GILES, JOSEPH F.* , ALLAN W. CATTANACH and NORMAN R. CATTANACH, Dept. of Soil Science, North Dakota State Univ., Fargo, ND 58105. Effect of seedbed preparation on sugarbeet emergence.

## ABSTRACT

Fields within a geographical area which are prepared for seeding during the same time period with various secondary tillage implements do not result in equal sugar production. The objective of this study was to evaluate seedling emergence in seedbeds prepared by three secondary tillage systems in combination with a small grain drill.

Secondary tillage experiments were established on silt loam soil near Amenia, ND in 1989, and near Casselton, ND in 1990 and 1991. Tillage was performed with a multiweeder, rau tillage system and flexi-coil S-tine tillage system. Following tillage, half of each tillage area was packed perpendicular to the direction of tillage with a Lilliston grain drill with the disc openers in the ground. Sugarbeet seed was drilled at 0.75, 1.25 and 1.75 inches deep and at 0.5, 3, 6, 24, 48 and 72 hours following tillage. No precipitation was received during the 72 hour period. Moisture content and bulk density of the surface six inches of soil were determined at each planting time. Moisture in the first inch of the soil profile decreased significantly with delayed planting time. Significant increases in moisture occurred in the second and third inches of soil depth with the rau tillage system during the same time periods. Changes in water content due to tillage were greater with the multiweeder to the depth of tillage at each planting time.

Stand counts were taken at regular intervals once seedling emergence began and continued until no new plants were observed. Seedling emergence after multiweeder tillage was 6 percent less when compared with the other tillage implements. Sugarbeets planted at the 1.75 inch depth had 4 to 7 percent less emergence when compared to those planted at the 0.75 or 1.25 inch depths. Total seedling emergence from the 0.75 inch depth was significantly increased by delayed planting, but planting time had no influence on emergence from either of the other planting depths. Soil firming with a small grain drill had no effect on soil moisture content following tillage with either the flexi-coil or rau tillage system. Seedling emergence on the multiweeder treatment was increased with the use of the small grain drill.