

**Washington Grain Commission**  
**2023 Wheat and Barley Research Annual Progress Reports and Final Reports**  
*Format*

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**Project #: 3184**

**Progress Report Year:** *1 of 3 (maximum of 3-year funding cycle)*

**Title:** **Breeder Quality Trials**

**Cooperators:** Kim Garland-Campbell, Arron Carter, Mike Pumphrey, Clark Neely

***Executive summary:*** A new program commenced in FY 2019/20 to ‘pre-screen’ experimental breeding lines before they are entered into the WSU Wheat Variety Trials. This pre-screening was aimed at increasing the likelihood that newly released soft white wheat varieties meet industry standards before gaining substantial acreage and influencing the overall quality of the grain being exported from the Inland PNW. Quality data generated from this trial in 2022 has been analyzed using the standard *t*-Score and the results (and interpretation) returned to the breeder. Data generated from this trial in 2023 is being analyzed and will be returned to the breeder. The data can also be included in the analysis used for the *Preferred Variety* brochure. The check variety has been drawn from the adjoining Variety Testing nursery.

**Introduction:** The PNW has produced approximately 250-300 million bushels of wheat per year with an export value (Portland) of approximately \$2.5 billion per year. There are many reasons why we need new wheat varieties. However, inferior varieties—public or private—jeopardize our exports and reputation as a supplier of quality wheat. When flour mills go to other suppliers outside the PNW because of quality considerations, wheat prices and wheat producers suffer. Conversely, varieties with particularly good quality can be promoted and will better compete with Australian, Canadian, and ‘Black Sea’ wheat. Often the number of entries available to each breeder for the Variety Testing program is limited by space constraints. Additionally, when lines are very new, breeders may be hesitant to enter them into Variety Testing where the yield and quality data are all public. The Breeder Quality Trial program gives breeders the ability to enter up to ten lines at no cost to be grown throughout the state. Yield data are not taken and quality data are shared with breeders and others who ask

specifically for those data, but are not publicized in the same way that Variety Testing data are. These aspects allow breeders to enter lines earlier in the breeding process and help with selections, without any public pressure around yield or quality scores.

**Approach:**

A maximum of 10 soft white wheat (spring and winter combined) entries will be submitted per breeding program (four programs: AgriPro, Limagrain, WestBred, and WSU). A total of eight locations will be planted to ensure at least five locations are acceptable for quality testing. One replication will be planted per location for a maximum number of 40 plots per location or 320 plots per year. Breeder Quality Trials will be planted adjacent to variety trials planted by the WSU Cereal Variety Testing Program and managed the same. Quality analyses include the same standard grain, milling, and baking tests used for the G&E program. Quality data generated from this trial will be analyzed using the standard t-Score and the results and interpretation returned to the breeder.

**Results:**

Each year the results have been made available to breeders in both the t-score format along with a general analysis of variance with the means for each line and each test. The data are available to the public upon request. We are available to any breeder wanting to discuss interpretation of the results. As mentioned in the Impact, several up-and-coming varieties with high quality have first been entered into this program and moved on to Variety Testing. Conversely, some lines with poor quality were dropped from the breeding programs and never entered Variety Testing.

**Impact:**

The new varieties AP Exceed (Most Desirable), Rollie (Desirable), and TMC M-Pire (Desirable) all came from this Breeder Quality program of screening. We have seen lines both public and private entered into the Breeder Quality trials that have been excellent and moved on to Variety Testing, and some that have sub-par quality and have been withdrawn for further consideration in the Variety Testing program. We anticipate that the project will continue to provide value to growers in two significant ways: First, it documents and highlights the quality of varieties so that breeders – public and private – are aware of the importance of quality and will hopefully continue to include quality in their selection and variety release decisions.

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**Outputs and Outcomes:** Following is a summary of experimental lines evaluated under this program (harvest 2023): There were 27 SWW lines submitted and they were evaluated at five locations. The SWW lines were submitted by WSU (Dr. Arron Carter), Limagrain, and Westbred. In total there were 140 samples evaluated.

WGC project number: 3184				
WGC project title: Breeder Quality Trials				
Project PI(s): Kiszonas & Neely				
Project initiation date: July 1, 2023				
Project year (1 of 3-yr cycle):				
Objective	Deliverable	Progress	Timeline	Communication
Evaluate 10 advanced breeding lines from each of 4 programs at 5 locations	Complete end-use quality evaluation and t-Scores	Completed each year by early spring after prior year harvest	Completed by June 1	End-use quality data, t-Score, and interpretation shared with originating breeder