GERMINATION OF 20-YEAR-OLD WHEAT, OATS, BARLEY, CORN, RYE, SORGHUM, AND SOYBEANS

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The knowledge that farm seeds when stored in a dry atmosphere maintain their viability over a long period of years may be of value in the storage of reserve seed stocks to meet war and post-war needs. The data reported in this paper are from a study of seeds stored for periods varying from 1 to 22 years.

The literature on storage of farm seeds was reviewed in previous papers by the authors and will not be discussed here. Previous results have shown that seeds of wheat, oats, and barley stored under arid climatic conditions declined slowly for the first 10-year period with a sharp break in germination between the tenth and twelfth years. There were indications of different reactions to storage between six-rowed hulled, two-rowed hulled, and six-rowed hulless barley.

Rosen rye and Wisconsin Black soybeans did not maintain their viability to the same degree as wheat, oats, and barley.

Black Amber sorghum still maintained an excellent germination percentage after being stored for 10 years, and Yellow Dent corn germinated well for the first 6 years and dropped off rapidly between the ninth and tenth years. The results reported in this paper are a continuation of the previous work reported by the authors.

EXPERIMENTAL METHODS

The first tests were made in 1921 on the 1920 crop. The grains were threshed, cleaned, and stored in 100-pound sacks, which were then placed in an unheated room. They were stored in the same room during the entire period of the test. Samples were taken in February of each succeeding year. Composite samples from each sack were made by mixing grain drawn from the sacks by a grain probe and by taking off a portion, with a small scoop. Germination tests were made before July 1 of each year. Crops from the succeeding years, 1920–29, were saved when grown and placed in the storage room. Only perfect seeds were used for germination, broken and damaged seeds being discarded. In the later years of the experiment, considerable damage was done by the dermestid beetle (Trogoderma turkestanicum). All damaged seeds were discarded. The storage room was sprayed with an ethylene dichloride-carbon tetrachloride mixture to control insect pests.

The crops used were the standard varieties of cereals shown in Table 1.

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2 Agronomist, formerly Seed Analyst, and Seed Analyst, respectively.


5 The mixture used was ethylene dichloride 3 parts and carbon tetrachloride 1 part by volume, according to Roark, R. C., and Cotton, R. T. Tests of various aliphatic compounds as fumigants. U. S. D. A. Tech. Bul. 162. 1929.