

THE EFFECT OF HELENA NUTRITIONAL PRODUCT APPLICATION ON SUGARBEET YIELD AND QUALITY-2000

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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 2000. 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 Glyndon and 35 feet long at Fargo. Soil nitrogen levels were adjusted with fertilizer to approximately 120 lbs/acre of available residual soil test plus added fertilizer N.

Sugarbeet, Beta 2084, seed was planting on May 3 and 9 at Glyndon and Fargo, respectively, with a John Deere MaxEmerge 2. Sugarbeet was placed 1.25 inches deep with 3-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. The sugarbeet stand was hand thinned to approximately 150 beets per 100 feet at the 4-leaf stage. Post emergence herbicides, cultivation and hand labor was used as needed for weed control. One application of Super Tin and two applications of Eminent were applied for Cercospora leafspot control at Glyndon and one application of each fungicide at the Fargo location.

Three foliar treatments, 1) ManZinc (containing manganese and zinc) applied (1 qt/A) at the 4 to 6 leaf stage of growth, 2) Manganese Flowable (containing Manganese) applied (1 pt/A) 14 days later, 3) Phoscal-Zin (containing phosphorus, calcium and zinc) and 12-0-05B (containing nitrogen and boron) applied (2 qt/A each) 14 days later, on sugarbeet at both locations. 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 21 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 an application of these nutritional products ([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 following the extensive rainfall of June 17. The last application, with nitrogen being one of the elements applied, caused a dark green canopy to exist for an extended period of time. This is possibly related to the decreased sucrose percent at both locations and perhaps the increased root yield at one location. These products shows limited potential for increasing sugar production in this sugarbeet growing area.

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, 2000.

| TREATMENT | FARGO | | GLYNDON | |
|----------------|---------|------------|---------|------------|
| | DATE | ACTUAL DPH | DATE | ACTUAL DPH |
| Planting | 5/6/00 | | 5/3/00 | |
| 4-6 Leaf Stage | 6/8/00 | 101 | 6/8/00 | 104 |
| 14 Days Later | 6/28/00 | 80 | 6/29/00 | 84 |
| 14 Days Later | 7/13/00 | 65 | 7/14/00 | 69 |
| Harvest | 9/18/00 | | 9/21/00 | |

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, 2000.

| TREATMENT | ROOT YIELD Tons/A | SUCROSE Percent | LOSS TO MOLASSES Percent | RECOVERABLE SUGAR Lbs/Acre | HARVEST BEETS /100 FT |
|-----------|----------------------|--------------------|--------------------------------|----------------------------------|-----------------------------|
| Check | 19.7 | 18.1 | 1.2 | 6672 | 149 |
| Helena | 19.1 | 18.0 | 1.2 | 6355 | 147 |
| 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 21), Glyndon, MN, 2000.

| TREATMENT | ROOT YIELD Tons/A | SUCROSE Percent | LOSS TO MOLASSES Percent | RECOVERABLE SUGAR Lbs/Acre | HARVEST BEETS /100 FT |
|-----------|----------------------|--------------------|--------------------------------|----------------------------------|-----------------------------|
| Check | 24.2 | 16.9 | 1.1 | 7646 | 152 |
| Helena | 25.3 | 16.3 | 1.2 | 7700 | 146 |
| LSD (.05) | NS | NS | NS | NS | NS |

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