

Report of Seed Germination Committee

BION TOLMAN¹

I.--WASHING OR SOAKING OF SEED.

Washing seed can be a more standard procedure than soaking and is generally more convenient. The Committee therefore recommends that washing the seed in running water for a period of 2 hours be made a standard procedure.

II.--TEMPERATURE CONTROL.

Present indications are that temperature control within the limits of 20 to 30 degrees centigrade is not a critical factor. The general opinion seems to be that a constant temperature is just as good and more convenient than an alternating temperature. General preference favors a constant temperature between the limits of 25 degrees to 30 degrees centigrade. Germination proceeds more rapidly within this range.

The Committee recommends that some work be done to make the following comparisons: 20, 25, 30 and 35-degree centigrade constant temperatures and 20-30 and 25-30-degree centigrade alternating temperatures. In connection with the alternation of temperature, a quick change in temperature should be compared with letting the change take place gradually.

III.--MOLD PROBLEM.

Is it permissible to use such treatments as:

- A. Lignisan (ethyl mercury phosphate) 5 p.p.m. or 1:12500 as a seed and blotter dip?
- B. Wettable Phygon or Arasan--dilution 1:1000--seed to be soaked for 5 minutes prior to washing in running water?

Would it be more acceptable to show both the treated and untreated germination percentage?

IV.--DESCRIPTION OF ABNORMALS.

The following should definitely be classed as abnormal:

- A. Where the cotyledons appear first.
- B. Where the cotyledons and root appear at the same time.
- C. Where the cotyledons and the tip of the radicle remain in the seed particle and the sprout shows as a loop extending out of the seed particle.
- D. If the root or stem is broken to the extent that it cannot produce a normal plant.

¹Agricultural Research Director, Utah-Idaho Sugar Company, Salt Lake City, Utah.

There is considerable question as to just what should be classed as a mutilated seedling. Some further work is needed along this line. Some seedlings with one cotyledon broken or just the tip of the radicle broken apparently develop into healthy, vigorous plants.

The Committee seriously questions whether browned radicles should be classed as abnormals. Browning of the radicle can be overcome by washing the seed and by altering the substratum on which the seed is germinated, consequently it would appear that they should not be classed as abnormals.

Someone should work up a series of photographs showing just what should be classed as abnormal.

V.—DETERMINATION OF PURITY.

Determination of purity is much more difficult in processed seed than in whole seed. This is obviously due to the fact that the seed has been broken into fragments. The question as to what should be classed as a seed unit and what should be classed as inert material is sometimes difficult to determine. Some definite sieve size should be indicated for use in purity determination. Should all seed fractions larger than $5/64$ -inch in diameter be classed as a seed unit and all smaller than this size be classed as inert material? We should know whether this screen size should be set at $4/64$, $5/64$ or $6/64$. The above sizes refer to the diameter of round holes in the screen to be used in making the separation. Some work should be done on this point.

VI.—TESTING METHODS.

It was the consensus of the Committee that in most tests they would much prefer to stay with blotters, and check only when necessary on Kimpac or sand. The necessity of checking further than the blotter test would be governed by two factors:

- A. Excess browning of the radicles.
- B. Discrepancy between the crack test and the blotter test.

VII.—CRACK TEST.

It is recommended that a crack test be run on all low samples. This test can be rapidly run by cracking the seed with a hammer on a heavy steel plate and the possible potential germination can be quickly determined. When the blotter germination runs considerably lower than the potential as indicated by the crack test, then special procedures should be followed.

VIII.—GENERAL RECOMMENDATIONS—*not covered above.*

- A. Drying of Seed. After washing, the seeds may be either air dried or thoroughly blotted to remove all excess moisture before they are placed on the blotters.

- B. Moistening of the Blotters. Submerge the blotters in water and then drain them until all free water is eliminated.
- C. Maintain plenty of water on the blotters throughout the germination period, but in no case permit the formation of a water film.
- D. Space the seeds on the blotter far enough apart to avoid all contact between either seeds or sprouts. Blotter indentations are helpful in this regard.

IX. VITAL DATA NEEDED.

- A. Whole Seed.
 - 1. Germination percentage.
 - 2. Purity.
 - 3. Number of seedballs per pound.
- B. Segmented Seed.
 - 1. Germination percentage.
 - 2. Purity.
 - 3. Percentage of singles.
 - 4. Number of germinating seed units per pound.

Only normal sprouts should be counted in reporting germination of the seed.