THE INFLUENCE OF TIME OF THINNING CORN AND THE NUMBER OF PLANTS REMOVED ON THE GRAIN YIELD OF THE REMAINING PLANTS

The use of small plots or a limited number of plants in corn cultural experiments is usually both necessary and desirable. Because of this, it is essential that the plant competition within and between hills be equalized as possible by having a perfect stand. The method most often used to minimize competition is planting thick and later thinning to the desired number of plants.

Different investigators use various methods and different dates for the thinning operation. This paper presents limited experimental data collected at Urbana, Ill., on the influence of time of thinning and number of plants removed on the grain yield of the remaining plants.

The spacing between rows and hills within rows was 39.6 inches. Individual plots were 2 hills wide and 10 hills long. The variety of corn used was U.S. 13. The tests were located on heavy clay loam of good texture and high fertility.

The planting rates used were 3, 4, 5, and 6 kernels per hill. Every planting rate plot was adjacent to a check plot planted at the rate of two per hill. Therefore, every third plot was a check plot. Six comparisons or replications for each treatment were included. Thinnings were made on 4 dates, at which time the plants averaged 7, 20, 41, and 70 inches in height to the tip of the top leaf extended.

In the thinning operation, the stand was reduced to correspond to the stand of the adjacent check. For example, when a plant or hill was missing in the check plot, the identical situation was left in the adjacent thinned plots. The thinnings method used for each date was selected as the most appropriate and easiest method considering the size of the corn plant (see bottom of figure 1).

Grain yields were calculated on the basis of 15.5% moisture. In the compilation and analysis of the data, the deviations between the treatment plots and adjacent check plots were used. The mean yield of all check plots (planted 2 kernels per hill or 8,000 per acre) was 70 bushels.

Thinning or removal of plants from individual hills of corn in general resulted in a lower grain yield for the remaining plants. This yield loss increased as the number of plants removed increased and as the plant height at time of thinning increased. The yield loss when 2, 3, and 4 plants were removed per hill showed a positive linear relationship to the plant height at the time of thinning (figure 1).

Yield reductions from thinning might be attributed to two sources: the amount of nutrients taken up by the thinned plants before their removal, and the mechanical disturbance to the root system of the remaining plants. The deviation trends, therefore, seem to indicate that the yield loss from the removal of too many plants is more likely to occur. The latter is particularly true when the soil is dry. In insects or root pruning experiments the germination is good and it is not a general practice to plant 3 and 4 extra kernels. Usually only 2 extra kernels are planted per hill times only 1. At these two planting rates the effect of removal of too many plants is more likely. It should be pointed out, however, that the experiments the germination is good and it generally disturbs the other plants in the hill to a lesser degree. It is certain that the morale of the personnel is higher when plants are large. Also, more care must be exercised in counting and removal of too many plants is more likely.