V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Global Food Security and Hunger: Cereals

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		14%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		15%	
202	Plant Genetic Resources	20%		15%	
205	Plant Management Systems	25%		20%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
212	Pathogens and Nematodes Affecting Plants	10%		5%	
213	Weeds Affecting Plants	10%		10%	
216	Integrated Pest Management Systems	15%		10%	
501	New and Improved Food Processing Technologies	0%		3%	
502	New and Improved Food Products	5%		3%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	5.2	0.0	10.0	0.0
Actual Paid Professional	5.2	0.0	9.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
158068	0	335409	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
158068	0	335409	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
158158	0	3898494	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Cereals Team conducts dozens of field trials across the state to document the performance of wheat and barley varieties; to evaluate diseases, disease resistance, and disease management techniques; and to assess fertility management, irrigation, cover crop and rotational crop options, weed management, and other cultural practices. In 2013, knowledge gained through these trials was delivered to growers and consultants through nine cereal schools and 14 various crop tours and field days. Faculty members deliver programs for pesticide applicator certification and re-certification. Team members participate as advisors to grain producers' associations and collaborate with major industry partners. Cereals Team members publish their findings in Extension publications and share new information through trade magazines and local media outlets.

2. Brief description of the target audience

Cereal growers in Idaho - will be provided with technology to enhance cereal production and profitability and provide feedback and suggestions of needs and areas of concern for profitable cereal production. They will also provide resources for the project through direct use of facilities, and through checkoff contributions to commodity commissions.

Agribusiness and support workers - will provide resources for technology development and delivery, be targets for information delivery, provide feedback and suggestions for directions of the program.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	6741	13714	63	143

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

201300342 Wheat, common, UI Stone , University of Idaho

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	5	17	22

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Idaho Cereal Schools.

Year	Actual
2013	15

Output #2

Output Measure

- Release and adoption of new cereal varieties.

Year	Actual
2013	0

Output #3

Output Measure

- Publication of CIS, Progress reports, PNW, and other Ext. Pubs.

Year	Actual
2013	7

Output #4

Output Measure

- Develop pest control technology - project/experiments.

Year	Actual
2013	8

Output #5

Output Measure

- Research on management systems - projects/experiments.

Year	Actual
2013	16

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	O: Producers gain knowledge about improved cereals management at cereal schools, field days, seminars, and re-certification events. I: Number of participants attending cereal schools, field days, etc.
2	O: Producers are aware of cereal resource publications. I: Number of cereal extension publications distributed.
3	O: Producers adopt new cereal varieties. I: Increase in number of acres of new varieties (released within 5 years; greater than previously grown).
4	O: Adoption of new crop production methods. I: Number of growers who report adoption through surveys at educational events and meetings.
5	O: An increase in the number of trained graduate students prepared to enter the workforce. I: Number of M.S. and Ph.D. candidates relevant to this topic team.
6	O: Develop environmentally adaptable wheat and barley varieties and agronomic practices that maximize productivity and profitability. I: Identify cultivars and advanced breeding lines of wheat and barley that were developed for resistance to other fungi and diseases (such as Fusarium head scab) for the potential to resist root and crown-infecting fungi.

Outcome #1

1. Outcome Measures

O: Producers gain knowledge about improved cereals management at cereal schools, field days, seminars, and re-certification events. I: Number of participants attending cereal schools, field days, etc.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1058

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
It is important for producers to be aware of new information regarding cereal varieties, pests, and fertilization and irrigation practices. Current knowledge is necessary to maintain profitable farms and to provide healthy, safe foods.

What has been done
One entomologist delivered 3 hours of workshops at 3 multistate venues that provided Integrated Pest Management (IPM) training to 121 commercial cereal producers and industry field staff in Idaho, Washington and Montana during 2013. Venues were Columbia Basin Crop Consultants Association Short course, PNW Farm forum and North Idaho Pesticide Applicator Training.

Results
An audience of 121 commercial grain growers and agricultural professionals who advise grain growers about pest management learned about IPM practices for cereal insect pests by attending workshops delivered at conferences and recertification events during 2013. Overall gain-in-knowledge (measured by 6-question pre-test:post-test administered via wireless audience response cards at 1 venue) was 64%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants

212	Pathogens and Nematodes Affecting Plants
502	New and Improved Food Products

Outcome #2

1. Outcome Measures

O: Producers are aware of cereal resource publications. I: Number of cereal extension publications distributed.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	103

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
It was important to alert growers of potential pest problems and a pest alert system and press interviews spread the information.

What has been done
Websites have been updated, new and existing publications were posted, and growers were notified at Extension events about the range of materials and how to find them.

Results
Although downloads were not summarized across the websites, faculty members have been contacted directly through the contact information posted on the websites, including inquiries by media and growers. The most common inquiries were related to pest alerts and pest management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
502	New and Improved Food Products

Outcome #3

1. Outcome Measures

O: Producers adopt new cereal varieties. I: Increase in number of acres of new varieties (released within 5 years; greater than previously grown).

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

O: Adoption of new crop production methods. I: Number of growers who report adoption through surveys at educational events and meetings.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	218

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With the high cost of electricity and the increasing shortage of water, growers are increasingly interested in when to cease irrigation of cereals.

What has been done
One faculty member wrote an article for the newspaper on final irrigation of cereals and was asked to come and review the information in the field on a growers' ranch.

Results
As a result of the farm visit, the grower turned off his water on the cereal at the appropriate time, saving 7 days of energy and redirected the water to the alfalfa crop, which grew an additional 130 ton of forage worth $19,500.

4. Associated Knowledge Areas

KA Code	Knowledge Area

202	Plant Genetic Resources
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

O: An increase in the number of trained graduate students prepared to enter the workforce. I: Number of M.S. and Ph.D. candidates relevant to this topic team.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The number of completed advanced degrees relative to this topic team remained equal to the last reporting cycle.

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants

216	Integrated Pest Management Systems
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

Outcome #6

1. Outcome Measures

O: Develop environmentally adaptable wheat and barley varieties and agronomic practices that maximize productivity and profitability. I: Identify cultivars and advanced breeding lines of wheat and barley that were developed for resistance to other fungi and diseases (such as Fusarium head scab) for the potential to resist root and crown-infecting fungi.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In the water-limited environments of Southern and Southeastern Idaho, production of dryland wheat and barley is hampered by fungal root rots that invade stress-compromised plants.

What has been done
The outcomes are the identification of advanced breeding lines and currently grown varieties with resistance or tolerance that can be used to improve resistance in current lines. In addition, we can identify the best lines to grow in areas with high disease pressure, nematode and water stress. The impacts including improving economic conditions for growers to reduce disease losses, and reduced environmental impacts with less foliar fungicide treatments needed to control disease. Clarification on effectiveness of seed treatments for control of foot rot disease is critical, but results of the seed treatment trails indicate that in most years, seed treatments are ineffective in controlling foot rot diseases, especially when measured as impact on yield. Currently, host resistance continues to be the most effective method for reducing fungal and nematode damage.

Results
The results of resistance and tolerance to cereal cyst nematode in wheat and barley have been published and progress has been made on the results for the foot rot trials.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}