

REPELLENT-COATED SEED OF LOBLOLLY PINE CAN BE STRATIFIED

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Germination of unstratified, repellent-coated seed of loblolly pine is often slow and irregular, increasing the chance of depredation and causing irregularity in the density of the resulting stands. Therefore, more seed is required to insure a full stand. At planting, the moisture content of repellent-coated seed must be increased so that the seeds will germinate promptly, especially if they have been redried and stored. Adding moisture to such seed poses problems because the repellents can be toxic to the forthcoming radicle.²

A study just completed shows not only that it is possible to stratify repellent-coated seed of loblolly pine safely, but also that stratification is necessary to obtain maximum germination and an increase in speed of germination.

Methods

Five mixed lots of loblolly pine seed from Virginia and the North Carolina Coastal Plain were used. Half of each lot was repellent-coated; then all the seed in each lot was sealed in glass jars for storage at 20° F. The various lots (both the coated and uncoated) were removed after storage periods ranging from 4 to 20 months.

Both the coated and the uncoated parts of each lot were divided into five sublots, each of which received one of the following pregermination treatments:

1. Control (sealed in a glass jar at 20° F.) .
2. Placed in open trays at high relative humidity

- for 30 days at 38° F.
3. Overnight water soak at 70° F.
4. Stratified in cloth bags surrounded with damp moss for 30 days at 38° F.
5. Stratified in polyethylene bags for 30 days at 38° F. (No water soak was given before placing seed in the bags, but a handful of damp moss was added to one corner before each bag was sealed.)

All seed was tested for germination at the same time.

Results

Before the pregermination treatments, the moisture content of the five seed lots ranged from 5 to 13 percent. The average moisture content was 7.91 for uncoated seed and 7.72 for coated seed (table 1, controls). The moisture content was doubled in treatment 2 by exposing the seed to 86 percent relative humidity at 38° F.; however, this treatment did not promote germination. The moisture content was increased approximately 4 to 5 times by the other treatments. The percent of moisture content was not significantly affected by repellent-coating.

Length of storage had no effect on percent of germination; all repellent-coated seed were dormant when removed from storage, whereas no dormancy was noted in the uncoated seed after undergoing

TABLE 1.—Average moisture content of loblolly pine seed after pregermination treatment

Treatment	Average moisture content	
	Uncoated	Coated
	<i>Pct.</i>	<i>Pct.</i>
1. Control	7.91	7.72
2. Open to high humidity	16.66	15.94
3. Water soak	28.32	30.82
4. Stratified in moss	28.40	32.19
5. Stratified in polyethylene bag ..	26.42	26.76

¹ Operated cooperatively by Southeastern Area, State and Private Forestry and the Southeastern Forest Exp. Sta., U.S. Forest Serv.; the Ga. Forest. Comm. and the Ga. Forest Res. Council.

² Jones, LeRoy. Germination of repellent-treated southern pine seed before and after storage. U.S. Forest Serv. Southeastern Forest Exp. Sta., Res. Note SE-15: 4 pp. 1963.

³ The repellent-coating consisted of 2 gals. DuPont Arasan 42-S, 2 lbs. "Fasco" brand Endrin 50W, 300 cc. undiluted Dow Latex 512-R, and 1 cup of aluminum powder per 100 lbs. of seed. Seed was treated by Union Camp Corp., Franklin, Va.

PREGERMINATION TREATMENTS

- 1. CONTROL
- 2. OPEN TO HIGH HUMIDITY
- 3. WATER SOAK
- 4. STRATIFIED IN MOSS
- 5. STRATIFIED IN POLY-ETHYLENE BAGS

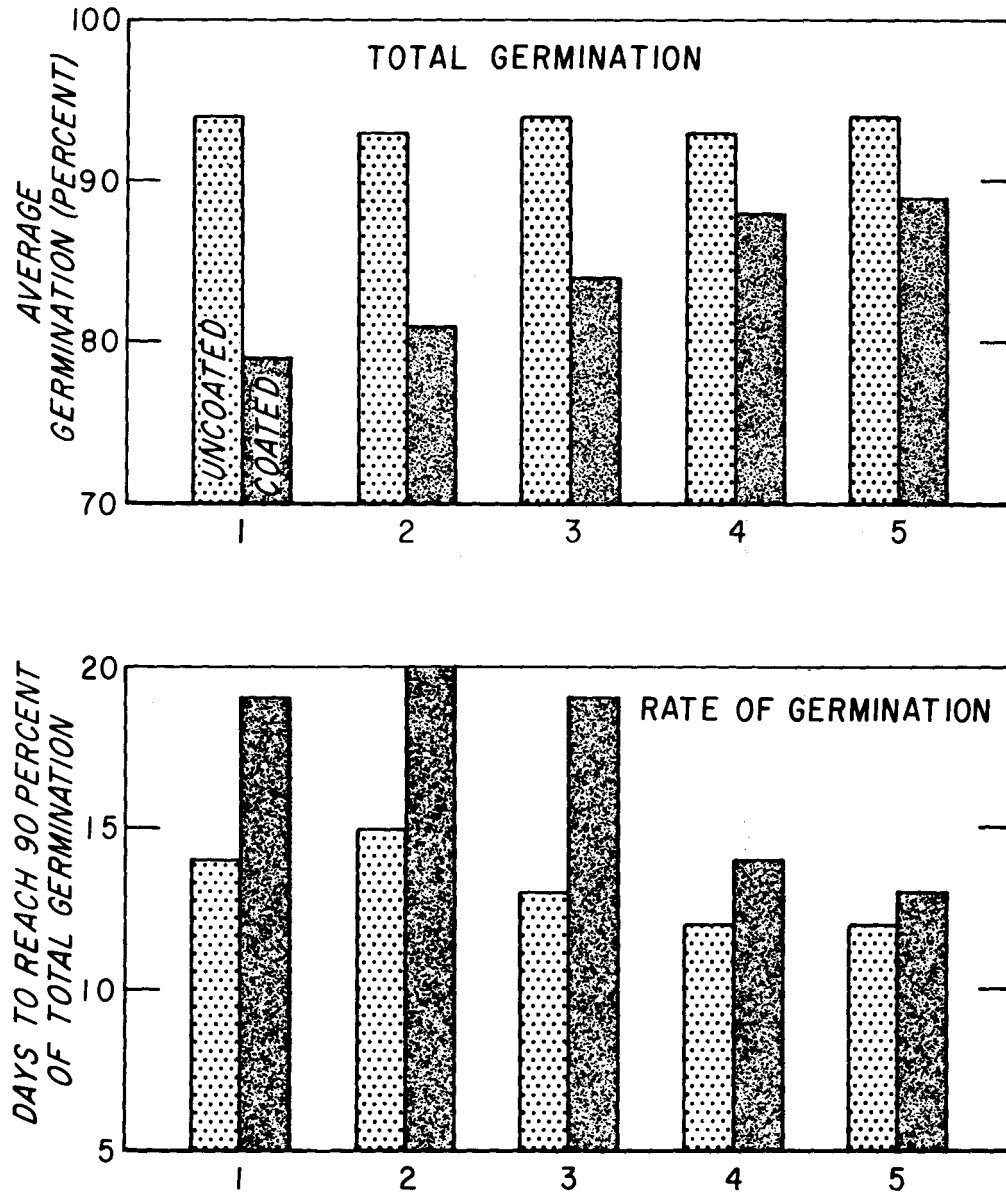


Figure I.- (Top). While uncoated seed of loblolly pine exhibited no dormancy after storage, stratification (treatments 4 and 5) promoted germination of coated seed. (Bottom). The number of days necessary for seed to reach 90 percent of total germination was reduced for those coated seed that had previously undergone stratification (treatments 4 and 5).

the same storage conditions. Dormancy in the repellent-coated seed was overcome by stratification (fig. 1).

Little difference in percent of germination was noted between the seed that had been placed in cloth bags packed with moss and the seed that had been placed in polyethylene bags with a handful of moss. However, the polyethylene-bag treatment is preferable because it is simpler and prevents the repellent chemicals from coming in direct contact with the moisture-holding medium.

Recommendations

The results indicate that repellent-coated seed of loblolly pine have a higher degree of dormancy af

ter storage than do uncoated seed. Germination of this coated seed is greatly improved, however, by stratifying prior to sowing.

Repellent-coated seed of loblolly pine should be stratified in polyethylene bags *without* prior soaking. A handful of wet moss should be added to a corner of each bag, but this moss should not have water running from it. The bags of seed should be sealed and kept at 38° to 40°F. for approximately 30 days.

It should be noted that these results are based on treatment of seed in small batches. Until further information is available on the feasibility of treating large lots of seed, the treatment recommended should be confined to relatively small lots.