

B001 – Barley seeding rates

Introduction

Partnering with Triple H Farms in Carstairs, Alberta, this trial compared three different seeding rates on the malt barley variety CDC Copeland. 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 120.5, 150.6, and 180.7 lbs of seed per acre, respectively. Treatments were replicated and randomized.

Protocol #: B001

Closest Town: Carstairs, Alberta

Soil type: Medium textured Orthic Black Chernozem

Seeding Date: May 14, 2021

Harvest Date: August 31, 2021

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

Variety(s): CDC Copeland

Reps: 4

Previous Crop: Canola

Tillage: Spring harrowed

Herbicides:

Pre: None

In-Crop: Express SG followed

by Axial + Pixxaro

Seed Treatment: Vibrance Quattro

Foliar Insecticides: None

Foliar Fungicides: Trivapro

Fertilizer:

46-0-0 @ 130lbs/ac

6-30-10-0 @ 93lbs/ac with seed

Total fertilizer applied: 65.5 lbs actual N/ac;

27.9 lbs P₂O₅/ac; 9.3 lbs actual K₂O/ac

Irrigation: None

Rainfall: Between May 1 and August 1: 185.4mm (7.3")

Treatments

Treatment 1: Target 22 plants/ft²

Treatment 2: Target 27.5 plants/ft²

Treatment 3: Target 33 plants/ft²

Goal:

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

In-crop assessment results:

Although seeding rates were adjusted to achieve target protocol plant stands, treatments 2 and 3 saw no difference in plant stand counts 21 days after seeding. However, treatment 1 was significantly lower than both treatment 2 and 3 (Table 1).

Yield results:

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

Grain quality results:

No significant differences in grain protein, thins, chitting, greens, or germination were observed. Significant differences were seen for plump with treatment 1 displaying the lowest plump percentage (Table 1).



Figure 1: Visual plant stand density differences between treatment 1 (Left) and treatment 3 (Right). 22 plants/ft² target on left and 33 plants/ft² target on right.

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 malt barley variety, CDC Copeland, in Carstairs, Alberta, 2021.

Target Plant Stand	Plant stand count at 21 days after seeding (plants/ft ²)	Yield at 14.5% seed moisture content (bu/ac)	Protein %	Test Weight (kg/hL)	Plump %
Target 22 plants/ft ²	19.8 a	72.05 a	12.2 a	62.4 a	89.25 a
Target 27.5 plants/ft ²	27.6 b	72.3 a	11.9 a	62.8 a	91.95 b
Target 33 plants/ft ²	28.1 b	73.8 a	12.5 a	62.8 a	91.88 b
<i>p</i> -value	0.0079	0.5807	0.5319	0.0844	0.0011
CV%	18.44%	3.23%	3.27%	0.595%	1.564%

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

Summary

Overall, no significant differences were seen in yield or quality with the exception of decreased plump at the 22 plants/ft² treatment. This contrasts research seen by O'Donovan, 2012 which showed an increase in yield up to 30 seed/ft² and decreasing plump at higher seeding rates.