SHEARED SUGAR BEET SEED WITH SPECIAL REFERENCE TO NORMAL AND ABNORMAL GERMINATION

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SINGLE-GERMED sugar beet seed has long been sought by the sugar beet industry. Attempts to produce seed with only a single germ by the process of selection have made very little progress. Townsend and Rittue (7) report the early efforts of workers in the U. S. Dept. of Agriculture along this line. Bordonos (2) reports that a single-germed beet seed has recently been developed in southern Russia by hybridizing with natural single-seeded types. However, there is no immediate prospect of single-germed seed being available to the commercial industry in this country.

Parallel with efforts to select single-germed seed, attempts have been made to "crack" the sugar beet seed ball into its component units. Palmer (3) reports that prior to 1900 some "cracked" seed from Germany was placed on the American market, but it did not give satisfactory results, and he proceeds to enumerate the difficulties encountered in the use of "cracked" seed, several of which were (a) some of the germs were destroyed in the cracking machine; (b) other germs were exposed and the function of the seed ball in regulating germination was destroyed; (c) it was impossible to crack the seed balls without ruining a large portion of the germs, unless many pieces were left with more than one germ, in which case the field had to be thinned as usual.

Tabentsky (5) reports the efforts of some Russian workers to break single-germed seeds out of the multiple-germed seed ball. He states that the structure of some seed balls was such that they broke up rather easily, while some others were so completely unified by sclerenchymatous tissue that attempts to break them into units were largely unsuccessful.

Recently, in the United States, there has been a revival of interest in shearing the seed ball into single-seeded units, and Bainer (1) has developed machinery to do this on a commercial scale. During the past two years the use of sheared seed has spread rapidly due to the labor-saving possibilities it offers, and the prospect that it may become an important factor in the ultimate mechanization of the sugar beet industry.

Because of the widespread use of sheared seed it becomes important to have a fundamental understanding of the functions of the pericarp tissue of the seed ball and what can and cannot be done with it without seriously interfering with those essential functions. The present report gives the results of blotter and soil tests with seed units recovered from sheared seed as compared with the germination of whole seed balls and with naked seeds removed from the locule of the seed ball.

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2Associate Agronomist and Assistant Physiologist, respectively.
3Figures in parenthesis refer to "Literature Cited", p. 759.