

Seeding Rate Trials

Increasing seeding rates in barley (Mountain View)

Closest Town: Carstairs, Alberta

Soil type: Medium textured Orthic Black Chernozem

Seeding Date: May 26, 2022

Harvest Date: Swathed Aug 30, combined Sept 5, 2022

Row Spacing: 25.4 cm (10"), 3" paired row

Variety(s): CDC Austenson

Reps: Four

Previous Crop: Canola

Tillage: Fall harrow

Herbicides: **Pre:** Priority® + Roundup®

In-Crop: Axial® + Infinity® FX + AMS

Seed Treatment: Vibrance® Quattro

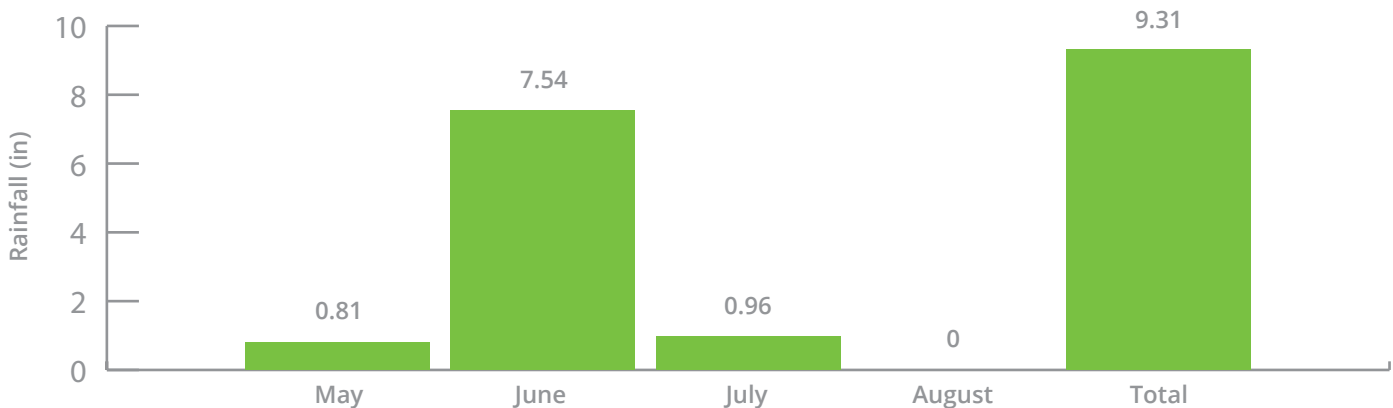
Foliar Insecticides: None

Foliar Fungicides: Miravas® Neo

Fertilizer: 59N-26P-7.6K lbs nutrient/ac

Irrigation: None

Rainfall (in) at trial location from May through August, 2022



Introduction

Partnering with Triple H Farms in Carstairs, Alberta, this trial compared three different seeding rates on the barley variety CDC Austenson. The trial was seeded using a 60-ft wide drill with 10" row spacings and 3" openers. Seeding rates to target plant stand treatments were determined using thousand kernel weight, germination percentage and farm specific emergence mortality estimates. Seeding rates to attain the treatment target plant stands of 22 (treatment 1), 27.5 (treatment 2) and 33 plants/ft² (treatment 3) were 76.7, 95.9, and 115 lbs of seed per acre, respectively. The seed thousand kernel weight was 33g. Treatments were replicated and randomized.

Treatments

Trial design goal

To determine the yield and grain quality impacts of seeding rates on barley.

Treatment 1: Target 22 plants/ft²

Treatment 2: Target 27.5 plants/ft²

Treatment 3: Target 33 plants/ft²

Results

In-crop assessment results

Although seeding rates were adjusted to achieve target protocol plant stands, treatments 1 and 2 had the same plant stand counts 21 days after seeding. However, treatment 3 was significantly higher than both treatment 1 and 2 (Table 1).

Emergence percentage across the entire trial was 94.0%

Yield results

No significant yield differences were seen between target plant stand treatments (Table 1).

Table 1: Plant stand counts, yield, and quality results comparing three target plant stands (22 plants/ft², 27.5 plants/ft², and 33 plants/ft²) on the barley variety CDC Austenson, in Carstairs, Alberta, 2022.

Target plant stand	Plant stand count at 21 days after seeding (plants/ft ²)	Yield at 13.5% seed moisture content (bu ac ⁻¹)	Protein (%)	Thins (%)	Test weight (lb/bu)	Plump (%)
Target 22 plants/ft ²	25.1 a	91.1 a	10.7 a	1.7 a	57.7 a	90.6 a
Target 27.5 plants/ft ²	24.1 a	90.3 a	10.4 a	2.0 a	58.0 a	89.2 ab
Target 33 plants/ft ²	35.1 b	90.7 a	10.4 a	2.5 b	57.9 a	89.8 b
p-value	0.0137	0.969	0.4408	0.0039	0.0734	0.0184
CV%	26.89%	3.23%	2.54%	19.02%	0.69%	1.65%

Values with the same letter within a column are not significantly different. Significant difference if $p \leq 0.05$.

Grain quality results

Thin kernels were significantly higher in the highest seeding rate treatment. No plump differences were seen between the middle seeding rate and the lowest or highest seeding rates. Plump in the lowest seeding rate was significantly higher compared to the lowest seeding rate. However, the difference is likely not large enough to impact economic return. No significant differences in grain protein, chitting, greens, or were observed. Significant differences were seen for plump with treatment 1 displaying the lowest plump percentage (Table 1).

Economics

Table 2: Economic comparison of different seeding rates (22 plants/ft², 27.5 plants/ft², and 33 plants/ft²) on the barley variety CDC Austenson, in Carstairs, Alberta, 2022.

Target plant stand	lbs of seed sown ac ⁻¹	Cost of seed (\$ ac ⁻¹)*	Cost per acre above base seeding rate (\$ ac ⁻¹)
Target 22 plants/ft ²	76.7	\$20.71	-
Target 27.5 plants/ft ²	95.9	\$25.89	\$5.18
Target 33 plants/ft ²	115	\$31.05	\$10.34

*Assuming \$0.27/lb cost for certified barley seed

Summary

Overall, no significant differences were seen in yield when increasing seeding rates. This contrasts research seen by O'Donovan, 2012 which showed an increase in yield up to 30 plants/ft². Plumps and thins were negatively affected with higher seeding rates. However, grain quality impacts would likely not cause economic loss.