FOR ADMINISTRATIVE USE
Program Area Code Proposal Code

Minnesota Wheat Research and Promotion Council

RESEARCH PROPOSAL GRANT APPLICATION

1. NAME AND ADDRESS OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE

Name: Regents of the University of Minnesota
Address: Sponsored Project Administration
454 McNamara Alumni Center, 200 Oak Street SE
Minneapolis, MN 55455-2070

2. TITLE OF PROPOSAL
Wheat Stem Sawfly Resistance Screening

3. PRINCIPAL INVESTIGATOR(S)
J.J. Wiersma

PI# 2 Name: J.A. Anderson

4. PI #1 BUSINESS ADDRESS
Northwest Research & Outreach Center
2900 University Avenue
Crookston, MN 56716

5. PROPOSED PROJECT DATES (calendar years)
01/01/24 - 12/31/24
Note: Research Reports are Due November 15th of Each Year

6. TOTAL PROJECT COST
6,438.-

7. PI #1 PHONE NO.
218-281-8629

8. RESEARCH OBJECTIVES: (List objectives to be accomplished by research grant)

Evaluate the current, adapted HRSW varieties and candidate releases for resistance to stem cutting by WSS.

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).

Signature Of Principal Investigator	Date	Phone Number
	01/05/24	(218) 281-8629

Signature Of Authorized Representative	Title	Date
Victoria Troyler	Principal Grant & Contract Officer	1/9/2024

Address Of Authorized Representative	Phone Number
Office of Sponsored Projects Administration 450 McNamara Alumni Center 200 Oak Street SE, Minneapolis, MN 55455-2070	612-624-9567 awards@umn.edu

Minnesota Wheat Research and Promotion Council
RESEARCH PROPOSAL GRANT APPLICATION
(2-pages maximum)

Project Title: Wheat Stem Sawfly Resistance Screening

Importance of this project to the profitability of wheat producers: Wheat stem sawfly (WSS) is an insect pest that has caused concern in recent years, especially in NW MN where populations have had a considerable impact on some fields. While yield losses and quality losses as a result of the WSS infestations are rare, harvest challenges and losses as a result of the lodged grain were observed and reported. In most instances, these problems are restricted to the first 120 ft. of the affected field's edges as WSS migrate into the current season's wheat from nearby previous season's wheat fields. Over the past seven years, the area affected by WSS in Minnesota has steadily grown larger and now reaches from Wilkin to Kittson counties. The only known approach to combat this insect is the use of WSS resistant varieties. Knowing which varieties have presence of stem pith between Feekes 6 and Feekes 9, whether partial or complete, is the most predictive method to identify WSS resistant varieties

Procedures: A duplicate of the HRSW variety performance evaluation trial will be seeded as 5ft. short rows instead of full size yield plots on the Northwest Research & Outreach Center near Crookston, MN. The standard check varieties (Marshall, Glenn, and Knudson) are replaced with WSS check varieties that differ in stem solidness (WB Gunnison, SY Tyra, and Duclair). The field in which the trial will be located will have been continuous wheat for the past three years. Changing from full yield trial plots to single rows reduces the footprint of the trial without compromising the ability to score stem solidness effectively. Stem solidness will be scored visually by clipping stems on 1 ft. of row at two height at Feekes 6 and Feekes 9 with a handheld battery-powered mini hedge trimmer (Craftsman V20 Cordless Handheld Grass Trimmer and Mini Hedge Trimmer Model # CMCSS800C).

Simultaneously the project will continue to work with the USDA-ARS's North Central Small Grains Genotyping Lab in Fargo, ND to determine the absence/presence of the Qss.msub-3BL.c QTL associated with the WSS resistance expressed in WB Gunnison (Cook et al. 2019). Unfortunately, we will likely not be able to screen many of the privately developed HRSW varieties because of intellectual property rights limitations.

Regional linkages to other research activities: Dr. Andrew Green, NDSU spring wheat breeder, used the screening nursery in 2021 and 2022 as a local site to have greenhouse raised novel sources of WSS resistance in cone-tainers get infested with WSS. Dr. Green has not indicated he will need the Crookston location in the coming growing season for screening WSS resistance material.

List any other secured, pending, or planned submissions to outside funding sources for this work: None

Research Group: J.J. Wiersma and J.A. Anderson

Relationship to past projects: This project is a continuation of the previous efforts to determine the absence/presence of a pith in adapted HRSW varieties. The proposed protocol is an attempt to make the screening for the absence/presence of the pith more efficient and less labor intensive.

Estimate the budget requirements: $ 6,438.-

References:

Cook, J.P., D.K. Weaver, A.C. Varella, J.D. Sherman, M.L. Hofland, H.Y. Heo, C.Caron, P.F. Lamb, N.K. Blake, L.E. Talbert. 2019. Comparison of Three Alleles at a Major Solid Stem QTL for Wheat Stem Sawfly Resistance and Agronomic Performance in Hexaploid Wheat. Crop Sci 59: 1639-1647. https://doi.org/10.2135/cropsci2019.01.0009

Minnesota Wheat Research and Promotion Council

RESEARCH PROJECT PROPOSAL BUDGET

Project Title: Wheat Stem Sawfly Resistance Screening

Principal Investigator(s) / Project Director(s) J.J. Wiersma and J.A. Anderson	Funds Requested For Year 1 (2021)	Year 2 (2022)	Year 3 (2023)
A. Salaries and Wages	$	$	$
1. Co-principal Investigator(s)			
2. Senior Associates			
3. Research Associates – Post Doctorate			
4. Other Professionals			
5. Graduate Students			
6. Prebaccalaureate Students	$ 5,120.-		
7. Secretarial - Clerical			
8. Technical, Shop and Other			
B. Fringe Benefits	$ 318.-		
C. Consulting and Professional Services			
D. Supplies and Services	$ 500.-		
E. Travel			
F. Sub-Contracts			
G. Repairs & Maintenance			
H. Rentals & Lease (plot charges)	$ 500.-		
I. Other Expenses			
TOTAL AMOUNT OF THIS REQUEST (per year)	**$ 6,438.-**	**$**	**$**

Brian Sorenson Intls: _____Date _____