THE EFFECT OF SPACING AND DENSITY OF STAND ON HILL PRODUCTION OF SUGAR BEETS

F. G. Larmer, Division of Sugar Plant Investigations
Bureau of Plant Industry, U. S. D. A.
(Read by Title)

In the experiments to which I refer, sugar beets were grown in hills or clumps and results compared with the conventional single-plant method. In the first experiment four treatments were compared with very carefully spaced single beets 10 inches apart. Contrasting treatments were (a) hand blocking, 10-inches spacing, with no finger thinning, (b) doubles in hills spaced 10 inches apart, (c) doubles in hills spaced 20 inches apart.

The second experiment compared hand blocking (a, above), and hand blocking, the hills being 20 inches apart, with contract labor thinning and carefully supervised thinning.

In the third experiment hand blocking (a, above) and mechanical cross cultivation, the hills of beets being 20 inches apart, were compared with single-plant thinning on three rates of seeding: 5, 9, 13 pounds of seed per acre.

In summarizing the results of these experiments, significant differences in tonnage yields or sucrose percentage were not obtained except in the low seeding rates of experiment three where stands were not sufficient. Beets grown as doubles, regular 10-inch spacing, averaged approximately 50 percent as large as beets grown as singles, while those grown as doubles in hills 20 inches apart were comparable to beets grown singly 10 inches apart. In hills of three, spaced 20 inches apart, the beets were approximately two-thirds as large as those grown singly 10 inches apart. Although hand-blocking with 10 inch spacing did give approximately as good tonnage yields as the conventional single beet method, the beets were more numerous, much smaller individually and difficult to harvest. Increasing the spacing between hills to 20 inches alleviated these difficulties and gave tonnage yields comparable to single beet spacing.

These results, although not entirely conclusive, demonstrate that, experimentally at least, beets can be grown in hills approximately 20 inches apart, which suggests the possibility of cross cultivation, with a minimum of hand work on hills that contain in excess of 2 or 3 beets. The method, aside from affecting a vast saving in thinning costs, should have merit in reducing the cost of weed control during the growing season.

THE EFFECT OF BOLTING ON SUGAR BEET PRODUCTION

F. G. Larmer, Division of Sugar Plant Investigations, Bureau of Plant Industry, U.S.D.A.
(Read by Title)

The characteristic of some sugar beets to produce aerial stems bearing flowers and seeds during growth the first season has been commonly termed "bolting." Bolting beets are common in winter-planted fields in Central California, especially in the domestically-produced, disease-resistant strains

of sugar beets. Because of genetic variability in respect to the annual habit, bolters are readily classed as early or fast bolters, intermediate, and late or slow bolters, depending upon the age of the plant at the beginning of seed stalk development.

A seasonal study of the influence which bolting has on root development has shown root weight at harvest to be inversely proportional to the age of the plant at the initiation of seed stalk development. Root weight of early and intermediate bolters remained approximately constant after fertilization, the plants becoming chlorotic and showing evidence of decadence after the seed matured. Indications are that late bolting beets are more vigorous individuals than non-bolting plants, the root weight being greater at the beginning of seed stalk development. This may be true of all bolters but was not determined for the early and intermediate classes.

Intermediate bolting has a pronounced competitive effect on adjacent beets during the period of rapid vegetative growth accompanying seed stalk development. Beets adjacent to early bolters seemingly overcome this competitive influence after decadence of the bolter occurs, while beets adjacent to late bolters apparently are well established before bolting takes place.

A significant lowering of the sucrose percent was recorded during seed stalk development in all classes of bolters studied. This disparity gradually disappeared with cessation of vegetative growth and maturing of seed. Significant differences in apparent purity coefficients were not observed although the purity coefficients were at all times slightly lower in roots from bolting plants.

Cutting the seed stalks 6 to 8 inches above the crowns of intermediate bolters at flowering time had a detrimental effect on the quality of the roots. Thirty-nine percent of the beets succumbed to this treatment, with root decay causing a loss of 27.00 percent in tonnage yields. Sugar synthesis was entirely checked, the sugar content remaining approximately constant throughout the period from June 12 to August 1. However, there was an accumulation of total solids, the apparent purity coefficient being reduced from 81.15 to 50.49 percent.

CONDITION OF STORAGE AND FINAL QUALITY OF SUGAR

Hatler Gearheart, Utah-Idaho Sugar Co.
Chinook, Montana.
(Read by Title)

Tremendous losses are borne annually by the sugar beet industry because of faulty storage methods. At some factory units the loss has run to more than one hundred thousand dollars in a single year.

Beets placed in storage under ideal conditions have been observed to lose little if any in purity or to become more difficult to process. However, the loss of sugar in long storage under ideal conditions is appreciable toward spring, since nature calls the beet to put forth her leaves in the process of reproduction and she also decrees that in this process the mother beet give up sugar which was stored originally for this purpose.