

IMPACT OF EXCESSIVE POTASSIUM ON SUGARBEET QUALITY

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Freshly harvested sugarbeets are composed of approximately 75% water and 25% dry matter. Of the 25% dry matter, 20% consists of soluble solids and the remaining 5% are insoluble solids. Assuming the soluble solids are 16% sucrose (sugar), that leaves the remaining 4% as non-sucrose or non-removable, non-sugar (NRNS).

Sugarbeet quality is normally identified by two components:

- (1) % Sugar: which is the ratio of sugar to the total beet weight. Using the example above $\frac{16}{100} = 16\%$ sugar.
- (2) Beet Purity: which is the ratio of sugar to total soluble solids. Using the example above $\frac{16}{20} = 80\%$ purity.

NRNS is very important in beet quality and beet processing because of its two fold effect. (1) As NRNS increases both sugar content and beet purity decrease. (2) Every 1 pound of NRNS carries 1 1/2 lbs. of sugar with it into the molasses stream. This sugar is not recovered in processing.

The Amalgamated Sugar Company measures NRNS in the growers fresh beets by use of a conductivity reading. Research testing has shown that on the average 65% of NRNS, as measured by conductivity, is composed of Na + K. K constitutes 85% of the Na + K. Factoring that out (.65 X .85 = .55) identifies that K alone is responsible for over 1/2 (55%) of the NRNS in fresh beets.

While K is an essential plant food, excessive K in the crop will result in decreased sugar content, increased impurities and reduces profit to both growers and processor.

Table 1. shows the 92,000 acres of the Mini-Cassia District in the 1992 production year computer sorted by conductivity groupings.

This data clearly shows that tons per acre are not affected by increasing K (as measured by conductivity), but, % sugar and gross \$ per acre are affected negatively.

An important component of growing high quality sugarbeets is to have adequate, but not excessive K available for the crop.

Table 1. Conductivity groupings for Mini-Cassia district, 1992 production year.

	.50-.59	.60-.69	.70-.79	.80-.89	.90-.99	1.0-1.09	1.1-1.19	1.2-1.29	1.30+
CONDUCTIVITY GROUPINGS									
% OF ACRES	.2	4.9	18.9	29.5	26.6	12.0	5.5	1.3	.9
NO ₃ -N	106	132	178	250	340	447	561	737	933
% SUGAR	18.56	17.97	17.67	17.35	16.93	16.51	16.20	15.68	15.14
T/A	24.3	25.4	25.0	26.6	26.4	26.8	26.3	25.5	24.2
GROSS \$ @ \$22 NETS	1078	1082	1041	1084	1046	1026	983	915	829