Sugar Enhancement Trial

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Introduction: The sugar content and purity of a beet crop is a major factor in how efficiently the factory can operate and ultimately how profitable the sugar beet crop will be to the shareholders. The SMBSC growing area has struggled to increase the sugar content of the beet crop in recent years. The impact of finding a product that could substantially increase the sugar content of the beet crop would be a monumental achievement.

Objective: Low sugar content has hindered the SMBSC beet payment in recent years. Several products currently available were tested in this trial to evaluate their ability to improve the sugar content of the crop.

Materials and Methods: A trial was conducted near Renville to screen several products that may have the ability to improve sugar content. The trial was planted on April 22nd using SV863. Normal agronomic practices were used to keep the trial weed and disease free. This trial was designed as a randomized complete block with four replications and ten treatments (Table 1). Plots in this trial were six rows wide with the center 4 rows being treated and the center two rows being harvested for yield and quality analysis. The 4 leaf treatments were applied on May 26th using a bike sprayer with XR11002 nozzles with a spray volume of 17gpa. The 8 leaf and the 12 leaf treatments were applied on June 4th and June 15th respectively, using the same sprayer equipment. The center two rows of each six row plot were harvested on October 11th using a six row defoliator and a two row research lifter. The beets harvested from the center two rows were weighed on the lifter and a sample of those beets were used for a quality analysis at the SMBSC tare lab. The data was analyzed for significance using SAS GLM version 9.4.

Results: No significant differences were found in the yield parameters other than purity (Table 2). None of the products tested performed statistically better than the check. These are results from a one year study with a limited number of entries. Further testing may need to be done to see if there is a product that could significantly improve the sugar content of beets in the SMBSC growing area.

Treatment	Description	Timing
1	Check (110lbs Total N)	Preplant
2	Additional Urea (40lbs N)	Preplant
3	Orbix (32oz)	8 leaf and 12 leaf
4	Generate (16oz)	4 leaf and 12 leaf
5	Foliar Essentials 2-1-1 (2gal)	4 leaf, 8 leaf, and 12 leaf
	PRO 10-4-5 (3gal)	12 leaf
6	Photo N (16oz)	4 leaf
7	FP-20 Early (2gal)	8 leaf
8	FP-20 Late (2gal)	12 leaf
9	Ascend SL (10oz)	4 leaf and 8 leaf
10	Voyagro/ZMB+ (32oz/64oz)	4 leaf and 8 leaf

Table 1: Description of treatments in the Sugar Enhancement Trial.

Treatment	Percent Sugar	Tons Per Acre	Percent Extractable Sugar	Extractable Sugar per Ton (lbs.)	Extractable Sugar per Acre (lbs.)	Percent Purity
1	17.2	44.9	14.5	289.5	13007.3	90.2 abc
2	16.3	47.5	13.5	270.8	12827.4	89.4 bcd
3	16.8	47.7	14.0	280.7	13388.2	90.1 abcd
4	17.2	46.7	14.5	289.7	13538.5	90.2 abc
5	16.8	45.4	13.8	276.6	12549.8	88.9 d
6	17.0	44.5	14.0	280.8	12510.7	89.2 cd
7	17.1	44.6	14.4	288.1	12842.5	90.5 ab
8	16.9	47.0	14.3	286.1	13451.7	90.9 a
9	16.7	45.9	13.9	278.0	12725.7	89.6 bcd
10	16.9	45.9	14.1	281.4	12925.9	89.6 bcd
Mean	16.9	46.0	14.1	282.2	12976.8	89.9
CV%	2.9	5.3	3.5	3.5	5.9	0.9
Pr>F	0.3651	0.5375	0.1698	0.1681	0.5215	0.0398
lsd (0.05)	ns	ns	ns	ns	ns	1.1

Table 2: Yield parameter results for the Sugar Enhancement Trial.