

EFFECT OF THE PREVIOUS CROP ON SUGAR BEETS.

As previously mentioned differences in top growth of the beets were observed during the growing season which appeared to be due to the effect of the previous crop. Some samples were taken at harvest of contrasting conditions.

Ten paired samples were taken of beets following winter wheat and of beets growing on the three foot alleys which had separated these wheat plots in 1939. One row of beets 50 feet in length was taken in each case. Averages of each ten samples were as follow: (Yields calculated to acre basis.)

Beets after winter wheat	20.98 tons.	14.78%	sucrose.	6215 lb.	gross sug.	107	stand
" " alley	22.44 "	14.73%	"	6618 lb.	" "	100	"

On the basis of the samples taken the differences do not quite reach the value of twice the standard error of a difference. Differences in top growth were very pronounced in the latter part of the season; the tops of the "alley" beets being larger and darker green.

Five samples were taken of beets following sudan grass and five samples of beets following a bulk crop of oats were also taken. These samples were each a single row 100 feet in length. Both sets of samples were taken at random from beets growing on the same <sup>2</sup>acre <sup>2</sup>Experiment Farm "Series", but can not be considered as paired samples. The averages of these samples were as follows:

Following sudan grass;	20.31 T.	5322 lb.	gross sugar.	13.12 %	sucrose.	99	stand.
" oats	20.49 T.	5834 lb.	" "	14.26 %	"	106	"

Top growth of the sudan grass beets was apparently two to three times as heavy as for the oat beets. The continued, luxuriant growth of the sudan grass beets probably indicates a plentiful supply of nitrates throughout the growing season. The yield of roots was not in proportion to the top growth and the relatively low percent sucrose resulted in less gross sugar per acre than was produced by the beets following oats which had much smaller top growth.

The large beet field in 1940 was planted across five of the Experiment Farm "Series". Each of these series had been separated in 1939 by an uncropped alley 16 feet in width. By midsummer of 1940, the location of each of these alleys could be seen by the heavier top growth of the beets on them. No samples were taken.

Whenever there were lower spots in this field due to poor leveling of the land, there was some ponding of water at the May 13 to 15 irrigation. Top growth of the beets on these spots was much scantier and lighter in color throughout the season. On one spot in particular, the beet tops at no time completely covered the ground. The beet roots were also somewhat smaller on these spots, but the reduction in root size was not great in comparison to the reduction in top growth and percent sucrose was probably higher; at least this condition is indicated by the higher "tests" on certain loads delivered to the sugar factory from one corner of the field. Overwatering at the early irrigation of these spots probably leached much of the available nitrates beyond the reach of the young beet plants. One replication of Top Cross Test was rather severely affected in this manner and yields of roots from that replication were lower and percent sucrose higher, in general, than from the adjacent unaffected replications.