scope of the experimental work with sugar beets at the Northwest Experiment Station was increased beginning in 1917 to include cultural and fertilizer experiments.

During the twenties and early thirties, while the Sugar Companies were relying on imported sugar beet seed, the variety tests at the Experiment Station were discontinued and emphasis was placed on spacing, soil preparation and fertilizer trials. Variety testing was resumed in the early thirties in a cooperative project with the Department of Agronomy, Minnesota Experiment Station and the Office of Sugar Investigations, United State Department of Agriculture when new home-grown strains of sugar beets were tested for sugar content yield and disease resistance. In the late thirties all of the sugar beet testing work in the Minnesota Experiment Station was transferred to the Southeast Experiment Station at Waseca. The American Crystal Sugar Company, which operates the three sugar processing plants in the Red River Valley, has through the years maintained a research staff which has passed on information to the sugar beet growers on the best cultural and fertilizing practices.

During the first few years of operation of the American Crystal Sugar plant at East Grand Forks, practically all of the field culture, including the lifting and much of the hauling of beets was done by horse labor. Some tractors were in use for plowing, discing, harrowing and fallow work.

The physical condition of the heavier soils of the Red River Valley was deteriorating up to the advent of sugar beet culture, through continuous grain cropping and the plowing of the land with horse drawn plows. Plowing of the land at the same depth year after year developed plow soles which prevented an easy flow of water to the sub-soil and retarded the deep penetration of roots of crops. Sub-soiling and deep plowing tests to break up the plow sole were conducted by the writer, in preparation of soil for sugar beets. Deep plowing through the plow sole proved as effective in fall plowing as deep tillage. Today, with deep tillage implements and deep rooted legumes such as alfalfa and sweet clover in rotation, the plow sole is no longer a factor but other problems on the physical condition of the soil need to be solved and such cooperative experimental projects are now in progress.

The yield of sugar beets is dependent on the number, size and quality of beets produced. In the spacing tests the writer found that the greatest yield of beets was obtained on the 14" spacing in the row. With the weed problem in beet fields in the early years of beet culture in the county, growers resorted to cross cultivation on the level fields of the county. Cross cultivation increased the size of beets but did not compensate in yield for the reduced number of beets. The weed problem on fields that have gone through several rotation cycles with sugar beets is now less acute and most growers have discontinued cross cultivation and are relying on closer spacing with so called "long handled thinning and hoeing". New methods of processing sugar beet seed has