

# Beet Seed Germination Methods

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**T**HE PROCEDURES used by the American Crystal Sugar Company in germination tests of sugar beet seed follow the general recommendations of the Committee on Standardization of Experimental Methods (1).<sup>2</sup> The procedure now used for whole and processed seed will be briefly outlined.

A 1-pound sample of seed is reduced in a Boerner Grain Sampler to a little more than 200 seeds. From this amount 2 samples of 100 seeds are counted out, placed to soak in a seed washer (2) which is connected to the tap-water outlet by means of a rubber tube. Seed samples are washed from 5 to 6 hours. The volume of water used during the washing period is approximately 8 gallons. No attempt is made to control the temperature of the wash water. After washing, the seed baskets are taken out of the washer and allowed to drain for 5 minutes. Standard germination blotters, cut 9 x 16 inches, are soaked in tap water and after the excess moisture has drained off the 100-seed sample is spread evenly over half of the blotter—the other half being used as a cover. A Minnesota Seed Germinator is used. No temperature control has been used on the germination cabinet the past 2 years, consequently, germination tests are conducted during the spring and fall when temperatures normally fall within the range of 21 to 26 degrees centigrade. First germination counts are made on the third day, and the final count on the tenth day.

## Comparison of Germination Tests

The Western Seed Production Corporation, during 1946 and 1947, furnished the Rocky Ford Beet Seed Office germination samples of seed increases of American Crystal Sugar Company varieties, taken from their cleaning plants at Cashion, Arizona, and Mesquite, New Mexico. Each of these samples was germinated at the Rocky Ford Laboratory and the results compared with the germination percentages furnished the Western Seed Production Corporation by a Commercial Seed Laboratory. Comparison of these tests for these 2 years is given in table 1.

It will be observed that the Western Seed Production Corporation germinations were slightly higher than those obtained at Rocky Ford in 1946, and slightly lower in 1947. The higher germinations obtained at Rocky Ford in 1947 may be partly due to the fact that germination tests were made in September, at which time no excessively high temperatures were obtained in the germinator. In general, there is good agreement between the two laboratories for the 136 samples tested in the 2-year period 1946-47.

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<sup>2</sup>The numbers in parentheses refer to literature cited.

### Present Germination Problems

As indicated above, temperature control is one of the problems encountered during the mid-summer season at Rocky Ford. Germination tests consequently are avoided during the hot summer months. In both the spring and the fall, temperatures in the germinator range from 21 degrees to 26 degrees centigrade, at which level germination is quite vigorous and consistent. Mold growth has not been a problem in germination work since the 6-hour soak in running water was begun, except in very rare instances. If a seed sample is obtained which has a very heavy spore load, fungus control is obtained by soaking the seed in wettable Phygon or Arasan in a dilution of 1-to-1,000 for 5 minutes prior to washing in running water.

One of the recent problems in processed-seed germinations at this time is the determination of purity. Processed seed usually contains large numbers of seed fragments which are desired if viable, but which, if they are inert, should be screened out and considered in the purity determination. The question of what should be classed as inert material in processed beet seed is often a problem, and one which should be given further consideration.

**Table 1.**—Comparison of germination tests on American Crystal Sugar Company commercial seed increases, 1946 and 1947.

Varieties	Number of samples tested	American Crystal Sugar Company	Western Seed Production Corporation
<b>1946</b>			
American No. 1 a	31	90.22	92.64
American No. 1 b	14	87.17	88.73
American No. 3	23	89.50	90.21
	Average	89.349	91.013
<b>1947</b>			
American No. 2	5	84.90	83.00
American No. 3 a	19	85.58	85.50
American No. 3 b	33	84.62	83.91
U. S. No. 22	11	92.50	91.35
	Average	86.184	85.491
Average 1946-47		87.766	88.252
Correlation coefficient on 1947 tests: $r = +0.88$			

### Literature Cited

- (1) 1942. Report of the Committee on Standardization of Experimental Methods. Proc. Amer. Soc. Sug. Beet Tech. p. 595-599.
- (2) GADDIE, R. S.  
1946. Beet seed germination technique used by the Utah-Idaho Sugar Company. Proc. Amer. Soc. Sug. Beet Tech. p. 287-288.