



U.S. Wheat & Barley  
Scab Initiative

**FY18 USWBSI INDIVIDUAL PROJECT PROPOSAL(S)**

NOTE: This document will be retained in the USWBSI's NFO

**COVER PAGE**

**Instructions:** Update any contact information that is not correct and sign cover page before submitting full Individual Project Proposal(s).

<b>USWBSI Consolidated Funding Title:</b>	<i>Fusarium Head Blight Resistance for Montana Spring Wheat.</i>
<b>Principal Investigator (PI):</b>	Luther Talbert
<b>PI's Institution:</b>	Montana State University
<b>PI's Address:</b>	Plant Sciences & Plant Pathology P.O. Box 173150 406 Leon Johnson Hall Bozeman, MT 59717-3150
<b>PI's E-mail:</b>	ltalbert@montana.edu
<b>PI's Phone:</b>	406-994-5060
<b>Fiscal Year (FY):</b>	2018
<b>Award Period:</b>	05/06/18 - 05/05/19
<b>ARS Agreement Number:</b>	59-0206-5-004
<b>Institution's Indirect Cost Rate for the USWBSI for FY18:</b>	5% DC
<b>USWBSI's FY18 Total Recommended Amount:</b>	<b>\$ 16,109</b>
<b>USDA-ARS FY18 Total Award Amount:</b>	<b>\$ 15,609</b>

USWBSI Project ID	USWBSI Research Category	USWBSI Project Title	PI Requested Amount	USWBSI's Recommended Amount	ARS Award Amount
FY18-SP-012	VDHR-SPR	Fusarium Head Blight Resistance for Montana Spring Wheat.	\$ 15,000	\$ 16,109	\$ 15,609
<b>FY18 USWBSI's Total Recommended/ARS Award Amount</b>				<b>\$ 16,109</b>	<b>\$ 15,609</b>

# FY18 USWBSI INDIVIDUAL PROJECT PROPOSAL

## PROJECT SUMMARY PAGE

### *Principal and Co- Investigator(s):*

**Principal Investigator:** Luther Talbert

**Institution:** Montana State University

**Co-Investigator #1:**

**Institution:**

**Co-Investigator #2:**

**Institution:**

**Co-Investigator #3:**

**Institution:**

**Project Title 1:** *Fusarium Head Blight Resistance for Montana Spring Wheat.*

### PROJECT SUMMARY

Our focus is to introduce genes for Fusarium head blight resistance into the germplasm base for the Montana public spring wheat breeding program. Our participation in the WheatCAP program and the Uniform Regional Nursery system has allowed us to evaluate lines from neighboring programs to use as parents. In particular, FHB-resistant lines that perform well in local nurseries have been used yearly in our crossing blocks. Initial selection in head rows is for agronomic characteristics of interest to Montana growers. Lines that advance to statewide nurseries are then entered into screening nurseries conducted in Idaho and Montana. We will continue this approach as the foundation of our efforts for the current grant. In addition, in cooperation with Jason Cook, we are using markers for the Sumai3 3B QTL to introduce *Fhb1* into several of our most advanced lines and varieties. Several lines are at the fourth backcross generation, and we will now select homozygous resistant types for further agronomic and FHB testing. Our objective is to develop FHB-resistant varieties for dryland and irrigated spring wheat production in Montana.

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## Project Description

Efforts to increase FHB resistance on the Montana spring wheat program have included a focus on incorporating resistance genes into our standard germplasm base. First, we have selected lines from regional nurseries, especially the Uniform Regional Hard Red Spring Wheat nursery, with documented FHB resistance for use as parents. These lines have included ones known to carry *Fhb1* such as Rollag and SD4181, as well as others (Lang, ND819, RB07, Glenn, SD4250, Traverse, Faller) that showed non-*Fhb1* resistance in regional screening nurseries. Progeny from crosses of FHB resistant lines with adapted Montana material have been incorporated into our standard breeding pipeline. Selection has proceeded based on agronomic characteristics to the point that lines with an FHB-resistant parent are in statewide yield trials. One parent that has yielded several progeny lines that have survived selection to the point of entry into our four location Preliminary Yield Trial is the Minnesota variety RB07. Four of the RB07-derived lines were screened in inoculated nurseries in 2017. Data from the Idaho nursery showed very low infection (0 to 3%) in lines MT1717, MT1716, and MT1731. This compares to scores of 40% for susceptible control Klasic, and 37% for the known-susceptible Montana variety McNeal. These lines were also entered into an inoculated nursery in Montana, though data has not been tabulated yet. Lines from additional crosses have also advanced through head row selection. The South Dakota line Traverse has several progeny in our F<sub>6</sub> yield trial nursery grown in Bozeman. FHB-resistant parents with several progeny lines in our F<sub>5</sub> nursery include Rollag and SD4181 with *Fhb1*, and Lang with a different gene for resistance. Thus, the frequency of potentially commercial FHB-resistant lines in our advanced trials is increasing. The increased FHB screening has also given us a better sense of our current germplasm. For instance, the variety McNeal was dominant in Montana for several years in the 1990's, and has shown high susceptibility in most screening nurseries. Our current most popular variety, Vida, typically shows moderate resistance. Our newest variety lanning include Glenn as a parent, and has shown a moderate level of resistance to FHB.

In addition to our traditional crossing and selection program, in cooperation with Jason Cook we have conducted a marker-assisted selection program with the *fhb1* and the QTL for resistance on chromosome 5A. We are currently at the fourth backcross into popular cultivars McNeal, Duclair, Vida and Lanning. An interesting discovery in the past two years has been that *Fhb1* provides some degree of resistance to damage caused by our major insect pest, the wheat stem sawfly. We have tested four sets of near-isogenic lines (NIL) in sawfly infested sites, including NIL in Norm and Wheaton backgrounds, and NIL developed from tilling (mutagenesis) populations. In both 2015 and 2016, the group of NIL with the *Fhb1* allele has shown significantly less cutting by the wheat stem sawfly than their counterparts with the allele for FHB-susceptibility. However, this effect has been inconsistent across the NIL backgrounds. Though the effect has been modest (approximately a 20% reduction in cutting), this may provide increased incentive for Montana farmers to plant FHB resistant varieties.

## Objective

Develop hard red spring varieties with resistance to Fusarium head blight for Montana.

## Plan of Work

The past three years have seen a new infusion of material into the program with FJHB resistance. We will continue to include FHB lines as parents in our annual crossing block, concentrating on material from Minnesota, North Dakota, and South Dakota. The Hard Red Spring Wheat Uniform Regional Nursery is an excellent source of new material for us. The 2017 nursery grown in Bozeman has several lines with FHB resistance and the best of these will be used in our 2017/18 crossing block. We also continue evaluation of lines currently in the program. Selections have not yet been made based on 2017 data, but we will include resistance to FHB as an important criteria to insure advanced nurseries contain FHB

## FY18 USWBSI INDIVIDUAL PROJECT PROPOSAL

resistant material. We will continue to utilize the screening nurseries in Idaho and Montana to select for resistance.

Our strategy for the core variety development program will remain to evaluate progeny for agronomic suitability in initial generations, leading to a manageable number of lines to evaluate for FHB resistance. The Minnesota variety RB07 has yielded several lines that have survived head row selection and an initial yield trial in Bozeman. However, a risk of concentrating on agronomics in initial generations is that we may inadvertently select against FHB resistance in our segregating materials. In fact, several crosses we have made in the past have begun the head row selection process with 100 or so lines, from which none have been advanced to statewide trials. Thus, we will also continue an MAS project in cooperation with Dr. Jason Cook to incorporate FHB resistance at both the 3B and 5A QTL into Montana spring wheat. At this point, we will derive lines from the final backcross for agronomic and resistance testing. Recurrent parents included in this project include the leading solid stemmed, sawfly-resistant variety, Duclair, as well as our newest release Lanning.

A final project we will complete in the next year or two is the evaluation of near-isogenic lines for Fhb1 in wheat stem sawfly-infested areas. This entails planting replicated plots of each of the in sawfly-infested areas of Montana, and determining the impact of Fhb1 on sawfly cutting. During the course of this grant, we will evaluate the fate of sawfly larvae in stems from our 2017 trials. This information will be used to determine the extent of our trials in 2018 and 2019.

### **Timeline**

The breeding pipeline now has materials with FHB resistance at all levels. We will make new crosses each year with new resistant lines to continue to insure a steady output of resistant material. Material from advanced nurseries will be entered into screening nurseries in order to verify and select resistant types. Our goal is to continue the process in with the goal that variety releases in the near future will not only have the agronomic characteristics needed for Montana production, but will also have resistance to FHB.

**FY18 USWBSI INDIVIDUAL PROJECT PROPOSAL**

**BUDGET JUSTIFICATION**

<b>Project Title 1: Fusarium Head Blight Resistance for Montana Spring Wheat.</b>	
<b>Principal Investigator: Luther Talbert</b>	
<b>Total USWBSI Recommended Amount for FY18:</b>	<b>\$ 16,109</b>
<b>ARS Award Amount for FY18:</b>	<b>\$ 15,609</b>

**Instructions:** Complete all applicable sections below where funds are being requested; description (left columns) and requested amount (right column). If budget category is not applicable, leave line item blank.

**NOTE:** All amounts **must be rounded** to the nearest whole number.

<b>A. SENIOR/KEY PERSON:</b> In fields below, add details for salary and fringe benefits associated with the Senior/Key Person (i.e. PI/PD). <b>Details should include PI's Base Salary (\$), the number of Calendar, Academic and/or Summer months/time to be devoted to the award agreement.</b> Provide subtotals for both 'Salary' and 'Fringe Benefits' to the right of the descriptive details. The total amount requested for the Senior/Key Person category should be included in the far right column.		<b><u>TOTAL \$</u></b> <b><u>AMT.</u></b> <b><u>REQUESTED</u></b> <b><u>FOR</u></b> <b><u>SENIOR/KEY</u></b> <b><u>PERSON</u></b>
Salary:	\$	\$
Fringe Benefits:	\$	

<b>B. OTHER PERSONNEL:</b> For each sub category listed below, add details for salary and fringe benefits associated with that sub category. Details should include the percentage of time (months)/total hours to be devoted to the funding, rate of pay and fringe rate. Include the amounts requested for Salary, Fringe Benefits and number of personnel for each subcategory (Post Doc, Graduate Students, Undergraduate Students, etc.) as well as the total amount. The TOTAL amount requested for ALL 'Other Personnel' should be entered in the far right column.			<b><u>TOTAL \$</u></b> <b><u>AMT.</u></b> <b><u>REQUESTED</u></b> <b><u>FOR OTHER</u></b> <b><u>PERSONNEL</u></b>
	<b>Sub Total \$</b> <b>Amts. Request</b> <b>for Salary and</b> <b>Fringe Benefits</b>	<b>Total \$Amt.</b> <b>Requested per</b> <b>Sub</b> <b>Category(ies)</b>	<b>\$13700</b>
<b>Post Doctoral Associates</b>			
Salary:	\$	\$	
Fringe Benefits:	\$		
Number of Post Doc Personnel:			
<b>Graduate Students. NOTE:</b> Graduate Student Tuition/Fees/Health Insurance should be included in section 'Participant/Trainee Support Costs' (E1).			
Salary:	\$	\$	
Fringe Benefits:	\$		
Number of Graduate Student Personnel:			
<b>Undergraduate Students</b>			
Salary:	\$	\$	
Fringe Benefits:	\$		
Number of Undergraduate Student Personnel:			
<b>Secretarial/Clerical</b>			
Salary:	\$	\$	
Fringe Benefits:	\$		
Number of Secretarial/Clerical Personnel:			
<b>Other – Research Technician</b>			
Salary: Provides 2 month funding for a research associate at \$5000 per month.	\$ 10,000	\$ 13,700	
Fringe Benefits: (37% as per university guidelines)	\$ 3,700		
Number of Other – Research Technician Personnel:	1		

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<b>B. OTHER PERSONNEL</b> (cont.)	<b>Sub Total \$ Amts. Request for Salary and Fringe Benefits</b>	<b>Total \$Amt. Requested per Sub Category(ies)</b>
<b>Other – Temporary Labor</b>		\$
Salary:	\$	
Fringe Benefits:	\$	
Number of Other – Temporary Labor Personnel:		
<b>Other</b>		\$
Salary:	\$	
Fringe Benefits:	\$	
Number of Other Personnel:		

<b>C. EQUIPMENT:</b> List below any items whose total dollar amount exceeds \$5,000 and has a useful life of one year or more. Justification must include relevance to proposed research and dollar amounts. Include cost per item if more than one item will be purchased AND the total amount requested for this budget category in right column.	<b>TOTAL \$ REQUESTED FOR EQUIPMENT</b>
	\$

<b>D. TRAVEL:</b> Travel costs are the projected expenses for transportation, lodging, subsistence, and related items incurred by employees who are in travel status on official business related to the Federal award. This category is only for cooperator staff travel. Provide requested amount for domestic and foreign travel (middle \$ column) in addition to the ‘Total \$ Requested for Travel’ (left \$ column). The travel costs should be supported with the purpose of the travel, the estimated amount of the trip(s) and the destination(s) if known at the time of award. It is not necessary to identify traveler names and travel dates.	<b>TOTAL \$ REQUESTED FOR TRAVEL</b>
<b>D.1. Domestic Travel (DT):</b> List below proposed trips individually and describe their purpose in relation to the award. Also provide dates, destination, and number of travelers where known. Include total amount per sub category below next to ‘\$’ and total amount requested for DT in middle column. Enter the total for Travel (DT and FT) in far right column.	\$
<b>Research Related</b> (e.g. travel to research plots):	\$
<b>Non-Research Related</b> (i.e. professional meetings):	
FHB Forum:	\$
Other Conferences/Meetings:	\$
<b>D.2. Foreign Travel (FT):</b> List below proposed trips individually and describe their purpose in relation to the award. Also provide dates, destination, and number of travelers where known. Include total amount per sub category below and total amount requested for FT in column on the right.	
<b>Research Related</b> (e.g. travel to research plots):	\$
<b>Non-Research Related</b> (i.e. professional meetings):	\$

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<b><u>E. PARTICIPANT/TRAINEE SUPPORT COSTS (P/TSC):</u></b> <i>Participant support costs</i> means direct costs for items such as stipends or subsistence allowances, travel allowances, and registration fees paid to or on behalf of participants or trainees (but not employees) in connection with conferences, or training projects. The cost of training and education provided for employee (i.e. Graduate and Undergraduate Students) development is allowable. Include total amount per sub category below next to '\$' and total amount requested for 'Participant/Trainee Support Costs' in column on the right (i.e. Total \$ Requested).		<b><u>TOTAL \$ REQUESTED FOR P/TSC</u></b>
1. Tuition/Fees/Health Insurance:	\$	\$
2. Stipends:	\$	
3. Travel:	\$	
4. Subsistence:	\$	
5. Other:	\$	

**F. OTHER DIRECT COSTS (ODC):** This section contain multiple sub categories. Totals per sub category are required in addition to the total requested for Other Direct Costs (far right column). If there are additional sub categories under the main sub categories (i.e. Materials and Supplies), provide a total as well.

<b><u>F.1. Materials and Supplies (M/S):</u></b> In the space below, provide as much detail and specificity as possible for all materials and supplies associated with proposed research. Materials and Supplies should be described in detail e.g., chemical reagents, printer/field paper and supplies, glassware, lumber, etc. under each sub category (Field, Greenhouse, Laboratory and Other). Include total amount per sub category below next to '\$' and total amount requested for M/S in the middle column (i.e. Total \$ Amt. Requested – M/S)		<b><u>Total \$ Amt. Requested - M/S</u></b>	<b><u>TOTAL \$ AMT. REQUESTED - ODC</u></b>
<b>Field:</b> This will include gasoline, herbicide, and fertilizer for field plots, as well as envelopes and bags for planting and harvest.	\$ 600	\$ 1,166	\$ 1,166
<b>Greenhouse:</b>			
<b>Laboratory:</b> Funding will cover costs of reagents for PCR reactions	\$566		
<b>Other:</b>	\$		
<b><u>F.2. Publications and Printing Costs (PPC):</u></b> Below, provide details for any publication costs for electronic and print media, including distribution, promotion, and general handling, for which funds are being requested. NOTE: Page charges for professional journal publications are allowable provided publications report research that was supported by USDA-ARS.		<b><u>Total \$ Amt. Requested - PPC</u></b>	
		\$	
<b><u>F.3. Consulting Services (CS):</u></b> For each consultant, list below the services he/she will perform, total number of days, travel costs, and the total estimated costs. Please include names and organizational affiliations for all consultants, other than those involved in consortium/contractual arrangements.		<b><u>Total \$ Amt. Requested - CS</u></b>	
		\$	

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<b>F. OTHER DIRECT COSTS (ODC) (cont.)</b>		
<b>F.4. Automatic Data Processing /Computer Services (ADP/CS):</b> This section covers cost of computer services, including computer-based retrieval of scientific, technical, and education information. In the space below, list all ADP/CS and include the established computer service rates, if applicable.	<u><b>Total \$ Amt. Requested - ADP/CS</b></u>	
	\$	
<b>F.5. Subawards/Consortium/Contractual Costs (SCCC):</b> In the space below, provide details for all costs associated with subawards, consortium and contractual costs. The total requested amount for this sub-category should include both direct and indirect costs for all subaward/consortium organizations. A separate budget for the subaward should be included (i.e. attached to funding application).	<u><b>Total \$ Amt. Requested - SCCC</b></u>	
	\$	
<b>F.6. Equipment/Facility/Land Rental and User Fees (RUF):</b> List the total funds requested for equipment or facility rental/user fees. Justify each rental user fee by providing specific details (e.g. Land Rental Fees – number of acres/cost per acre).	<u><b>Total \$ Amt. Requested – RUF</b></u>	
	\$	
<b>F.7. Alterations and Renovations (A&amp;R):</b> List the total funds requested for alterations and renovations (A&R). Justify (i.e. required in order to carry out research) the costs of alterations and renovations, including repairs, painting, and removal or installation of partitions, shielding, or air conditioning. Where applicable, provide the square footage and costs.	<u><b>Total \$ Amt. Requested – AR</b></u>	
	\$	
<b>F.8. Other - Miscellaneous Direct Costs (OMDC):</b> Under each relevant sub category below, enter a brief description, and basis for the estimate (i.e. individual fee rate/price). Include total amount per sub category below next to '\$' and total amount requested for ODC in column on the right.	<u><b>Total \$ Amt. Requested - OMDC</b></u>	
<b>Laboratory Animal Fees:</b>	\$	\$
<b>U.S. based Winter Nurseries:</b>	\$	
<b>International Nurseries:</b>	\$	
<b>Double Haploids:</b>	\$	
<b>Other Analyses/Services:</b>	\$	
<b>Communication (postage, shipping, fax, long distance phone):</b>	\$	
<b>Photocopying:</b>	\$	
<b>Other MODC (describe):</b>	\$	

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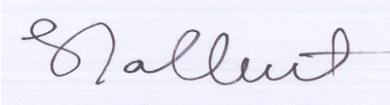
<b>H. INDIRECT COSTS (IDC):</b> Provide below your Institution's approved Indirect Cost (IDC) rate for USWBSI/USDA-ARS awards. 'Type' refers to Total Costs (TC), Direct Costs (DC), Modified Direct Costs (MDC). Rate and Type has been pre-filled by NFO based on submitted FY18 Pre-Proposals.	<b><u>TOTAL \$ AMT. REQUESTED FOR IDC</u></b>
<b>IDC Rate and Type:</b> 5% DC <b>IDC Base Amount:</b> \$14,866	\$ 743

<b>J. FEE (Small Business Act – SBIR Fee):</b> The SBIR fee is a Congressional mandated fee charged to all ARS/USWBSI awards and is applicable to <u>all non-ARS PIs</u> . The rate for FY18 is 3.2% and will be deducted from the USWBSI's recommended amount prior to the processing of the award by ARS. The <b>Formula</b> for calculating the fee is below (pre-filled by the NFO): <u>Step 1</u> – USWBSI's Total Recommended Amount/1.032 <u>Step 2</u> - Result from Step 1 should be subtracted from USWBSI Recommended Amount to obtain the SBIR Fee).	<b><u>TOTAL \$ AMT FOR FEE-SBIR</u></b>
<b>Step 1:</b> 16,109 / 1.032 = 15,609 <b>Step 2:</b> 16,109 - 15,609 = 500	\$ 500

**FY18 USWBSI INDIVIDUAL PROJECT PROPOSAL**

**PROJECT BUDGET PAGE**

**Instructions:** *Insert values from corresponding budget justification into this form.*

<b>PROJECT 1 TITLE:</b> Fusarium Head Blight Resistance for Montana Spring Wheat.		<b>PROJECT ID:</b> FY18-SP-012	<b>ARS AGREEMENT NO:</b> 59-0206-5-004
<b>PRINCIPAL INVESTIGATOR:</b> Luther Talbert			<b>Totals (\$)</b>
<b>ORGANIZATION:</b> Montana State University			
<b>A. Senior/Key Persons</b> (i.e. PI/PD) ..... →			
<b>B. Other Personnel</b> (Post-Docs, Graduate Students, Secretarial/Clerical, Research Technician, Temporary Labor, and Other) ..... →			13,700
Total Number of 'Other Personnel':		1	
<b>Total Salaries, Wages and Fringe Benefits</b> (A + B) ..... →			
<b>C. Equipment</b> ..... →			
<b>D. Travel</b> (Insert total amount for D. Travel to left and totals for subsections (1 and 2) below)..... →			
1. Domestic ..... →			
2. Foreign ..... →			
<b>E. Participant/Trainee Support Costs</b> (Insert total for E to left and totals for sub sections below)..... →			
1. Tuition/Fees/Health Insurance ..... →		\$	
2. Stipends..... →			
3. Travel..... →			
4. Subsistence..... →			
5. Other..... →			
Total Number of Participants/Trainees:			
<b>F. Other Direct Costs</b> (Insert total amount for F)..... →			1166
1. Materials and Supplies ..... →		1166	
2. Publication Costs..... →			
3. Consultant Services..... →			
4. ADP/Computer Services..... →			
5. Subawards/Consortium/Contractual Costs..... →			
6. Equipment or Facility Rental/User Fees..... →			
7. Alterations and Renovations ..... →			
8. Other - Miscellaneous..... →			
<b>G. Total Direct Costs</b> (Total Salaries, Wages and Fringe thru F) ..... →			14866
<b>H. Indirect Costs</b> ..... →			743
Rate and Type: 5% DC			
Base: 14866			
<b>I. Total Direct and Indirect Costs - ARS FY18 Award Amount</b> (G + H) ..... →			\$ 15,609
<b>J. FEE - Small Business Act – SBIR Fee</b> (3.2%) ..... →			\$ 500
<b>K. TOTAL COSTS - USWBSI FY18 Total Recommended Amount</b> (I + J) ..... →			<b>\$ 16,109</b>
<b>NAME AND TITLE</b>		<b>SIGNATURE</b> (Adobe E-Sign or insert image of signature)	<b>DATE</b>
Principal Investigator Luther Talbert			7/9/18

Budget based on OMB Number: 4040-0001

**FY18 USWBSI INDIVIDUAL PROJECT PROPOSAL  
ADJUSTMENT SUMMARY PAGE**

**USWBSI Consolidated Funding Title:** *Fusarium Head Blight Resistance for Montana Spring Wheat.*

**Principal Investigator:** Luther Talbert

**Institution:** Montana State University

**Fiscal Year:** 2018

**USWBSI's FY18 Total Recommended Amount:** \$ 16,109

**ARS Agreement Number:** 59-0206-5-004

**USDA-ARS FY18 Total Award Amount:**  
\$ 15,609

**Instructions:** Under each of the project titles listed below, please indicate the changes made to the pre-proposal that address the comments given by the Review Panel(s) and/or the Executive Committee (see table in "Letter of Instructions"). Use additional pages if necessary.

**Project Title 1:** *Fusarium Head Blight Resistance for Montana Spring Wheat.*

The budget was altered in two ways. First, funding for a research technician was increased from \$12000 to \$13700. Funding for research supplies was decreased from \$1843 to \$1166.

COMMUNICATION PLAN

**USWBSI Consolidated Funding Title:** *Fusarium Head Blight Resistance for Montana Spring Wheat.*

**Principal Investigator:** Luther Talbert

**Institution:** Montana State University

**Fiscal Year:** 2018

**USWBSI's FY18 Total Recommended Amount:**  
\$ 16,109

**ARS Agreement Number:** 59-0206-5-004

**USDA-ARS FY18 Total Award Amount:**  
\$ 15,609

**Instructions:** Using the space below, describe in detail how you plan to communicate the results from this research to your stake-holders in the most effective way. Please describe your target audience (i.e. USWBSI Administration/members, industry, private growers, interest groups etc.) and the methods (i.e. written, electronic, oral, etc.) of communication you will use to communicate your results to your audience.

The primary mode of communication will be direct contact with wheat growers and the broader agricultural community through field days and crop school presentation. The best means of communication will be in the eventual release of a widely grown FHB-resistant hard red spring wheat variety.

I agree to send copies of any printed materials (e.g. brochures, extension publications, etc.) and/or electronic versions of communication materials or URL links to materials posted on the Web to the Networking & Facilitation Office of the U.S. Wheat & Barley Scab Initiative.



Principal Investigator

Date

7/9/18