


**FOR ADMINISTRATIVE USE**  
**Minnesota Wheat Research and Promotion Council**

**Program Area Code**

**Proposal Code**

**RESEARCH PROPOSAL GRANT APPLICATION**

<b>1. NAME AND ADDRESS OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE</b> <b>Name:</b> North Dakota State University <b>Address:</b> Office of Sponsored Programs Administration NDSU Dept #4000; PO Box 6050 Fargo, ND 58108-6050		
<b>2. TITLE OF PROPOSAL</b> 2023 Hard Red Spring Wheat Regional Quality Survey		
<b>3. PRINCIPAL INVESTIGATOR(S)</b> Dr. Shahidul Islam	<b>4. PI #1 BUSINESS ADDRESS</b> North Dakota State University Department of Plant Sciences PO Box 6050, Dept 7670 Fargo, ND 58108-6050	
<b>PI # 2 Name:</b>		
<b>PI # 3 Name:</b>		
<b>5. PROPOSED PROJECT DATES (calendar years)</b> 01/01/2023 to 12/31/2023 Note: Research Reports are Due November 15th of Each Year	<b>6. TOTAL PROJECT COST</b> \$15,000	<b>7. PI #1 PHONE NO.</b> 701 318 9823
<b>8. RESEARCH OBJECTIVES: (List objectives to be accomplished by research grant)</b> Annual survey of Hard Red Spring (HRS) wheat grown in the North Great Plain states. The survey encompasses sample collection, analysis, and reporting important wheat quality attributes useful for marketing the crop. The range of environmental diversity, cultivars and agronomic practices results in a range of quality attributes and assessment of important marketing attributes of wheat entering into the commercial market channels.  Attach a 2-page detailed discussion of importance of the proposal to wheat profitability; how study complements previous research in area; procedures to be used; and competency of the research group in achieving research objectives. (Please keep the proposal concise, only 2 pages will be provided reviewers).		
<b>Signature of Principal Investigator</b> 	<b>Date</b> 10/27/2022	<b>Phone Number</b> 701 318 9823
<b>Signature of Authorized Representative</b> Amy B. Scott <small>Digitally signed by Amy B. Scott Date: 2022.10.31 20:06:13 -05'00'</small>	<b>Title</b> Assistant Director, Sponsored Programs Administration	<b>Date</b>
<b>Address of Authorized Representative</b> Dept. 4000 PO Box 6050 Fargo, ND 58108-6050		<b>Date</b> 701-231-8045

# Minnesota Wheat Research and Promotion Council

## RESEARCH PROPOSAL GRANT APPLICATION

**Project Title:** 2023 Hard Red Spring Wheat Regional Quality Survey

**Introduction:**

Wheat quality is recognized as properties and characteristics which meet, or contribute to, the requirements of food manufacturers in the production of marketable end-products. American millers and bakers have different perceptions and needs than their international counterparts. Growers define quality as the set of attributes that allow maximum economic return. Thus, quality has a multiplicity of meanings, dependent upon the market situation. It is the end user who ultimately establishes value associated with a given standard of quality.

The North Dakota State University Department of Plant Sciences has been conducting annual surveys of North Dakota grown hard red spring (HRS) and durum wheats since the early 1960's. Surveys encompassed collection, analysis, and reporting important wheat quality attributes useful for marketing the crop. In recognition that other Northern Great Plains states produce approximately 40 percent of the HRS grown in the region, the 1980 and successive surveys have included the four northern plains states that produce 90% of the HRS and durum wheats grown in the U.S. More recently HRS grown in the three states of Pacific North West (PNW) has been included in the survey, covering approximately 95% of total U.S. production. The range of environmental diversity, cultivars, and agronomic practices results in a range of quality attributes. Thus, expanding the survey to encompass the entire Northern Great Plains and PNW growing regions allows assessment of important marketing attributes of HRS and durum wheat entering into the commercial market channels.

**Sample Collection:**

Samples of hard red spring and durum wheats grown in the upper Great Plains are collected from the four-state region. The number of samples collected is based on wheat production within each county. The greater the production the more samples collected. In low producing counties a minimum of two samples are collected and in high producing counties a maximum of fifteen samples are collected. Every effort is made to obtain samples that accurately reflect condition of grain within an area that is available to the commercial market.

The samples will be collected under contract by the North Dakota Agricultural Statistics Services, located in Fargo, ND. They will have samples collected in North Dakota, Minnesota, Montana, and parts of South Dakota.

**Quality Tests:**

Approximately sixty percent of the HRS wheat and about fifty percent of the durum wheat samples obtained are graded by a federally licensed grain inspector. Additionally, these same samples are analyzed for protein content, falling number, test weight and thousand kernel weight. Estimations of assay distributions within the wheat crop are made from these data.

Samples representing each of the eighteen hard red spring wheat and six durum crop reporting areas (CRA's) will be prepared by combining equal portions of individual samples collected. Complete analyses will be performed on these sample composites to assess quality. Analytical procedures for HRS and durum have some commonality and some differences. Assays common to both classes of wheat include test weight, falling number, size distribution, protein, ash, 1000-kernel weight, and grade. Milling yields are determined for both HRS and durum, along with flour/semolina ash and protein. The preferred dough testing for the HRS wheat is the farinograph whereas the Alveograph is used for semolina quality evaluations. The Alveograph and Extensograph will also be used to evaluate the HRS wheat crop dough strength. End-product performance model system is bread (100 g pup loaves) for HRS wheat and spaghetti for durum wheat. Bread criteria evaluated are baking absorption, bread loaf volume, crumb

and crust color, symmetry, grain, and texture properties. Spaghetti attributes evaluated include spaghetti color score, cooked weight, cooking loss, and firmness value.

**Data Analysis and Reporting:**

Data collected from the assays are presented in three formats. Arithmetic means of results from the assays are presented as distribution histograms. Data obtained from the CRA’s composite samples are reported as averages of the respective assay for each CRA. Statewide and regional averages are biased based on the most recent five-year production average.

**Protein Ranges:**

Wheat samples representing protein ranges of less than 13.5%, 13.5% to 14.5%, and greater than 14.5% protein (12% moisture basis) will be prepared from the existing sample population for each of the two HRS wheat export regions. Complete wheat, flour, and bread baking analyses will be performed on the protein-range samples. Results of these analyses will be reported on additional tables within the published bulletin.

**Weekly Updates:**

Summary reports of analytical data collected will be provided each week during harvest and sample analyses. Summary reports will reflect wheat quality based on export regions. Weekly updates will be sent by e-mail to supporting agencies on each Friday morning of each week during harvest and subsequent wheat sample evaluation periods.

**Printed Reports:**

Reports summarizing the findings are submitted to U.S. Wheat Associates for incorporation into their international wheat marketing brochure. Bulletins summarizing the four state findings are published for distribution primarily by the sponsoring agencies. Approximately 4,100 (HRS) and 2,800 (Durum) copies of each report will be printed. The data is also available electronically on the North Dakota Wheat Commission web site.

Distribution of the crop quality report with an approximate copy distribution is as follows:

	<u>HRS</u>	<u>Durum</u>
Plant Sciences	150	150
North Dakota Wheat Commission	500	550
Minnesota	50	5
Montana	150	140
South Dakota	50	5
Domestic	1500	850
International	1500	850
NCI	100	150
ND Ag Statistics	100	100

Additional or fewer copies can be provided as necessary.

**Budget Justification:**

Dr. Shahidul Islam is an Assistant Professor in Plant Sciences Department at NDSU. He is the primary project director. \$4,500 from the budget will be used to pay part of the salary for a food technologist in the Wheat Quality Program. Fringe benefits are calculated at 47%. A total of \$7,425 is being requested as operation cost, which includes laboratory materials and supplies such as chemicals, glass ware, and sample bags. Wheat quality data generated by this laboratory are deposited in a repository named “Dashboard”. This will allow access to historical data of HRS quality. All the quality data of Minnesota grown wheat is deposited in that repository. \$960 will cover Minnesota’s share of the maintenance cost.

**Minnesota Wheat Research and Promotion Council**  
**RESEARCH PROJECT PROPOSAL BUDGET**

<b>Project Title: 2023 Hard Red Spring Wheat Regional Quality Survey</b>			
Principal Investigator(s) / Project Director(s) Dr. Shahidul Islam	Funds Requested For		
	Year 1 (2023)	Year 2 (2024)	Year 3 (2025)
	\$	\$	\$
A. Salaries and Wages			
1. Co-principal Investigator(s)			
2. Senior Associates			
3. Research Associates – Post Doctorate			
4. Other Professionals (Food Technologist)	4,500		
5. Graduate Students			
6. Pre-baccalaureate Students			
7. Secretarial - Clerical			
8. Technical, Shop and Other			
B. Fringe Benefits @ 47%	2,115		
C. Consulting and Professional Services			
D. Supplies and Services	7,425		
E. Travel			
F. Sub-Contracts			
G. Repairs & Maintenance			
H. Rentals & Lease			
I. Other Expenses	960		
<b>TOTAL AMOUNT OF THIS REQUEST (per year)</b>	<b>\$ 15,000</b>	<b>\$</b>	<b>\$</b>