

**E. THOMPSON, and J.S. GERIK, Holly Sugar Co., P.O. Box 60, Tracy CA 95378. Effect of nitrogen fertilizers on sugarbeet yield, quality, and root disease.**

The Hamilton City sugarbeet production area in Northern California has for several years been plagued by extremely low quality beets and high incidence of root rots and rhizomania. Low quality in sugarbeets can be the result of several factors. Excess soil nitrogen is one of the most important. Residual nitrogen levels in this area are in the 40 pounds per acre range, which is one of the lowest in the industry. Another major cause of low quality is sugarbeet diseases. Pathogens like *Sclerotium rolfsii* are poor competitors. The addition of nitrogen has been shown to stimulate the growth of beneficial fungi which should out compete the pathogen and stimulate early plant development into healthier seedlings less susceptible to diseases. The aim of this study was to evaluate four different nitrogen fertilizers for disease suppression and their effects on sugarbeet yield, and quality. Three different locations in the Hamilton City production area were chosen. Ranch 1 is in Butte County east of the Sacramento River in the Butte City area. This ranch has a history of severe *Sclerotium* root rot. The soil type is Marvin silt clay loam. Ranch 2, also had a long history of various root rots. This ranch is located in Glenn County southwest of Hamilton City. Soil type was Tehama silt loam. Ranch 3 is also in Glenn county, southwest of Hamilton City. There was no history of disease problems. Soil type here was Tehama silt loam. All plots were established on commercial sugarbeet fields. Four different nitrogen sources were used in these experiments. Treatments were: no additional nitrogen, ammonium sulfate, ammonium nitrate, calcium nitrate, and urea. The plot on ranch 1 was established on April 7, 1992. Nitrogen was applied, at the rate of 150 pounds per acre in addition to the 80 pounds per acre of nitrogen applied by the grower. The field was planted on April 1, but had not been irrigated for emergence. Stand counts were taken on April 23 and plots were hand thinned at a six inch spacing. The plots on ranch 2 were established on March 12. The beets were three weeks old when the nitrogen was applied. Nitrogen was applied at a rate of 300 pounds per acre. Grower applied nitrogen was 180 pounds per acre. The plots were hand thinned on April 6 at a eight inch spacing. The field on ranch 3 was planted after the plot was established on April 17. Nitrogen was applied at a rate of 150 pounds per acre with the grower applying 125 pounds of nitrogen. Beets were lifted with a one row beet lifter and topped by hand. All beets in each plot were dug. Each beet sample was analyzed by the Holly Sugar tare lab at Hamilton City. Ammonium sulfate applications increased yields 1 to 3 tons per acre on 2 of 3 fields. In all cases nitrogen applications increased Brei nitrate, an average of 77 PPM and reduced sucrose by 0.5%. No reduction of disease incidence was noted.