HUBBELL, LEE A.*, JAMES F. STEWART and DAVID B. WISHOWSKI, Michigan Sugar Company, 341 Sugar Street, Carrollton, MI 48724. **Determine the ideal population in 30 inch row spacing.**

ABSTRACT

Over the last 25 years the number of seeds planted per acre by our growers has increased significantly. This change came after we documented the advantages of thicker beets in research trials that compared populations up to 160 beets per 100 feet (27,878 beets per acre) and later up to 200 beets per 100 feet (34,848 beets per acre). The seed spacing used by our growers decreased over 34% from 6.54 inches in 1982 to 4.30 inches in 2006. In recent years, growers have become concerned about the beets being too thick. The trial we conducted compared thinned populations from 60 to 300 beets per 100 feet, (10,454 to 52,272 beets per acre). The tons per acre and the recoverable sugar per ton were both less at the thinner populations. Recoverable sugar per ton increased up to the thickest population of 300 beets per 100 feet. The yield, in tons per acre, decreased at the highest populations.

OBJECTIVE

To compare different beet populations evaluating for yield, sugar content and quality.

MATERIALS AND METHODS

Trials were conducted three years at various locations planted in 35-foot long plots harvesting 28 feet of row. The plots were six rows and six replications. The seed was planted thick (1.3 inch spacing in 2004 and 2005 and a 2 inch spacing in 2006) and then hand thinned to the various populations. Four locations were planted each year. There were two usable in 2004 and 2006 and all four were usable in 2005. Trials were evaluated for yield and quality.

Table 1

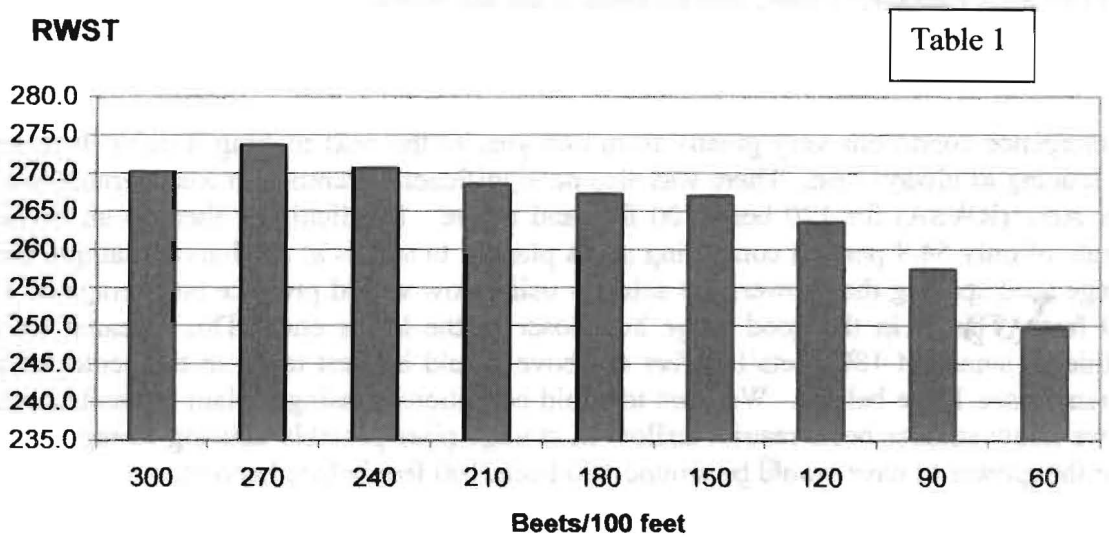
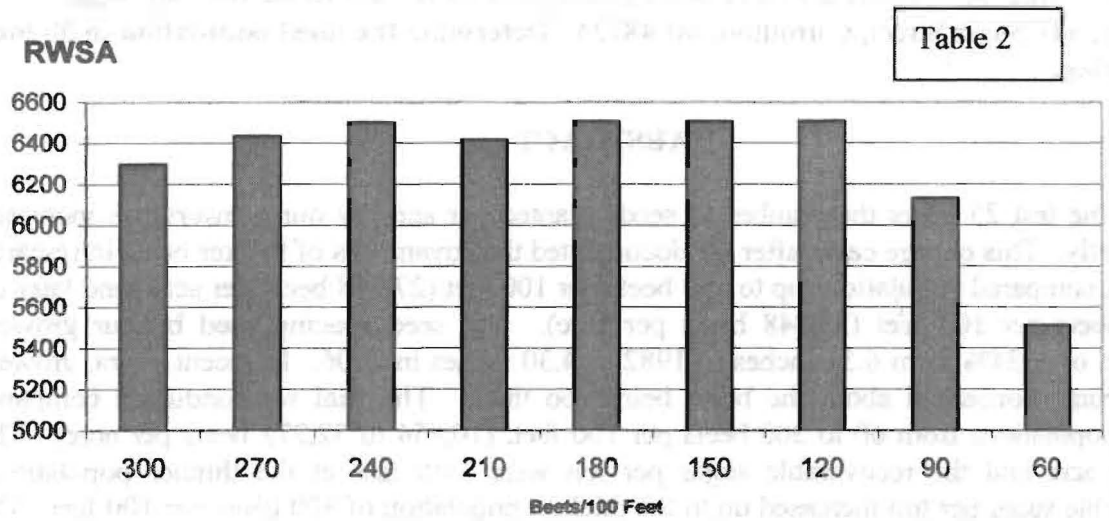


Table 2



RESULTS AND DISCUSSION

The motivation for this trial was to find what population was too thick. After three years of trials, the 300 beets/100 feet was lower than the best population in all factors of yield and quality but it was significantly less than the best in only tons/acre (Table 1 and 2). Other factors of purity, amino nitrogen and sugar content were better up to 270 beets/100 feet. The 60 and 90 beets/100 feet were significantly less in all factors. 120 beets/100 feet was also significantly less in amino nitrogen, purity, sugar content and Recoverable White Sugar per Ton (RWST). Our growers will have a quality factor in the payment system for the first time in 2007. Including purity to use RWST as a payment factor the return to the grower is very similar at populations from 120-270 beets/100 feet. 300 beets/100 feet decreases some in payment and 90 and 60 beets/100 feet are considerably less, with 60 beets being the worst.

CONCLUSIONS

Emergence conditions vary greatly from one year to the next making it difficult to pick one seed spacing as always best. There was also no significant difference in Recoverable White Sugar per Acre (RWSA) for 120 beets/100 feet and above. In Michigan, there is an average survival rate of only 54.9 percent comparing seeds planted to stands at pre-harvest sample time. The average seed spacing the growers are actually using now would produce an average of 153 beets/100 feet. This is in the good range but closer to the lower end. This research would indicate thicker stands at 180 beets/100 feet or above would be best to be in the center of the 120-270 range (see Table below). We want to avoid conditions causing replant if stands are too thin and we know smaller beets restrict airflow in storage piles possibly causing storage losses. A goal for the grower to have would be around 180 beets/100 feet before harvest.

Row Width	Seed Spacing	Beets/ 100 Ft	Plants/ Acre	Seed Spacing	Beets/ 100 Ft	Plants/ Acre	Seed Spacing	Beets/ 100 Ft	Plants/ Acre
30"	4.3	153	27,019	**3.7**	**180**	31,363	3.34	200	34,848
28"	4.3	153	29,019	**4.0**	**167**	31,196	3.6	186	34,662
22"	4.3	153	36,933	**5.0**	**134**	31,762	4.6	145	34,524