

DUSEK, LYNN D.*, CURTIS A. FUNK, JOE M. HASTINGS and ALLAN W. CATTANACH, American Crystal Sugar Company, 101 North 3rd Street, Moorhead, MN 56560. **The effect of variable rate seeding on sugar beet production.**

Establishing optimum plant populations is one of the most critical factors to maximize sugarbeet yield and quality. Equipment manufacturers are now selling planters capable of variable rate seeding to desired plant populations. Objective of the study conducted at 6 locations in 2008-2010 was to determine optimum plant populations for different management zones in commercial fields. All fields were planted in 22 inch row widths. Cooperating growers used recommended agronomic and pest management practices. Productivity zones were established using previous crop yield maps, soil survey maps, satellite imagery or topographic maps. Yield and quality parameters measured included tons per acre, sugar percent, sugar loss to molasses, recoverable sugar per ton and per acre, and revenue per ton and per acre. Harvest loss assessments were completed after the 2008 and 2009 harvests. Yield and quality samples were taken by hand several times during the growing season to monitor crop growth. Final yields were taken with harvesters equipped with yield monitors. Optimum seed spacing determined for high, intermediate, and low productivity zones was 4.9-5.5 inches, 4.3 to 4.6 inches, and 3.5 to 3.9 inches respectively. Selecting the right seed spacing increased recoverable sugar per acre by 156 to 1415 lbs/acre for high productivity zones, 325 to 737 lbs/acre for intermediate zones and 103-1326 lbs/acre for low productivity zones depending on location and year. Harvests losses were greatest for higher plant populations required for maximizing yields in low productivity zones. Optimum ranges for plant populations based on this study were 35-42,000, 42-47,000 and 47-55,000 plants per acre for high, intermediate and low productivity zones respectively.