

## Prairie Oat Growers Association



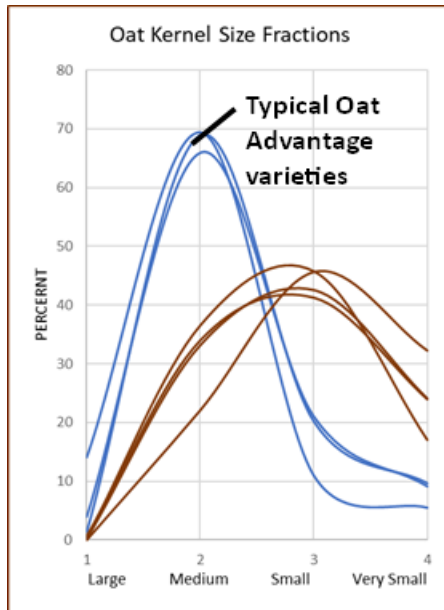
August report from Oat Advantage, Year 4 of the 5-year project beginning.

With the coming of spring 2024 we had 4 oat lines in the Western Cooperative Oat Registration Trial (OT6039,40,41,42), new Alberta funding from the Results Driven Agricultural Research, and 7 oat research locations across the prairies.

The 4 WCORT entries have among them the grain qualities that meet our goals, and the yield levels that will satisfy oat growers. In our visits to 7 WCORT locations around the prairies and we have seen good plant growth and hope now that, as the growing season performance is evaluated, we find success with at least one of our 4 oat lines.

Our work on oat kernel density will continue to be evaluated with a small group of advanced lines where we can directly compare our gravity table oat breeding selection performance. This continues our gravity table work and is helping to validate the effectiveness of gravity table selection. Gravity table pair comparisons are the means by which we are moving forward on the 55lb/bu oat.

From our New Zealand winter nursery, 240 oat lines came back to us out of the 300 that were sent. Those 300 were chosen from about 1,200 of 15,000 single plants from Manitoba and Alberta combined. The 240 lines are represented in subsets of single plots at 4 prairie locations in 2024. They all have been selected with the gravity table method and we have the opportunity this fall and winter to evaluate high- and low-density breeding categories.



We already have the Oat Kernel Uniformity characteristic well in hand (blue curves on chart to the left). Now we can easily compare and assess high physical grain quality of the “off the combine” experimental oat lines with competitor oat varieties (lower and brown curves on the chart to the left).

In order to expand our breeding evaluations and our search for **higher yield** we have selected, in 2023, some single experimental oat plants with **awns** and also with high levels of **tertiary kernel** development. This is a big change for us as breeders as we were formerly staying away from these characteristics. Now, these chosen plants with ① **tertiaries + awns**, ② **tertiaries + no awns**, and ③ **no tertiary + awns**, are among the 240 increased oat lines from New Zealand in the 2023/2024 winter that are being grown as full plots for detailed assessment. We have included these new characteristics as it is our intention to not limit any chance for high yield and density combinations or insights.

Along with our work on oat kernels, in 2023 we selected many single oat plants from Manitoba that shattered less. In September 2023 at the Paterson research farm at Winnipeg, a chance opportunity, was created both by leaving hundreds of selected and tagged oat plants in the field, and receiving a strong wind storm there coming through before taking the plants off the field. This meant that we were able to do one final selection of those plants, before cutting stems, that held on to more seed in their panicles.

It is important to note that in the latest Oat Scoop newsletter (June 2024), we have these two recorded statements from Oat Advantage:

***“We are working to eliminate all the very small kernels in our oat varieties.”***

We have already accomplished a significant reduction in very small oat kernels in all of our oat varieties, and continue to press further in this direction. As a result, our oat varieties produce reactions like this from oat millers → “We have never seen this before!” ... and from seed growers → “you saved us from purchasing a colour sorter...”.

***“So, to summarize: one of our top goals is to produce heavier oats, but not by increasing the number of third kernels that fall through the standard industry sieve and we are making progress on that goal.”***

This is our goal, to produce heavier oats, and we are seeing progress toward it. At the same time, we have not yet seen a financial incentive from Oat millers for breeding and being successful in developing this kind of very highly efficient milling oats. That lack of incentive means that we must perhaps pay more attention to grain yield at the oat grower level. Still, the future of Canada’s oat industry needs innovation and advancement at the plant breeding level. It will serve us all well to press on with the top goals and the drive to continue making Canadian oats the best in the world.

Are we contradicting ourselves?

No. Again, the reason that we are now looking at third oat kernels or “tertiaries”, is that our intention is to not limit any chance for high yield and density combinations or insights. Even now, in our field evaluations, we are seeing the evidence of improved tertiary kernel size quality. Perhaps we will find that very heavy tertiary are developing as an outcome of our breeding methodology and strategy.

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## **From the June 1<sup>st</sup> 2021 Oat Advantage proposal to POGA:**

### 10. Outcomes

#### **a. Main Outcome: 10% higher bushel weight**

“The 55lb\* bushel target will create efficiencies for farm oat grain storage, trucking, and the harvesting operation.” I said this at the outset of the current 5 year POGA/Oat Advantage project. **While this remains our goal, we have come to learn that higher bushel weight MUST NOT come from a multitude of thin kernels co-mingled with larger more desirable kernels.** That kind of density coming from thin kernels works against real quality. For true grain improvement in the oat industry, Oat Kernel Uniformity (OKU) must be sought after. When OKU is partnered with low hull content, bushel weight and true yield will rise in a meaningful way.

#### **b. Main Outcome: low hull content**

Oat hulls are packaging. More and more, society is looking to reduce waste. So too through plant breeding we work to reduce waste by reducing oat hull content. Formerly, we said that “High bushel weight goes hand in hand with low hull percentage.” While this connection may at times be true, we want to make sure, as said above in ‘a.’, that OKU remains high. By fixing our kernel size requirements and ‘forcing’ oat plants to produce denser kernels, hull percentage will go down.

**c. Extra Outcome: high protein**

The high protein goal was realized in OT6038. However, OT6038 was voted down in the PRCOB meetings in March 2023. This line was a proof-of-concept oat line that actually did bring together exceptional quality traits and strong hints of good field yield. OT6038 had good yield, high protein, high beta glucan, high OKU, and other excellent agronomic strengths. On February 29th of 2024, OT6038 passed the PRCOB vote and became eligible for registration. To date, Avena Foods of Saskatchewan is working with Oat Advantage to partner in developing this oat variety.

We continue to investigate the OT6038 parent oat population to find higher yield. In 2023 at Westlock AB, selected lines with from the OT6038 parent population went to New Zealand for increase. These are growing well in 2024 at key locations in western Canada and look strong in their agronomic performance.

**d. Extra Outcome: harvest durability**

We had a chance opportunity to examine harvest durability of our single plant nursery in Manitoba in 2023. Selected lines that were challenged by strongly windy conditions gave us an immediate selection force. 50 key selected oat lines were in New Zealand in the 2023/2024 winter and are growing well back in Manitoba in 2024. The remainder of the shattering event lines are being increased at Saskatoon in 2024.

**e. Main Outcome: high yield and valued oat varieties**

Oat Advantage lines already have good yield potential. The work on sieve selection (K) and Gravity Table work (GT) does not get in the way of yield goals. At the same time, we are working to merge the high yield and quality pathways. The performance of our 4 WCORT entries for 2024 will tell of our advancement in yield. As a newer strategy for single plant selection, I am changing some decision principles and boundaries to be able to see and select better plant types and panicle architecture to bring success to this combination goal. As noted above, we are looking at awns as a possible source of yield improvement, and also including some small percentage of plants with third or tertiary kernels in the developing floret.

Thank you to POGA. Thanks to your members in Manitoba, Saskatchewan and Alberta. Your financial support does for us what an end use royalty would do by sending funds directly to the breeder. The competition for oat acres in western Canada is being pursued by more oat development organizations in recent years. We are glad that you have believed in our locally adapted work in oat development.

All the best to you as Oat Growers! May oat prices rise and your harvest be beyond expectations!  
Thanks for your support!

Sincerely,

Jim Dyck