

Factsheet: Malt versus Feed Barley Management

Objective:

The objectives of this project were to demonstrate that newer malt varieties can provide comparable yield to the best feed varieties, to demonstrate the importance of adequate plant populations for yield and malt acceptance and to demonstrate the differences in N management for malt versus feed barley.

Methodology:

The trial was conducted in 2018 at 7 sites across Saskatchewan (Yorkton, Prince Albert, Indian Head, Melfort, Redvers, Outlook and Scott) and again in 2019 at 8 sites across Saskatchewan (Yorkton, Prince Albert, Indian Head, Melfort, Redvers, Outlook, Scott, and Swift Current). The first factor compared malt variety CDC Bow (2018) or AAC Synergy (2019) and feed variety CDC Austenson (2018 & 2019). The second factor evaluated seeding rates of 200 and 300 seeds/m². The third factor examined nitrogen rates of 50, 75 and 100 lb N/ac (soil & fertilizer) in 2018 and 80, 120, and 160 lbs N/ac (soil & fertilizer) in 2019. Overall resulting in 12 different malt treatments.

Table 1. Treatment List for Malt versus Feed Barley (Resubmission with variety change) Trial for 2018				Table 2. Treatment List for Malt versus Feed Barley (Resubmission with variety change) Trial for 2019			
Trt #	Variety	Seeds/m ²	Lb N/ac soil + Fertilizer	Trt #	Variety	Seeds/m ²	Lb N/ac soil + Fertilizer
1	CDC Bow (Malt)	200	50	1	AAC Synergy (Malt)	200	80
2	CDC Bow (Malt)	200	75	2	AAC Synergy (Malt)	200	120
3	CDC Bow (Malt)	200	100	3	AAC Synergy (Malt)	200	160
4	CDC Bow (Malt)	300	50	4	AAC Synergy (Malt)	300	80
5	CDC Bow (Malt)	300	75	5	AAC Synergy (Malt)	300	120
6	CDC Bow (Malt)	300	100	6	AAC Synergy (Malt)	300	160
7	CDC Austenson	200	50	7	CDC Austenson	200	80
8	CDC Austenson	200	75	8	CDC Austenson	200	120
9	CDC Austenson	200	100	9	CDC Austenson	200	160
10	CDC Austenson	300	50	10	CDC Austenson	300	80
11	CDC Austenson	300	75	11	CDC Austenson	300	120
12	CDC Austenson	300	100	12	CDC Austenson	300	160

The full reports are available at www.warc.ca. This project was funded through the Agricultural Demonstration of Practices and Technologies (ADOPT) and the Saskatchewan Barley Development Commission

Key Findings:

- In 2018, increasing seeding rate increased inter-plant competition for moisture and reduced yield at the dryland sites since precipitation was well below average. Increasing seeding rate only resulted in more yield at Outlook as it was irrigated.
- In 2019, increasing seeding rate significantly increased plant emergence at all locations.
- In 2018, CDC Austenson was 8% higher yielding than CDC Bow when averaged over treatments and location. However, the yield difference between varieties varied from as low as 1.9% at Prince Albert to as high as 11% at Redvers.
- In 2019, increasing seeding rate did not increase yield. When averaged across location, there was little yield difference (0.16%) between the varieties.
- In 2018, increasing nitrogen significantly increased protein. For most sites, protein stayed below the maximum limit even with the highest nitrogen rate of 100 lb N/ac. The exception to this was at Scott where acceptable protein levels for malt were exceeded even with 50 lb N/ac.
- In 2018, when averaged over location, increasing seeding rate was observed to decrease thousand kernel weight. However, it did not decrease kernel plumpness which is of more concern to malsters. No other quality parameters were influenced by seeding rate.
- In 2019, increasing seeding rate did not decrease protein or improve any quality factors for malt barley. Increasing rates of N did increase protein and tended to decrease % plump.
- In 2019, the most economic level of N for Scott was 155 lb/ac for malt (AAC Synergy) and 123 lb/ac for feed (CDC Austenson). At Melfort, the most economic rate of N for feed was 116 lb/ac, while the most economic rate for malt was questionable as the response curve was linear, meaning that the rate of return was the same for every pound of added N, which is not likely. At Yorkton, rates of N tested did not go high enough to determine the most economic rate for either variety, meaning the economic rate of N was above 160 lbs/ac. At Swift Current, Prince Albert, and Outlook, even the lowest rate of N (80 lbs/ac) produced protein levels above 12.5%, which is not acceptable for malt. Furthermore, these sites along with Indian Head and Redvers showed yields for both malt and feed were unresponsive to increasing levels of N. Thus, indicating the most economic level of N at Swift Current, Prince Albert, Outlook, Indian Head and Redvers was somewhere below 80 lb/ac for both AAC Synergy (malt) and CDC Austenson (feed).

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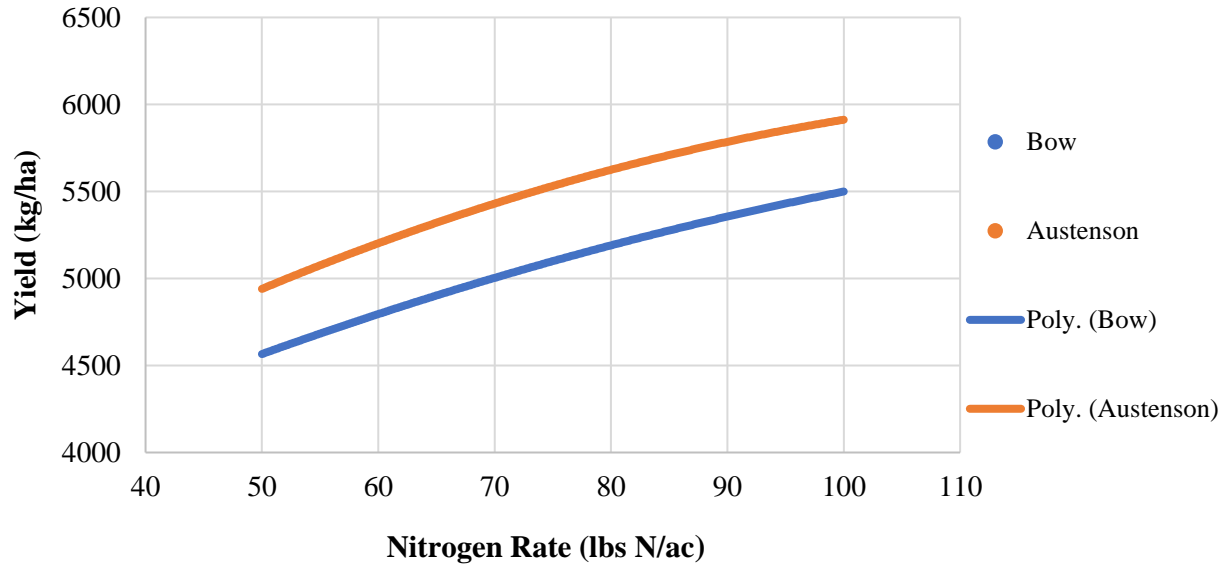


Figure 1: Yield Response of CDC Bow and CDC Austenson to Added Nitrogen Rate, Averaged over Seeding Rate and Location in 2018

Table 3. Main effects of variety, seeding rate and nitrogen rate on barley grain yield at multiple locations in 2019.								
Main effect	Yield							
	Indian Head	Melfort	Outlook	Prince Albert	Redvers	Scott	Swift Current	Yorkton
<u>Variety</u>	----- Kg ha ⁻¹ -----							
AAC Synergy	5048	4537	7909	4014	5302	4975	3323	7354
CDC Austenson	4916	4969	7559	4685	5046	5126	2968	7261
<u>LSD</u>	92.6	390	NS	467	208	NS	253	NS
<u>Seeds/m²</u>								
200	5001	4817	7660	4288	5270	5073	3249	7349
300	4963	4689	7807	4411	5078	5029	3041	7265
<u>LSD</u>	NS	NS	NS	NS	NS	NS	NS	NS
<u>lbs N/ac</u>								
80	5046	4416	7613	4532	5288	4590	3090	6449
120	4984	4845	7778	4171	5284	5136	3068	7457
160	4916	4998	7810	4346	4950	5427	3279	8016
<u>LSD</u>	NS	490	NS	NS	261	216	NS	195

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