

GILES, J.F. <sup>1</sup>, A.W. CATTANACH<sup>2</sup>, and N.R. CATTANACH<sup>1\*</sup>, <sup>1</sup>Dept. of Soil Science, North Dakota State Univ., Fargo, ND 58105 and <sup>2</sup>American Crystal Sugar Co., Moorhead, MN 56560. Sugarbeet stand establishment and sugar production using John Deere MaxEmerge 2 planter attachments.

#### ABSTRACT

Placement of sugarbeet seed within the row can be a factor in sugar production. In recent years, numerous modifications and attachments for the Deere MaxEmerge 2 planter have appeared in the market. A two-year (1996, 1998) field study was conducted with the primary objective of determining the performance from these modifications and attachments in seed placement accuracy and the effect on sugarbeet stand establishment and sugar production.

Sugarbeets (medium size) were seeded at a  $4 \frac{15}{16}$  inch seed spacing to a depth of  $1 \frac{1}{4}$  inch using  $\frac{3}{4}$  inch of vacuum for raw seed and 2 inch vacuum for pellets and a ground speed of 4 MPH on a Fargo silty clay (Fine, smectic, frigid, Typic Epiaquert) near Fargo, ND each year and Bearden silt loam (Fine-silty, mixed, frigid Aeric Calciaquoll) near Glyndon, MN in 1998. The seed furrow attachments, seed tube configurations and closing wheel combinations were in 2 row combinations on a 6-row planter. Treatments were randomly seeded in 6 replications. Plant stand counts were made beginning with the emergence of the first plants and continued until counts remained constant. In the two to four leaf stage, measurement of distance between plants in the row was recorded for 30 feet of row for each treatments within each replication. Post emergence herbicides, cultivation and hand labor were used as needed for weed control. Unusual rainfall occurring during May and June in 1998, resulted in severe root rot at the Fargo location causing yield data to be very suspect. Sugarbeets were harvested during the last week of September.

Plant emergence and yield results in 1998 on the light textured soil at Glyndon were effected by  $\frac{3}{4}$  inch of precipitation the day following planting and were variable from those collected in 1996 on Fargo silty clay. Using the straight seed tube without insert resulted in most uniform stand spacing in 1998, but did not significantly produce more recoverable sugar than the straight seed tube with insert or the small sugarbeet tube. Similar results were found with regular pellet sugarbeet seed. Seed furrow attachments (Keeton seed firmer, Rebounder, V formers, V closing wheel, Soil enforcer, etc.) did not significantly increase recoverable sugar production when compared to the standard John Deere factory planter setup. The use of smooth closing wheels from May Manufacturing, alone or in combinations with their star closing wheel increased recoverable sugar yield over factory supplied closing wheels. Combining a small closing wheel with a star or using two star closing wheels together also resulted in increased but non-significant sugar yields. These closing wheel combination deserve further testing.