

## A PRELIMINARY TRIAL OF THE SODIUM BIASELENITE METHOD OF SEED GERMINATION TESTING.

On page 796 of the August, 1937 number of the Journal of Forestry (American) is a description of a biochemical method of seed testing developed by Eidmann, Hasegawa and others. The method is based on colour reactions on the seed embryo secured by treating the seed in the laboratory with a dilute solution of sodium biselenite ( $\text{NaHSeO}_3$ )—usually a 2% solution. This method, it is claimed, goes beyond “germinative capacity” as shown in usual test and evaluates also actual “tree utility” by indicating the relative vitality of the treated embryos through the intensity of their colour reaction to this chemical reagent.

A preliminary trial of the method on a comparative basis with soil and cutting tests was carried out on the seed of five pine species by Messrs. Mayfield and Moorhouse of the N.Z. State Forest Service in conjunction with Messrs. Clare and Monro of the Chemical Laboratory of the Department of Agriculture.

Owing to the fact that some of the first soil tests were started in the autumn and that those started in the spring of 1938 progressed unevenly because of erratic weather and temperature, despite the fact that all tests were under the glass of a conservatory, no maximum germination period, such as 60 days, could well be adhered to in conducting these soil tests to secure a criterion of germination comparable with that of “germinative capacity” by the sodium biselenite method. Thus, the first soil tests were allowed to progress until no further germination occurred (up to 215 days for *Pinus caribaea*) and the second series are still progressing upon going to press and have so far been taken to 100 days, at which stage *P. palustris* appears to have completed germination, while *P. echinata*, *P. taeda* and *P. caribaea* are definitely still germinating.

The results obtained in this preliminary trial are shown in the accompanying table. In this, the most obvious feature is one to be expected, i.e. that the cutting test percentages are in every case higher than those obtained by the other two methods and, in most cases, so much greater as to appear an unreliable index of germinative capacity. The number of seeds empty or with shrivelled kernels in the sodium biselenite tests for lots number 38/289 to 38/292 plus the number of sound seeds obtained for these lots by cutting test, should approximate one hundred. This can be seen to be the case.

A comparison of the percentages for “germinative capacity” obtained by sodium biselenite tests with the final germination of the soil tests shows no general higher or lower value in all the results. The sodium biselenite tests give much higher figures for *Pinus patula*,

appreciably higher figures for two tests on *P. palustris* and a slightly higher result (8%) for the third. (This margin of 8% in results is about as close to coincidence as those of any two methods can be expected to be without exhaustive tests under standardised conditions) For *P. taeda* the first tests on lot 37/281 gave results close enough to similarity but on lot 38/290 the sodium biselenite test gave a decidedly lower value than both soil tests, although one is still incomplete. In the case of *P. echinata* the chemical test result is only half the value of that of the first soil test and less than that of the second soil test which is incomplete. For *P. caribaea* the results, excluding that of the incomplete second soil test, are close enough to be called the same.

Thus, to date, in view of the small number and lack of uniformity of results and control of the tests here described, no definite conclusion can be arrived at as to the absolute value of the sodium biselenite germination testing method. However, as the results obtained and shown in the table in some instances give higher and in some lower values than the previously used and proved but protracted soil tests method, it would appear that under exhaustive comparative tests of both methods, using well picked duplicate samples of the seed of various species, more even and perhaps very close results might be obtained; thus proving the feasibility of using a rapid, yet accurate and absolute test for finding the "germinative capacity" and perhaps the "tree utility" of tree seed.

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