

LAMB, JOHN A.<sup>1\*</sup>, MARK W. BREDEHOEFT<sup>2</sup> and CHRIS DUNSMORE<sup>2</sup>, <sup>1</sup>Department of Soil, Water, and Climate, University of Minnesota, 439 Borlaug Hall, 1991 Upper Buford Circle, St. Paul, MN 55108 and <sup>2</sup>Southern Minnesota Beet Sugar Cooperative, P.O. Box 500, 83550 County Road 21, Renville, MN 56284. **Where does turkey litter fit with sugarbeet production?**

Livestock operations, mainly poultry and swine, are increasing in size and impact in the Southern Minnesota sugar beet growing area. Many sugar beet producers own or have interest in these operations; thus have manure available to use on their fields. A concern has been raised about the effect of late season nitrogen mineralized from the manure on sugar beet quality. The question is when in the sugar beet crop rotation should manure be applied to minimize quality concerns and realize benefits? This research project has been designed to: 1) determine when in a three-year rotation, should turkey litter be applied and 2) determine nitrogen fertilizer equivalent of turkey litter applied in advance of sugar beet production.

Three sites were established over a period of three years. At each site, a soybean/corn/sugar beet rotation was used. This study had five replications of the treatments. The treatments included two rates of turkey litter applied at 3 and 6 tons per acre, one, two, and three years before sugar beet production plus fertilizer N rate applications for comparison. Grain yields, sugar beet root yield and quality were measured.

At the time of this presentation, the results for two locations are available. There was a significant response to nitrogen application at the first location or root yield, extractable sucrose per acre, and revenue. Sugar beet quality was not affected by N fertilizer application. The optimum nitrogen rate was 90 pounds per acre. The residual nitrate-N in the surface 4 feet was 40 pounds per acre. The optimum fertilizer application was similar statistically to the best litter application for revenue.