V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Global Food Security and Hunger: Sugar Beets & Minor Crops

☑ 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	15%		5%	
111	Conservation and Efficient Use of Water	10%		5%	
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		10%	
202	Plant Genetic Resources	10%		10%	
205	Plant Management Systems	15%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		10%	
212	Pathogens and Nematodes Affecting Plants	10%		10%	
213	Weeds Affecting Plants	10%		10%	
215	Biological Control of Pests Affecting Plants	5%		10%	
216	Integrated Pest Management Systems	10%		10%	
402	Engineering Systems and Equipment	0%		5%	
511	New and Improved Non-Food Products and Processes	0%		5%	
	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	4.2	0.0	6.0	0.0
Actual Paid Professional	4.1	0.0	9.3	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**
139577	0	550361	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
139577	0	550361	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
153335	0	4227753	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The sugar beet and minor crops team integrated field research, demonstration, and outreach education primarily related to numerous crop pests and diseases, and to irrigation systems and soil moisture relationships. Studies exploring relationships between irrigation, soil moisture, and soil-borne pathogens such as rhyzomania and rhyzoctonia are underway in multiple settings. Field studies and tours were conducted in collaboration with growers and in UI Agricultural Experiment Station fields to study onions, sugar beets, dry beans, and sweet corn. Pest diagnostic services and treatment recommendations are provided for growers. Economically important pests studied and reported include onion thrip, Rhizoctonia, Aphanomyces, leaf minor and curly top. Significant efforts were devoted to weed management, pesticide registration, development and extension of knowledge about IPM tools, and soil moisture/irrigation protocols influencing pests and diseases. A survey was conducted to learn about IPM practices currently used by sugar beet growers.

New and practical information was shared through a dozen regional conferences and commodity schools. PNW pest management handbooks were updated and IR-4. Faculty prepared a host of Extension publications and research publications explaining their findings to end users and to other scientists.

2. Brief description of the target audience

Growers of minor crops in Idaho and western U.S., EPA, USDA, ISDA and other western departments of agriculture, regional land grant institutions, public interest groups, crop advisers and farm workers throughout Idaho are a targeted audience of this program. Other targeted audiences include sugar beet growers, growers of minor crops, and those who advise growers (i.e. sugar company fieldmen and agronomists, chemical companies, seed companies and consultants).

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	4603	93377	2	25

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

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

201300085 - Durola, University of Idaho, (RAPE)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	5	16	21

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Presentations at grower conferences and other non-extension venues.

Year	Actual
2013	27

Output #2

Output Measure

- Extension workshops, schools and conferences.

Year	Actual
2013	13

Output #3

Output Measure

- Field tours and demonstration projects.

Year	Actual
2013	10

Output #4

Output Measure

- Applied and basic laboratory and field research experiments

Year	Actual
2013	37

Output #5

Output Measure

- Professional invited presentations.

Year	Actual
2013	2

Output #6

Output Measure

- Presentations at Extension Workshops, schools, and conferences

Year	Actual
2013	13

Output #7

Output Measure

- Sugarbeet costs and returns estimates

Year	Actual
2013	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	O: growers use best practices in the production of sugar beets and minor crops. I: Number of Idaho growers indicating adoption of recommended practices (follow-up survey data).
2	O: Development of new research information. I: Research publications (peer reviewed).
3	Growers use best practices in regard to irrigation management and nutrient use efficiency in the production of sugar beet and minor crops. Indicator: Number of Idaho growers indicating adoption of recommended practices (follow-up survey data).
4	Producers have increased knowledge of pest management and water / nutrient management practices that affect the environmental and economic sustainability of sugar beet and other minor crop production. Indicator: Number of participants who demonstrate increased knowledge following Extension education programs.

Outcome #1

1. Outcome Measures

O: growers use best practices in the production of sugar beets and minor crops. I: Number of Idaho growers indicating adoption of recommended practices (follow-up survey data).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	594

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
76% of the growers in SW Idaho now utilize drip irrigation in onion fields. There is a need to educator growers on pesticide applications through drip irrigation systems, and the benefits of drip irrigation.

What has been done
Onion plots were established to test thrip control with drip irrigation three years ago; various pesticide treatments were applied. A field tour was held in summer of 2013 to discuss the benefits of drip irrigation, and the results of pesticide trials. A survey of growers was administered at the field trial

Results
90% of the growers attending the field day indicated an increase in knowledge of thrip management using chemigation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
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

Outcome #2

1. Outcome Measures

O: Development of new research information. I: Research publications (peer reviewed).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	21

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The publication of sugar beet research results benefit the scientific community, growers and industry.

What has been done
Over the course of the last reporting cycle, there were 21 peer reviewed research and extension publications.

Results
Information generated can be used as preliminary or supporting information for the sugar beet industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants

Outcome #3

1. Outcome Measures

Growers use best practices in regard to irrigation management and nutrient use efficiency in the production of sugar beet and minor crops. Indicator: Number of Idaho growers indicating adoption of recommended practices (follow-up survey data).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	204

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Field scouting is necessary to insure that pests are present in sufficient numbers above an economic threshold before taking treatment action. Unnecessary pesticide treatments impact the grower's economic viability and may harm the environment.

What has been done
Research based information about pests and treatment thresholds was disseminated on the PNWPestAlert.net website.

Results
Based on a user survey conducted in 2012, PNWPestAlert.net subscribers used field scouting to document pest levels before taking treatment actions. In some cases growers were able to reduce the number of sprays applied because information received through the website is dynamic.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
402	Engineering Systems and Equipment

Outcome #4

1. Outcome Measures

Producers have increased knowledge of pest management and water / nutrient management practices that affect the environmental and economic sustainability of sugar beet and other minor crop production. Indicator: Number of participants who demonstrate increased knowledge following Extension education programs.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	224

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In order to maintain pest management programs that are effective and economically and environmentally sound, growers need to be armed with knowledge of integrated pest management practices and options.

What has been done
IPM has been taught at sugar beet schools, grower conferences, field days and tours through the 2013 growing season. Growers and crop consultants attended these meetings in high numbers. Surveys conducted during many of these events indicate up to 90% of the attendees are better equipped with new knowledge relevant to their systems, compared to before the educational events.

Results
Based on interviews with irrigation equipment dealers from Parma to Idaho Falls, cooperators reported an increase of about 20-30% in sales of maintenance-related equipment this year. The exception was the Parma area where conversion from surface irrigation to sprinkler occurred more recently, and grower spending tends to be focused on additional conversion of surface to sprinkler irrigation. Sales of new nozzles, gaskets and sprinkler heads will help reduce leak and worn nozzle losses. The reported reduction in the time between replacement of center pivot packages from 7-10 years historically to 3-5 years currently is a response to the center pivot uniformity data and should reduce excess irrigation (and energy costs), and improve crop yield and quality within fields.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations
- Other (climate)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UI minor crops topic team members developed a drip irrigated onion plot at the Parma R & E Center three years ago. The purpose of the trial was to demonstrate drip irrigation for onion production and conduct pesticide trials using drip irrigation, or chemigation for the management of onion thrip. Throughout the last two growing seasons, data was collected on thrip counts and emergence dates, beneficial insects present in each plot, and timing and rates of pesticides used. These data were summarized and displayed on two posters at a summer field tour. The tour was help in August at the Parma R & E Center in collaboration with the Natural Resource Conservation Service, allied industry and pesticide registrants. A survey was administered during the 2013 field tour to determine impacts from conducting a field tour. The following impacts were measured:

90% of the growers indicated an increase in knowledge of thrip management using chemigation treatments

79% plan to use information they learned from the tour for their own farm management decisions

72% gained knowledge of the benefits of drip irrigation for water conservation and water quality protection

62% learned about NRCS programs to help offset initial costs of installing drip irrigation

76% of the onions planted in 2013 are irrigated with drip irrigation

66% of the growers are still interested in learning more and drip irrigation and the benefits

all growers who participated in the tour indicated that the tour was worth their time, and they acquired quality and useful information for their farming operations.

Key Items of Evaluation