IMPROVING STORAGE OF SPRUCE PINE SEED

J. P. BARNETT and B. F. MCLEMORE,
Southern Forest Experiment Station,
Forest Service, USDA

Landowners where spruce pine *(Pinus glabra* Walt.) grows best have recently become interested in planting and seeding this species because it grows fast and is useful for both pulpwood and sawtimber. However, seed storage schedules suitable for other species of southern pine are not suitable for spruce pine seed. Interim results of a study on the best way to store spruce pine seed are reported here. Both low temperature and low moisture levels appear necessary.

Cones were collected in late October 1964 in Livingston Parish, La. Seeds were extracted in a kiln heated to approximately 100°F. After empties had been floated off in ethyl alcohol, the seeds were dried to either 6, 9, 12, or 15 percent moisture content, and assigned to storage at either 0, 25, or 34°F. The test thus included all 12 possible combinations of four moisture contents and three storage temperatures. Each treatment was replicated three times.

Before the seeds were stored, samples were stratified for 28 days and tested for germination.

Initial viability was high, averaging 94 percent, with no differences among the moisture-content groups. After 1 year, germination after stratification averaged 92 percent for all lots stored at 0° 78 percent for lots stored at 25°, and 64 percent for storage at 34°. The differences between the storage temperatures- were significant at the 0.05 level.

Low moisture contents, like low temperatures, preserved germinability best. On the average for all storage temperatures, seeds with 6 percent moisture had significantly better germinability than those with 12 and 15 percent, though not better than those with 9 percent (table 1). Seeds stored at 15 percent moisture had significantly poorer germinability than all the others.

The rapid decline in viability with increasing moisture content and storage temperature was unexpected. It now appears that spruce pine seer should be stored at 0°F. and at moisture content not above 9 percent, for best results.

TABLE 1.—*Summary of normal germination of spruce pine seed after 1 year of storage*

Moisture content	Germination after 1 year at—			Treatment means [1]
	0°F.	25°F.	34°F.	
	Pct.	*Pct.*	*Pct.*	*Pct.*
6	95	89	80	88]
9	94	80	77	84]]
12	90	83	60	78]
15	88	61	40	63]
Treatment means [1]	92	78	64	

[1] Arcsin $\sqrt{\text{percent}}$ transformation used for analysis. Means of storage treatments which are underlined by the same line or lie within the same bracket are not significantly different at the 0.05 level.