RUST RESISTANCE IN TIMOTHY.¹

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INTRODUCTION.

Among the first published papers on improvement in timothy is a short report by Hays (4)² of variations observed at the Minnesota station, together with a discussion of the possibilities of improving this crop. Extensive breeding studies with timothy have been carried on at the Cornell University station by Webber (10) and results of much promise have been obtained. A number of the improved sorts have given increased yield and also a better quality of hay than the commercial varieties. Aside from agronomic characters, such as stooling, height, and vigor, differences were observed in susceptibility to rust (*Puccinia graminis*). These differences in rust resistance were believed to be partially responsible for the yielding ability of these new sorts.

EXPERIMENTAL PLAN.

A project was outlined in 1916 for timothy selection studies at the Minnesota station. For the foundation stock 11 of the better Cornell sorts were obtained thru the kindness of Dr. C. H. Myers, who has charge of the timothy improvement work at Ithaca. Six of the better Minnesota selections were also grown. Seedlings were started in the greenhouse in the spring and approximately 125 plants of each selection were placed in the field in rows 4 feet apart, the plants being spaced 3 feet apart in the row.

Correlated data were taken in 1917 on such important characters as yield, erectness, average length of head, height, number of stools, and resistance to rust. All of the above data except those on rust were taken on the first growth the latter part of June. Spores were then collected from an infected timothy field and as soon as the second growth of the plants was well started they were sprayed with rust spores and data taken some time later on the amount of infection. As nearly all plants of the Minnesota selections were heavily rusted the epidemic was considered to be a satisfactory one.

It was planned to take individual plant data in 1918 and then save

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² Figures in parentheses refer to "Literature cited," p. 69.