Tree Improvement Branch

# Cone and Seed Improvement Program
# BCMoF Tree Seed Centre

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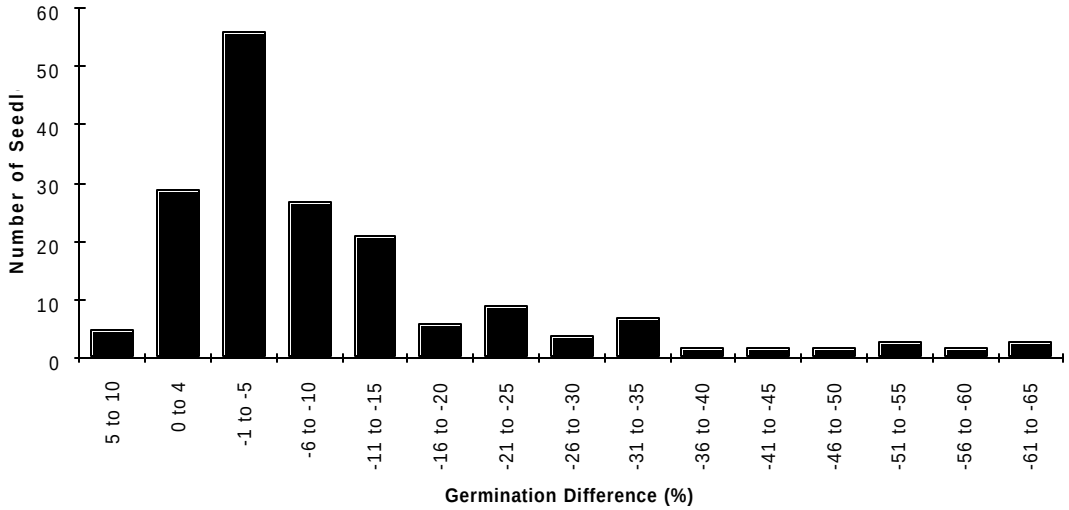
# Western Redcedar Seed

This note addressing concerns over reduced nursery germination of western red-cedar (Cw) seed and the pelletting process. It also presents results of trial work on Cw at the Tree Seed Centre (TSC) that may be pertinent to nurseries.

**Retesting**

During the winter of 1996 the germination of 178 seedlots of western redcedar was retested. Most of these seedlots had not been tested since 1990. For some seedlots large drops in germination were observed which have had large impacts on nurseries growing them. Below is a histogram illustrating the germination difference between the 1990 and 1996 tests (in 5% increments). A positive difference describes seedlots that have increases in germination over time while a negative difference indicates deterioration. We generally do not think of seedlots as increasing in germination over time. Small increases presented here are probably due to sampling variability between tests.

Approximately 19% of seedlots tested showed deterioration greater than 20%, with some as high as 65%. 75% of seedlots showing large downfalls were collected prior to 1982. Predicting germination decline is difficult because performance of most Cw seedlots is consistent over long periods of time. Cw Linear deterioration rate (using initial and current germination results divided by storage time) was updated to 1.35%/year from 0.77%/year based on the above retests. Deterioration rate of a seedlot was not related to its initial germination capacity. Although linear deterioration rates are useful in terms of prioritizing species the usual trend is for seedlots to perform consistently for a period and then drop-off rapidly. For many Cw seedlots the drop-off seemed to occur after about 4000 days in storage (»11 years). In the future, retesting of Cw seedlots will be conducted more frequently.

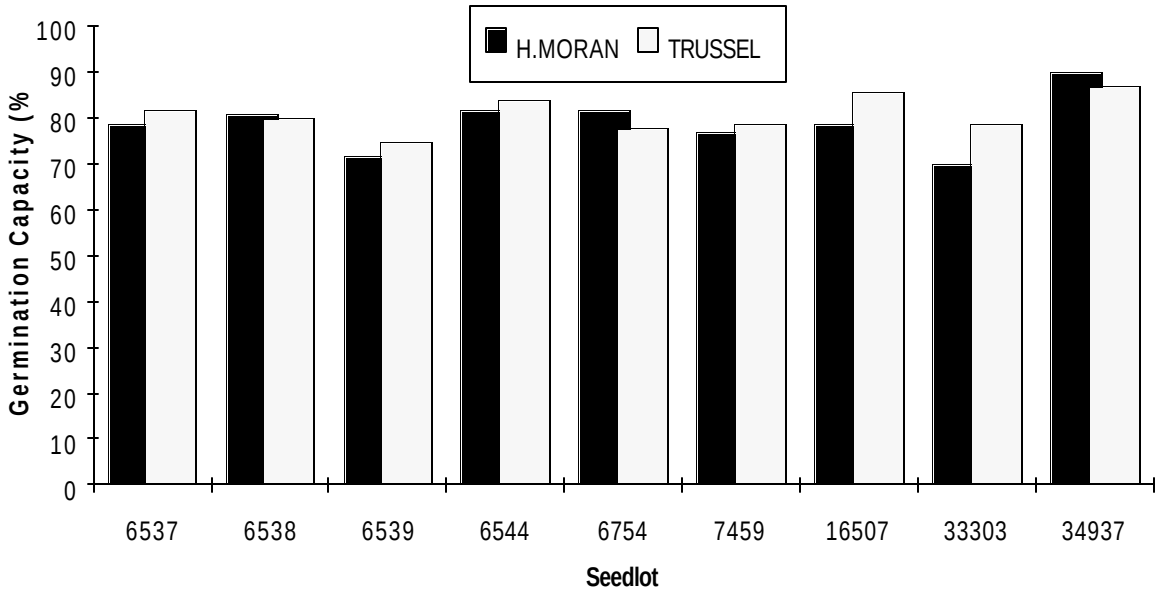


## Pelletting

Pelletting was performed on all Cw sowing requests for greenhouse culture in 1996. It improves seeding efficiency by increasing individual seed weight and making the propagule shape more regular and easier to handle with most seeding machines. Cw does not require soaking or stratification treatments making it ideal for pelletting. Although pelletting can be performed on stratified seed the window of opportunity for use is greatly decreased. The disadvantage of pelletting is the reduction in germination rate because of the need to penetrate the pellet as well as the seedcoat (estimated at four days). Cw seed has a very small proportion of nutritive tissue (megagametophyte) and for seedlots of low vigour it is possible that seed reserves can be used up before emergence from the pellet.

Pelletizing is coordinated through the Tree Seed Centre and performed by Harris-Moran in California or on contract by Dr. Paul Trussel at the TSC. Choice of pelleter is based on sow date, size of request and whether any bulking of requests can take place. Some nurseries feel that one pellet type is superior, but the choice varies by nursery. In 1996 we tested nine seedlots that were pelletted by both Harris-Moran and Dr. Trussel. There was no difference in the germination capacity between the two as indicated in the Figure below. It is possible that a significant interaction occurs between pellet type and the equipment at individual nurseries, but results indicate that both pelleters can produce pellets of comparable quality.

The practice of pelleting adds an additional barrier to germination of Cw seed. It is crucial that after sowing pellets are not left to dry, but misted frequently to aid in pellet breakdown. Drying can cement the pellet to the seed restricting germination. The TSC has attempted various methods of assessing pellet breakdown (soaks, mists, germination dishes), but scoring was quite subjective and differences not clear. If anyone is involved in assessing pellet breakdown we would be interested in your methods and in helping to develop an industry standard for pellet quality.



## Stratification

It is generally assumed that no dormancy exists in Cw and that stratification would not have a beneficial effect on germination. This assumption was tested with 22 seedlots of Cw that were tested dry and with three weeks of stratification following a 24-hour soak. There was no difference in germination capacity (both 63%) and no appreciable difference in germination rate measured by the peak value (3.9 versus 4.1). This adds substance to the assumption that dormancy does not appear to exist in Cw and that there is no advantage in stratifying Cw seed. It was surprising that there was no appreciable gain in germination rate as stratification usually increases the rate of germination even if no increase in germination capacity occurs.

## Soaking

Although stratification was not beneficial, a comparison of dry seed vs. a 24-hour soak in aerated and non-aerated water was performed on three seedlots of Cw. The aerated soak was the best treatment (90%), followed by the non-aerated soak (86%) and the no soak treatment (78%). Although soaking and stratification are practical only for non-pelletized requests the option of soaking seed appears promising once one has decided not to use pelletized Cw seed.

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