

FIELD SURVIVAL OF COLD STORED LOBLOLLY PINE SEEDLINGS

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There are varying reports in the literature concerning the effect of cold storage on subsequent survival of out-planted forest tree seedlings. In a recent paper, Stone and Schubert² reported that date of lifting from nursery bed and placing in cold storage affected survival of ponderosa pine seedlings. Ruth³ has reported that date of lifting and cold storing did not affect survival of Douglas-fir and Port -Orford -cedar.

If pine seedlings could be lifted in late fall or early winter and placed in cold storage, a "rush" period in spring could be avoided and permanent labor better utilized. To determine the optimum time of lifting seedlings from the nursery bed and placing them in cold storage, an experiment was conducted over a 2 -year period by the Illinois State Division of Forestry and the University of Illinois.

Loblolly pine seedlings were lifted from the nursery bed on October 16, November 6, and December 27, 1958, and January 30, 1959. Immediately after lifting, the roots of the seedlings were packed in sphagnum moss and they were placed in a cold storage room at 36° F. During the following lifting season, loblolly pine was lifted on October 10, November 12, and December 10, 1959, and January 11, February 10, and March 22, 1960. As before, seedlings were packed in moss and stored at 36° F. Periodic watering kept the moss moist.

Groups of seedlings lifted during the 1958-59 lifting season were removed from cold storage March 30, 1959, and 136 seedlings from each lifting date were planted the following day. Plants stored during the 1959-60 lifting season were removed from cold storage April 6, 1960, and 144 seedlings from each lifting date were planted April 7. Soil moisture was near field capacity and air temperature near 75° F. on both planting dates. Firstyear field survival seedlings lifted on the 10 dates is as follows:

<u>Date lifted</u>	<u>First-year field survival</u>
	<i>Percent</i>
October 16, 1958	0
November 6, 1958	50
December 27, 1958	97
January 30, 1959	98
October 10, 1959	0
November 12, 1959	0
December 10, 1959	60
January 11, 1960	92
February 10, 1960	95
March 22, 1960	98

A simple test for dormancy in pine seedlings is to determine how easily the cambium layer of the stem can be separated from the wood; the harder the cambium is to separate, the more dormant is the plant. In this study, the earlier the seedlings were lifted from the nursery bed, the less dormant they appeared to be when planted in the field.

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² Stone, Edward C., and Gilbert H. Schubert. Ponderosa pine planting stock. Calif. Agr. 13(10). 1959.

³Ruth, Robert H. Survival and growth of fresh and stored planting stock, U.S. Forest Serv. Pacific N.W. Forest and Range Expt. Sta. Research Note 93. 1953.

Under the conditions of this experiment, loblolly pine seedlings cannot survive cold storage unless they are hardened off and dormant before being placed in cold storage. Survival in this experiment was influenced by the physiological condition of the seedling, not by storage conditions. Loblolly pine in southern Illinois probably should not be lifted during normal years before the middle of December for placing in cold storage for spring planting.