SIZE OF PLAT AND NUMBER OF REPLICATIONS NECESSARY FOR VARIETAL TRIALS WITH WHITE PEA BEANS

C. M. LOESELL

Any experiments have been conducted with different field crops to determine what size of plat and how many replications are necessary to give reliable results in the conducting of varietal trials. Economical administration of funds requires that the plats be small and repeated a minimum number of times. Efficient plat technic, however, requires that the plats be of sufficient size and repeated often enough to make the results dependable.

That information obtained for one crop under certain conditions cannot be applied to another has been clearly shown. A complete bibliography (1) of articles dealing with plat technic in general was reported by a committee of the American Society of Agronomy for the standardization of field experiments. Additional articles (2) were recently reported. A search of this literature fails to reveal any experiments of this nature with white pea beans (Phaseolus vulgaris L.).

Odland and Garber (4) in their work with soybeans, which comes nearest to this particular subject, concluded that under conditions existing where their experiment was conducted, a 16-foot plat one row wide replicated three times was the most satisfactory when both accuracy and economy of land and of labor were taken into consideration.

The object of the study reported in this paper was to find the proper size of plat and the number of replications of this size necessary for varietal trials with white pea beans when the trials are conducted under conditions similar to those prevailing in this experiment. Due consideration should be given to the amount of land to be used and to the convenience of handling the plats in all field operations.

MATERIAL AND METHODS

The Robust variety of white pea beans is used as a standard of comparison in variety trials at the Michigan Agricultural Experiment Station and is grown extensively throughout the state. Consequently, it was used in this experiment.

An area of Conover soil of approximately 1½ acres, located in one of the regular plant breeding sections, was chosen for the planting. The beans were planted in rows 28 inches apart on June 15, 1932, and so spaced that the plants were approximately 1 to 2 inches apart. To insure a good stand, 60 pounds of beans were planted to the acre instead of the usual rate of 45 pounds. After the last cultivation, an area 210 feet long and 210 feet wide was chosen from the center of the

1 Contribution from the Farm Crops Section, Michigan Agricultural Experiment Station, East Lansing, Mich. A thesis submitted to the Faculty of Michigan State College in partial fulfillment of the requirement for the degree of doctor of philosophy. Published as Journal Article No. 260 n. s. of the Michigan Agricultural Experiment Station. Received for publication April 13, 1936.

2 Graduate student. The author wishes to express his appreciation to Professor E. E. Down for aid in outlining the problem and in preparing the manuscript, and to H. M. Brown for many valuable suggestions.

3 Figures in parenthesis refer to "Literature Cited", p. 547.