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17. © Five years' storage of seeds from three willow species. Simpson, J. D. and Daigle, B. I. Native Plants Journal 10(1):63-67. 2009.



Five years' storage of seeds from three willow species

| Dale Simpson and Bernard I Daigle

ABSTRACT

Seeds of *Salix bebbiana* Sarg., *S. discolor* Muhl., and *S. eriocephala* Michx. (Salicaceae) were stored at 2 moisture contents (low, 5.1 to 7.3% and high, 8.5 to 9.8%) and 4 temperatures (4, -20, -80, and -145 °C [39, -4, -112, -229 °F]) for 60 mo. Seeds stored at 4 °C lost most or all viability by 24 mo. We observed no significant difference in germination between the 2 seed moisture contents for each species. After 60 mo of subzero storage, germination of *S. bebbiana* seeds declined from 89 to 83%, *S. discolor* from 60 to 54%, and *S. eriocephala* from 71 to 54%.

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KEY WORDS

Salix bebbiana, *S. discolor*, *S. eriocephala*, Salicaceae, germination, moisture content

NOMENCLATURE

USDA NRCS (2008)

The National Tree Seed Centre (NTSC) collects, processes, tests, and stores seeds of Canadian tree and shrub species. The NTSC's mission is to provide seeds for research and to store seeds for genetic conservation. The NTSC has been actively fulfilling this mandate for the past 40 y with about 10 000 seed collections of Canadian tree and shrub species in storage.

The Salicaceae family includes *Populus* L. (poplars) and *Salix* L. (willows) genera. Poplar and willow seeds—which consist of an embryo, seedcoat, and almost no endosperm—are small (< 1 to 3 mm long [0.04 to 0.12 in]), short-lived in nature, and must germinate soon after dispersal. Storage temperature is a well-known factor affecting the storage life of seeds. Douglas (1995) reported that *S. setchelliana* C.R. Ball seeds stored at room temperature lost all viability after 20 d. Mean germination of seeds from 4 *Salix* species stored for 36 mo at -10 °C declined from 96 to 75% (Zasada and Densmore 1980). Storing *Salix* seeds cryogenically in liquid nitrogen is also feasible. Maroder and others (2000) reported that dry seeds of *S. alba* L. and *S. matsudana* Koidzumi survived immersion in liquid nitrogen without loss of viability. Moisture content is another storage factor that must be considered when storing seeds. Optimal seed moisture content for *Populus* and *Salix* seeds was reported to be between 4.0% and 7.5% (Buch 1960), and Tauer (1979) recommended that *Populus deltoides* Bartram ex Marsh. seeds be dried to a moisture content of 6 to 10%.

Recent germination results from *Populus* and *Salix* seeds stored at -20 °C at the NTSC show little loss in viability after several years in storage. Seeds of *Populus* species showed similar results. Mean germination of seeds from 7 seedlots of *P. tremuloides* Michx. declined from 93.6 to 90.8% after 10 y whereas mean germination of 9 *P. grandidentata* Michx. seedlots stored for 9 y increased from 90.3 to 94.1% (Simpson and Daigle, unpublished data).