

LUARS Research 2022 – Results from Spring Cereals Varieties Experiments

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Genetic potential is one of the main factors for increasing food production. Therefore, LUARS keeps on testing new varieties for their yield potential. This year's results from spring cereal variety trials are summed up as follows:

Canadian Western Red Spring (CWRS) Wheat Varieties:

- Fifteen CWRS wheat varieties were evaluated for their production potential.
- Grain yields in the highest yielding varieties were in the order of *AAC Starbuck* (4.17 MT/ha) \geq *SY Gabbro* (3.73 MT/ha) \geq *CDC SKRush* (3.65 MT/ha). Grain yield in other varieties ranged from 2.51 MT/ha in *AAC Hockley* to 3.58 MT/ha in *AAC Leroy*.
- *AAC Starbuck* (7.19 MT/ha) and *AAC Leroy* (7.12 MT/ha) produced higher straw yield than all other varieties (3.43 MT/ha in *CS Resolve* to 5.69 MT/ha in *CDC SKRush*
- Averaged over 2021-2022, *Brandon* (4.83 MT/ha), *AAC Starbuck* (4.69 MT/ha) and *CDC SKRush* (4.46 MT/ha) were the three top grain yielding varieties. Only *AAC Starbuck*, *AAC Leroy* and *CDC SKRush* gave more than 6 MT/ha straw yield.
- Three varieties (*Brandon*, *AAC Starbuck* and *AAC Wheatland*) that were common during 2019-2022 more or less equaled in grain (4.43-4.66 MT/ha) and straw (5.13-5.84 MT/ha) yields.
- Area producers could add *AAC Starbuck* to their wheat portfolio.

New Canadian Western Red Spring (CWRS) Wheat Varieties:

- Five CWRS wheat varieties (*AAC Wheatland*, *Brandon*, *Rednet*, *AAC Redberry* and *AAC Leroy*) were compared for their production potential.
- Highest grain (4.26 MT/ha), straw (6.15 MT/ha) and biomass (10.41 MT/ha) yields were obtained with *AAC Redberry*. However, the grain, straw and biomass yield differences among all varieties were not significant.
- Grain yields in other varieties ranged from 3.72 MT/ha in *AAC Leroy* to 3.99 MT/ha in *Brandon*. Straw yield varied from 5.18 MT/ha in *AAC Leroy* to 6.03 MT/ha in *AAC Wheatland*.
- Grain protein content was in the order of *Rednet* (17.31 %) > *Brandon* (16.75 %) > *AAC Wheatland* (16.19 %).
- *Since it is only the first year of testing AAC Redberry, it cannot yet be recommended for cultivation on farms!*

Effect of Mixed Cultivation of Spring Wheat Varieties:

- Three varieties (*AAC Wheatland*, *Brandon* and *Rednet*) were compared singly and in mixtures with each other in different proportions in 10 treatments.
- *Rednet* recorded the highest grain (5.36 MT/ha), straw (9.78 MT/ha) and biomass yields (13.54 MT/ha).
- *Grain yield from Rednet was 16.8 % higher than that from Brandon!*
- None of the mixtures of the three varieties exceeded grain, straw or biomass yields than that from *Rednet*.

Barley Varieties:

- Fifteen barley varieties were compared for their production potential.

- *AB Wrangler* (4.31 MT/ha), *Chambly* (4.11 MT/ha) and *Boroe* (4.06 MT/ha) were the three top grain yielding varieties.
- *Synasolis* had the highest straw yield (6.34 MT/ha). *AB Wrangler* (5.68 MT/ha) and *TR1867* (5.62 MT/ha) were the two next best varieties for straw production.
- Biomass yield (10.34 MT/ha) was highest with *Synasolis*; followed by *AB Wrangler* (9.98 MT/ha), *Chambly* (9.72 MT/ha), and *Boroe* (9.65 MT/ha).
- Eight varieties (*AB Wrangler*, *AB Cattelac*, *Amberly*, *Boroe*, *CDC Bow*, *Chambly*, *Oceanik* and *Synasolis*) were common during 2019-2022. Averaged over these 4 years, *Synasolis* (5.74 MT/ha), *Boroe* (5.47 MT/ha) and *Oceanik* (5.33 MT/ha) were the three top grain yielding varieties. However, the straw yield was highest with *Amberly* (6.18 MT/ha). Biomass yield ranged from 9.27 MT/ha in *CDC Bow* to 11.47 MT/ha in *Amberly*.

Malting Barley Varieties:

- Seventeen varieties were evaluated for grain production. *KWS Kellie* was the new variety in 2022. The two malting barley experiments from last year (Canadian Malting Barley Varieties and California Malting Barley varieties – *Butta 12*, *UC Capay* and *UC Tahoe*) were combined into one experiment this year.
- Three top grain yielding varieties were *CDC Fraser* (5.10 MT/ha), *UC Tahoe* (4.87 MT/ha) and *CDC Kindersly* (4.70 MT/ha). *CDC Bow* produced the lowest grain yield (2.99 MT/ha) this year. However, averaged over 2017-2022, *CDC Bow* produced the highest grain yield (5.95 MT/ha). The next two best varieties for grain production on the long run were *AAC Synergy* (5.74 MT/ha) and *CDC Kindersly* (5.63 MT/ha).
- *CDC Copeland* recorded the highest straw yield (10.8 MT/ha). *CDC Kindersly* (7.74 MT/ha), *KWS Kellie* (7.61) and *CDC Copper* (7.57 MT/ha) were also good for straw production. Averaged over 2017-2022, *CDC Bow* (7.58) and *CDC Copeland* (7.27) produced the highest straw yield.
- Diseases (BYDV, Net Blotch, Spot Blotch and FHB) incidence was nil to negligible.

Oat Varieties:

- Ten oat varieties were evaluated for their yield potential. *CDC Endure*, which has good milling qualities and high beta glucan levels that end users require to make heart healthy products like breakfast cereals, was one of these varieties.
- *AAC Excellence*, *AAC Reid*, *AAC Justice* and *AAC Kongsore* were the new varieties this year.
- *AAC Kongsore* (3.78 MT/ha), *AAC Douglas* (3.48 MT/acre) and *AAC Justice* (3.37 MT/ha) produced the highest grain yields. *AAC Douglas* recorded the highest straw yield (6.20 MT/ha) followed closely by *AAC Kongsore* (5.58 MT/ha). Biomass yield followed the same trend as the straw yield.
- Averaged over 2020 to 2022, there was no significant difference in the grain, straw and biomass yields of the five varieties (*AC Rigodon*, *CDC Arborg*, *Akina*, *CDC Skye* and *AAC Douglas*) common during these years.
- *Oat growers could grow any of the five varieties mentioned in the previous bullet point in 2023.*

Conclusions/Take Home Messages:

- Based on one experiment on each of the following CWRS wheat varieties in 2021 and two experiments on each variety in 2022, the following picture emerges:

Variety	Grain Yield MT/ha*	Grain Protein (%)
AAC Wheatland	4.03	16.19
AAC Brandon	4.21	16.75
Rednet	4.27	17.31

*Average over one experiment in 2021 and two experiments in 2022!

- *Rednet* (seed source Stamp Seeds or Seednet) could be recommended for cultivation on farms because of its highest grain protein content.
- *Synasolis* (5.74 MT/ha), *Boroe* (5.47 MT/ha) and *Oceanik* (5.33 MT/ha) that gave high yields in the long run may be grown for high yield of 6 row feed barley production. Please check with Ryan Jaspers for *Synasolis* seed. While *CDC Bow* sprouted before harvesting this year, *Synasolis* didn't sprout.
- *CDC Bow* malting barley produced the highest grain yield (5.95 MT/ha) in the long run. *AAC Synergy* (5.74 MT/ha) and *CDC Kindersly* (5.63 MT/ha) were the next best varieties to *CDC Bow*.
- Oat growers could seed any of the following oat varieties that gave high grain yields over three years: *AC Rigodon*, *CDC Arborg*, *Akina*, *CDC Skye* and *AAC Douglas*. In fact, *AC Rigodon* has given consistently high grain yields at LUARS for more than 15 years!