BORDER EFFECT AND WAYS OF AVOIDING IT.1

A. C. ARNY.2

In 1917 and 1918, when the extent of border effect for spring-sown oats, wheat and barley was determined (1, 2), it was noted that winter wheat, growing under similar conditions, appeared to have more marked border effect than the spring grains.

In 1921, the border effect in winter grains was as marked as usual and its extent was determined for a limited number of varieties. These data, considered in connection with that secured in previous years, extend the information over another year and to an additional crop.

Since border effect has been shown to be a factor in the reliability of plot tests, possible methods of preventing its occurrence and hence obviating the necessity and consequent expense of the removal of marginal areas have been of interest.

Growing varieties in contiguous plots without the intervention of alleys is open to several objections. Inability to distinguish exactly where one plot leaves off and the other begins when contiguous varieties are similar, and the practical impossibility of maintaining varieties pure, are mechanical difficulties. However, the more serious objection is the possible effect of one variety on another (3, 4, 5, 6) when grown in this way, particularly since any one variety is flanked on either side by different varieties. Sowing the variety plots without the intervention of alleys, therefore, does not obviate the necessity of the removal of border rows.

The use of spring sown winter wheat on either side of each plot of spring-sown grain has been mentioned in this connection (7). Employing this method provides a uniform border which is in effect a cropped alley for all varieties in a test and in that respect is similar to the use of uncropped alleys. However, there is the possibility of the variety of winter wheat used in the cropped alleys reacting differently on the different varieties in a test. This effect might possibly be obviated to some extent by using seed of a number of winter wheat varieties composited instead of that of one variety only.

While the results of previous work appeared to make the efficiency

1 Published with the approval of the Director, as Paper 316 of the Journal Series of the Minnesota Agricultural Experiment Station.
2 Head of Section of Farm Crops, Division of Agronomy and Farm Management, Department of Agriculture, University of Minnesota.
3 Reference by number is to "Literature Cited," p. 278.