

THE ROCKEFELLER FOUNDATION

DIVISION OF NATURAL SCIENCES
AND AGRICULTURE

WARREN WEAVER, Director

J. G. HARRAR,

Deputy Director for Agriculture

AGRICULTURAL PROGRAM
IN MEXICO

E. J. WELLHAUSEN, Local Director
Calle Londres 45

MEXICO 6, D. F., Mexico

THE USE OF FLEXIBLE COMPOSITE WHEAT VARIETIES TO CONTROL THE CONSTANTLY CHANGING STEM RUST PATHOGEN.

N. E. Borlaug ^{1/} and J. J. Gibler 1/

If a commercial wheat variety is to be developed which will have a possibility of remaining rust resistant indefinitely, this variety must be constituted so that its resistance can be modified to meet changing relative prevalence of different races of Puccinia graminis tritici.

It is proposed to produce such a "composite variety" by a modification of conventional backcross methods. The variety when distributed commercially, will be a mixture of a number of phenotypically similar lines, which are genotypically different for resistance. The "backcross lines" which are eventually employed in the "composite variety" are developed by crossing a commercial variety to a number of varieties carrying different types of resistance. Each single cross is backcrossed several times to the commercial variety.

When the "composite variety" is ready for release the several lines are multiplied separately, then mixed mechanically to form the variety for release to seed growers. With changes in races, one or several of the lines in the "composite variety" can be removed or replaced. As many lines can be developed and held in reserve as there are types of resistance.

This program ^{must be} based on current accurate knowledge of the rust race situation, extensive greenhouse testing to identify the best lines from each backcross, the maintenance of viable inoculum of all races collected in a given area, and a seed production program adequate to supply the required lines.

The unique feature of this new approach is to confront the shifty pathogen with an equally shifty suscept. Currently we are attempting to improve five commercial varieties by this method.

1/ Rockefeller Foundation, Mexico D.F., Mexico

Division 7-crop breeding section

15 minutes

Slides