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: North Dakota State University
Address: Office of Sponsored Programs Administration
Dept #4000 PO Box 6050, Fargo, ND 58108-6050

2. TITLE OF PROPOSAL

Strategies for meeting N requirements of wheat with new fertilizers and fertilizer additives.

3. PRINCIPAL INVESTIGATOR(S)

Joel Ransom

PI# 2 Name:

PI# 3 Name:

4. PI #1 BUSINESS ADDRESS

NDSU Plant Sciences
PO Box 6050, Dept 7670
Fargo, ND 58108-6050

5. PROPOSED PROJECT DATES (calendar years)

2016

Note: Research Reports are Due November 15th of Each Year

6. TOTAL PROJECT COST

$28,000

7. PI #1 PHONE NO.

701-730-0384

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

The objectives of this research is to determine the benefit of fertilizer nitrogen types and additives on its use efficiency when applied at different timing, and to determine the potential for predicting N requirement using an active sensor.

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
Joel K Ransom	12/21/15	701-730-0384
Signature Of Authorized Representative	**Title**	**Date**
Amy B. Scott	Asst. Director - SPA	12.30.15
Address Of Authorized Representative		**Phone Number**
Sponsored Programs Administration NDSU Dept. 4000, PO Box 6050 Fargo ND 58108-6050 Attn: Amy Scott		701-231-8045

Minnesota Wheat Research and Promotion Council
RESEARCH PROPOSAL GRANT APPLICATION

Project Title:
Strategies for meeting N requirements of wheat with new fertilizers and fertilizer additives.

Importance of this project to the profitability of wheat producers:
Nitrogen fertilizer is the single most expensive input used in wheat production. Losses of N can be substantial during wet years due to leaching and denitrification, particularly in the RRV region. Improved nitrogen use efficiency (NUE) can increase the profitability of producing spring wheat. It can also help ensure adequate levels of protein so that market discounts for low protein are minimized. Improved NUE will be good for the farmers and good for the environment.

Losses of N have been substantial during recent wet years due to leaching and denitrification, particularly in the RRV region. Furthermore, excessively wet weather can also affect the ability to enter the field in the spring to apply nitrogen, often slowing down an already delayed process of planting. This project may offer ways to enhance nitrogen use efficiency and allow for greater flexibility in the timing of nitrogen application by using newer nitrogen fertilizers and fertilizer additives. Improving N use efficiency and applying N in a timely manner relative to planting has the potential of increasing farmers' profits and reducing environmental concerns. We have two years of data dealing with this topic and feel that an additional year of research will be valuable as it will allow us to expand the scope of reference of the results and help us better understand the potential interactions of our treatments with the environment.

Procedures:
Experiments will be established in three locations (two in MN and one in ND). The following treatments are proposed and are similar to those we included last year:
1. Check (no fertilizer)
2. 50% rate ESN fall applied and incorporated
3. 75% rate ESN fall applied and incorporated
4. 100% rate ESN fall applied and incorporated
5. 50% rate urea fall applied and incorporated
6. 75% rate urea fall applied and incorporated
7. 100% rate urea fall applied and incorporated
8. 100% rate 50:50 ESN:urea fall applied and incorporated
9. 100% rate 75:25 ESN:urea mix fall applied and incorporated
10. 75% rate urea fall applied and incorporated with Instinct II
11. 100% rate urea fall applied and incorporated with Instinct II
12. 50% rate ESN spring applied and incorporated
13. 75% rate ESN spring applied and incorporated
14. 100% rate ESN spring applied and incorporated

15. 50% rate urea spring applied and incorporated
16. 75% rate urea spring applied and incorporated
17. 100% rate urea spring applied and incorporated
18. 100% rate 50:50 ESN:urea spring applied and incorporated
19. 100% rate 75:25 ESN:urea mix spring applied and incorporated
20. 75% rate urea spring applied and incorporated with Instinct II
21. 100% rate urea spring applied and incorporated with Instinct II
22. 100% rate 50% urea applied /incorporate spring plus 50% as UAN streamed at 4 leaf stage
23. 100% rate 50% urea applied /incorporate spring plus 50% as UAN plus Agrotain Ultra streamed at 4 leaf stage
24. 200 lbs N as urea applied in the spring

Data on yield and protein will be collected.

Regional linkages to other research activities:
This work has important linkages with the on-farm research activities supposed by MWRPC.

List current or potential other funding sources for this project:
This project is currently funded by the MWRPC. There is the possibility that the ND Wheat Commission could also partially fund this project.

Research Group:
We will work with the on-farm research team funded by MWRPC, who will help with the implementation of this research at the Minnesota sites.

Relationship to past projects:
This will be the third year of a three year project.

Estimate the budget requirements:
Funds are requested to cover the cost of a graduate research assistantship ($17,000) and fringe using a rate of 3% ($510). A total of $2,990 is requested for materials and supplies which will cover the cost of filters, tags, bags, spare parts for equipment, fuel for tractor and combine. Funds ($7,500) requested will be used for travel to research sites in North Dakota and Minnesota and travel cost for the graduate student to travel to a national conference and present the results of this research.

References:
Kaiser, D. A. Sims, and J. Wiersma. 2010. Efficient N fertilization of wheat grown in Minnesota – final report. AFREC Project, 2008-2010. Can be viewed at http://www.mda.state.mn.us/en/chemicals/fertilizers/afrec/researchprojects/~/media/Files/chemicals/afrec/reports/wheatnitrogenfert.ashx

Motavalli, P., K. Nelson, P. Nash. Utility of polymer-coated urea as a fall-applied N fertilizer option for corn and wheat. University of Missouri Research Report. http://aes.missouri.edu/pfcs/research/prop708b.pdf

Minnesota Wheat Research and Promotion Council
RESEARCH PROPOSAL BUDGET

PROJECT TITLE:
Strategies for meeting N requirements of wheat with new fertilizers and fertilizer additives.

Principal Investigator(s) / Project Directors(s) Joel Ransom	Funds Requested For Year 1 (2016)	Year 2 (2017)	Year 3 (2018)
A. Salaries and Wages	$	$	$
1. Co-principal Investigator(s)			
2. Senior Associates			
3. Research Associates - Post Doctorate			
4. Other Professionals			
5. Graduate Students	17000.00		
6. Prebaccalaureate Students			
7. Secretarial - Clerical			
8. Technical, Shop and Other			
B. Fringe Benefits @ ~~35%~~ 3%	510.00		
C. Nonexpendable Equipment (Planting and harvesting equipment use)			
D. Materials and Supplies	2990.00		
E. Travel	7500.00		
F. Publication Costs			
G. Computer Costs			
H. All Other Direct Costs (Attach supporting data)			
TOTAL AMOUNT OF THIS REQUEST (per year)	$ 28,000.00	$ 0.00	$ 0.00