

# Western Regional IPM Grants Annual Progress Report Guidelines

Due October 15, 2008

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INSTRUCTIONS: PLEASE PROVIDE ONLY THE ESSENTIAL COMPONENTS OF ACCOMPLISHMENT WHICH ARE:

1. A CLEAR IDENTIFICATION OF THE PROBLEM/ISSUE ADDRESSED BY THE RESEARCH/EXTENSION.
2. A CONCISE EXPLANATION OF HOW THE RESEARCH/EXTENSION ACHIEVEMENT CONTRIBUTED TO THE SOLUTION OF THE PROBLEM/ISSUE BEING RESEARCHED.
3. THE IDENTIFICATION OF OTHER BENEFITS RESULTING FROM THE RESEARCH/EXTENSION, EVEN IF UNPLANNED.
4. **PLEASE ATTACH A SUMMARY OF THE PAST YEARS PROGRESS, ONE PAGE MINIMUM.**

PROJECT NUMBER: ORE00258

PROJECT TITLE: Effect of Primary Tillage Sequence, Insecticides, and Weed Seed Placement on Seed Predator Conservation, Efficacy, and Weed Emergence

PRINCIPAL INVESTIGATOR: Ed Peachey

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INSTITUTIONAL ADDRESS: Research Office, Oregon State University, 312 Kerr Admin. Bldg., Corvallis, OR 97331-40

CO-PIs or TEAM MEMBERS: Carol Mallory-Smith, Rick Boydston

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CO-PIs or OTHER KEY PERSONNEL, and their INSTITUTIONS or AFFILIATIONS:

Carol Mallory-Smith, Rick Boydston

WHO MAY WE CONTACT FOR ADDITIONAL INFORMATION IF NOT THE LEAD PI?

NAME: Carol Mallory Smith

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THE PROBLEM, ISSUE, OR REASON FOR PURSUING THIS RESEARCH/ EXTENSION PROJECT. The goal of this project is suppression of summer annual weed populations in vegetable row crop systems through development of cropping systems that conserve seed predators and enhance weed seed predation. Summer annual weeds continue to trouble row crop producers, even though producers have access to many weed management tools. Regulation of seed density over time has been erratic. Herbicides, tillage, and cultivation are commonly used to bridge the gap between the number of weeds that are expected to emerge and weed control objectives. These weed control practices often produce unintended consequences such as herbicides loss to ground water and soil erosion. Effective regulation of soil weed seed banks with biologically based strategies is essential to the long-term success of sustainable, integrated weed management programs in food systems.

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THE SINGLE MOST IMPORTANT ACCOMPLISHMENT OR BENEFIT RESULTING

FROM THIS RESEARCH/EXTENSION PROJECT.

The research is producing the data needed to develop agricultural systems that will maximize biological suppression of weed populations. The study is in the 2<sup>nd</sup> year of a 3 year study. Tillage rotations put in place in 2006 impacted both winter and summer annual weed abundance in 2008. Enhanced activity-density of seed predators appears to be the cause but data collection for 2008 is still in progress. This is the first report that we are aware of that has linked crop rotation and cultural practices with changes in weed density due to carabid beetle activity-density.

**BRIEFLY DESCRIBE ADDITIONAL BENEFITS, SUCH AS:**

**SOCIAL BENEFITS** – Consumers expect high quality food with low risk of exposure to pesticides. Increased weed seed predation will enhance weed control efforts and reduce the need for additional intervention. Coupled with other integrated practices, herbicide use should decrease, resulting in assured food quality.

**ECONOMIC BENEFITS** – Enhanced seed predation should result in the need for fewer weed management inputs, but will need to be balanced against additional inputs that may be required to enhance seed predator density.

**ENVIRONMENTAL BENEFITS** – Fewer weed management activities will translate directly to a reduced potential of herbicide loss to groundwater or soil erosion.

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PLEASE SUBMIT A HIGH RESOLUTION DIGITAL IMAGE REPRESENTATIVE OF YOUR RESEARCH/EXTENSION PROJECT THAT WE CAN USE IN WESTERN IPM CENTER PUBLICATIONS WHICH MENTION YOUR PROJECT.

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When you have completed this form, return to

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THIS FORM WAS COMPLETED BY:

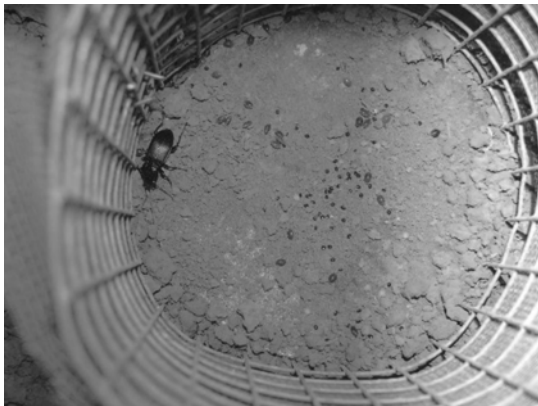
Ed Peachey, Project Leader  
(Name and Title)



Weed Seed Predation Team: Mikio Miyazoe (RA), Ed Peachey (project leader), Jess Green (GRA), Nicole Marshall (RA), and Alyisa Greco (RA).



Alyisa Greco counting weed seedlings in an experiment to test the effect of ground beetle density on weed seed survival.



*Pterostichus melanarius* consuming pigweed seeds, taken with a time-lapse camera. This picture was taken with a red filter so the flash would not deter seed predators. I converted it to grayscale. If this picture is of interest, we can convert it to color.