

EFFECTS OF REFRIGERATION AND SHIPPING ON SUGAR PINE FIELD SURVIVAL

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Field survival of sugar pine planting stock that has been held in refrigerated storage several months or more is often quite poor. Consequently, present nursery practice is to ship freshly lifted sugar pine directly to the planting areas, avoiding refrigerated storage whenever possible. The study reported here was designed to test for significant differences in survival between refrigerated and freshly lifted seedlings shipped from the nursery 2 weeks, 1 week, and the day before planting.

Three comparable full-size bundles of 2-0 sugar pine seedlings which had been in refrigerated storage (33° to 35° F.) 5 1/2 months were used for the stored seedlings. The seedlings were packed in washed cedar shingle tow and bundled in vapor barrier paper with tops exposed. Two weeks before a selected planting date (early May), one of the stored bundles and a bundle of an equal number of freshly lifted seedlings from the same seed source as the stored seedlings were shipped by common carrier to the outplanting area. The seedlings arrived 3 days later and were placed in a shaded snowbank until planting time. This same procedure was repeated 1 week before planting. On the day before planting, the last bundle of refrigerated seedlings and a bundle of freshly lifted seedlings were taken directly from the nursery to the planting site by car. Two hundred seedlings from each treatment were outplanted in a statistical design. A survival count made early in September 4 months after planting gave the following results:

	<u>Transit period</u>	<u>Survival</u>
	<i>Weeks</i>	<i>Percent</i>
Stored seedlings.....	2	32.0
	1	34.5
	0	41.5
Freshly lifted seedlings.....	2	56.5
	1	46.5
	0	45.0

An analysis of variance using transformed survival percentages showed that the variation between transit periods was not significant, whereas the variation between stored and freshly lifted seedlings was highly significant (1 -percent level). With the confidence limits of this study so high, the results (1) support the nursery practice of shipping freshly lifted sugar pine seedlings and (2) show that transit and holding periods of 2 weeks or less have little effect on the field survival of either refrigerated or freshly lifted stock.