NOTES

SIZING WHOLE SUGAR BEET SEED TO IMPROVE GERMINATION

IN CONNECTION with the breeding work of the Holly Sugar Corporation at Sheridan, Wyo., low-germinating seed has frequently been encountered. The low-germinating seed arises largely as a result of small plantings of mother beet roots and stecklings which are space isolated in gardens in this area for seed production. The use of this low-germinating seed has been a problem which interferes with the breeding work and particularly the small plot variety testing program. Increased planting rates, hand plantings, transplanting, and other procedures have been utilized with limited success. Procedures for improving germination, such as the use of polishing machines, air separation devices, gravity tables, and cleaning machines, have all been tried with limited success. Investigations of germination qualities of fractional sizes of seed have given rise to the use of a procedure which has proved to be very useful and it is believed may prove of value to other workers.

The seed is all harvested, threshed, and cleaned in the customary manner. Each lot of seed is thoroughly mixed and a representative sample is used for germination. All seed lots having a germination below 70% are reworked to improve the germination. A sizing test is conducted using a representative sample of about 1 pound or the full amount of seed if less than 1 pound. The seed is divided into six sizes by a nest of six 12 X 12-inch hand screens. The nest contains a blank for the bottom, 8/64, 9/64, 10/64, 11/64, and 12/64 inch round hole perforated screens. After the seed is graded over these screens, each fraction is weighed and a crack test is made of each fraction. A crack test consists of mashing 100 seeds and examining each seed for the presence of white starchy germ material. The number showing starch is referred to as the crack test. The difference between actual germination and the crack test is quite variable in different lots of seed and must be taken into account. This difference varies from zero up to as much as 30%. By examination of the weight and crack test of these fractions and the comparison of actual germination and the crack test of the original seed, a screen size for grading the seed is selected which will give the desired result.

In general, all seed below an 80 crack is discarded, but where the germination and crack test are close together a lower standard is sometimes used. If desired, weighted averages may be calculated and an estimate made of the germination of the final product as well as an estimate of the loss in weight for any size screen for each lot of seed. This is a desirable procedure for larger amounts of seed. For the average lot of seed there is usually a decided change in both the weight and crack test at a given size which can readily be located by examination of the data.

Table 1 presents the results obtained for 40 seed lots with original germinations of from 32 to 69% where all fractions below an 80 crack were discarded. The data show a progressive increase in crack.