NEW RED OATS FOR FALL SEEDING RESISTANT TO RUSTS AND SMUTS

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THE introduction of Victoria and Bond into the United States, the discovery of their crown rust resistance (5, 10), and the recently demonstrated role of stem rust in the South have materially changed the objectives and course of breeding oats in most parts of the United States. Progress in breeding early oats for spring seeding, resistant to these diseases, has been discussed in previous papers (2, 4, 5, 6, 11, 12, 13); also, the successful attempts to introduce crown rust and smut resistance into the so-called common (Avena sativa) winter oats varieties Lee and Hairy Culberson (7). These latter, together with certain crosses between leading varieties of red oats with Victoria in 1930 and with Bond in 1932, promised a solution of this problem, but, no sooner had crown-rust-resistant segregates become available for testing than it became evident that resistance to stem rust also is necessary for the above-named section. The role of stem rust in the South, although apparently less important in some sections than that of crown rust, had not been fully realized prior to 1932. It is now clear that oats are needed which are resistant to both rusts, as well as to cold and to smut. The present paper indicates the progress made in attaining these objectives.

MATERIALS AND METHODS

The resistance of Victoria to crown rust was first observed by Murphy (5) at Manhattan, Kans., in June, 1929. It was then too late to make crosses at Manhattan; but, promptly utilizing the information gained, crosses were made with Red Rustproof at Aberdeen, Idaho, 10 days later, and with numerous other varieties in the greenhouse at Arlington Farm, and at Ames, Iowa, during the following winter. Unfortunately, at the time these first crosses were made, it was not known that Victoria was impure for crown rust resistance. All segregates of the cross made at Aberdeen in 1929 proved susceptible. Because of this, the value of Victoria as a source of crown-rust resistance was not universally recognized. A second major setback occurred with the destruction by birds of all F1 plants from Victoria crosses made at Ames in 1930. Hence, data on selections resulting only from the crosses made in 1930 at Arlington are presented in this paper.