

REFRIGERATION PROLONGS VIABILITY OF COTTONWOOD SEED

J. L. Gammage and L. C. Malsenhelder
 Southern Forest Experiment Station,¹ U. S. Forest Service
 Stoneville, Miss.

Tests at Stoneville, Miss., indicate that refrigeration can keep cottonwood seed viable for several weeks.

Test Procedure

In July 1958, after cottonwood seed had begun to shed, partially open catkins were collected from an open-grown tree and dried at room temperature for 24 hours. To insure the use of mature seed only, capsules were discarded if they had not opened completely after drying.

Some of the seeds were placed in a paper bag and stored in a refrigerator at 40° F. Others were put in nylon mesh bags and kept indoors at about 75° F. A third lot, also in mesh bags, was hung in the shade in a cottonwood tree. The last two methods provided storage at relatively high air temperatures and varying conditions of air movement which caused more rapid drying of the seed than under refrigeration.

Each day for 25 days, 10 seeds were taken from each lot and placed in clay pots filled with moist sand and set in pans of water in a greenhouse. Germination was checked at the same hour daily.

In June 1959, seed from the same tree, stored only in a refrigerator, was tested in a laboratory germinator at 84 to 86° F. Moist germination paper was used as a germinating medium.

Results

The seed deteriorated rapidly when exposed, germinating poorly after less than 1 week of storage in the tree (table 1). This result suggests that seed exposed in open

TABLE 1.--Germination of cottonwood seed stored by three methods, 1958

Method and days in storage	Total germination after--			
	1 day	2 days	3 days	4 days
<u>Tree-stored</u>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1-5.....	31	67	71	78
6-10.....	0	27	34	35
<u>Room-stored</u>				
1-5.....	48	85	89	90
6-10.....	0	39	50	56
<u>Refrigerator-stored</u>				
1-5.....	66	96	96	96
6-10.....	27	84	87	90
11-15.....	31	91	94	95
16-20.....	9	69	74	78
21-25.....	3	45	56	57

¹Stoneville Research Center, maintained by the Southern Forest Experiment Station in cooperation with the Mississippi Agricultural Experiment Station and the Southern Hardwood Forest Research Group.

capsules to temperatures over 75^o F. and drying air currents for as long as 1 week should not be used for direct seeding or nursery sowing. Rapid deterioration of the seed may also account for some of the difficulty in getting natural reproduction of cottonwood.

Storage at room temperature maintained viability (as indicated by germination after 2 to 4 days) for about 1 week.

Refrigeration kept seed viable for 3 weeks in the first test and for 5 weeks in the second. Some of the variation between the 2 years' results with refrigeration may be attributable to the methods by which germination was tested.

The characteristically quick germination of cottonwood seed was also demonstrated in the tests. Some of the germination took place on the first day, most within 2 days, and practically all within 4 days.