

PROJECT NO.: NEW

TITLE: Grower Strip Trials for UI wheat varieties in Southeast Idaho

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JUSTIFICATION: Idaho has been the number one producer of hard white wheat in the US, until this year, when we slipped to number three, behind Colorado and Nebraska. Idaho has lost hard white spring wheat acreage to higher value crops such as corn and malt barley. The Idaho Wheat commissioners feel our opportunity to increase acreage of hard white wheat is in winter acres where there are fewer crops to compete with. To date Idaho growers have not had a winter hard white wheat variety that would meet the yield, agronomics and end-use quality needed on Idaho's winter acreage. In 2015, dryland growers, who were interested in trying a hard white winter wheat crop, were recruited by Idaho Wheat Commission to grow a hard white winter variety trial on a grower scale (1 ac per variety, non-replicated, under standard growing practices). Growers and potential seed producers want to see performance data from large scale field trials before taking the risk of using a new variety. A common belief among growers is that small replicated plots do not correlate well with large farm-scale plots in commercial fields under standard grower management for the specific class of wheat. The Idaho Wheat Commission solicited hard white wheat varieties from a variety of developers. The varieties selected had to be commercial or the developer had to be holding a seed position that would allow the variety to be commercially available to growers in two years (pre-commercial). Varieties selected had to be winter hardy, high yielding and have good end-use quality. The large scale trials were intended to allow the grower to see enough of the variety to compare them side by side in his field and make a decision on the variety(s) they would be willing to grow in the future. The IWC's objective was to identify the best hard white winter varieties for use in Southern Idaho. We would like to continue with this type of research through the 2016- 2017 growing season. We have preliminary data from this year's grower trial. The data look positive with two pre-commercial lines from Limagrain that compete well on yield. The IWC, the grower cooperators, as well as seed dealers, were willing to put out large scale field plots for another year. The samples from the 2016 crop trials are at 5 testing mills for a comprehensive quality analysis. We are looking forward to receiving the information.

HYPOTHESIS & OBJECTIVES: Growing new varieties of wheat will give Idaho grain producers and the Idaho Wheat Commission a better understanding of the agronomic characteristics at different farms in Idaho. The one-acre grower strip trials will give producers a better idea how it will yield and react to different soil types and environments in South East Idaho. The goal of this project is to identify winter wheat cultivars best adapted to production in the diverse climatic regions of the state of Idaho. There are many diverse regions in the state of Idaho, varying from weather patterns to amount of annual precipitation to crop rotation practices. Each region is in need of different wheat traits to make production profitable and sustainable. Individual needs vary in class of wheat, disease and insect resistance traits, emergence from deep planting, irrigated and dryland production, conventional and no-till, to herbicide resistance. To develop cultivars that meet these diverse needs we are constantly improving the efficiency and effectiveness of cultivars by rapidly adopting new technologies for improvement of cultivars as well as maintaining stringent breeding designs and selection criteria. Genetic advances result in many pre-commercial and commercial varieties for growers and seed

dealers to choose from which can be overwhelming.

Growers and the Idaho Wheat Commission hope to increase production of hard white and soft white wheat in Idaho. Our expectation is to showcase wheat cultivars that are highly profitable for the growers in individual climatic regions. We aim to find cultivars that are agronomically adapted and yield stable in each climatic region, maintain high levels of durable genetic resistance/tolerance to agricultural pests, and have high end-use quality characteristics. By doing so, wheat production in the state of Idaho will continue to be an economical option for area farms, market share will continue to be maintained or elevated, and farming will be beneficial to the environment through use of genetic resistance versus pesticides.

Objectives: a- Identify the best hard white winter and soft white winter variety(s) commercially available, for dryland and irrigated production in Idaho.

b- Analyze and verify the end-use quality of each variety with grain samples large enough to submit to multiple quality labs.

c- By collecting data and experience we can identify good hard white winter and soft white spring varieties, to allow growers to increase profitable production of hard white and soft white wheat in Idaho's diverse wheat regions and production practices.

PROCEDURES: We will be soliciting breeders who desire to grow their newest varieties in comparison with competitive varieties and check varieties. Intellectual property rights are protected by the use of a Materials Transfer Agreement (MTA) between the developer and the grower cooperator. We will have at least 8 varieties and as many as 10 varieties that we will grow and compare to one another. We will be growing the varieties in three locations in Idaho. The seed will be procured from the dealers who want to participate and it will be shipped or taken to the growers. When the grower lets us know they are going to plant, Jon Hogge will be available to assist the grower in planting. He will take a generator and shop-vac to clean out the drill between varieties. He will then clean out the drill so the growers can finish his planting of the field. Jon will return to each site after germination of the seed to do plant counts. Jon will also drive down in early spring to take winter survival stand counts and growing notes for each of the varieties. He will monitor the growth of the seedlings, apply Cerone as needed during the appropriate times and provide agronomic assistance as the cereals develop. Jon will take heading notes and monitor seed fill during maturity of the varieties. Jon will be on hand to assist in the harvesting of the cereals. He will also be available to process, composite and ship samples to mills for testing.

DURATION: This is planned to be a one year study of new varieties, if it goes well we will make plans and submit another application for further funding.

COOPERATION: This is a cooperative project between the University of Idaho Cereals Area Educator for South East Idaho, and the Idaho Wheat commission in a close collaboration with cereal growers across Idaho and public and private breeders.

ANTICIPATED BENEFITS/EXPECTED OUTCOMES/INFORMATION TRANSFER: Growing new varieties in large plot research gives our growers an opportunity to see how these new varieties will react on their farms. It has been a standard practice to grow new varieties in small plot research using five by twenty foot plots. The plots we propose to grow our varieties in are approximately one acre. This will give the producer an idea of how it will respond on their farm on their soil with their production practices. With this outlook we believe the producer will be able to make a decision on what variety they would like to try and grow in the coming years. Our hope is that grower scale research trials will help seed producers and growers make more informed decisions on varieties they choose to use in the future. This information will be showcased through farmer field days, through an extension bulletin, distributed to all counties through the extension office to be shared with producers by the extension educator in that county, and could be shared with growers at the extension cereal school programs at five locations in southeast Idaho. Results will be made available to all our

collaborators including growers, breeders, seed producers, millers and quality labs.

LITERATURE REVIEW:

<http://www.ers.usda.gov/media/1546551/whs04k01.pdf>

Comparison of Large Plot Farm Scale Strips and Small Plot Performance Trials for Variety Ranking
Kevin Larson¹, Jerry Johnson, Scott Haley, James Quick, James Echols, John Shanahan, Dennis Thompson, and Deborah Harn

REFERENCES:

W. Yan, L.A. Hunt, P. Johnson, G. Stewart, and X. Lu. 2002. On-farm strip trials vs. replicated trials for cultivar evaluation. *Crop Science* 42:385-392.

Kevin Larson, Superintendent/Research Scientist, Plainsman Research Center, Colorado State University.

Co-Hort Software, Co-Stat Users Manual. 1986. Nonparametric tests. Co-Stat Version 3.03. Berkeley, California. p. 199-211.

IDAHO WHEAT COMMISSION - BUDGET FORM

Allocated by	Idaho Wheat Commission	during FY 2016	\$	-
Allocated by	Idaho Wheat Commission	during FY 2017	\$	-

REQUESTED FY2018 SUPPORT:

	Salary	Temporary Help	Fringe	Travel	OE	Graduate Tuition/Fees	TOTALS
Idaho Wheat Commission	\$ -	\$ -	\$ -	\$ 2,288	\$ 700	\$ -	2,988

TOTAL BUDGET REQUEST FOR FY 2018: \$ 2,988

BREAKDOWN FOR MULTIPLE SUB-BUDGETS:

	(PI name)	(PI name)	(PI name)	(PI name)
Salary	\$ -	\$ -	\$ -	\$ -
Temporary Help	\$ -	\$ -	\$ -	\$ -
Fringe Benefits	\$ -	\$ -	\$ -	\$ -
Travel	\$ -	\$ -	\$ -	\$ -
Operating Expenses	\$ -	\$ -	\$ -	\$ -
Graduate Student Tuition/Fees	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ -	\$ -	\$ -	\$ -
Total Sub-budgets				\$ -

Explanatory Comments: (see FY2018 Guidelines for definition)

11.21.2016 - Version