GERMINATION TESTS WITH SUGAR BEET SEED

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CONSIDERABLE difference in methods used for conduct of germination tests with sugar beet seed exists among laboratories interested in this work. It has been the custom of the German seed trade to prescribe the use of fine-grained quartz sand, moistened to 60% of its moisture-holding capacity, as a "germination bed" for sugar beet seed. The containers used are of porcelain ware such as soup plates or bread tins. A representative sugar beet seed sample is weighed to ascertain number of seed balls per gram and kilogram. The sample is then reduced to 100 seed balls. These are lightly pressed into the sand, a piece of window glass is placed over the container, and left in place during the 14-day period of test. An alternating temperature of 30°C for 6 hours and 20°C for 18 hours is maintained during the period of the test. The reading of germinating seed balls and sprouts therefrom is made at the end of 7 days and 14 days, respectively. Results are reported in percentage germination per 100 seed balls, number of sprouts per 100 seed balls, and number of sprouts per kilogram of seed. This method is being used by many of the U. S. Beet Sugar Company laboratories in determining whether the seed purchased comes up to the prescribed Magdeburg standard on which European and domestic beet seed is purchased.

The Association of Official Seed Analysts of North America recommend the soaking of beet seed for 2 hours at a temperature of 20°C before germination; the use of folded blotting paper instead of sand; and the making of a preliminary count of germinating seed balls in 4 days and the final count in 10 days. There is a further recommendation that the germination of beet seed be confined to the determination of the percentage of balls that sprout.

Still another modification of these methods is used by one commercial seed testing laboratory in which the soaked seed is placed for one day into a warm germinating oven maintained at 30°C and then alternated between the warm and cold germinating ovens for the balance of the germination period. Counts are made on the 4th, 7th, 11th, and 14th day of the test. Only sprouts showing normal root and root hair development are considered normal and are counted.

The purpose of this paper is to present results from a series of tests in which the various methods mentioned and others are compared, and to propose a uniform method of procedure in the conduct of sugar beet seed germination tests.

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2General Manager and Plant Breeder, respectively. Acknowledgment is due to Miss Elizabeth Seamans, station clerk, for capable assistance in obtaining data used in this paper.
3German regulations (norms) governing the trade in sugar beet seed. Magdeburg, Germany. 1914.
5Correspondence received by senior author.