wood supply during this period so the species planted in the future has an important role to play.

### Procedure

Over the past 15 years the Forestry Service has established a series of Permanent Sample Plots (PSPs) across the Province in a variety of forest types. Starting in 1989, a number of PSPs were established in young (6-15) year old plantations. It is primarily these PSPs which provide the source for the information contained herein.

A PSP is composed of two or more subplots, each of 1/50 hectare (200 square metres) in size, in which all trees are identified with aluminum tags bearing a number. Each tree is measured for diameter and five trees in each subplot are measured for height as well. The plots are remeasured on a three year cycle with all measurements being recorded by individual tree.

The Tree Improvement white spruce family tests established in 1974 and 1976 were used as an additional data source. These were measured at ten years of age and again in 1991. Plots were superimposed on these measurements and compiled to provide volume growth for young white spruce plantations.

## Results

The following graphs based on this data show that the time when merchantable volume commences varies by species and by site. The average age by species when merchantable volume begins is noted in Table I.

**Table I**  
Age at which Plantations start producing  
Merchantable Volume

Species	Average age	Range
Black spruce	13	11-15
White spruce	10	-
Red pine	8	6-10
Jack pine*	11	9-13
eastern larch	8	6-9
Japanese/European larch**	7	6-9

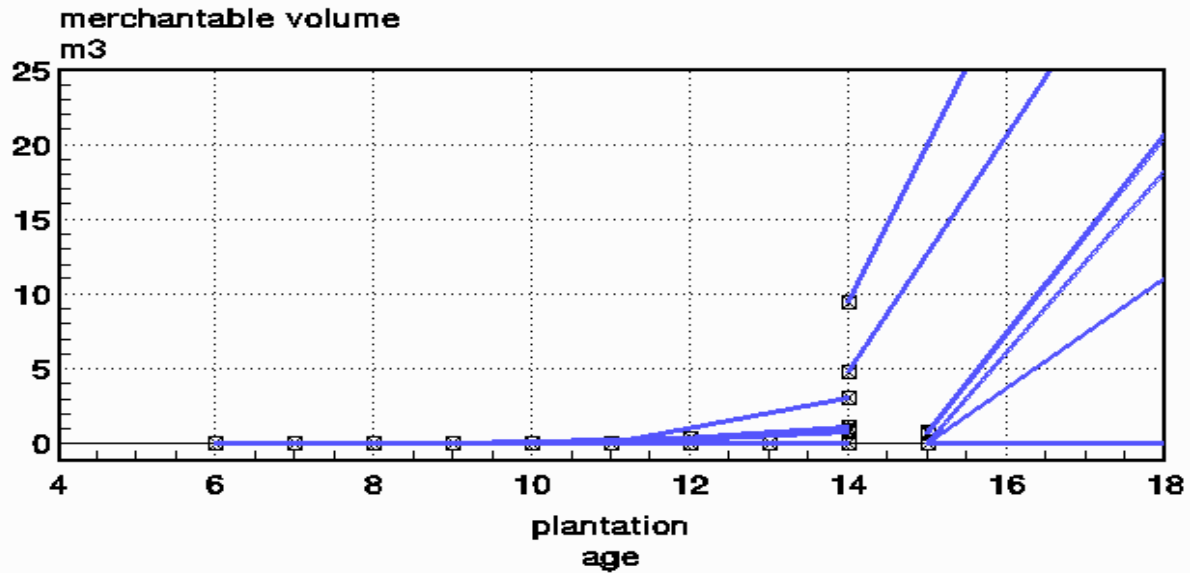
Notes -Merchantable volume is defined as the volume of the stem of a tree with the smallest piece being longer than 2.4 metres (8 feet) with a small end diameter of greater than 9 centimetres (3.5 inches).

\*-Jack pine is no longer grown by the J.F. Gaudet Tree Nursery.

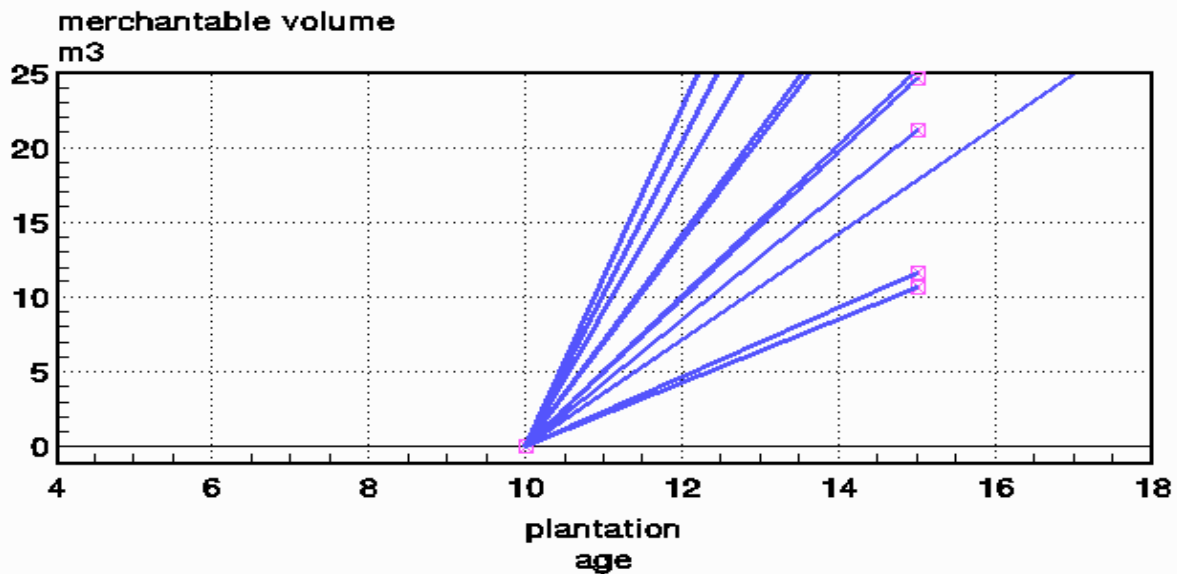
\*\* -Japanese and European larch are grouped due to the small sample size (some of these plantations contain a component of hybrid larch, European/Japanese crosses).

In the following six graphs the measurements from each PSP subplot or Tree Improvement test are represented by two points and a line connecting them. The points show the volume on the vertical axis and age at time of measurement on the horizontal axis. A straight line has been used to connect the points and represents the volume growth of the plot.

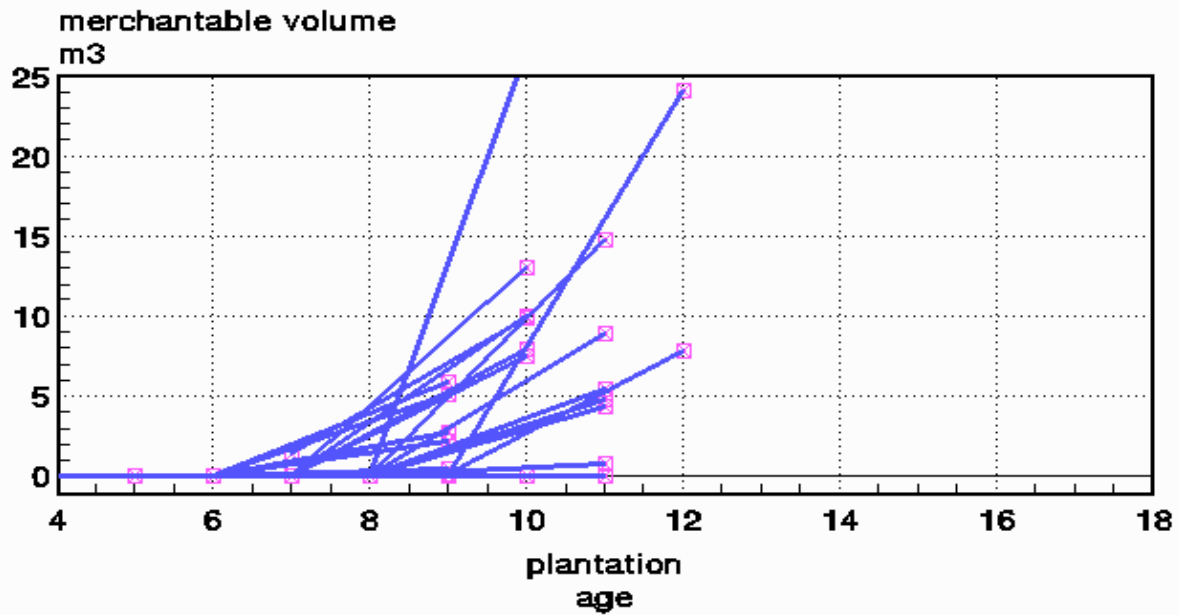
## Black Spruce Plantations Beginnings of Merchantable Volume based on 48 PSP subplots



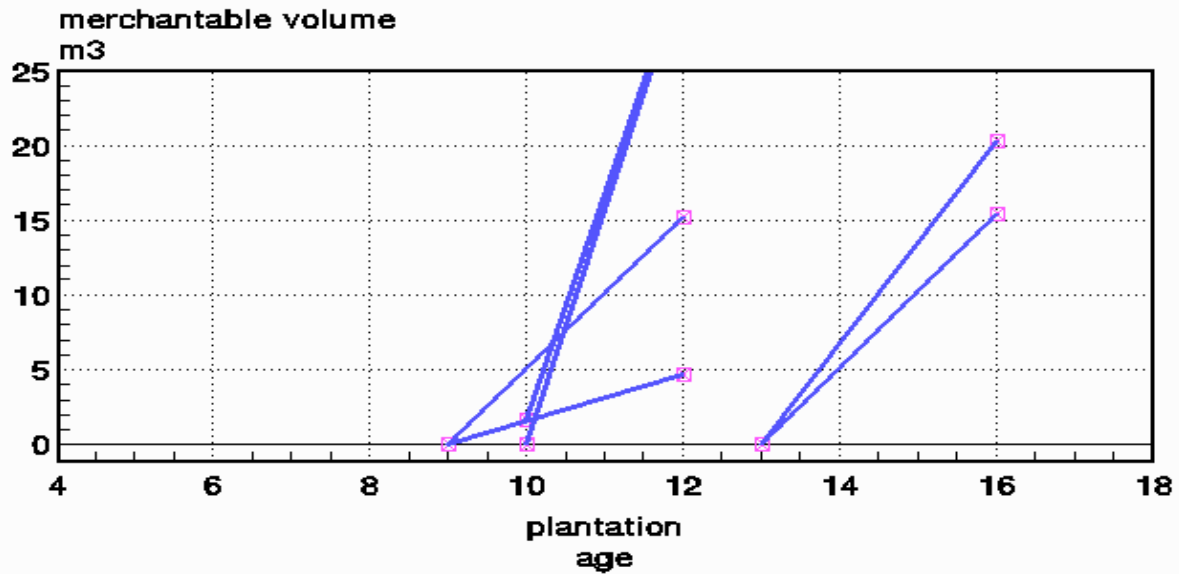
## White Spruce Plantations Beginnings of Merchantable Volume based on 11 Tree Improvement Tests



## Red Pine Plantations Beginnings of Merchantable Volume based on 41 PSP subplots



## Jack Pine Plantations Beginnings of Merchantable Volume based on 6 PSP subplots





## Discussion

The selection of tree species has an impact on the time it will take to produce merchantable wood. From the above limited list of species, the larches and red pine will produce timber quicker than black spruce. The ultimate volumes which these species may produce are also different as are the wood characteristics. If a site is suitable for larch or red pine and they will produce wood of the required quality or type, substitution of these species will allow merchantable wood production in a shorter period than is possible with black spruce. This has profound implications on wood supply and sawlog availability in the future.

### Notes

1- The PSP program as of March 1995 has 117,000+ individual tree diameters in 349 plots (810 subplots). This report utilizes the results from the 138 subplots established in young plantations that have had remeasurements. These plots provide an initial look at the beginnings of merchantable volume growth for five plantation species. Eleven Tree Improvement family tests provided the data for the sixth species, white spruce. These beginnings provide a critical piece of the growth curves used for the prediction of the Province's future wood supply.

2- Older plantation growth has been documented in *Prince Edward Island History of Plantations established pre 1980* by the author dated June 1994 and the second edition in April 1995.