SMITH, LARRY J, Northwest Experiment Station, University of Minnesota, Crookston, MN 56716. Nitrogen status changes in a three-year sugarbeet rotation following variable rate nitrogen application the sugarbeet year.

Variability in soil nitrate-nitrogen (NO_3-N) levels in commercial sugarbeet fields can affect yield and quality. Grid soil sampling and variable rate nitrogen (N) application in the sugarbeet year of the crop rotation have been suggested as a means to decrease soil NO_3-N variability in the rotation. The objective of this study was to follow the changes in NO_3-N status on a field with a 3-year rotation (sugarbeet, wheat, barley) that had been grid soil tested and variable rate N fertilized in the sugarbeet year of the rotation. NO_3-N in the four-foot soil profile prior to sugarbeet ranged from 35-238 lb/A. Following the sugarbeet crop, the variability decreased to 11-431 lb/A, but increased to 69-250 lb/A following a conventionally fertilized wheat crop. Following the barley crop, to which no additional N was applied, NO_3-N variability ranged from 19-194 lb/A.