



Cone and Seed Improvement Program BCMoF Tree Seed Centre

from Tree Seed Working Group Newsbulletin
28 May 1998



Hardwood Storability

The storage of hardwood species for reforestation is often considered to be a short-term venture due to the relatively rapid deterioration of these species in storage. The BCMOF currently has seedlots of paper birch (*Betula papyrifera* - **Ep - 12** seedlots), trembling aspen (*Populus tremuloides* - **At -8**) and red alder (*Alnus rubra* - **Dr -5**) stored at -18°C, at moisture contents between 5 and 10%. Seedlots described here have been germination tested at least twice. To quantify storability a simple linear deterioration rate calculation is used with initial and current germination capacity (GC) and total days in storage $[(GC_{cold} - GC_{now})/days\ in\ storage]$. Although deterioration is probably non-linear, this simple equation is useful in comparing deterioration rates among species and seedlots and for prioritizing retesting efforts. Retesting frequencies for BC conifers were recommended based on this variable and operational experience with each species.

For trembling aspen the average deterioration rate was 8.6% indicating that a seedlot would decrease in GC by an average of 8.6% each year (Table 1). Seedlots ranged from a very high deterioration of 22.8% to a gain in germination of 1.5%. For the other two species the average deterioration rate was a gain of 0.2% and both have had longer storage experience and a much smaller range in deterioration rates than trembling aspen. These positive values do not indicate increased quality during storage, but reflect sampling variation and possibly changes in dormancy due to storage.

Based on these initial storability results retesting frequencies of one year will be adapted for trembling aspen and two years for red alder and paper birch. Although the sample sizes for the latter two species are quite small the deterioration rates are in the same range as conifer species, while deterioration in trembling aspen is considerably greater. For *Populus* sp. it has been shown that freezer storage [-18 to -24°C] is preferable to cooler storage [2 to 5°C] (Benson and Harder 1972; Fung and Hamel 1993; Tauer 1979; Wang 1980). It is very important for trembling aspen that collection timing is correct and that seed extraction is completed as quick as possible (Fung and Hamel 1993). The very large differences in deterioration rates for trembling aspen indicate other factors are important to storability and high initial germination did not ensure slow deterioration (i.e. seedlot 40959). If anyone else has any information on the storability of west coast hardwoods I would appreciate corresponding with you.

References

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Table 1. Germination and storage information and deterioration rates of seedlots of *Populus tremuloides* (At); *Alnus rubra* (Dr) and *Betula papyrifera* (Ep).

Species	Seedlot	GCold	Gcnw	Storage (days)	Deterioration (%/yr)
At	39511	86	68	968	6.8
At	39512	41	22	967	7.2
At	40959	93	73	380	19.2
At	40960	91	76	441	12.4
At	40961	86	62	384	22.8
At	42306	96	96	965	0.0
At	42307	92	90	363	2.0
At	42308	93	97	965	-1.5
At mean		85	73	679	8.6
Dr	30017	84	79	2132	0.9
Dr	33252	83	83	2195	0.0
Dr	39844	90	86	1009	1.4
Dr	40473	90	92	691	-1.1
Dr	43086	24	30	1080	-2.0
Dr mean		74	74	1421	-0.2
Ep	2756	81	74	1829	1.4
Ep	2883	70	70	6388	0.0
Ep	3272	95	67	6827	1.5
Ep	30966	12	9	2169	0.5
Ep	30967	3	4	2168	-0.2
Ep	42414	74	69	1012	1.8
Ep	42415	81	80	993	0.4
Ep	42416	74	76	1012	-0.7
Ep	42417	82	90	911	-3.2
Ep	42426	92	95	949	-1.2
Ep	42427	89	93	952	-1.5
Ep	42428	92	94	993	-0.7
Ep mean		70	68	2184	-0.2

David Kolotelo, RPF
Cone and Seed Improvement Officer
Dave.Kolotelo@gems7.gov.bc.ca
(604) 541-1683 extension 228