Project #: 139311
Progress Report: Year 2 of 3
Title: EVALUATION OF BARLEY VARIETIES
Researcher: Clark Neely, Variety Testing Program Lead

EXECUTIVE SUMMARY:

The WSU Extension Cereal Variety Testing Program (VTP) continues to conduct spring barley variety trials at 12 locations throughout Eastern Washington. Newly added in 2023 was the addition of a winter barley trial at eight high rainfall locations with six entries total. This increased the total number of barley plots managed by the program by 17%. Data were posted in a timely manner following harvest and distributed via list serve, website, popular press articles, and in-person field days and grower meetings.

INTRODUCTION:

The primary goal of the WSU Extension Cereal Variety Testing Program (VTP) is to provide growers, the agribusiness industry, university researchers, and other interested clientele with comprehensive, objective, and independent information on the adaptation and performance of barley cultivars across the intermediate and high rainfall dryland production regions of eastern Washington where barley is grown. Major decisions or changes made by the program are run by an advisory committee composed of representatives from the WGC, WAWG, seed industry, and WSU Extension. The committee meets twice a year and provides valuable feedback on how the program can best support industry and grower needs.

APPROACH:

The VTP planted 12 spring barley and 8 winter barley variety trials in 2023. This is the first year the program conducted winter barley variety trials at the request of the WGC and WSU barley breeder. While the trial was small in 2023 (just four experimental lines and two commercial checks), two more commercial varieties were added for the 2024 season with more interest already expressed by private companies for the upcoming 2025 season. While all trials were harvested, data from Pullman spring and Dayton and St. John winter trials were not published due to high variability or lack of significant differences within each trial. All data is posted on our website and email notifications were sent out via the ‘prelimdata’ list serve when data were available. In the past year, the number of members on this list has increased 7% to 424 subscribers. The final technical report was posted on our website (http://smallgrains.wsu.edu/variety) at the end of December 2023.

RESULTS:

Barley varieties were covered at seven field days with a total of 175 attendees. Dr. Neely led efforts to revive the Spillman Farm Field Day in 2022, where 82 attendees listened to numerous researchers, including Dr. Bob Brueggeman who shared his breeding program updates and attendees heard about the newest spring barley varieties being tested in the VTP. Through conversations with the Whitman County Association Wheat Growers the plan will be to alternate years for the Spillman Farm Field Day.

Spring barley entries were also submitted to University of Idaho for screening of Hessian fly resistance, which will be a new addition to the list of variety characteristics. In 2024, we plan to provide seed to Dr. Kim Garland-Campbell with USDA-ARS for cold tolerance screenings of winter barley entries. Seed was provided in 2023 for cold tolerance screening, but was used to fine tune growth chamber conditions to better detect varietal differences. Generated ratings will be uploaded on to the variety selection tool once data is compiled. Select harvested sample are also sent to the WSU Barley Breeding Program for micro-malting analysis

IMPACT:

The economic value (impact) of the WSU VTP is measured by providing information to growers and seed industry personnel leading to variety selections that maximize profitability and minimize risk. Choosing an appropriate barley variety to plant is one of the easiest ways that a grower can increase production and decrease costs (through decreased inputs). In 2023, 95,000 acres of spring barley were planted. When comparing the yield from the top four varieties in each trial to the trial average, there is approximately a 251 lb/a yield advantage. When multiplied across planted acres and using an average sales price of $321/ton, the VTP had the potential to generate an additional $3.8 million dollars in 2023 alone as shown in the table below. The VTP strives to disseminate information to growers as widely as possible. Both the variety testing website and the variety selection tool average over 8,000 page views each on an annual basis. Typically, well over a hundred contacts are also made through field days and grower meetings each year. While yield is important, there are multiple traits that growers look for in a variety, which vary in importance from region to region. The VTP publishes data on test weight, grain protein, plump seed, plant height, maturity, Hessian fly resistance and stripe rust resistance. An additional impact of the VTP comes through the evaluation of breeding lines, providing valuable information to aid breeders in variety release decisions, leading to new and improved barley varieties available to growers in Washington.

Year	Harvested Barley Acres	Average Yield Gain for Top Four Varieties in Trials	Average Price of Feed Barley	Additional Income Generated
	# acres	lb/acre	$/ton	$
2022	71,000	570	$243	$4,917,105
2023	95,000	251	$321	$3,827,123
Total				**$8,744,228**

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WGC project title: Evaluation of Barley Varieties

Project PI(s): Clark Neely

Project initiation date: 07-01-2022

Project year (X of 3-yr cycle): 2 of 3

Objective	Deliverable	Progress	Timeline	Communication
1. Conduct representative and objective barley variety field trials at locations that represent major production areas of Washington.	i.) 12 spring barley trials; 24 entries/trial ii.) 8 winter barley trials; 6 entries/trial	i.) 2022 trials harvested and data shared with growers ii.) 2023 trials harvested and data shared with growers iii.) 2024 winter trials planted	Trials planted in the spring and fall, data results are available to growers at end of each harvest season.	Results from the variety trials are communicated via Extension programming and are detailed under Objective #4.
2. Include commercially relevant entries in trials including currently grown varieties and advanced breeding lines from major public and private breeding programs in the region	All widely grown, commercially available varieties and promising experimental lines are included in trials.	i.) 2022 spring barley entries: 29% public, 71% private. ii.) 2023 barley entries: 40% public, 60% private iii.) All major barley breeding programs in the PNW are actively participating in the VTP. iv.) 2022 entries, locations, and maps all posted online v.) 2023 entries, locations, and maps all posted online vi.) Winter 2024 trial maps posted following planting.	i.) Deadline for spring entry requests are February 1 and seed is due February 11. ii.) Deadline for winter entry requests is August 8 and seed is due by August 22.	i.) Send out 'call for entries' letter by mid-January requesting spring barley entries. i.) Send out 'call for entries' letter by mid-July requesting winter barley entries. ii.) Maintain positive relationship with breeding programs to ensure future participation.
3. Provide access to variety trials and harvested grain enabling other researchers and supporting projects to gather information from the trials.	Participation and ratings from other projects/ programs.	Cooperation with breeders, pathologists, seed dealers, WSCIA, other universities, and Extension. Data are used by breeders for variety release and promotional materials. Began screening barley lines for Hessian fly resistance for first time in 2022. Will begin screening winter barley entries for cold tolerance in 2024.	Ongoing cooperation and collaboration that fit with timelines and other listed objectives.	Stripe rust and Hessian fly ratings presented in seed buyers guide and variety selection tool. VTP data used for variety release and PVP applications.
4. Deliver an Extension education program to make the results and interpretation of the variety trials available to growers, the seed industry, and other clientele.	a.) Grower Meetings	No invitations to speak at meetings on barley specifically to date.	Will attend when invited	Attend in person and present results with slides and handouts when appropriate.
	b.) Field Tours	i.) 2022: 7 in-person field days (172 attendance) ii.) 2023: 7 in-person field days (175 attendance)	June	*List of Field Days provided below; provide paper handouts of data at events; List of dates posted on website and emailed through prelimdata list serve
	c.) Email List Serv	2022 data and trial updates delivered; total of 37 emails sent to subscribers in 2022 2023 data and trial updates delivered; total of 53 emails sent to subscribers in 2023	Data emailed out September through December; trial updates/observations posted throughout year.	i.) 2022 data and trial updates delivered to 395 subscribers; subscribers increased 11% in 2022 ii.) 2023 data and trial updates delivered to 424 subscribers; subscribers increased 7% in 2023
	d.) Website	i.) 2022 data and VT field maps posted ii.) 2023 data and VT field maps posted iii.) 2024 winter VT field maps posted	August through December	10,255 pageview for 2022 VT website TBD pageview for 2023 VT website
	e.) Annual Report	i.) 2022 final report posted in January ii.) 2023 final report posted in December	December-January	The final annual technical report is published online and in hard copy upon request.
	f.) WSCIA Seed Buyers Guides	2022 Guide completed 2023 Guide completed	February	Seed Buyers Guide published in February
	g.) Wheat Life	2022: Spring Barley VT article completed 2023: Spring Barley VT article completed	i.) Completed December 2022 for January 2023 publication. ii.) Completed December 2023 for January 2024 publication.	Article published in Wheat Life in January each year.
	h.) Variety Selection Tool (smallgrains.wsu.edu)	Selection tool is updated once the final technical report is completed.	January	2022: 3,337 page views; 177 new app downloads 2023: TBD page views; 96 new app downloads

*2022 in-person Field Days included Dayton, Fairfield, Farmington, Mayview, Pullman, Reardan, St. John.
*2023 in-person Field Days included Fairfield, Dayton, Fairfield, Mayview, Reardan, St. John, Walla Walla.