Comparing both varieties in a test where 10-inch and 15-ineh spacing intervals between beets within the row were employed on a high and average level of soil fertility, it was found that both the sugar and the tonnage varieties responded to closer spacings of beets in the row.

The percentage sucrose in the sugar variety remained fairly constant when the variety was subjected to increased fertilization and to an increased interval of spacing between beets in the row. On the other hand, the percentage sucrose in the tonnage variety was depressed sharply when the variety was subjected to these same conditions.

Both varieties produced under fertilization significantly higher sugar-per-acre yields for both spacing intervals, compared to the non-fertilized check plots.

Literature Cited

1. Hurst, L. A., Skuderna, A. W., and Doxtator, C. W. A Study of High and Low Levels of Soil Fertility Response to Two Varieties of Sugar Beets. Jour. Amer. Soc. Agron. 31: 649-652. 1938.
2. Skuderna, A. W., and Doxtator, C. W. A Study of Spacing Effects with Two Varieties of Sugar Beets on a High and Low Level of Soil Fertility. Proceedings Am. Soc. Sugar Beet Tech. 1940, Part 1, pp 100-102.

Fertilizers—Manner of Application

.1. E. JENSEN[1]

For many years there has been some question in the minds of men engaged in agriculture regarding the proper application of commercial fertilizers. Considerable experimental work has been carried on in various areas. To further these investigations with the idea of determining more fully the correct manner of application, an experimental plot was planned and conducted in the West Jordan district, Salt Lake County, Utah, during the 1940 season.

In order to care for variation in soil conditions, the randomized-block scheme was employed. Six methods of application were used and each was replicated four times. The two center rows in each block were used for selective harvest. The beets from each were cleaned and weighed in the field. The weights were checked by two persons in order to assure an accurate record.

The experiment was continued in 1941 in West Jordan, Utah, and Shelley, Idaho, districts on strip plantings comprising three replications. It was noted that moisture control and correct cultural methods had much to do with obtaining maximum results through

[1]Utah-Idaho Sugar Company.

the application of commercial fertilizer. These were especially noticeable in the Shelley. Idaho, district because of proper drainage and the highly cultured condition of the soil.

Table 1.— Phosphate application studies—West Jordan District—1940

Treatment	Yield—tons per acre
50 lb. with seed—100 lb. side-dressed	14.80
None with seed—150 lb. broadcast	14.28
50 lb. with seed—100 lb. broadcast	14.26
None with seed—100 lb. side-dressed	13.84
75 lb. with seed—75 lb. side-dressed	13.24
100 lb. with seed—100 lb. side-dressed	12.98
Difference for significance (19:1 odds)	1.69

Planted: April 22, 1940 — 4 replications
Harvested: October 23, 1940 — Block acreage: 0.038

Table 2.—Phosphate application studies continued in 1941 at West Jordan and Shelley Districts with three replications on strip plantings.

Treatment	Yield—tons per acre
50 lb. with seed—150 lb. side-dressed	15.54
50 lb. with seed—100 lb. side-dressed	14.79
50 lb. with seed—50 lb. side-dressed	13.68
100 lb. with seed—none side-dressed	12.71
50 lb. with seed—200 lb. side-dressed	12.35
50 lb. with seed—250 lb. side-dressed	12.14
Difference for significance (19:1 odds)	1.23

Planted: April 23-24, 1941 — 3 replications
Harvested: October 28, 1941 — Block acreage: 0.130

Table 3.—Phosphate application studies, Shelley District—1941

Treatment	Yield—tons per acre
50 lb. with seed—250 lb. side-dressed	19.12
100 lb. with seed—none side-dressed	18.87
50 lb. with seed—200 lb. side-dressed	18.82
50 lb. with seed—50 lb. side-dressed	18.46
50 lb. with seed—150 lb. side-dressed	18.32
50 lb. with seed—100 lb. side-dressed	18.07
Difference for significance (19:1 odds)	1.43

Planted: April 26, 1941 — 3 replications
Harvested: October 20, 1941 — Block acreage: 0.127

The conclusions from these data are outlined as follows:

1. Phosphate applied with the seed in excess of 75 pounds per acre apparently does not give a response in keeping with that from other methods of application.

2. Optimum point seems to be an application of 50 pounds per acre with the seed and between 100 and 150 pounds per acre either side-dressed or broadcast.

3. Quantities in excess of 200 pounds per acre do not seem warranted economically regardless of manner of application.

4. It appears desirable to apply up to 50 pounds per acre with seed.