VARIABILITY IN MEASUREMENTS OF HEIGHT AND WIDTH OF MARKET GARDEN PLANTS

Donald R. Willard and John B. Smith

In a recent comparison of the growth of vegetable crops from single and fractional applications of nitrogen, the height and width of several crops were measured at intervals. The results of a simple statistical analysis of the variability of the measurements are presented very briefly in the hope that time may be saved for other workers who contemplate such measurements. No discussion of the various methods for measuring growth rates has been undertaken, nor are the methods used in this study advocated; but because of simplicity, some procedure of this type is often adopted.

The plants measured were grown on \( \frac{1}{30} \) -acre plots of the agronomy field in accordance with accepted cultural practices, and were probably representative of the variability that might be found elsewhere. No unusual precaution was taken to secure uniformity in plant size.

The measurements were made with a caliper improvised from a meter stick with a fixed arm making a right angle at the tip of the stick, and a movable arm, also vertical to the stick, held by a brass clamp. Stations were chosen at spaced intervals, and the spacing was changed for each measuring date. Height measurements for cabbage and tomatoes were taken from the ground line to the highest part of the plant directly above the point where the stem emerged from the soil, and at the portions of the row nearest the predetermined stations for celery, beets, and spinach. Width was measured across the row, and at the place where the height measurements were made.

The probable errors (Table 1) are presented as the percentages of the means to simplify the comparisons. The measurements of cabbage and celery improved in uniformity as the crops grew in size, and this was true in lesser degree for beets. The products of height multiplied by width were less uniform than either dimension alone, showing a tendency for tall plants also to be wide, rather than narrow. The two dimensions were not compensatory.

Measurements were the most uniform for tomato vines and least uniform for celery. If a 10% difference between measurements is considered significant, probable errors of 3% should be allowable. Grouping the crops measured in three categories, this average accuracy for the season could have been approximated by 10 measurements of height or width for spinach and tomatoes, 15 measurements for beets and cabbage, and 20 measurements for celery.

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2Assistant Chemist and Chemist, respectively.