TRANSPLANT COMPARISONS AT THE WEBSTER NURSERY

PLUG-1s AND BAREROOT 2-1s

James M. Sedore and William Fangen

ABSTRACT: August and March transplanted plug-1s are compared with 2-0 and 2-1s. Plug-1s were generally larger than 2-1s. Although some seedlings lost needles in a severely cold winter the seedlings recovered the following season.

INTRODUCTION

We have been growing bareroot transplants for many years at the Webster Nursery. In 1981 we began raising container seedlings for transplanting. After three years of experience we have made some comparisons.

REASONS FOR PRODUCING TRANSPLANT STOCK

Transplant stock types are planted where browsing and vegetative competition are problems for smaller seedlings. Plug-1 stock is significantly larger than plug stock. Larger seedlings with a balanced shoot/root ratio, caliper, and root symmetry have a better chance at reaching release size in browse and competition sites than smaller stock.

The second reason for transplanting container stock is the unique characteristics of Douglasfir plug-Is. Bareroot 2-0 Douglas-fir often grow too tall for easy transplanting. Even when transplanting only the smaller seedlings the trees are spaced farther apart than other transplanted species, 18 stems/bedfoot. This requires additional bed space which adds to the cost. Container 1-O Douglas-fir are planted at 21 stems/bedfoot. All the seedlings that meet a minimum specification are transplanted. The root mass that develops from the plug has a mop-like appearance (fig. 1). This contrasts with the more spreading root-mass of the 2-1. Some tree planters prefer the plug-1 root system for its ease of planting.

The third reason for plug-1s is the ability to produce a transplant seedling in 2 years rather than 3 years.

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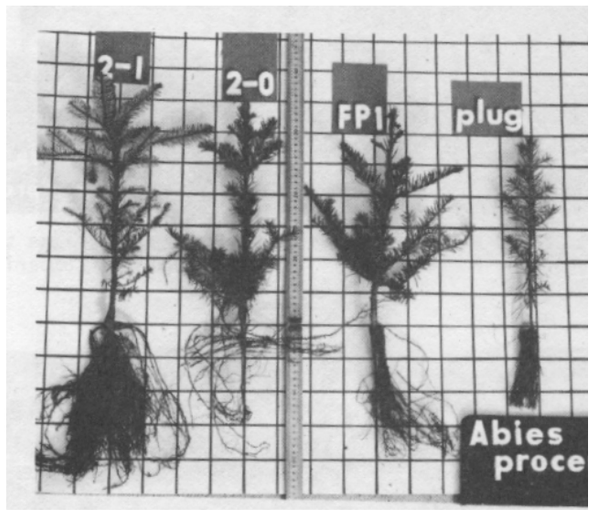

Figure 1.--Comparison of root configuration between bareroot and container transplants.

Table 1.--Average measurements of different stock types grown at the Webster Nursery. October. 1983

Species	Stock type	Height cm (in)	Caliper mm	Shoot/root (fresh wts)
Douglas-fir	2-0	45 (18)	5	2.1
(Pseudotsuga menziesii)	2-1	58 (23	7	1.7
	AugP-1	65 (26	11	2.2
	MarP-1*	58 (23)	8	2.0
Sitka spruce	2-0	34 (13)	6	2.2
(Picea	2-1	45 (18)	8	
sitchensis)	AugP-1	53 (21	8	1.7
Noble fir	2-0	34 (13	8	4.7
(Abies	2-1	36 (14)	9	
procera)	AugP-1	35 (14)	8	4.2
Western hemlock	AugP-1	62 (24)	8	2.1
(Tsuga heterophylla)	MarP-1	42 (17)	6	3.0
Western redcedar	AugP-1	71 (28)	9	5.1
(Thuja plicata)	MarP-1	64 (25)	6	7.6
Silver fir	AugP-1	25 (10)	7	1.7
(Abies amabilis)	MarP-1	26 (10)	7	1.4

*Measurements from October, 1982

MORPHOLOGICAL COMPARISONS

August Plug-1 Douglas-fir (Pseudotsuga memziesii), Sitka spruce (Picea sitchensis), and noble fir (Abies procera were all equal to or larger than 2-1 transplants (table 1) (figs. 2-7).

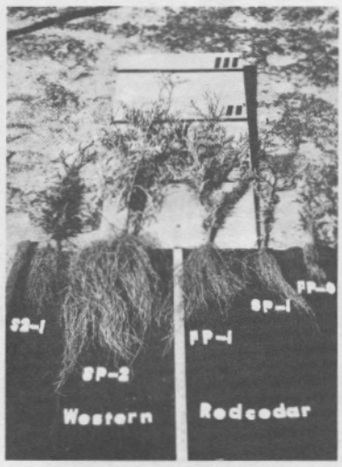

Figure 2.--Western redcedar transplant comparisons.

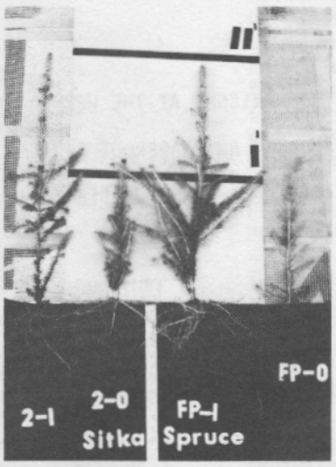

Figure 3.--Sitka spruce transplant comparisons.

Figure 4.--Pacific silver fir transplant comparisons.

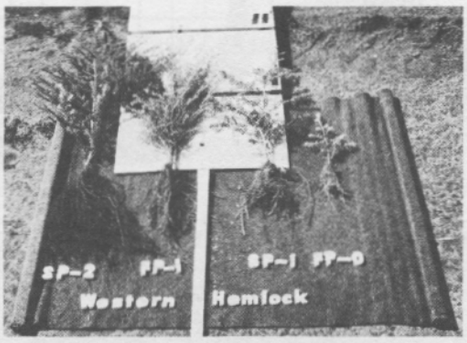

Figure 5.--Western hemlock transplant comparisons.

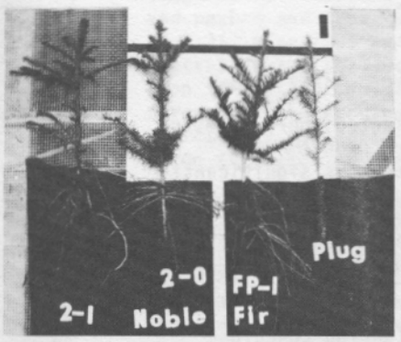

Figure 6.--Noble fir transplant comparisons.

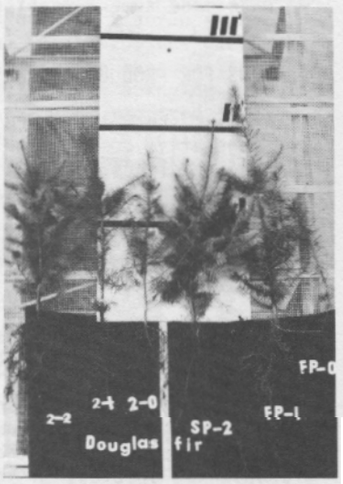

Figure 7.--Douglas-fir transplant comparisons.

August transplants of western hemlock and western redcedar were larger in height and caliper than March transplants. We do not raise 2-1 hemlock or silver fir so no comparisons could be made.

NEEDLE BURN ON PLUG-1s

The annual cold spells at the Webster Nursery are usually brief and no lower than 10°F (-12°C). However, in 1983-84 the temperature reached -7°F (-21°C) and stayed below freezing for 7 days. One month later it again dropped below 20°F (-7°C) for 7 days. Needles of many of the plug-Is were injured and fell off in March. We did not know if the cold had killed the roots, cambium, or the buds, so we photographed the seedlings monthly (figs. 8-17). As the photos show the seedlings recovered well. This ability of transplants to lose their needles from winter cold burn and yet recover should be noted when making plantation surveys in the spring.

Figure 8.--Western redcedar, January 20, 1984.

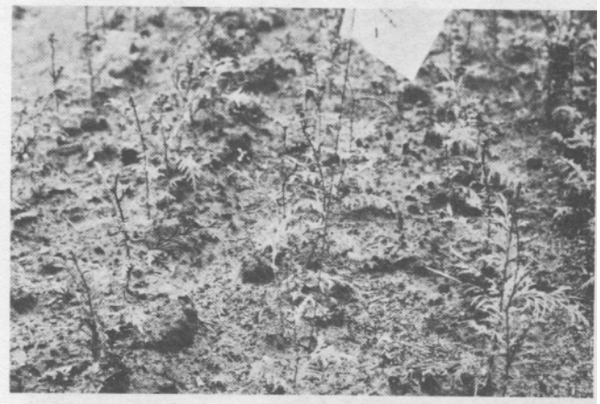

Figure 9.--Western redcedar, March 1, 1984.

Figure 10.--Western redcedar, April 2, 1984.

Figure 11.--Western redcedar, May 21, 1984.

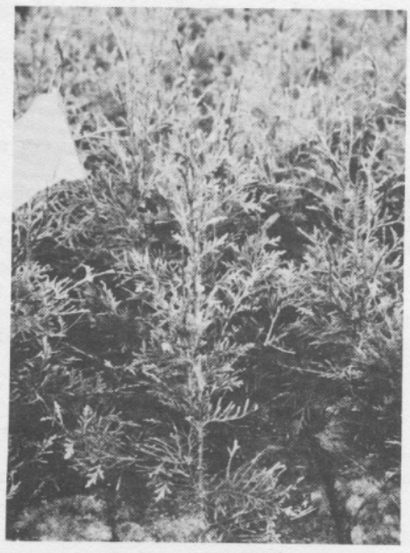

Figure 12.--Western redcedar, July 3, 1984.

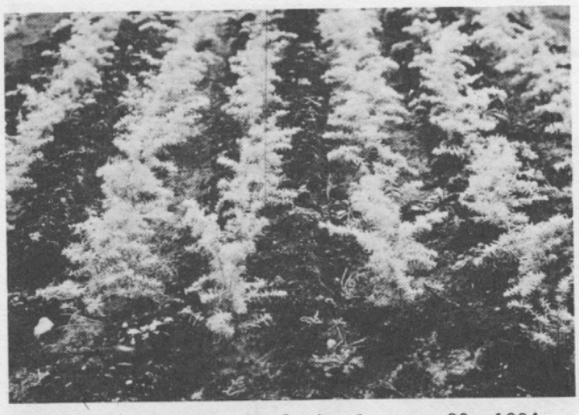

Figure 13.--Western hemlock, January 20, 1984.

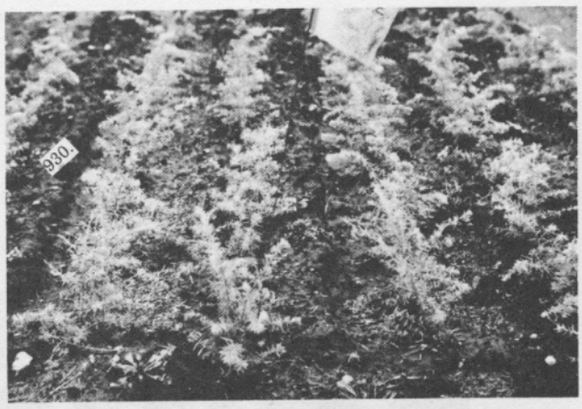

Figure 14.--Western hemlock, March 1, 1984.

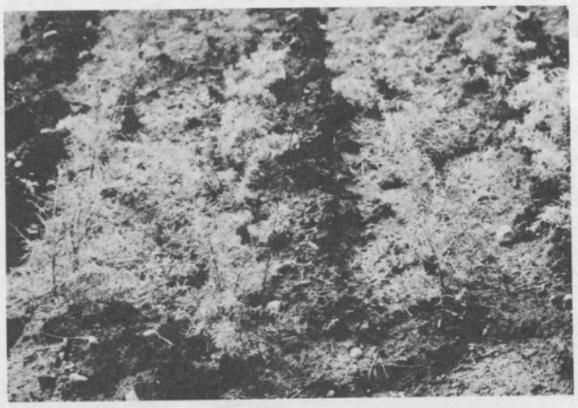

Figure 15.--Western hemlock, April 2, 1984.

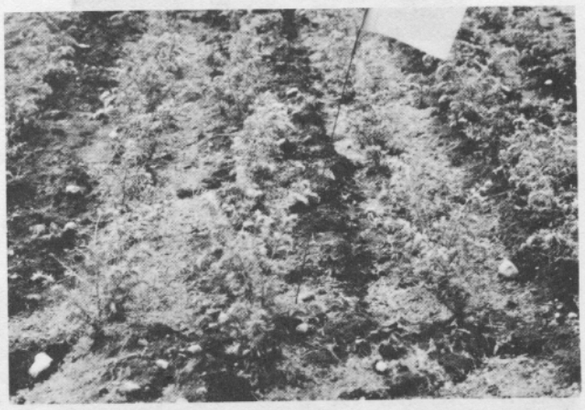

Figure 16.--Western hemlock, May 21, 1984.

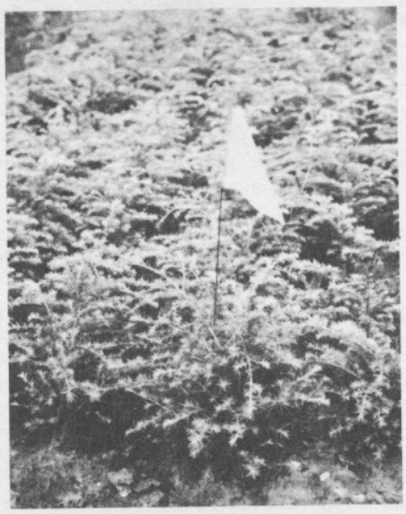

Figure 17.--Western hemlock,
July 3, 1984.