

A-600

GERMINATION PERCENT OF STANDARD

	<u>Series "A"</u>	<u>Series "B"</u>
Standard	100.00	100.00
Thru 3 MM Remaining on 2.75 MM	50.9	33.3
Thru 2.75 MM Remaining on 2.50 MM	39.8	19.6
Thru 2.50 MM Remaining on 2.00 MM	24.1	13.7
Thru 2 MM	8.4	1.9

GERMINATION TESTS WITH SUGAR BEETSEED\*

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Germination tests conducted on 172 samples of beetseed in quadruplicate were made at Rocky Ford, Colorado, during 1935, 1936 and 1937. The purpose of this study was to develop if possible a standard method of procedure for use by the sugar beet industry. Three different types of germination beds were used, namely, paper toweling, blotting paper, and fine grained sterilized river sand. The results of this work indicate that either paper toweling or blotting paper is preferable to sand as a germination bed. Further, germination and sprout counts were made 30 or more percent faster when either paper toweling or blotting paper was used as a germination bed.

Tests were made with <sup>86</sup>four <sup>68</sup>temperature methods, these being, first, a continuous temperature of 20° C. for the entire period of test; second, a continuous temperature of 30° C. for entire period of test; third, an alternating temperature of 20° C. for 16 hrs., and 30° C. for 8 hours daily for period of test; and fourth a temperature of 30° C. for the first 24 hours and then alternating the temperature 16 hrs. at 20° and 8 hours at 30° C. for period of test. Method 1 and method 4 proved best in this set of results...Further work is necessary to establish best temperature method.

Tests conducted with various size seedballs indicate a positive correlation with seed size and germination. Seedballs were graded into 4.00 mm., 3.5 mm., and 2.5 mm. sizes. The larger the seedball the higher the germination, and greater number of sprouts obtained with the kind of seed used in these tests. The results were as follows:

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\*This paper will appear in detail in the April issue of the Journal of Agronomy.

<u>4.0 mm</u>	<u>3.5 mm</u>	<u>2.5 mm</u>	<u>Random Size</u>
92.79%	87.79%	74.0%	84.88%
225 sprouts	169 sprouts	119 sprouts	177.54 sprouts

These results indicate that to eliminate bias in preparation of a sample the use of a mechanical grain sampler (such as Boerner) is necessary to secure a representative sample.

Tests conducted on presoaking of seed for 2 hours prior to conduct of germination test versus dry seed, show that with beetseed from a fresh crop this treatment is not necessary, unless presence of toxic substances in the seed coat has been shown. However, on older seed, the presoaking treatment is beneficial.

Tests were conducted in using tap water and distilled water in moistening the paper toweling, blotting paper and sand, and in presoaking of seed. The results obtained indicate that when the tap water is available of the quality indicated in these tests (about 800 p.p.m. mixed salts) there is no advantage to be gained in distilled water.

Tests conducted with different lengths of germination period, indicate that reporting of results at the end of 10 days is preferable to waiting 14 days before concluding the test. It would seem that for practical field purposes the germination count obtained on most germination tests at the end of 7 days is the important consideration from standpoint of producing vigorous seedlings of uniform size. Apparently, greater emphasis should be placed on vigor and condition of seedlings than relying entirely on percentage germination as a sole index of acceptability of seed.

#### Conclusion

The results of tests discussed in this summary of results from work conducted in 1935 - 1936 - 1937, indicate the need of a random sample of beetseed (mechanically reduced to proper sample size), presoaking seed (especially older seed) the choice of either paper toweling or blotting paper, reporting results of test at end of 10 days, and supplementing laboratory tests with field test wherever possible so as to determine vigor of seedling plants. Germinating beetseed at cooler temperatures appears desirable. The tentative choice of a 20° C. continuous temperature seems warranted by these tests. Further work on this point is necessary to establish best temperature methods.

#### SOME FACTORS WHICH INFLUENCE THE RATE AND TOTAL PERCENTAGE GERMINATION OF SUGAR BEET SEED

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Seeds from various varieties of sugar beets vary in both rate and total percentage germination. This difference between varieties is largely dissipated when the naked seeds are germinated after being removed from the corky pericarp. Toxic substances are present in the seed ball which affect both rate and total germination, and which when present in sufficient con-