

WINTER, S. R.* Texas Agricultural Experiment Station, P. O. Drawer 10, Bushland, TX 79012. - Nitrogen management in cropping systems of sugarbeets and grain crops. Grain crops in rotation with sugarbeets need adequate nitrogen (N) to produce profitable yields. However, excess N applied to grain crops may accumulate in some soils and reduce sugarbeet quality. The objective of this research was to determine optimum N rates in a sugarbeet rotation considering yield and quality of all crops grown. Nitrogen rates used (0, 80, and 160 lb/A annually) on wheat grown prior to the 1989 sugarbeet crop were not high enough to provide significant accumulation of residual soil N. The combination of low residual N and about 240 lb/A of applied N resulted in sugarbeets with 16.0 to 18.1% sucrose and a yield of 30 to 38 tons/acre in 1989. Many producers in Texas apply excess N to crops grown prior to sugarbeets as evidenced by the fact that they frequently have excess residual N and seldom have 16.0% or higher sucrose. Soil sampling before applying N to any rotation crop should be standard practice to assure low residual N prior to sugarbeets. Results in 1989 indicate that high quality sugarbeets can be grown without shortchanging N on preceding crops; however, further results are needed for conclusive proof. A broader range of residual N levels was present prior to the 1990 sugarbeet crop so more conclusive results are expected.

SCHEPERS, J.S.*, J. KRALL, R. FULLMER, J. POORE, K. DAVIS, and M. SCHEFCIK. USDA, Agricultural Research Service, 113 Keim Hall, Lincoln, NE 68583-0915, University of Wyoming, Torrington, WY, Holy Sugar, Torrington, WY, Servi-tech Inc., Dodge City, KS. Comparison of leaf petiole and chlorophyll meter techniques to evaluate N status of sugarbeet. Nitrogen status of sugarbeet (*Beta vulgaris* L.) is frequently monitored by analyzing leaf petioles for nitrate concentration. Petiole sampling is time consuming and interpretation of results is delayed until after laboratory analyses. Recently, hand-held chlorophyll meters have been used to evaluate N status of rice, corn, wheat, and sorghum crops. The objective of this study was to compare chlorophyll meter data with petiole nitrate concentrations of sugarbeet for several dates during the 1990 growing season in Colorado, Nebraska, and Wyoming. Petiole nitrate concentrations declined throughout the growing season, but varied substantially between fields. Chlorophyll meter readings generally remained high across a wide range of petiole nitrate concentrations and declined at low petiole nitrate levels. Preliminary data indicates that the chlorophyll meter technique can be used to identify fields with low petiole nitrate concentrations, however additional research will be required to calibrate chlorophyll meter readings with crop N status across varieties, growth stage, and climatic conditions.