

GILES, JOSEPH F.^{1*}, CARL STAEL VON HOLSTEIN², ROBERT WILSON³, CORY RANSOM⁴, COREY GUZA⁴, JOEY ISHIDA⁴, and ALLAN CATTANACH⁵, ¹Department of Soil Science, North Dakota State University, Fargo, ND 58105, ²Novartis Seeds, Glyndon, MN 56547, ³University of Nebraska, Panhandle Research & Experiment Center, Scottsbluff, NE, 69361, ⁴Oregon State University, Malheur Experiment Station, Ontario, OR, 97914, and ⁵American Crystal Sugar Company, Moorhead, MN, 56560. **Effect of within-row spacing and row width on sugarbeet production using Glyphosate resistant sugarbeet.**

ABSTRACT

A row spacing wide enough to accommodate soil cultivation for weed control in commercial sugarbeet production has been essential. With the possibility of complete weed control in herbicide resistant sugarbeets, the effect of using different row width and within-row spacing to establish a wide range of plant population can be evaluated without the necessity of mechanical cultivation.

Trials were conducted over a two-year period in sugarbeet growing areas of Nebraska, North Dakota and Oregon using glyphosate resistant sugarbeet. Sugarbeet was planted in 22 inch and 11 inch row widths and thinned to varying in-row spacing to establish a range of plant population from 23,760 to 71,280 plants per acre. Glyphosate was applied for weed control two or three times at each location. These applications provided for excellent weed control. Other pesticides were applied as recommended when needed in each growing area.

Root yield and extractable sucrose were measured at each location each year. Roots were harvested from the center two rows of plots with 22 inch row spacing and from the center three or four row of plots with 11 inch row spacing.

Results of these studies suggest that a combination of row spacing and spacing within the row have the greatest effect on sugar beet yield and quality. Using a narrow row spacing, which allowed for increased in-row plant spacing, resulted in an increased sugar production when compared to a wide row spacing with similar plant population. Maximum sugar production resulted with plant populations between 35,640 and 47,520 plants per acre with an 11-inch row spacing across all locations.