A PRELIMINARY STUDY OF THE INHERITANCE OF RUST RESISTANCE IN OATS.¹

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INTRODUCTION.

Having found that there are disease-resistant species or varieties in a given crop, the next problem often is one of hybridization. The literature of the subject contains many references to the discovery or production of disease-resistant varieties, but there are, in proportion, very few examples of the profitable or extensive culture of such varieties. This is largely due to the fact that most of them are so undesirable with regard to one or more other equally important characters that they cannot be generally and profitably grown. This is exactly the present condition of affairs in the case of rust-resistant oat varieties.

It has been shown (15)² that so far as cultivated varieties are concerned, resistance to crown rust exists almost exclusively in varieties of the red oat group (Avena sterilis). Resistance to stem rust is not to be found in any of the varieties of the red oat group so far tested, but does exist in some of the varieties of the common oat group (Avena sativa). Some of the red oats resistant to crown rust are well suited to culture in the Southern States where they are widely grown, but they are not adapted to the conditions of the Northern States. On the other hand, the white oats, certain varieties of which are resistant to stem rust, seem specially adapted to the northern half of the United States and are entirely unsuited to conditions in the South. These conditions make it highly desirable that some knowledge be gained of the manner of inheritance of the character, rust resistance. In fact, this is essential if the method of hybridization is to be intelligently and successfully used in producing...

¹ Contribution from the Office of Cereal Investigations, Bureau of Plant Industry, United State Department of Agriculture, Washington, D. C. Received for publication September 15, 1919.

² The experiments here described were conducted at Cornell University. The work was under the supervision of Dr. H. H. Love, Professor of Plant Breeding, whose suggestions and assistance are gratefully acknowledged. Thanks are due Mr. W. I. Fisher for making the photographs used in the paper.

² Reference is made by numbers in parentheses to "Literature cited," page 37.