

Cover Crop Interseeding 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 solution that could substantially increase the sugar content of the beet crop would be a monumental achievement. Another issue facing sugar beets is the lack of residue and ground cover following harvest. The establishment of a cover crop after harvest has proven difficult with the late harvest of sugar beets. The interseeding of cover crops in sugar beets during the season could tie up excess nitrate in the soil and provide ground cover to prevent soil erosion after harvest.

Objective: To test the ability of cover crop species to establish between sugar beet rows and provide ground cover after harvest.

Materials and Methods: A trial was planted on June 3rd using Hilleshog 9739 near the Murdock piling site. 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 five treatments. Plots in this trial were six rows wide with the center 3 inter-rows being treated and the center two rows harvested. The cover crop treatments were seeded on July 19th applying the seeds by hand down the row and incorporated via interrow cultivation. Plots were harvested on October 18th using a six row defoliator and a two row research harvester. The beets harvested from the center two rows were weighed on the harvester and a sample of those beets were used for a quality analysis at the tare lab. The data was analyzed for significance using SAS GLM version 9.4.

Results and Discussion: No significant differences were found in the yield parameters (Table 1). With the late planting the cover crop seeding took place later in the season than planned and the cover crop species did not appear to establish well (Figure 1). Some of the cover crop species appeared to be sensitive to an application of Supertin plus Badge SC. The red clover had heavy leaf burn damage and was only in the cotyledon growth stage. The only cover crop species that appeared to survive the defoliation process was the ‘Kodiak’ mustard (Figure 2). To successfully establish a cover crop during the growing season an earlier cover crop seeding may be required. However, this would conflict with the present weed control strategy in sugar beets of multiple glyphosate plus a chloroacetamide post application. Any cover crop planting would need to take place after the last glyphosate application and may be inhibited by any residual chloroacetamide.

| Treatment | Seeding Rate lbs/acre | Percent Sugar | Tons/Acre | Percent Extractable Sugar | Extractable Sugar per Ton (lbs.) | Extractable Sugar per Acre (lbs.) | Percent Purity |
|------------|--------------------------|---------------|-----------|---------------------------|----------------------------------|-----------------------------------|----------------|
| Winter Rye | 20 | 16.1 | 25.8 | 13.9 | 277.8 | 7148.2 | 92.3 |
| Annual Rye | 20 | 16.1 | 23.1 | 14.0 | 279.7 | 6457.7 | 92.8 |
| Mustard | 5 | 16.2 | 22.8 | 14.1 | 281.4 | 6416.7 | 92.8 |
| Red Clover | 15 | 15.9 | 24.6 | 13.7 | 274.0 | 6737.4 | 92.3 |
| Control | n/a | 16.1 | 25.1 | 13.9 | 277.5 | 6839.2 | 92.3 |
| Mean | | 16.1 | 24.3 | 13.9 | 278.1 | 6689.4 | 92.5 |
| CV% | | 2.3 | 11.9 | 2.5 | 2.5 | 12.5 | 0.7 |
| Pr>F | | 0.8247 | 0.5471 | 0.6319 | 0.6319 | 0.8439 | 0.6830 |

Table 1: Yield parameter results for the Cover Crop Interseeding Trial



Figure 1: Cover crop species have established by Aug 21st but are not developing high amounts of biomass. Cover crop plants are small and not vigorous.



Figure 2: Mustard plants survived the defoliation process in several plots. No other cover crop species were visible after defoliation.