

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 Projects Administration 454 McNamara Alumni Center, 200 Oak Street SE Minneapolis, MN 55455-2070		
2. TITLE OF PROPOSAL: Purchase of a Dura-Pack Single Feeder Linear Net Weigh Scale (model DL-111).		
3. PRINCIPAL INVESTIGATOR(S) Jochum J Wiersma PI# 2 Name: PI# 3 Name:	4. PI #1 BUSINESS ADDRESS Northwest Research & Outreach Center 2900 University Avenue Crookston, MN 56716	
5. PROPOSED PROJECT DATES (calendar years) 01/01/2015 – 12/31/2015 Note: Research Reports are Due November 15th of Each Year	6. TOTAL PROJECT COST 8,500.-	7. PI #1 PHONE NO. 218-281-8629
8. RESEARCH OBJECTIVES: (List objectives to be accomplished by research grant) <ul style="list-style-type: none"> To increase the productivity and efficiency of breeding program and collaborative research projects by increasing the speed and accuracy of weighing and packaging of seed and fertilizer for trials. <p>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).</p>		
Signature Of Principal Investigator 	Date 1/16/15	Phone Number 218-281-8629
Signature Of Authorized Representative 	Title Kevin McKoskey, Sr Associate Director Sponsor Projects Administration	Date 1/20/15
Address Of Authorized Representative Kevin McKoskey, Sr. Associate Director, Office of Sponsored Projects Administration 450 McNamara Alumni Center, 200 Oak Street SE, Minneapolis, MN 55455-2070		Phone Number 612.624.5599 Telephone 612.624.4843 Fax No.

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

Project Title: Purchase of a Dura-Pack Single Feeder Linear Net Weigh Scale (model DL-111).

Importance of this project to the profitability of wheat producers: The purchase of a linear weigh scale for the project provides little direct benefit to the wheat producers other than the cost savings achieved by the reduction in labor expenses associated with packaging seed for yield trials. These savings are translated in a smaller overall request to the MWRPC for the spring wheat breeding program.

Procedures: Packaging the seed for the HRSW and HRWW variety trials is currently completely done by hand. The required amount of seed for each individual plot is weighed out on a small digital laboratory scale and then packaged in a #5 coin envelope. Care is taken that the correct weight is measured as the amount of seed will differ not only for each individual variety but also varies by trial location and/or within a trial, as is the case in the seeding rate trial that is funded by the MWRPC. The average pace for filling envelopes is about 50 envelopes an hour and to prepare the seed packages for the state variety trial for HRSW that is grown to 15 locations across the state takes about 0.2 FTE per year from start to finish.

Breeding programs have historically used gravity-fed seed dividers such as those manufactured by Precision Machine Co. of Lincoln, NE (http://www.pmcinc.biz/precision_machine_company_inc.htm) The project bought a 12 packet model in 2012 as a way to speed up seed packaging but uses it very sparingly as the gains in speed are limited compared to filling by hand while accuracy is lost. Quality control experiments have shown that the divider is prone to a bias up to 3% when weighing and packaging (Figure 1). Furthermore the seed divider is not suited for weighing and packaging fertilizer treatments.

Unsatisfied with the gravity-fed seed divider, the project has been exploring alternatives by working with Lean Packaging of Crookston (<http://www.goleanpackaging.com/>). A possible solution is a linear net weigh scale. Linear net weigh scales are computer controlled automated weigh and filling machines that are well suited for free flowing products such as beans, spices, coffee, and whole grains. A brief video introduction of a linear net weigh scale can be found here: <http://www.dura-pack.com/DL-115-Disassembly.html>. Most if not all pre-packed products you buy in a store today are weighed and filled by some form of linear net weigh scales as the technology combines speed with accuracy.

The expectation is that the DL-111 can fill up to 10 envelopes a minute. This equates to a 10 fold increase in the speed while the projected accuracy is ± 0.2 g or an approximate 10 fold increase in accuracy when compared to the accuracy achieved with the gravity-fed seed divider.

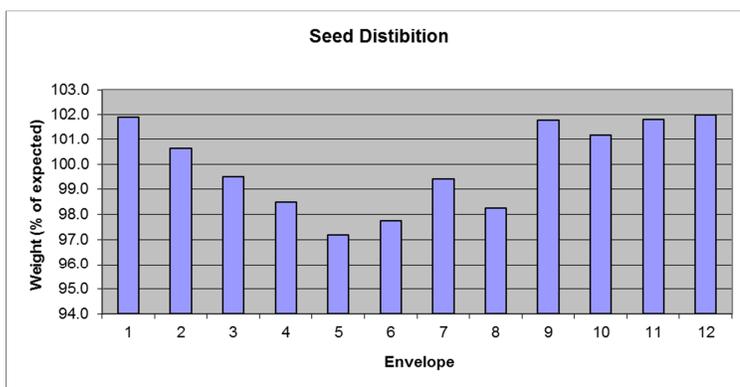


Figure 1 – Distribution of weight across the 12 rows of the 12-row Precision Machine Company seed divider.

Regional linkage to other research activities: The linear weigh scale will be made available to other faculty at the NWROC to weigh and package seed and/or fertilizer for trials.

Research Group: Jochum Wiersma. James A. Anderson, Douglas Holen, other NWROC faculty

Relationship to past projects: None

Budget request: \$8,500.-

List current or potential other funding sources for this project: The NWROC has pledged \$3,000.- towards the purchase of the Dura Pack Linear Weigh Scale Model 111

List your programs current and pending support:

1) Current Support

- Small Grains Initiative (General Support)
- NDSU/Ducks Unlimited (Winter Wheat in Minnesota)
- USWBSI (Uniform Fungicide Trials - Co-PI)

2) Pending Support

- MDA - Minnesota Crop Research Grant Program (Determining Best Agronomic Practices for Winter Barley Production in Minnesota - Co-PI)
- MDA - Minnesota Crop Research Grant Program (Winter Rye Performance and Taste - Co-PI)
- MWRPC (Optimum Seeding Rate for Diverse HRSW - Principal Investigator)
- MWRPC (Southern Wheat Research & Outreach - Co-PI)
- MWRPC (Variation in Response to Sulfur among HRSW Genotypes - Co-PI)
- MWRPC (University of Minnesota Wheat Breeding Program - Co-PI)
- MWRPC (Summer Plot Tours - PI)

References: <http://www.dura-pack.com/DL-115-Disassembly.html>

Minnesota Wheat Research and Promotion Council

RESEARCH PROJECT PROPOSAL BUDGET

PROJECT TITLE: Purchase of a Dura-Pack Single Feeder Linear Net Weigh Scale (model DL-111).			
Principal Investigator(s) / Project Directors(s)	Funds Requested For		
	Year 1 (2015)	Year 2 (2016)	Year 3 (2017)
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			
7. Secretarial - Clerical			
8. Technical, Shop and Other			
B. Fringe Benefits			
C. Nonexpendable Equipment (Planting and harvesting equipment use)	8,500.-		
D. Materials and Supplies			
E. Travel			
F. Publication Costs			
G. Computer Costs			
H. All Other Direct Costs (Attach supporting data)			
TOTAL AMOUNT OF THIS REQUEST (per year)	\$ 8,500.-	\$	\$