PROJECT NO: BJKV34, BJKV35, BJKV36

TITLE: Extension Wheat Nurseries

PERSONNEL: Dr. Juliet Marshall, Ext. Crop Mgmt. Specialist (SC and E Idaho)
Dr. Bradford Brown, Ext. Crop Mgmt. Specialist (SW Idaho)
James Johnson, Professor, Department Head (N Idaho)
Doug Finkelnburg, Extension Support Scientist (N Idaho)

ADDRESS: Dr. Juliet Marshall, 1776 Science Center Dr, Ste 205, Idaho Falls, ID, 83402;
208-529-8376; jmarshall@uidaho.edu

JUSTIFICATION: Idaho wheat producers need the most recent information and technology to improve production efficiency, increase economic returns, and maintain their competitiveness. Cooperative Extension programs enhance technology transfer to growers and industry personnel through cereal schools, published materials, cereal nurseries, demonstrations and field tours.

Idaho has extremely diverse growing conditions for wheat. Few varieties are widely adapted to all environments. Appropriate variety selection is critical for maximizing grower financial returns. Extension Wheat Nurseries provide an objective, uniform, and statistically sound evaluation of several winter and spring wheat varieties or advanced lines (candidates for release) in diverse Idaho environments. Public varieties, especially from Idaho, Oregon, Washington, and Utah, as well as selected private entries are evaluated. The testing program is statewide in scope. Since it is not feasible to locate wheat breeder nurseries in all geographic areas of Idaho, the Extension nurseries provide performance information critical for the release of varieties for specific areas and management systems.

In addition to providing much needed performance data for the wheat entries, the Extension Wheat Nurseries, which are located mostly in grower fields, serve as excellent demonstration tools for the transfer of wheat technology to growers and agribusiness personnel. Exposure to new varieties and/or advanced lines, and in some cases market classes, can increase the rate at which the new alternatives are evaluated or adopted by the producer. The nurseries also provide increased exposure of the programs and activities of the Idaho Wheat Commission and Idaho Grain Producer Association.

HYPOTHESIS & OBJECTIVES: The hypothesis is that the relative performance of varieties, new releases, and advanced lines differ in the diverse environments in the state. The specific objectives are

- To evaluate the agronomic performance of current varieties, advanced lines, and classes of winter and spring wheat at diverse locations in Idaho.
- To hasten the adoption of improved varieties by increasing their exposure to Extension workers, growers, and agribusiness personnel.
- To inform producers and supporting agribusinesses of new cereal technology.
- To support local county wheat extension programs.

PROCEDURES:

Extension Wheat Nurseries

The Extension Wheat Nurseries are coordinated through the leadership of the Extension Cereal Specialists. County Extension Educators are the local coordinators of the trials. Fourteen winter nurseries were planted and 11 spring nurseries are planned for the 2012 season. There are 2 winter nurseries (late and early) and 1 spring irrigated nursery in SW Idaho, 6 winter nurseries (3 irrigated, 3 dryland) and 5 spring nurseries (4 irrigated, 1 dryland) in SE Idaho, 6 winter (all dryland or rainfed) and 3 spring nurseries (all dryland) in north Idaho. Whereas most trials are conventionally planted, three nurseries (three in northern Idaho and one in SE Idaho) are direct seeded. The winter and spring nurseries typically include soft white, hard red, and hard white wheat classes and at times durum. The nurseries emphasize the evaluation of new varieties or advanced lines (with excellent potential for release) for which local performance data is lacking. Nursery entries are evaluated for stand establishment, winter survival, disease and insect pests, yield, test weight, protein, plant height, and lodging. Similar procedures are used in all nurseries. The entries are randomized and replicated (three or four times) in a randomized complete block design to provide for objective evaluations and statistical analysis.

Wheat quality is a concern and wheat samples harvested from the Extension Wheat nurseries are submitted to the Wheat Quality Lab in Aberdeen, directed by Katherine O'Brien, for milling and baking tests and the wheat quality information compiled with the agronomic information. The information is critical to breeders and the industry for determination of advanced line performance in diverse Idaho environments.

Field Tours

Field tours are conducted at several Extension Wheat Nurseries or variety strip demonstrations to provide growers and industry personnel the opportunity for viewing the varieties and their differences in agronomic characteristics. The tours are used to present results from previous nurseries, as well as other pertinent wheat research. The information shared invariably goes beyond the question of variety selection. Marketing, pest control (weeds, insects, and diseases), water management, fertilization practices and other topics may be covered as well. Specific concerns of producers are also addressed. Maximum use of the nurseries by County Extension and industry personnel is encouraged. Producers or fieldmen visit the nurseries at times other than the scheduled tour.

DURATION: Continuous

COOPERATION: Aberdeen Wheat Quality Laboratory: Katherine O'Brien, Director
County Extension Educators, public and private breeders, and grower cooperators.

ANTICIPATED BENEFITS/EXPECTED OUTCOMES/INFORMATION TRANSFER: Idaho wheat producers will receive the most recent wheat variety performance information to improve production efficiency, increase economic returns, and maintain their competitiveness. Information on variety performance is shared with growers and industry personnel through cereal schools, published materials, wheat nurseries, demonstrations, field tours and the Internet.

LITERATURE REVIEW: None

COMMODITY COMMISSION BUDGET FORM

Allocated by	Idaho Wheat Commission	during FY 2011	$ 25,900
Allocated by	Idaho Wheat Commission	during FY 2012	$ 25,052

REQUESTED FY 2013 SUPPORT:

	Salary	Temporary Help	Fringe	Travel	OE	CO	Grad Fees	TOTALS
Idaho Wheat Commission	$ -	$ 12,088	$ 6,165	$ 6,100	$ 4,737	$ -	$ -	$ 29,090

OTHER RESOURCES (not considered cost sharing or match):

a) Industry	$ 9,500
b) UI (salaries, operating)	$ 62,000
c) Other (local, state)	$ -
d)	$ -
e)	$ -
TOTAL OTHER RESOURCES	$ 71,500

TOTAL PROJECT ESTIMATE FOR FY 2013:	$ 29,090 *(Requested)*	$ 71,500 *(Other)*	$ 100,590 *(Total)*

BREAKDOWN FOR MULTIPLE SUB-BUDGETS:

	(PI name)	*(PI name)*	*(PI name)*	*(PI name)*
Salary	$ 7,300	$ 2,288	$ 2,500	$ -
Temporary Help	$ 3,723	$ 1,167	$ 1,275	$ -
Fringe Benefits	$ 3,000	$ 100	$ 3,000	$ -
Travel	$ 2,900	$ 650	$ 1,187	$ -
Operating Expenses	$ -	$ -	$ -	$ -
Capital Outlay	$ -	$ -	$ -	$ -
Graduate Student Fees	$ -	$ -	$ -	$ -
TOTALS	$ 16,923	$ 4,205	$ 7,962	$ -

Total Sub-budgets $ 29,090

10.31.2011 - Version

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CURRENT AND PENDING SUPPORT Form:

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Name: Juliet Marshall

NAME (List PI/PD #1 First)	SUPPORTING AGENCY AND AGENCY NUMBER	TOTAL $ AMOUNT	EFFECTIVE AND EXPIRATION DATES	% OF TIME COMMITT-ED	TITLE OF PROJECT
	Current:				
Marshall, J.M., Brown, B., and Finkelnburg, D.	Idaho Wheat Commission	$25,909	7/1/11 – 6/30/12	10	Education for What Production / Extension Wheat Nurseries
Marshall, J.M., Brown, B., and Finkelnburg, D.	Idaho Barley Commission	$10,932	7/1/11 – 6/30/12	10	Education for Barley Production / Extension Nurseries
Marshall, J.M. and Patterson, P.	Idaho Wheat Commission	$9,746	7/1/11 – 6/30/12	10	Production Systems and Wheat Varieties for Dryland Grain
Marshall, J.M.	USDA-ARS SCA	$30,000	10/1/11 – 9/31/12	25	Management of Wheat and Barley Root Pathogens in Idaho
Marshall, J.M.	Bayer Crop-Sciences, BASF, Syngenta, etc.	$74,149	11/1/11 – 1/1/12	10	Various Service Contractsf for Seed Treatment / Specialty Trials / Product Evaluation
Marshall, J.M.	Idaho State Funding	$17,847	7/1/11 – 6/30/12	15	Barley Enhancement Program
Marshall, J.M., Chen, J., and Hole, D.	Idaho Wheat Commission	$14,566	7/1/11 6/30/12	1	Dwarf Bunt Resistance and Nursery
Chen, J., Marshall J.M., Wheeelr, J., Zhao, W.	Idaho Wheat Commission	$19,066	7/1/11 – 6/30/12	2	Marker-Assisted Breeding of Fusarium Head Blight Resistance in Wheat
Marhsall, J.M.	Idaho Wheat Commission	$1,800	7/1/11 – 6/30/12	2	Winter Food Barley Breeding Cooperative Program
Marshall, J.M.	Hatch Project	$2,569	10/1/11 – 9/31/12	15	Cereal Root Disease

	Pending:				
Hayes, P., etc. etc., Flowers, M., Guy , S., Marshall, J.M., Wiersma, J.	USDA-AFRI	$750,000	10/1/11 – 9/30/12	10	Bringing barley to the table: addressing the challenges of climate change and human nutrition
Marhsall, J.M., Brown, B., and Finkelnburg, D.	Idaho Wheat Commission	$25,909	7/1/12 – 6/30/13	10	Education for Wheat Production Extension Wheat Nurseries
Marshall, J.M., Brown, B., and Finkelnburg, D.	Idaho Barley Commission	$10,932	7/1/12 – 6/30/13	10	Education for Barley Production / Extension Nurseries
Marshall, J. M. and Patterson, P.	Idaho Wheat Commission	$9,746	7/1/12 – 6/30/13	10	Production Systems and Wheat Varieties for Dryland Grain
Marshall, J.M. & Finkelnburg, D.	Idaho Wheat Commission	$10,270	7/1/12 – 6/30/13	1	Support Scientist Funding – Education for Idaho Wheat Production Extension Cereal Nurseries
Marshall, J.M. & Finkelnburg, D.	Idaho Barley Commission	$5,285	7/1/12 – 6/30/13	1	Support Scientist Funding – Education for Idaho Barley Production Extension Cereal Nurseries

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CURRENT AND PENDING SUPPORT Form:

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Name: Brad Brown

NAME (List PI/PD #1 First)	SUPPORTING AGENCY AND AGENCY NUMBER	TOTAL $ AMOUNT	EFFECTIVE AND EXPIRATION DATES	% OF TIME COMMITT-ED	TITLE OF PROJECT
	Current:				
B.D. Brown	IWC	3,600	7/1/11-6/30/12	4	Extension Wheat Nurseries
B.D. Brown	IWC	3,500	7/1/11-6/30/12	6	The Cereal Sentinel
B.D. Brown	IBC	1,920	7/1/111-6/30/12	4	Barley Education
B.D. Brown	USDA-Hatch	1,686	7/1/11-6/30/12	48	Plant and Soil Test Calibration
	Pending:				
Marshall, J., B.D. Brown, J. Johnson	IWC	4,205	7/1/12-6/30/13	14	Extension Wheat Nurseries
B.D. Brown	IBC	2,432	7/1/12-6/30/13	4	Education for Idaho Barley Production: Extension Cereal Nurseries

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CURRENT AND PENDING SUPPORT Form:

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Name: James Johnson

NAME (List PI/PD #1 First)	SUPPORTING AGENCY AND AGENCY NUMBER	TOTAL $ AMOUNT	EFFECTIVE AND EXPIRATION DATES	% OF TIME COMMITT-ED	TITLE OF PROJECT
	Current/Active:				
Johnson J.	U.S. Dry Pea and Lentil Council	$17,454	7/1/2011 – 6/30/2012	2%	Pea, Lentil and Chickpea Extension Variety Trials in Northern Idaho
Johnson J.	Idaho Wheat Commission	$9,800	7/1/2011 – 6/30/2012	2%	Support Scientist funding – Education for Idaho Wheat Production: Extension Cereal Nurseries
Johnson J.	Idaho Barley Commission	$5,040	7/1/2011 – 6/30/2012	2%	Support Scientist Funding – Education for Idaho Barley Production: Extension Cereal Nurseries
Johnson, J.	Idaho Wheat Commission	$129,337	7/1/2011-6/30/2012	2%	Developing soft white winter wheat for Idaho
Johnson, J.	USDA	$79,522	9/1/2011-8/31/2012	2%	PCN Eradication
Johnson, J.	USDA	$105,122	9/30/2011-9/29/2012	2%	Stimulation of hatching of Globodera pallida
	Pending				
Johnson, J.	U.S. Dry Pea and Lentil	$18,954	7/1/12-6/30/2013	2%	Pea, Lentil and Chickpea Extension Variety Trials in Northern Idaho
Johnson, J.	Idaho Barley Commission	$5,050	7/1/12-6/30/2013	2%	Support Scientist Funding – Education for Idaho Barley Production: Extension Cereal Nurseries
Marshall, J., Brown, B., Johnson, J.	Idaho Wheat Commission	$7,962	7/1/12-6/30/2013	2%	Extension Wheat Nurseries

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INTERNAL PEER REVIEW/PRINCIPAL INVESTIGATOR VERIFICATION FORM

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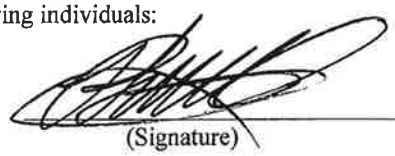
INTERNAL PEER REVIEW VERIFICATION

Commodity commissions/organizations require internal peer review by colleagues familiar with the subject matter. This proposal has been peer reviewed by the following individuals:

Reviewer 1: Dr. Phil Nolte (Type/Print name)  (Signature) 12-19-11 (Date)

Reviewer 2: Paul Patterson (Type/Print name) Paul J. Patterson (Signature) 12/20/11 (Date)

Dept. Head/ Unit Administrator: Dr. James Johnson (Type/Print name) James B. Johnson (Signature) 9 Jan. 2012 (Date)

PROGRESS REPORT

PROJECT NO: BJKV34, BJKV35, BJKV36

TITLE: Education for Idaho Wheat Production: Extension Wheat Nurseries and Demonstrations

PERSONNEL: Dr. Juliet M. Marshall, Ext. Cropping Systems Mgmt Specialist, Aberdeen
Dr. Brad Brown, Ext. Soil and Crop Mgmt Specialist, Parma
Dr. James B. Johnson, Entomologist, Department Head (Moscow)
Doug Finkelnburg, Research Support Scientist, Moscow

ADDRESS: Dr. Juliet M. Marshall, 1776 Science Center Drive, Suite 205, Idaho Falls, ID 83210. 208-397-4181; jmarshall@uidaho.edu

ACCOMPLISHMENTS: Replicated wheat trials were conducted at fourteen winter and nine spring locations for harvest in 2011. All trials were located on grower fields except Parma, Moscow, Kimberly and Aberdeen, which were located on University of Idaho Research and Extension Centers. Trials on producer's fields received the same management as did the surrounding field area. Five winter and five spring trials were irrigated and nine winter and four spring trials were rainfed. Numbers of entries, average yield, and yield range is given in Table 1. At selected locations data were collected for winter survival, heading date, plant height, and lodging. Grain yield, test weight and agronomic data from all sites were determined and samples were taken for laboratory evaluation of grain protein, kernel hardness and milling and baking quality. In addition to the more common market classes, durum varieties were included at some locations.

Milling and baking of harvest subsamples are still being processed. Available agronomic data have been sent to cooperating breeders and county extension offices, and are available on University websites. Data are being prepared for presentation at other venues to insure the information is provided to as wide an audience as possible. Winter results were distributed last fall to various popular press outlets and this will be repeated for spring trial results. Refer to the publications below for a complete listing. In addition to the winter reports, oral reports are given in cereal schools and at other grower meetings.

Field tours were held at many sites in collaboration with county extension educators and these provided excellent opportunities for technology transfer on many cereal related topics. Trial sites were located as much as possible on roadways where large signs could acknowledge the support from the Idaho Wheat Commission. Many sites had individual plots identified with variety markers to facilitate site visits by interested persons (industry and growers) at times other than scheduled tours. Cereal schools, coordinated by specialists, county educators and industry, were held at several locations throughout the state and afforded an opportunity to present the variety information as well as other related cereal management and marketing information.

Environmental conditions were highly varied throughout the state. Throughout the state, stripe rust became epidemic after overwintering in many locations. At Aberdeen, it was the coldest April, May and first two weeks of June ever recorded, resulting in devastating infections of stripe rust when not controlled with fungicides. The late and long spring resulted in late spring planting at the upper elevations, and cooler than average conditions persisted into the summer for all locations.

In southwest Idaho, the delayed planting spring wheat likely reduced grain yield. Stripe rust reduced yields of winter and spring wheat as there was no attempt to control the disease.

In southeast Idaho, there was significant wireworm damage in many dryland and irrigated production areas. Harvest was delayed by up to 7-10 days due to the cooler summer, and high grain moisture was an issue at harvest in the higher elevation spring grain. The fall was warm and permitted late harvests to be completed. In Ashton, the wheat was harvested three weeks after the barley due to late

varieties that didn't dry down. Snow fell on top of the unharvested wheat, increasing the lodging and impacting quality.

Winter wheat performance information for 2011: No one variety was dominant across the state as expected given the diversity of Idaho production systems and environments, and due to limited inclusion at all locations. Many varieties susceptible to stripe rust suffered significant damage due to the region-wide epidemic. In Northern Idaho, the highest yielding soft white wheats were Bruneau (125 bu/A), Cara (125 bu/A), and WB 528 (122 bu/A). Test weights averaged 60.9 bu/A, and overall yield for the trials were 113 bu/A.

In SW Idaho, striking yield differences among winter and spring entries were due primarily to entries ranging widely from completely susceptible to resistant to stripe rust. Outstanding rainfed yield was due to above normal rainfall during June. Of the named varieties, the soft white winter wheat Bruneau and AP Legion yielded over 150 bu/A, and the hard red winter wheats Moreland, Norwest 553 also yielded greater than or equal to150 bu/A.

In SC and SE Idaho, stripe rust had a huge impact on yield, significantly reducing test weight and at times plant height. SY Ovation, WB-Junction, Bitterroot and Bruneau were soft whites among the highest yielding group in the three irrigated sites, and AgriPro Legion, AgriPro Salute, Simon and WB 528 performed the best in the varieties under dryland production. Among hard wheats, entries Greenville, Yellowstone, WB-Arrowhead, and Promontory were in the highest yield group averaged over the irrigated sites. Curlew, Lucin-CL and DW were the highest yielding hard wheats under Ririe dryland conditions, and Utah 100, SRG, and Bonneville did well in Rockland.

Spring wheat performance information for 2011: For the soft white spring groups in Northern District, JD (club) (84 bu/A) and Diva (83 bu/A) were the highest yielding varieties. In SC and SE Idaho, Babe, Alturas, and UI Whitmore were in the high yield group. In the Soda Springs dryland location of Eastern District, Alturas, Cataldo and JD (club) yielded 57, 56, and 52 bu/A, respectively.

Among hard wheats, UI-SRG (115 bu/A), Expresso (76 bu/A), and WB-Hartline (HW) (74 bu/A) were the highest yielding in Northern Idaho. Average test weight was 61.9 lbs/bu. In SC and SE Idaho, Otis, WB-Idamax, Jerome, and Malbec (114, 110, 110, and 108 bu/A, respectively) were the superior performers in irrigated trials. In the Soda Springs dryland trial, Klasic, Lolo, Lochsa, and Otis yielded best (45, 45, 44, and 44 bu/A, respectively), with a nursery average of 37 bu/A. The hard spring trial had average proteins of 14%.

Additional information can be found on the website http://www.extension.uidaho.edu/cereals/, where links to all reports in all districts are available.

PUBLICATIONS:

Brown, B. Spring Cereal Variety Performance. The Cereal Sentinel. Issue 56. Feb. 11, 2011. pp 2-5.

Brown, B. Winter Cereal Variety Performance. The Cereal Sentinel. Issue 58. Oct. 1, 2011. pp 2-7.

Marshall, J.M., Jackson, C.A., Shelman, T., Beck, L., and O'Brien, K. 2011. 2011 Small Grains Report, Southcentral and Southeast Idaho Cereals Research and Extension Program. Idaho Agricultural Experiment Station. UI Research Bulletin. 120 pp.

Marshall, J.M., Brown, B.D., and Finkelnburg, D. 2011. 2010 Idaho Winter Wheat Variety Performance Tests and 2008-2010 Yield Summaries. Idaho Grain Producers magazine. p.21-23, Winter 2011.

Marshall, J.M., Brown, B., Finkelnburg, D., and Zemetra, E. 2010 Idaho Spring Wheat Variety Performance Tests and 2006-2008 Yield Summaries. Idaho Grain Producers magazine. p.19-20. Spring 2011.

Finkelnburg, D. and Zemetra, R. 2011. 2010 Small Grain and Grain Legume Report. University of Idaho Research Bulletin. Spring 2011.

In addition the tables were sent out specifically to Idaho, Oregon, Washington and Montana seed dealers, and extension personnel, PNW public and private wheat and barley breeders and specialists.

Table 1. Wheat nursery locations and site information, 2011 harvest.

Location	District[§]	Winter/ Spring	Irrigated/ Dry	Number of Entries	Average Yield*	Yield Range
Bonners Ferry	N	W	Dry	33	102	59-122
Lewiston	N	W	Dry	33	126	78-146
Genesee	N	W	Dry	33	138	127-151
Moscow	N	W	Dry	33	101	55-121
Craigmont	N	W	Dry	33	89	81-98
Craigmont	N	S	Dry	33	63	40-85
Genesee	N	S	Dry	33	74	63-85
Bonners Ferry	N	S	Dry	33	58	18-93
Parma	S	W	Irrigated	38	117	19-157
Parma - late	S	W/S	Irrigated	33	95	45-128
Parma	S	W	Dry	27	76	42-101
Parma	S	S	Irrigated	34	89	35-114
Kimberly	S	W	Irrigated	53	123	81-156
Rupert	E	W	Irrigated	53	98	60-121
Rupert	E	S	Irrigated	51	96	47-123
Aberdeen	E	W	Irrigated	53	141 (65)	119-148 (20-153)
Rockland	E	W	Dry	25	27	22-31
Ririe	E	W	Dry	53	11	7-19
Soda Springs	E	W	Dry	15	70	55-78
Aberdeen	E	S	Irrigated	53	114 (75)	77-141 (23-109)
Idaho Falls	E	S	Irrigated	53	129	98-143
Ashton	E	S	Irrigated	53	97	72-112
Soda Springs	E	S	Dry	38	44	25-64

*The yields reported in parentheses were from replications within the variety trials that were not sprayed with fungicides. The higher yields were from plots sprayed twice with fungicides (full rate of Quilt applied with herbicide application and at heading.)

[§]Previously four districts, the Extension Districts are now composed of the Northern, the Southern and the Eastern Districts