slight decrease in Rhizoctonia in the late thinned fields as compared with those thinned early.

Disease was responsible for 47.97% of all losses in 1938 and 36.25% in 1939. The relation of the loss caused by each disease recorded to the total loss caused by disease in 1938 and 1939 is shown below:

Year	Disease				
	Rhizoctonia	Black-root	Girdle scorf	Fusarium	Unknown
1938	37.41	31.22	19.34	7.01	5.01
1939	34.19	27.43	26.83	10.69	0.86

The principal differences between the two years are found in an increase of Girdle scorf and Fusarium and a decrease in Rhizoctonia and black-root in 1939.

The several counts during the season divided the growing season into 11 periods. The heaviest daily loss took place during the first 3 periods, i.e., 3 days after thinning, the 4th to 7th days after thinning, and the 8th to 14th days after thinning. The total loss for the 21 days covered by these periods was 65.98% of the season's loss. The daily losses expressed in terms of the total loss for the season were 5.73, 5.51, and 1.9, respectively, for the 3 periods under consideration.

Losses due to insects, work animals, cultivating, exposure, hoeing, and irrigation are partly, at least, controllable. These constitute 36.7% of the total loss in 1938 and 46.1% in 1939.

Better care, more attention to the handling of tools and work animals and closer supervision of labor should materially reduce these post-thinning losses.

The effect of post-thinning losses is not proportionate to losses in number of beets. Much of the loss, especially that caused by disease, occurs so late in the season that the remaining beets have no opportunity to make up for this loss by increased growth as a result of the wider spacing the loss brings about. Therefore, these late season losses are more serious than those occurring earlier in the growing season.

A STUDY OF SUGAR BEET GROWTH AT JEROME, IDAHO

D. E. Smith[1/]

In an effort to determine the amount of growth made by sugar beets from week to week under conditions such as prevailed at Jerome, Idaho, during 1938 and 1939, representative growing beets were measured and a record of increase in circumference recorded. At the end of the growing season these beets were weighed.

To convert this weekly growth into pounds per acre, the following

1/Amalgamated Sugar Company

formula was used: - The total weight of a representative sample of beets is to their total circumference as the total growth in inches per acre (determined by knowing the approximate stand of beets) is to "X", or pounds of growth per acre.

After two seasons of measuring and weighing beets in test, as well as many others at random, it was found that on an average beets circumference at the soil level was 6.57 times their weight. A two pound beet would be near 13.1 inches around. A further example: - 60 average beets were measured and found to have gained .5 inches per beet in one week. Assuming that there were 21,000 beets on this acre and that all made an average gain, the total growth increase would be 10,500 inches. By using the above mentioned factor of 6.57, this would show a growth of 1,598 pounds on the acre within the week.

Figures on the large chart accompanying this paper were established through this method. For convenience they are presented here showing the year, the week, and the amount of growth in tons:

TONS GROWTH PER WEEK - PER ACRE

	1938	1939
July 21 to 27	---	.92
July 28 to Aug. 3	---	1.26
Aug. 4 to 10	---	.96
Aug. 11 to 17	1.96	.89
Aug. 18 to 24	1.70	.48
Aug. 25 to 31	1.44	.62
Sept. 1 to 7	.56	.45
Sept. 8 to 14	.82	.25
Sept. 15 to 21	.28	.13
Sept. 22 to 28	.46	.23
Sept. 29 to Oct. 5	.66	.37

It is interesting to note that in each year growth was most rapid during mid-summer, and gradually declined until fall. Also, that there was an "upturn" in growth at harvest each year. In 1938 this followed high temperature during the latter part of September, and in 1939 following recovery from a severe hail storm which occurred September 13th. It is also interesting to note that growth almost stopped immediately following the hail storm, but was recovering rapidly when harvested.

These beets were grown on the same land. In 1938 the land had been previously crowned out of 7 year old Alfalfa, fall plowed and 125 pounds of Triple Super-Phosphate drilled with the seed. The yield was 21.03 tons per acre. In 1939, ten tons of barnyard manure was applied, spring plowed and the crop irrigated up. The yield was 16.71 tons per acre.

During both growing seasons, moisture was kept as near an optimum condition as possible (never allowed to reach a permanent wilting point). Plant food appeared to have been ample during 1938, but may have been slightly lacking during the latter part of 1939. There was a mild infestation of curly top during 1938, but none in 1939.

The factors which affect plant growth were studied and the mean temperature together with stage of growth or maturity seemed to have most effect upon the rapidity of growth - generally speaking, as the mean temperature declined, the amount of growth became less. The fluctuation of air temperature seemed to have a delayed effect upon growth, apparently because of the slowness of soil to "take in" or "give off" heat.

From these preliminary results, indications are that sugar beets make most growth during the warmer part of the season. That it is possible to establish a "factor" in a district to determine the growth in fields, to aid in estimating yields, to approximate the growth in test plots and similar work where factors affecting growth are being studied, and to record the growth of beets affected with varying degrees of curly top or other diseases.

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*INFLUENCE OF PLANTING DATE AND CULTURAL PRACTICES ON SUGAR BEET SEED PRODUCTION

Bion Tolman 1/

Data from experimental plots in the St. George area indicate that the percentage of plants developing seedstalks, the rate of development of the seedstalks, the yield of seed per acre, and seed quality (including size of seed balls, percentage germination and weight per bushel) are influenced by planting date, fertility level, and cultural practices (including previous crop and time and method of seed-bed preparation).

These three factors (planting date, fertility level, and cultural practices) may act separately or in combination. The combined effect of any two factors may be additive or one may alter the effect of the other. For example, lack of phosphate and nitrogen may be accentuated by improper seed-bed preparation or the benefit of early planting may be lost as a result of poor cultural care or failure to supply needed fertilizer.

There is a definite relationship between planting date and proper fall growth, and the physiological processes of photo-thermal induction that takes place during the overwintering period. It appears to be desirable to make the fall growth as rapid as possible. No amount of care in the spring can compensate for the incomplete photo-thermal induction which may follow insufficient fall growth.

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* Read by "title."

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