

LAMB, JOHN A.^{1*}, MARK W. BREDEHOEFT² and CHRIS DUNSMORE², ¹Department of Soil, Water and Climate, University of Minnesota, 439 Borlaug Hall, 1991 Upper Buford Circle, St. Paul, MN 55108 and ²Southern Minnesota Beet Sugar Cooperative, P. O. Box 500, 83550 County Road 21, Renville, MN 56284. **Influence of starter fertilizer on optimum nitrogen rate.**

Nitrogen management for optimum sucrose production is the goal of the nutrient management research in the Southern Minnesota Beet Sugar Cooperative growing area. Recent research results have caused growers to adopt the use of seed placed fertilizer on their sugar beet crop as a phosphorus source. The question growers have, will this use of starter affect the nitrogen rate needed for optimum sucrose? This research project was design to determine if the use of seed placed liquid fertilizer (10-34-0) affects sugar beet yield or quality and if the use of this practice affects revenue.

Eight sites were established over a period of three years. The treatments included a factorial arrangement of the use of seed placed liquid fertilizer (28 L ha⁻¹, 10-34-0) and nitrogen rates of 0, 22, 45, 67, and 90 kg N ha⁻¹ with 4 to 6 replication depending on the location. The N was applied broadcast as urea (45-0-0). Sugar beet root yield and quality were measured.

The soil nitrate-N to a depth of 120 cm before the trials were established ranged from 32 to 109 kg ha⁻¹. The root yield, extractable sucrose ha⁻¹, and revenue ha⁻¹ responded to the seed placed fertilizer and nitrogen applications differently at each location. In most cases, the response was to seed placed fertilizer was either none or a positive increase to root yield. The change in root yield expressed itself in the extractable sucrose ha⁻¹ and the revenue ha⁻¹. The extractable sucrose Mg⁻¹ of root was increased by the use of seed placed fertilizer and the use of nitrogen fertilizer did not affect the use of starter. This information indicates that the use of seed placed liquid fertilizer does not affect the nitrogen management of sugar beet for yield and quality.