

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

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**Project #: 4722**

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

**Title:** **Supplemental support for assessing the quality of Washington Wheat Breeding Samples**

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

**Executive summary:** This WGC support provides for about 3 months of additional technician time. The additional work is devoted to evaluating breeder samples for quality from early October through mid-January. During this period, spring wheat samples are given priority over winter wheat samples. The aim is to coordinate with the WSU Wheat Quality Program, and complete as many analyses as possible before spring wheat planting decisions are made in early February. In this way, the spring wheat program is made more efficient because inferior quality lines are not planted and grown. The standing goal for WSU winter wheat breeding lines is to complete as many as possible before June 1. Milling and baking evaluations of the 2022 Crop were completed and 2023 Crop testing is well under way at the WWQL.

**Introduction:** Producers need new varieties with higher yield and better resistance to diseases, pests, and environmental stresses. An integral part of developing new varieties is the evaluation of end-use quality of breeding lines. The success rate is about 1 new variety for every 1,000 breeding lines evaluated for quality. The more breeding lines that can be evaluated and the more end-use quality tests that can be conducted on each, the greater our chances of success. Evaluating quality is a fundamental part of breeding new wheat varieties and is a high priority to the breeders.

**Approach:** Capacity of testing breeder samples is limited primarily by personnel. Current WGC funding provides 3+ months of additional technician time to the existing direct Federal support from the USDA. With the WGC supplemental support, more testing can be accomplished during the peak fall and winter months. The Oregon Wheat Commission provides a matching amount to support the analysis of the Oregon State University breeding programs and locations.

**Results:**

Below is a table of the breeder samples for the duration of this 3-year funding cycle. This supplemental support ensures that we can evaluate the breeder samples in a timely manner so that breeders have as much information as possible for making selections and field decisions.

<b>Breeder Samples Submitted to WWQL from WSU and ARS Breeding Programs</b>				
<b>Crop Year</b>	<b>WSU Winter Wheat</b>	<b>WSU Spring Wheat</b>	<b>ARS Club Wheat</b>	<b>Total</b>
<b>2020</b>	902	607	507	2016
<b>2021</b>	1020	537	693	2250
<b>2022</b>	894	420	470	1784
<b>2023</b>	1137	504	676	2317

**Impact:**

This work contributes directly to the WSU and ARS variety development and release. New varieties need to be fully evaluated for end-use quality so that our customers can purchase predictable, high quality Washington wheat.

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**Outputs and Outcomes:** We provide breeders with SKCS single kernel size, weight, and hardness, and the variability (SD) of each; grain protein, test weight, flour yield, break flour yield, milling score, flour ash and protein, dough mixing time and type, dough water absorption, Solvent Retention Capacity (SRC) Water, Lactic Acid, Sucrose, and Carbonate; SDS Sedimentation, cookie diameter, bread volume and score, sponge cake volume, and Flour Swelling Volume (FSV) (FSV is for starch quality).

WGC project number: 4722				
WGC project title: Supplemental Support for Assessing the Quality of WA Wheat Breeding Samples				
Project PI(s): Kiszonas				
Project initiation date: July 1, 2021				
Project year (3 of 3-yr cycle): 3				
Objective	Deliverable	Progress	Timeline	Communication
Complete spring wheat samples	Full mill & bake data delivered to breeder by early Feb	Will be reported; progress on last year's crop is on track	Starts at harvest when samples come in, ends with completion of last nursery	Data delivered directly to breeder; dialogue may ensue as to interpretation
Complete winter wheat samples	Full mill & bake data delivered to breeder by early June	Will be reported; progress on last year's crop is on track	Starts at harvest when samples come in, ends with completion of last nursery	Data delivered directly to breeder; dialogue may ensue as to interpretation