OPTIMUM PLANT POPULATION FOR LATE PLANTED SUGARBEET-2001

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Introduction

Plant populations of 150 to 175 plants per 100 ft of 22 inch row are recommended at the six leaf growth stage for early seeded sugarbeet to maximum sugar production in the Red River Valley of Minnesota and North Dakota. Most of the research on which this recommendation is based was conducted during the late 1970's and early 1980's and is reported in the Sugarbeet Research and Extension Reports. Some of the studies evaluated the effect date of planting and plant population had on sugarbeet yield and quality. Limited data evaluating the date of planting has been collected in recent years. With the lateness of planting in the spring of 2001, many growers queried the optimum plant population to maintain in order to maximize sugar production.

Materials and Methods

Field experiments were established on Bearden silty clay loam (Fine-silty, mixed, super active, frigid, Aeric Calciaquoll) on the Kirk Watt farm at Glyndon, MN and on Fargo silty clay (Fine, smectic, frigid, Typic Epiaquert) north of the airport at Fargo, ND, during the spring of 2001. Each experiment was arranged in a randomized complete block design with six replications at the Fargo location and four replications at Glyndon. Individual treatment plots measured 11 feet wide and 30 feet long at both locations. Soil nitrogen levels were adjusted with fertilizer to approximately 120 lbs/acre of available residual soil test plus added fertilizer N.

Sugarbeet, Crystal 817, was planted on May 25 at Glyndon and VDH 56156 was planted on June 4 at Fargo with a John Deere MaxEmerge 2. Sugarbeet was placed 1.25 inches deep with 5-inch in-row spacing. A 22-inch row spacing was used. Counter was surfaced band applied at 11.9 lbs/a and incorporated with chain at planting.. Post emergence herbicides, cultivation and hand labor was used as needed for weed control. One application each of Eminent and Super Tin were applied for Cercospora leafspot control.

Sugarbeet populations of 75, 100, 125, 150, and 175 plants per 100 feet of row were established with hand thinning on July 2 at both locations. Plants were in the six to eight leaf growth stage.

Sugarbeet were harvested September 18 and 19 at Fargo and Glyndon, respectively. The middle two rows of each 6 row plot were harvested. Yield determinations were made and quality analysis performed at American Crystal Sugar Quality Tare Lab, East Grand Forks, MN.

Results and Discussion

The yield data indicate a population of at least 150 plants per 100 feet of row is needed to maximize sugar production of these late seeded sugarbeet. (Table 1 and 2). The increase in root yield and recoverable sugar per acre as plant population increases from 75 plants to 150 or more is significant at the Fargo location. A similar but nonsignificant trend was shown at the Glyndon location. These one-year results need verification with additional years of data.

Table 1. Effect of late planted sugarbeet populations on root yields, sucrose percentage, sucrose loss to molasses, and recoverable sugar production (September 18), Fargo, ND, 2001.

Plants/100ft	ROOT YIELD Tons/A	SUCROSE Percent	LOSS TO MOLASSES Percent	RECOVERABLE SUGAR Lbs/Acre	RECOVERABLE SUGAR Lbs/T
75	17.2	15.5	1.5	4832	280
100	18.7	15.4	1.5	5215	279
125	20.0	15.7	1.5	5724	285
150	22.7	16.1	1.4	6597	292
175	22.7	15.7	1.5	6428	283
LSD (.05)	4.4	NS	NS	1125	NS

Table 2. Effect of late planted sugarbeet populations on root yields, sucrose percentage, sucrose loss to molasses, and recoverable sugar production (September 19), Glyndon, MN, 2001.

Plants/100ft	ROOT YIELD Tons/A	SUCROSE Percent	LOSS TO MOLASSES Percent	RECOVERABLE SUGAR Lbs/Acre	RECOVERABLE SUGAR Lbs/T
75	23.6	15.6	1.9	6516	275
100	24.6	15.5	1.8	6752	274
125	25.4	15.0	1.9	6624	261
150	24.8	15.3	1.8	6704	270
175	24.7	15.8	1.7	6984	283
LSD (.05)	NS	NS	NS	NS	NS