

Drying and Storing Stratified Loblolly Pine Seeds Reinduces Dormancy

James P. Barnett

*Principal Silviculturist, 1102 Timber Management Research Project
Southern Forest Experiment Station, USDA Forest Service*

Stratified pine seeds left over at the end of the sowing season must either be stored for 6 to 12 months or discarded. This article reports the effects of drying and storage on loblolly pine (*Pinus taeda* L.) seeds that had received several pregermination treatments.

Methods

Six separate lots of loblolly pine seeds, ranging in age from 1 to 11 years, were divided and given five pregermination treatments (Barnett 1971). The treatments tested were: (1) cold stratification in polyethylene bags, (2) aerated cold-water soaks, (3) cold soaks with twice-weekly water changes, (4) unaerated soaks, and (5) no prechilling treatment. All treatments were at 41° F. for 147 days. After treatment, samples were drawn for initial testing and the remaining seeds were dried to about 10 percent moisture content and stored at 34° F. for testing after 6 and 12 months.

At each testing time, duplicate 100-seed samples were drawn from each subplot and germinability was

determined at a temperature of 72° F. and a 16-hour photoperiod for 28 days. Germinated seeds were counted every 2 or 3 days. A germination value was computed for each sample by obtaining the product of peak value and mean daily germination (Czabator 1962). Peak day—the number of days to reach peak value—is a good indicator of dormancy. Germination percentages were transformed to $\arcsin \sqrt{\text{percentage}}$ for analysis. Differences in transformed percentages and peak days were tested for statistical significance at the 0.05 level.

Results

Data for the six original lots were combined, since peak days (which reflect speed of germination) did not differ appreciably by age or seed source. Germination did vary with seedlots, but all lots seemed vigorous. Differences among treatments varied about 14 percentage points at the start of storage (table 1).

After 6 months of storage, the only major losses of viability were in the water-change and unaerated

water soak treatments, each dropping about 20 percentage points. Other lots, including the check, had small, unimportant losses of viability. During this period, there was also a reduction in speed of germination of all lots. Peak germination of seeds stratified or soaked in aerated water dropped from 5 days to 12 and 13 days, respectively. The two lots soaked in water without aeration had peak germination after 21 and 20 days, which is substantially longer than the 14 days required for untreated seeds. After storage for 6 months, seeds given treatments that had no adverse effect on viability germinated at least as rapidly as the controls. Seeds adversely affected by pregermination treatments germinated much slower than the controls.

Viability of all lots dropped rather uniformly in the second 6 months of storage; decreases averaged about 10 percentage points. However, speed of germination changed very little over this period.

The results indicate that vigorous seed lots dried and stored for

periods up to 1 year after pregermination treatment lose the benefits of treatment. Viability of such lots of loblolly seeds is maintained well; it equals that in untreated seeds. Lots that have lower vigor or have been adversely affected by treatment may become more dormant than untreated seeds and also may lose considerable germinability.

Some of the return of dormancy in storage probably can be prevented by drying the seeds to well below 10 percent moisture content. Results of other studies have shown that storage of loblolly seeds at moisture contents of 10 to 18 percent induces deep dormancy (McLemore and Barnett 1968).

TABLE 1.—*Germination percentages and days to reach peak germination of loblolly pine seeds subjected to various pregermination treatments and then dried and stored for 6 and 12 months*

Treatment	Germination percentages			Peak day		
	0 mos.	6 mos.	12 mos.	0 mos.	6 mos.	12 mos.
Stratification	98	95	83	5	12	12
Aerated water soaks	97	91	83	5	13	13
Soaks with water changes	86	64	57	8	21	24
Unaerated soaks	84	64	55	12	20	20
Untreated seeds	94	93	81	15	14	14

Literature Cited

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