

THE EFFECT OF HELENA NUTRITIONAL PRODUCT APPLICATION ON SUGARBEET YIELD AND QUALITY-2001

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Introduction

Helena Chemical Company was interested in evaluation of the application of three nutritional products to sugarbeet, particularly in the Red River Valley of the North. The objectives of this research were to determine if these foliar applications might increase yield and sugar content of sugarbeet.

Materials and Methods

Field experiments were established on Bearden silty clay loam (Fine-silty, mixed, super active, frigid, Aeric Calciaquoll) on the Kirk Watt farm at Glyndon, MN and on Fargo silty clay (Fine, smectic, frigid, Typic Epiaquert) north of the airport at Fargo, ND, during the spring of 2001. Each experiment was arranged in a randomized complete block design with six replications. Individual treatment plots measured 11 feet wide and 30 feet long at both locations. Soil nitrogen levels were adjusted with fertilizer to approximately 120 lbs/acre of available residual soil test plus added fertilizer N.

Sugarbeet, Crystal 817, was planted on May 15 and 25 at Fargo and Glyndon, respectively, with a John Deere MaxEmerge 2. Sugarbeet was placed 1.25 inches deep with 5-inch in-row spacing. A 22-inch row spacing was used. Counter was surfaced band applied at 11.9 lbs/a and incorporated with chain at planting. Post emergence herbicides, cultivation and hand labor was used as needed for weed control. One application each of Eminent and Super Tin were applied for Cercospora leafspot control.

Three foliar treatments, 1) ManZinc FL (containing 13.9% manganese and 19.5% zinc) applied (1 qt/A) at the 4 to 6 leaf stage of growth, 2) 3-0-0 Manganese FL (containing 27.4 Manganese) applied (1 pt/A) 14 days later, 3) 4-15-0 PhosCa-Zn (containing 13% calcium and 7.8% zinc) and 12-0-05B CoRoN applied (2 qt/A each) 14 days later, on sugarbeet at both locations. Each of these treatments was applied alone and as a combination of the three. A standard practice treatment was also maintained as a check. The foliar applications were applied using a backpack handheld sprayer calibrated to apply 10 gallons of solution per acre. The middle four rows of each 6-row plot were sprayed.

Sugarbeet were harvested September 18 and 19 at Fargo and Glyndon, respectively. The middle two rows of each 6 row plot were harvested. Yield determinations were made and quality analysis performed at American Crystal Sugar Quality Tare Lab, East Grand Forks, MN.

Results and Discussion

Since the foliar treatments were scheduled beginning at the 4 to 6-leaf stage the date of application can be presented as to days prior to harvest (dph), an estimate of the approximate date of harvest was determined. [Table 1](#) shows the actual days prior to harvest that the treatments were applied.

The objective of this study was to determine if these Helena products would improve the yield and quality of sugarbeet crop. The results for this one-year study show no significant effect for increased sugar production with application of these nutritional products, either alone or as a combination of the three. ([Table 2 and 3](#)). The decreased root yield and sugar production at the Fargo location when compared to the Glyndon location is a result of the extended period of saturated soil conditions during the first three weeks of June. The ManZinc treatment was applied at the end of the very wet conditions. The results for the combination treatment are similar to those obtained in 2000. Since deficiencies of these elemental nutrients are rarely observed in the sugarbeet growing area of the Red River Valley of Minnesota and North Dakota, these products shows limited potential for increasing sugar production.

Table 1. Timing of Helena nutritional product foliar application, planting and harvest dates with actual days prior to harvest (DPH), Fargo, ND and Glyndon, MN, 2001.

TREATMENT	FARGO		GLYNDON	
	DATE	ACTUAL DPH	DATE	ACTUAL DPH
Planting	5/15/01		5/25/01	
4-6 Leaf Stage	6/19/01	92	6/19/01	93
14 Days Later	7/3/01	78	7/3/01	79
14 Days Later	7/17/01	64	7/17/01	65
Harvest	9/18/01		9/19/01	

Table 2. Effect of Helena nutritional product foliar applications on root yields, sucrose percentage, sucrose loss to molasses, recoverable sugar production, and harvest population (September 18), Fargo, ND, 2001.

TREATMENT	ROOT YIELD Tons/A	SUCROSE Percent	LOSS TO MOLASSES Percent	RECOVERABLE SUGAR Lbs/Acre	HARVEST BEETS /100 FT
Check	15.8	16.1	1.2	4734	115
ManZinc	13.6	16.5	1.1	4170	121
Manganese Fl	16.1	16.2	1.1	4852	129
PhosCa-Zn/CoRon	15.4	16.3	1.2	4670	124
3 Combination	15.1	16.5	1.1	4666	123
LSD (.05)	NS	NS	NS	NS	NS

Table 3. Effect of Helena nutritional product foliar applications on root yields, sucrose percentage, sucrose loss to molasses, recoverable sugar production, and harvest population (September 19), Glyndon, MN, 2001.

TREATMENT	ROOT YIELD Tons/A	SUCROSE Percent	LOSS TO MOLASSES Percent	RECOVERABLE SUGAR Lbs/Acre	HARVEST BEETS /100 FT
Check	21.5	17.9	1.2	7203	156
ManZinc	21.3	17.6	1.2	6972	158
Manganese Fl	21.6	17.7	1.2	7149	161
PhosCa-Zn/CoRon	22.6	17.9	1.2	7516	164
3 Combination	21.2	17.9	1.2	7064	148
LSD (.05)	NS	NS	NS	NS	NS