

Western IPM Center Project Report Form

How to submit: Please submit this completed form electronically, as an attached Microsoft Word file, to Frank Zalom at fgzalom@ucdavis.edu. **Content:** Complete each section below, and include responses to as many of the questions listed in Attachment A as are relevant to your project. *These are guidelines.* Provide your readers with enough detail that someone who is not familiar with your project can understand what you were trying to achieve, how you went about it, and what you accomplished, but please keep it concise.

A. Report Data

Date: 10/8/2009

Reporting Period: 8/1/08 to 7/31/09

Report Type (please check one):

Progress Report Final Report

B. Grant Data

- Grant Agreement #: grant # = W2232 proposal # = 387384
- Title: Using sheep in grain fallow management to control weeds and insect pest and reduce use of pesticides and fossil fuels
- Grant Type: Research
- Lead investigator:
 - Name: Patrick Hatfield
 - Title: Professor
 - Institution: Montana State University - Bozeman
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 - Email: hatfield@montana.edu
- Team members (name, title, institution): Hayes Goosey, Research Scientist, Montana State University - Bozeman
- Andrew Lenssen, Research Scientist, USDA, ARS, Sidney, MT
- Sue Blodgett, Professor and Head, South Dakota State University
- State(s) involved: Montana, South Dakota

C. Nontechnical Summary. An overview of the project, briefly outlining the problem(s), how your project addresses them, and your results, *written to a lay audience*. (500 words)

15.5 million acres of farmland (USDA-NASS) in the western U.S. are rotated into summer fallow annually with up to 4 applications of herbicides annually for weed control. As reduced tillage practices become more common, herbicide use will continue to increase. Currently, mechanical tillage is the only practical alternative to chemical fallow. However, tillage decreases residue cover and may increase soil erosion. Herbicide use in Montana’s grain production systems represents the single largest use of pesticides in the state. Montana wheat producers alone use approximately 4.5 million pounds of active ingredient of herbicides annually for weed control on summer fallow ground. Our goal is to reduce pesticide use in grain farming operations while maintaining or improving grain production profitability. We have begun begun data analysis. Our preliminary results indicate no differences for grain yield among summer fallow systems.

D. Objectives and Progress. List your objectives and describe your progress for each objective.

Our objectives are to compare strategically managed sheep grazing to chemical and mechanical fallow on: a) weed and volunteer grain biomass reduction, and weed and weed seedbank composition and density data collection is complete b) soil nutrients and soil bulk density c) insect populations (including pest, beneficial, and benign d) grain production and quality.

We have finished all of our field work and the majority of laboratory work. We are in the process of data analysis, publication, and outreach based on our peer reviewed results

E. Outputs. List your project’s outputs, which might include publications, information, data, meetings held, attendance at meetings held, etc.

Again - preparing for data analysis and publicaitons

F. Impacts and Potential Impacts. The “impacts” and “potential impacts” sections of your report will help the Western IPM Center highlight the value of IPM research and education by detailing the real-world impacts of Center-funded projects. We will use the information in news articles, reports, and informational brochures to showcase the impacts of projects that our program supports. *See Attachment A at end of form for questions to assist you in describing the impacts of your project.*

1. Impacts. Describe any impacts of your work. *Impacts* are specific changes in condition for those affected by your work. Impacts include adoption of technology, creation of jobs, reduced cost to the consumer, less pesticide exposure to farmers, access to more nutritious food, and a cleaner environment and healthier communities.

None at this time. Our philosophy is to have peer reviewed results in hand before we begin “selling” the program.

2. Potential impacts. Describe your project’s potential impacts. *Potential impacts* are the ways that your project’s outputs could directly lead to changes in condition that will unfold in the future.

Our team’s long-term goal is to develop an integrated crop/livestock production system that is economical and environmentally sustainable and provides benefits to both grazing livestock and grain producers. Grain farming systems in Montana and other Western states are based on substantial inputs of fossil fuel and burning to remove crop residues, synthetic fertilizers to maintain soil fertility, and pesticides to control weed and insect pests. Our long-term objective is to develop a holistic sheep/crop production farming system that uses sheep to manage crop residues, improve soil fertility, reduce weed and insect pests, and increase use of low cost crop residues for fiber and meat production. This will result in rural development with a new paradigm for production based on the “marriage” of food and fiber production with small ruminant grazing as a form landscape management.

G. Appendices

1. With your report, please attach *at least two (2) photographs* that illustrate your project. Please describe the photo and indicate the name and institution of the person who took the photo. (If you submit more than two photographs, please include those additional descriptions and photo credits under “H. Additional Information,” below.)

Photo #1 description:

Sheep grazing wheat stubble in the fall for residue reduction

Photo #1 credit (photographer’s name and institution):

Hayes Goosey, Montana State University - Bozeman

Photo #2 description:

Sheep grazing summer fallow for weed control

Photo #2 credit (photographer’s name and institution):

Hayes Goosey, Montana State University - Bozeman

2. Also attach any printed fact sheets or other publications resulting from your work that will enhance our understanding of your project and its impacts. Please provide a description of each attached publication below.

Document #1 description:

Document #2 description:

Document #3 description:

H. Additional Information

Credit: Some of the language about impacts and potential impacts was adapted from a PowerPoint presentation by H. Michael Harrington, Executive Director, Western Association of Agricultural Experiment Station Directors, Colorado State University.

Attachment A

Questions to Help in Reporting Impacts and Potential Impacts

Below are some questions that will guide you in assessing and then describing the impacts and potential impacts of your project. The relevance of each question may vary depending on whether yours is a research or extension project. Please answer as many as you can to the best of your ability, and feel free to describe any additional types of impacts not mentioned below. Remember to identify any potential impacts.

1. Innovations in IPM:

Are there new IPM practices that have been (impacts) or could be (potential impacts) adopted as a direct result of your project? What is the total number of acres (or homes, schools, greenhouses, nurseries) on which these practices could realistically be implemented?

2. Safeguarding human health and the environment:

- a. Has the project reduced risk (or could it potentially do so) by changing the use of pesticides on farms, in homes, in schools, etc.? For example, could it result in fewer sprays per season or a switch to lower-risk pesticides? If possible, quantify the changes in condition. (Since there is no unanimous definition of *high* and *low risk*, investigators selecting this indicator are asked to categorize the pesticides they are reporting on as *high* or *low risk* according to the particular situation [e.g., lower risk to natural enemies]).
- b. Are there any other impacts or potential impacts on human health or the environment as a result of your project?

3. Economic benefits:

- a. What is (or could be) the economic benefit (e.g., dollars saved) for clientele who adopt IPM strategies and systems you studied? Do you envision potential commercialization or mass production of these systems?
- b. How many clients are satisfied with IPM results (such as improved yield, improved quality of yield, reduced pest populations, more effective pest control, greater preservation of nonpest species)?
- c. Are there other financial benefits that might be realized (potential impact) as a result of your project?

4. Implementation of IPM:

- a. How many IPM strategies and systems have been validated through this project (e.g., through on-farm trials, large plot tests, or other methods used to confirm efficacy)?
 - b. How many educational materials were delivered? To whom? And what are the impacts or potential impacts?
 - c. What is the number of growers/personnel trained? And what are the impacts or potential impacts?
 - d. For a Web site, what volume of traffic and type of use has the site experienced? (For example, number of visitors per day or month; number of page views; number of unique user sessions; change in volume during growing season; average viewing time.) And what are the impacts or potential impacts?
 - e. How many more people adopted IPM practices as a direct result of your project, or how many people adopted new IPM practices?
 - f. Are there other ways in which your work will result in improved use or increased implementation of IPM strategies in your region or across the West?
5. Has your project or study increased collaboration among stakeholders interested in the development and implementation of improved IPM strategies and systems?