

LONG-TERM STORAGE OF BLACK CHERRY SEED IS IT EFFECTIVE?

HAROLD J. HUNTZINGER, *Associate Silviculturist*
Northeastern Forest Experiment Station
USDA Forest Service

Storage of tree seed for 1 year or more is often necessary, because most species do not produce good crops every year. Although Heit¹ had suggested that black cherry (*Prunus serotina*) seed can be successfully stored in sealed containers at low temperature, little specific information was available on long-term storage of this species. Therefore, we studied the germination of black cherry seed stored for 1 to 3 years in several types of containers under various temperature and seed moisture conditions.

We found that high seed viability can be maintained for at least 3 years by storage in a refrigerator at 33° to 41°F. or by drying the seed to 4 to 6 percent moisture content and storage in a freezer at 0° to 6°F. Freezer storage at high moisture content and storage at room temperature both resulted in loss of viability.

Methods

Seeds for this study were collected from several forest trees, cleaned of pulp, and surface dried for 4 to 6 hours. The seeds were then placed in a large, tightly sealed polyethylene bag and were stored at room temperature. After 37 days, the seed moisture content had dropped to 12 to 15 percent of dry weight. Then samples of 100 seeds each were counted out for assignment to treatments, which included these specifications:

- Containers-either glass jars or polyethylene bags, both tightly sealed.
- Temperatures-room temperature, 68° to 74°F.; refrigerator temperature, 33° to 41°F.; or freezer temperature, 0° to 6°F.
- Seed moisture contents-12 to 15 percent moisture or 4 to 6 percent moisture (latter obtained by drying seeds in an oven for about 3 hours at 90°F.)

There were three replicates of each of the 12 treatment combinations. One replicate from each treatment was removed for germination tests after 1, 2, and 3 years in storage.

After removal from storage, the seeds were stratified in moist peat for 120 days at 33° to 41°F. They were then transferred to sand flats in a greenhouse where tallies were made of all seeds that germinated. Erection of a plumule above the sand surface was considered to be germination.

Results and Discussion

Almost none of the seed stored at room temperature and almost none of the seed stored in the freezer at 12 to 15 percent moisture content remained viable for even 1 year. However, seed stored in the freezer at 4 to 6 percent moisture content retained high viability even after 3 years. Also, seed stored in the refrigerator at both moisture contents retained high viability (table 1).

In the treatments providing satisfactory storage conditions, germination was generally better after 2 or 3 years of storage than it was after the first year of storage. Previous studies² have shown that germination after 1 year of storage will be reduced if seeds are placed into cold storage immediately after cleaning and surface drying. Allowing the seeds to remain at room temperature for 2 to 4 weeks before cold storage will help to prevent this first-year reduction in germination. During this period, the seeds should be kept in a sealed plastic bag to prevent excessive drying. However, delay of more than 4 weeks before cold storage should be avoided, as this may reduce viability.

If, after 1 year of storage, it becomes necessary to germinate seeds that had not been given a 2- to 4-week warm period before cold storage, a

²Huntzinger, Harold J. Methods for handling black cherry seed. USDA Forest Serv. Res. Paper NE-102, 22 pp. NE. Forest Exp. Sta., Upper Darby, Pa. 1968.

¹Heit, C. E., Propagation from seed. Part II: Storage of deciduous tree and shrub seeds. Amer. Nurseryman 126(10); 12-13, 86-94, illus. 1967.

TABLE 1.—*Black cherry seed germination, by periods and treatments*

Treatment			Germination after storage of—		
Temp.	Moisture content	Storage container	1 yr.	2 yrs.	3 yrs.
°F.	Percent		Percent	Percent	Percent
0-6	4-6	Glass jar	52.3	81.0	80.7
		Polyethylene	43.3	91.0	85.0
33-41	12-15	Glass jar	4.0	7.3	0.7
		Polyethylene	1.3	5.0	0
	4-6	Glass jar	63.0	81.3	90.3
		Polyethylene	51.0	90.3	83.3
68-74	12-15	Glass jar	72.0	88.3	77.0
		Polyethylene	67.3	79.3	88.3
	4-6	Glass jar	0	0	0
		Polyethylene	2.6	0	0
12-15	Glass jar	0	0	0	
	Polyethylene	0.3	0	0	

warm stratification of 30 to 60 days before cold stratification will improve germination appreciably.

For storage over more than a year, reduction of moisture content to 15 percent or less before refrigerator storage, or to 4 to 6 percent before freezer storage, is desirable. Seeds should not be kept in warm storage for more than 4 weeks before cold storage. Freshly-cleaned seeds can be slowly air dried at room temperature to 12 to 15 percent moisture content in about 6 days when the surrounding air humidity is low. Slow oven drying at 85° to 90°F. for about 3 to 4 hours is

recommended for reducing the moisture content in the seeds to 4 to 6 percent.

Freezer and refrigerator storage appear to be about equally effective if the seeds have the proper moisture content. Freezer storage may have advantages for very long-term storage, although this has not been demonstrated for black cherry.

The type of storage container—either glass jar or polyethylene bag—had no consistent effect on germination. Both containers appeared to be satisfactory.

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