THE USE OF ACTUAL AND COMPETITIVE YIELD DATA FROM SUGAR BEET EXPERIMENTS

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In reporting tonages of sugar beets produced in plat experiments, the total weight of all beets produced on the area without regard to stand is given as the actual yield, which is often contrasted with a calculated or theoretical yield obtained from "normally competitive" or "competitive" beets. The beets serving as the base for calculation are those which have grown surrounded by neighbors on all sides at appropriate distances for the condition imposed by the experiment. These properly spaced beets buffered by neighbors are assumed to have been grown under "normal competition" and their designation has often been shortened in use to "competitive" beets.

Since some experiments may be more accurately reported by one method than the other, it is important that critical consideration be given to the reliability of each as a basis for judgment in agronomic experiments. It is recognized that there will occur cases in which, because of stand variability, neither method can be employed. The ideal condition is a perfect stand on all plats under which conditions the actual yield and competitive yield should be identical.

Where the stand is not good it is not possible to know how much yield is lost by the missing beets, as the other plants usually make some utilization of the adjacent missing spaces. It is also true that where the stand is not good the truly competitive beets may be too few in number to give a basis for a correct calculated yield.

Securing of actual yield is the more commonly used method of obtaining data, although agronomists have generally eliminated portions of plats where obvious mishap would have invalidated reliable results. "Normally competitive beets" have been used as a basis for data because of the belief that these beets would avoid unmeasurable competition effects and give more reliable data than could be obtained in the absence of such selection. The purpose of this paper is to explore this assumption and to show that under certain conditions acceptance of the yield from competitive beets has resulted in increased error rather than a gain in reliability. The point of view held is not antagonistic to the truly "normally competitive" beet concept, but rather is a critical one based upon the belief that in field work such selections, with inadequate stands, perforce cannot be properly restricted. Some of the difficulties encountered in obtaining actual and competitive yields in various types of sugar beet experiments are mentioned for the purpose of inviting further discussion of this problem, because at present there exists some confusion in the interpretation of the practical application of the results from a portion of the experimental sugar beet work.

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