EXPERIMENTS from 1943 to 1945 on all the principal soil types used commercially for producing table beets for processing had proved conclusively \((2, 3, 4, 5)^3\) that sodium salts applied as a soil amendment would greatly stimulate the growth and significantly and profitably increase the yield of beets. But beginning in 1946 the pricing system for beets was drastically changed from a flat rate per ton to a graded basis in which only the small sized beets would bring attractive prices and the returns from the larger sized beets would be discouragingly low. Consequently any treatment that had proved profitable due to stimulated growth of beets would have to be re-investigated to determine if it would still be profitable or merely result in larger beets of lesser value and thereby become an unprofitable practice.

Two methods of production that should increase the proportion of small sized beets seemed worthy of trial: namely, (1) growing the beets on poor soil and without soil amendments, thus depending on impoverishment of the crop to keep the beets small; and (2) growing the beets on well fertilized soil with and without sodium amendments, but seeding the beets at heavier rates, thus depending on increased competition between the larger number of plants to keep the beets from growing too large. The latter method should produce the heavier yields per acre and give an opportunity for evaluating amendments to the soil as measured by the returns from the beets under the new pricing schedules. This paper reports the results of experiments in 1946 and 1947 comparing increased rates of seeding beets grown with and without fertilizers and with each of the following sodium salts: sodium chloride, sodium nitrate, sodium sulphate, and sodium carbonate.

**1946 Experiment**

The 1946 experiment was located at Geneva, N. Y., on an Ontario silt loam soil, pH 7.2. A split-plot design was used, with three replications of two rates as the main plots, and five fertilizer treatments randomized within each main plot as the sub-plots. This design, re-randomized each time, was repeated on different planting dates on adjoining blocks, thus giving a total of 90 sub-plots in the experiment. The three blocks were planted, respectively, May 23, June 25, and July 17; and were harvested or approximately 3 months from each planting date. Due to the design of the experiments, the dates of planting are confounded with locations in the field, so they can not be directly compared.

Detroit Dark Red beets were seeded in 24-inch rows with a commercial 4-row seeder. Plots were 16-by 24 feet in size. Yield records were obtained from the entire area of each of the four interior rows. The same lot of seed, germination 76%, was used in all plantings.

**RATES OF SEEDING, 1946**

The effects of rate of seeding upon the yield, size, and gross returns from beets in 1946 are given in Table 1. The rates of seeding used were 6.7 pounds of seed per acre, which in the past had been the rate commonly used by commercial beet growers, and approximately double the usual rate, or 13.3 pounds per acre.

The data in Table 1 show that when all the fertilizer treatments are averaged, the heavier rate significantly increased the yield of small sized beets, and decreased the yield of large beets, but had no effect upon total returns from the beets. Because the increase in yield of the small and medium sized beets, but had no effect upon total returns from the beets, may be either a result of increased competition between the larger number of plants to keep the beets from growing too large, or an effect produced by the higher rate of seeding alone, it was necessary to make separate comparisons of the effects of the various treatments on the yields of small, medium, and large beets under the different rates of seeding.

**COMPARISON OF VARIOUS SODIUM SALTS, 1946**

The effects of various sodium treatments upon the yield, size, and gross returns from beets are summarized in Table 2. Inasmuch as...