

B002 – Trinexapac-ethyl (Moddus) plant growth regulator application on barley

Introduction

Partnering with Gordon Ellis of Ellis Agriculture Ltd. (near Olds, AB), this protocol compared application of trinexapac-ethyl (Moddus) at BBCH 31-32 to an untreated check on the malt barley variety AAC Synergy. The trial was seeded using a 50-foot Bourgault 3320 paralink drill with 3" paired openers on 10" row spacings. Treatments were replicated and randomized.

Protocol #: B002

Closest Town: Olds, Alberta

Soil type: Medium textured Orthic Black Chernozem

Seeding Date: May 6, 2021

Harvest Date: August 30, 2021

Row Spacing(cm): 25.4cm (10") with 3" paired rows

Variety(s): AAC Synergy

Reps: 5

Previous Crop: Canola

Tillage: Harrowed

Herbicides:

Pre: Prepass + Glyphosate

In-Crop: Achieve + Infinity + AMS

Seed Treatment: Insure Cereal FX

Foliar Insecticides: None

Foliar Fungicides: Tilmore applied at heading

Fertilizer:

Midrow Band: 35.8 – 0 – 13.2 @225lbs/ac

Seed Placed: 8.9 – 42.2 – 11.7 @ 80lbs/ac

Total fertilizer applied: 87.5 lbs actual N/ac; 33 lbs P₂O₅/ac;
39.1 lbs actual K₂O/ac

Irrigation: None

Rainfall: Between May 1 and August 1: 158.7mm (6.25")

Treatments

Treatment 1: No trinexapac-ethyl (Moddus) applied

Treatment 2: Trinexapac-ethyl (Moddus) applied at 0.42L/ac at BBCH 31-32

Note: Treatment application was made at BBCH 31 on June 11th, 2021.

Goal:

To determine the lodging, yield and grain quality impacts of trinexapac-ethyl (Moddus) application on malt barley.

In-crop assessment results:

At physiological maturity, the crop was assessed for lodging differences between treatments. At the time of inspection, no crop lodging had occurred. This is likely due to the well below average rainfall for the 2021 growing season.

Yield results:

Significant yield differences were seen between treatments. Application of trinexapac-ethyl (Moddus) at BBCH 31 resulted in a yield of 88.2 bu/ac, a 5.13% increase over the check (83.9 bu/ac) (Table 1).

Grain quality results:

No significant differences in grain protein, test weight, chitting, greens, or germination was observed. Significant differences were seen for plump, thins, and broken & peeled (Table 1).



Figure 1: Visual plant height difference between trinexapac-ethyl (Moddus) application and the check treatment. Image taken 15 days after application of trinexapac-ethyl (Moddus) on June 26th.



Figure 2: Visual height differences between the untreated check and trinexapac-ethyl (Moddus) treatment. Image taken July 7 N difference in height between treatments were seen at this stage.

Table 1: Yield, and quality results comparing application of trinexapac-ethyl (Moddus) to an untreated check on AAC Synergy near Torrington, Alberta, 2021.

Cultivar	Yield at 14.5% seed moisture content (bu/ac)	Protein %	Test Weight (kg/hL)	Plump (%)	Thins (%)	Peeled & Broken (%)
Untreated Check	83.9 a	13.6 a	63.3 a	97.6 a	0.36 a	1.04 a
Trinexapac-ethyl (Moddus) applied at 0.42L/ac at BBCH 31-32	88.2 b	13.4 a	63.3 a	96.7 b	0.5 b	1.24 b
<i>p-value</i>	0.0031	0.01533	0.9236	0.0321	0.0249	0.089
CV%	4.29%	1.88%	0.61%	0.84%	22.06%	18.59%

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



Figure 3: Drone imagery of trinexapac-ethyl (Moddus) trial area near Torrington Alberta in 2021. "R1", "R2", "R3", "R4", and "R5" represent replication 1, replication 2, replication 3, and replication 4. "T" and "C" represent trinexapac-ethyl (Moddus) treated area and check area, respectively. No lodging was seen in this trial.

Results Summary

Although application of trinexapac-ethyl (Moddus) did not cause any height or lodging differences, a yield increase of 5.13% was observed. The application of trinexapac-ethyl also led to a statistically significant decrease in plumps from 97.6% to 96.7% (0.92% decrease), increase in thins from 0.36% to 0.5% (38.8% increase), and an increase in peeled and broken kernels from 1.04% to 1.24% (19.2% increase). However, the quality impacts seen are not large enough to affect malt acceptance.