It will be noted that the essentials of germination tests are (1) an alternating temperature, (2) free ventilation, and (3) a moist atmosphere surrounding seed on all sides.

Purity Analysis.

For purity analysis the percentage by weight is the most important, and only under special conditions is the purity by numbers given.

The purity is worked on a 10-gram basis. The sample is thoroughly mixed and a definite amount accurately weighed by means of a chemical-balance. The amount taken varies for different seeds, thus: For larger seeds, such as rye-grass, $2\frac{1}{2}$ grams; for smaller seeds, such as crested dogstail, 1 gram; for seeds such as rape, 5 grams; for oats, prairie-grass, &c., 10 grams.

This weight is spread out evenly over a squared surface, and gone through carefully square by square with an eyeglass. All extraneous seeds are picked out and weighed, and the percentage of extraneous seeds calculated thus:—

Weight of extraneous seed ÷ Weight of sample examined × 100 = Percentage by weight.

The remainder of the sample is then gone through for additional impurities, other than those noted in the weight dissected. A list of all the impurities is made on the purity-card.

The percentage by numbers is estimated as follows:—

(1.) Weigh out definite amount of sample.
(2.) Pick out extraneous seeds, weigh and count.
(3.) Estimate number in 10 grams.
(4.) Calculate per cent. by weight.
(5.) Calculate weight of extraneous seeds in 10 grams.
(6.) Calculate weight of pure seeds in 10 grams.
(7.) Estimate weight of 1,000 pure seeds.
(8.) Estimate number of pure seeds in weight of pure seeds in 10 grams of sample:
Weight of pure seeds in 10 grams of sample ÷ Weight of 1,000 pure seeds × 1,000 = Number of pure seeds in 10 grams of sample.
(9.) Estimate total number of seeds in 10 grams of sample.
(10.) Then,
Number of extraneous seeds ÷ Total number of seeds × $\frac{100}{1}$ = Percentage by numbers of extraneous seeds.

Recording of Progressive Germination.

Four counts are made of each sample, but the interval between each count varies according to class of seed under test. Thus—

	Days.	Days.	Days.	Days.
Crucifers, clovers.. ..	2	4	7	10
Rye-grasses	3	6	10	14
Crested dogstail	4	8	12	18
Cocksfoot	5	10	16	22

The seeds that have germinated are counted out and discarded, and an entry made on the card under the date on which the count was made.