

AEIS 659

August 1999

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Seedbed Tillage and Planter Effects on Sugarbeet Emergence and Yield—1999

Mid-Season Observations

Sugar beet plots were established using three seedbed tillage options, two seed treatments and two planters. While there were no practical differences in plant population due to seed treatment or planter used, seedbed tillage affected both rate of emergence and 30-day plant population. Increasing the intensity of seedbed tillage created a drier seedbed, delayed plant emergence and reduced plant population. Use of an Accord precision planter improved plant spacing uniformity.

Sugar beet plots were established at the Saginaw Bean and Beet Research Farm to evaluate the effect of seedbed tillage, planter selection and seed type on plant emergence and stand, uniformity of beet spacing and size, sugar content and yield. All plots were fall moldboard plowed. Three seedbed tillage treatments were used: 1) **fall spring tooth/stale seedbed**, 2) **fall spring tooth/single pass, shallow Triple-K**, and 3) **spring field cultivate/ Triple-K**. Beets were planted with a John Deere **7300 general purpose vacuum planter** and an Accord **plate-type beet planter**. Stand establishment goals included early season emergence and growth, a high plant population and an even spacing between plants in the row. Seedbed tillage was within a few hours of planting. Shallow tillage with was at a depth of 1-2 inches to break the surface crust and level the surface yet avoid excessive drying of the seedbed. Field cultivating was at a depth of 4-5 inches with two passes of the Triple-K to level and firm the seedbed.

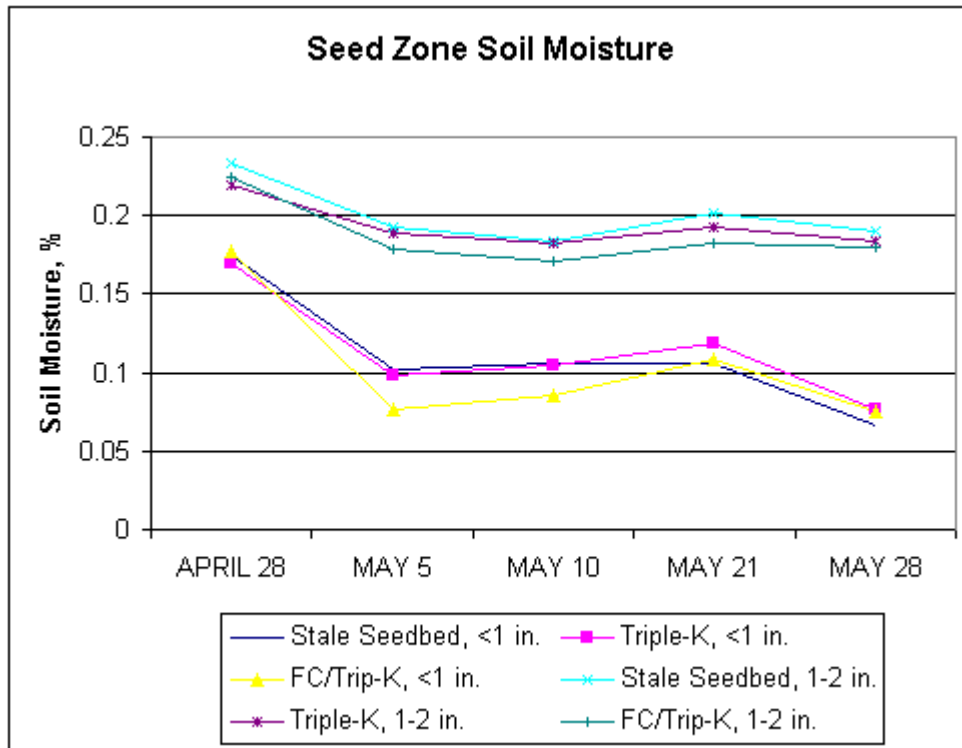
Planting date:	4/28/99	Row cultivate:	June 8
Target spacing:	6 inches		June 17
Planting depth:	1 inch	Spray schedule:	
Planting speed:	4 mph	April 30	2 qt/ac Nortron
Previous crop:	Soybean		5#/ac Pyramin DF

Variety: E-17	4mm PAT pellets	July 20	5 lb/ac Benlate
	or #3 Celpril		2 lb/ac Manzate
Fertilizer:	broadcast March 12	August 6	5 oz/ac SuperTin
	200#/acre 46-0-0	Soil type:	Zilwaukee

Table 1. Planting and crop care information

Soil Moisture

Increasing tillage intensity created a drier seed zone throughout the early growing season. This lack of soil moisture likely contributed to the delayed emergence in the spring tilled plots. When averaged across tillage systems, 83% of the 30-day population had emerged within 2 weeks of planting in the stale seedbed, but only 37% had emerged in the most intensively tilled plots.



Plant Population and Spacing

The target seed spacing was 6 inches (200 per 100 ft of row). When averaged across tillage methods at 30 days after planting, the stale seedbed provided 19% more plants than the most intensively tilled land. Selection of planter or seed treatment did not seem to have a practical effect on plant population within tillage treatments. The accord planter delivered a larger percentage of plants within the desired 5 to 7 inch spacing than the John Deere planter.

	Sugarbeet Plants per 100 Feet		
Spring Tillage	May 10	May 17	30-Day, May 28
Stale Seedbed			
JD Planter, Pelleted Seed	156	169	175
JD Planter, Celpril Seed	166	185	184
Accord Planter, Pelleted Seed	122	151	175
Shallow Triple-K			
JD Planter, Pelleted Seed	110	137	146
JD Planter, Celpril Seed	113	144	156
Accord Planter, Pelleted Seed	110	144	174
Field Cultivator/Triple-K			
JD Planter, Pelleted Seed	57	90	145
JD Planter, Celpril Seed	57	109	154
Accord Planter, Pelleted Seed	54	101	152

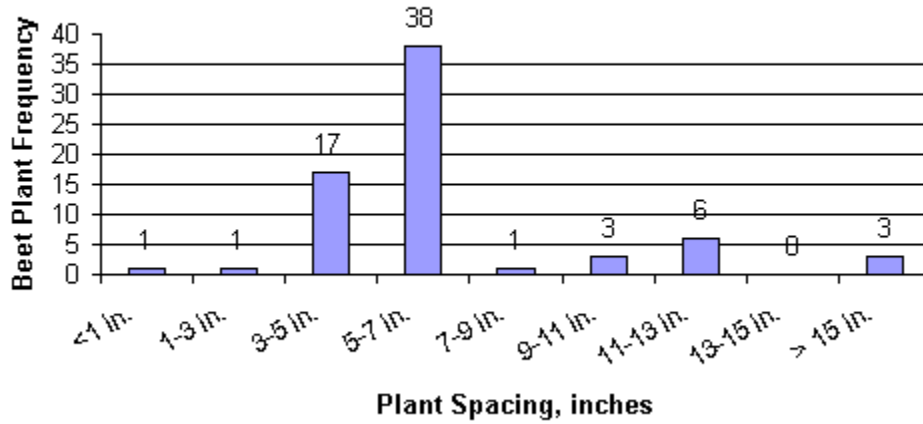
Summary

Based on early observations in 1999:

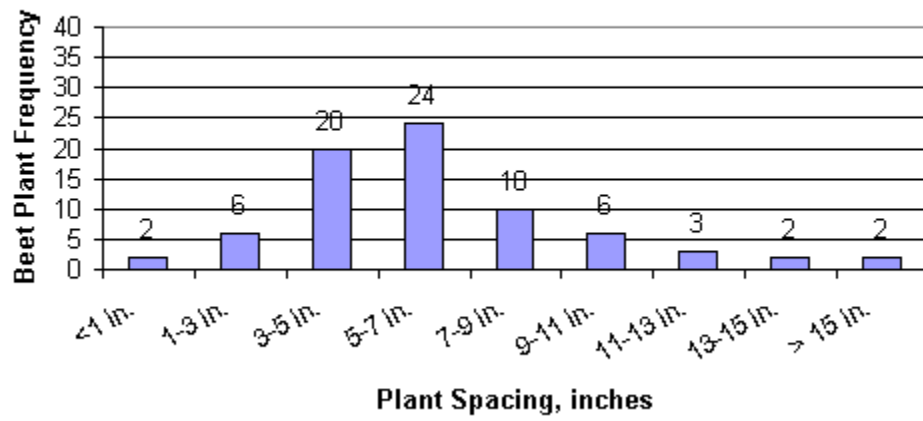
Increasing the intensity of spring seedbed tillage reduced soil moisture, delayed plant emergence and reduced final plant population. Use of the Accord planter improved the uniformity of plant spacing (see figures, page 3).

**Spacing, plants/40 ft
Stale Seedbed**

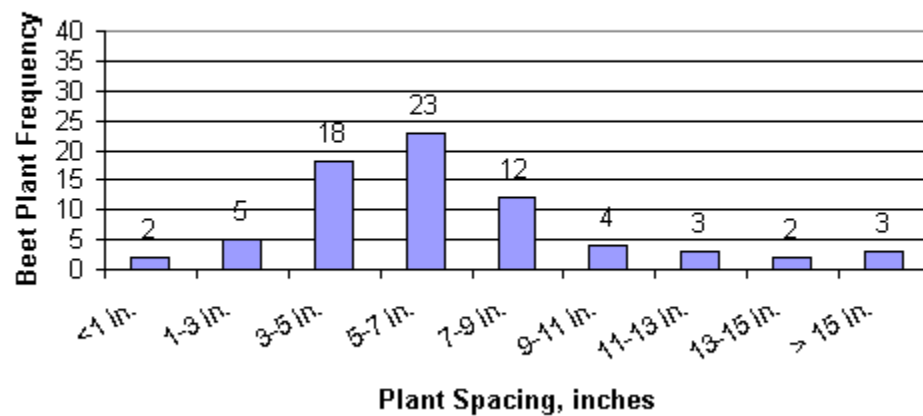
Stale Seedbed, Accord Planter, Pelleted Seed



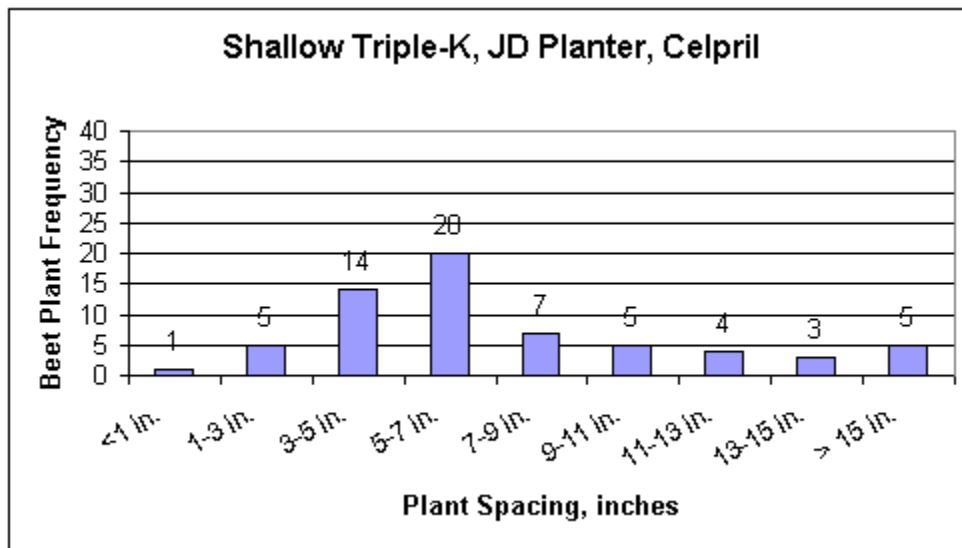
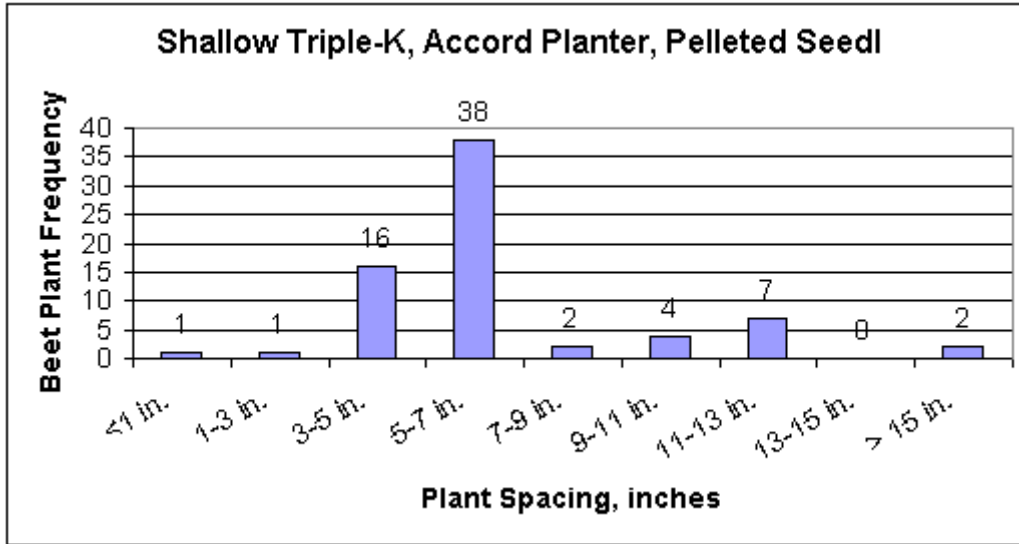
Stale Seedbed, JD Planter, Celpril

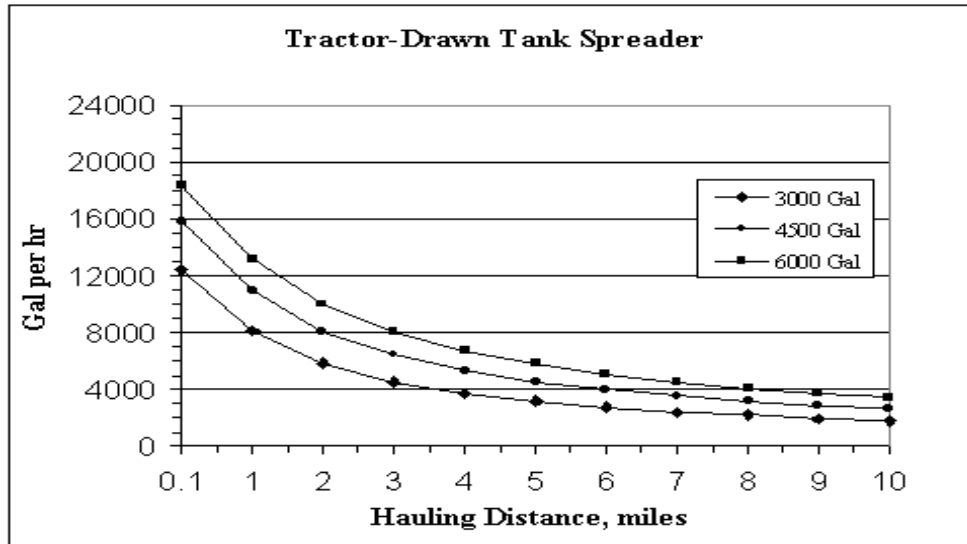


Stale Seedbed, JD Planter, Pelleted Seed

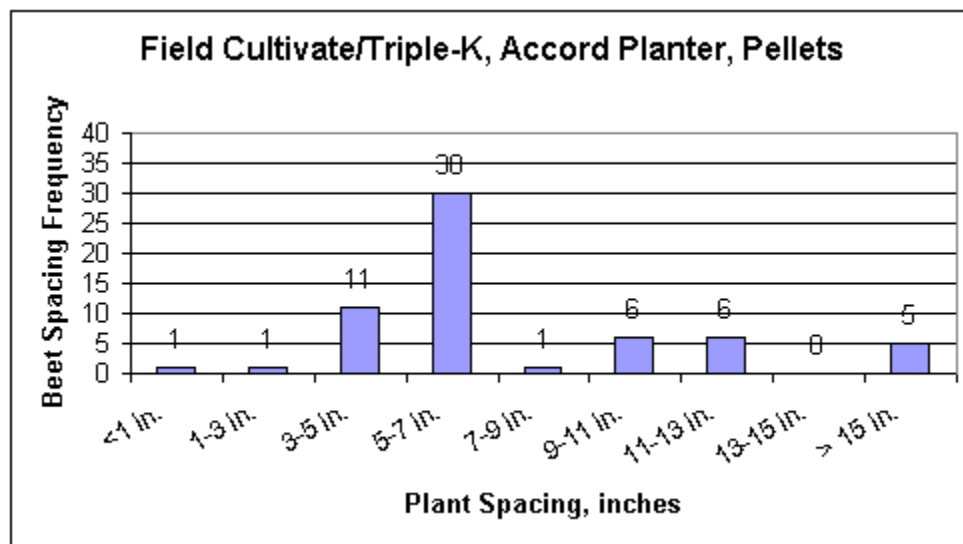


Shallow Triple-K

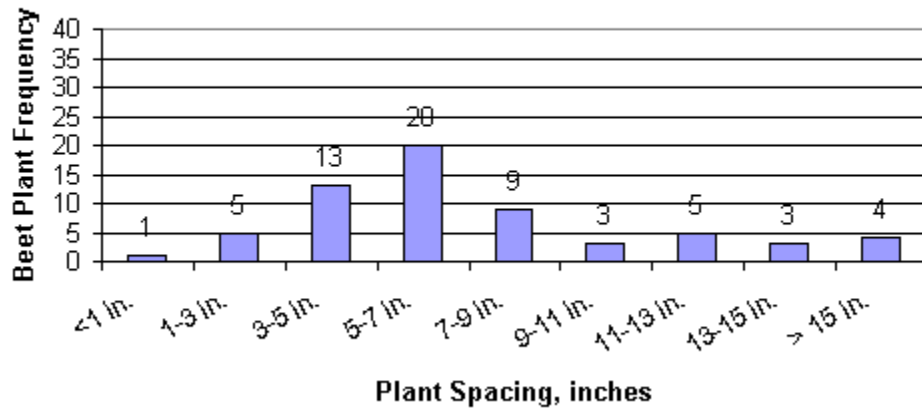




Field Cultivator/Triple-K



Field Cultivator/Triple-K, JD Planter, Celpril



Field Cultivate/Triple-K, JD Planter, Pelleted Seed

