

XU, DECHANG. Sugar Beet and Sugar Industry Research Institute, 111 Xue Fu Rd., Harbin, People's Republic of China. - Nutrient balance and sugarbeet yield.

The Diagnosis and Recommendation Integrated System (DRIS) has been demonstrated to be an effective tool for detecting plant nutrient deficiencies. In sugarbeet, the possibility was examined for using DRIS to predict nutrient deficiencies at any growth stage at which sugarbeet leaves are analyzed. For this purpose, a data bank comprising over 500 observations was used to explain the results of two field experiments and was compared with the concentration of nutrients in leaves and soils. Results indicated that DRIS could predict sugarbeet nutrient imbalances and the principal limiting nutrient at an early growth stage, which would allow sufficient time for correcting the deficiency in the field. A BASIC program was developed on a SHARP PC-1501.

LAMB, J.A.* and A.W. CATTANACH. University of Minnesota, Northwest Experiment Station, Crookston, MN 56716 and North Dakota State University, 203 Waldron Hall, Fargo, ND 58105. - Zinc Fertilizer for Sugarbeet Grown in Minnesota and North Dakota.

The question about the use of zinc fertilizer in sugarbeet production has routinely surfaced in the sugarbeet growing areas of Minnesota and North Dakota. Reasons for questions include that of the results of 75% of the zinc soil tests submitted by producers are below the adequate level and sugarbeet production practices such as planting date, variety, and applications of other nutrients have changed dramatically in the past 20 years. From 1988 to 1990, a study to determine zinc needs of sugarbeet was conducted at 9 locations with below adequate soil test levels (0.3 to 0.6 ug/g) on the glacial lake sediment and glacial till soils of Minnesota and North Dakota. In 1988 zinc rates of 0, 4, 8 and 16 kg Zn ha⁻¹ were applied. The 1989 and 1990 rates were 0, 2.8, 5.6, 8.4 and 11.2 kg Zn ha⁻¹. Zinc sulfate was broadcast applied and incorporated at all locations. Zinc uptake of the tops at row closer, root yield, recoverable sucrose, root amino N, and root Na were measured. The use of zinc did not significantly effect root yield, sucrose concentration, recoverable sucrose or the impurities measured even though the soil test values were at levels where zinc fertilizer response is expected for other zinc responsive crops grown in the same area such as corn and dry edible beans. At this time, zinc fertilizer is not necessary for optimum sucrose production in Minnesota and North Dakota.