

Biological Control of Pests Affecting Plants

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V(A). Planned Program (Summary)

1. Name of the Planned Program

Biological Control of Pests Affecting Plants

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
215	Biological Control of Pests Affecting Plants	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	4.2	0.0
Actual	0.1	0.0	1.1	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
	0	44423	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	683453	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	332611	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This program seeks to develop management strategies in the control of fire blight disease of pear, invasive weed species, and diseases of wheat, use of bacterial antagonists, natural enemies, and genetic diversity. The subprogram epidemiology and control of diseases of fruit crops in western Oregon will: improve control of fire blight of pear and apple; evaluate the risk of movement of the fire blight pathogen associated with pear fruit; and enhance knowledge of the biology and management of blackberry rust in the PNW. The subprogram biological control of weeds will measure the contribution of plant dormancy and insect dispersal to regulation of low-level populations of ragwort; monitor weed biocontrol organisms for increase, spread, and impact on purple loosestrife; measure ecological impacts of invasive plants on native plant and animal communities; monitor weed biocontrol organisms for establishment, performance and impact on non-target organisms; and release, establish and redistribute natural enemies. Specifically, investigators evaluated combinations of biological control agents in field trials. The subprogram dispersive epidemic waves will determine if host abundance, heterogeneity, and spatial structure influence the spatiotemporal spread of plant disease; determine if increased focus size speeds the onset of epidemic velocity increase over time; and determine if disease spread and effects of landscape variables are similar at different spatial scales. Specific activities include analyzing the shape and distribution of the invader's path, reviewing scientific basis for predicting invasions and analyzing the causes and consequences of variation in state weed lists. Results have been published in scientific journals and textbooks and presented at scientific meetings, national workshops and experiment station field days.

2. Brief description of the target audience

The target audiences include growers, crop consultants, extension faculty and researchers in the fruit and wheat industry; and ecologists, economists, policymakers, and managers concerned with invasive species.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1050	1000	5	0
2007	1470	400	500	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2007:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

SCHOLARLY excellence in referred articles, book chapters, and books; participation on professional boards and panels, as well as science panels.

Year	Target	Actual
2007	3	3

Output #2

Output Measure

PROVIDE ADDITIONAL UNDERSTANDING FOR PLANT AND ANIMAL PROTECTION FROM DISEASES AND PESTS - Determine control of fire blight of pear and apple with the use of avirulent pathogens, including whether they induce defense responses in the host - Determine the risk of movement of the fire blight pathogen with mature symptomless pear fruit. - Determine when rust spores are first released in spring and the minimum environmental requirements for infection of leaves. - Understand the potential impact of the introduced pathogen, blackberry rust, in the Pacific Northwest region and evaluate chemical control programs for susceptible cultivars. - - Reduce harm from invasive plant species like ragwort or purple loosestrife, through biological control - - Determine if host abundance, heterogeneity, and spatial structure influence the spatiotemporal spread of disease. - Determine if increased focus size speeds the onset of velocity increase over time. - Determine if disease spread and effects of landscape variables are similar at different spatial scales. - Determine which host variables (abundance, heterogeneity, or spatial structure) need to be included in models to make predictions about disease risks, and to determine the relative importance of each to disease spread.

Year	Target	Actual
2007	15	15

V(G). State Defined Outcomes

O No.	Outcome Name
1	Genetic studies <ul style="list-style-type: none"> • Determine susceptibility of blackberry germplasm, • Compare the genotypes of <i>P. violaceum</i> present in the Pacific Northwest to the genotypes in other regions.
2	Models: <ul style="list-style-type: none"> • Develop weather-based models that indicate when spores are first released in spring and the minimum environmental requirements for infection of leaves. • Compare chemical control programs for susceptible cultivars for economic feasibility • Determine which host variables (abundance, heterogeneity, or spatial structure) need to be included in models to make predictions about disease risks, and to determine the relative importance of each to disease spread. .
3	Best Practices ...5%/yr Increase learning, awareness, knowledge, skills, motivations, conformity to codes of best practices related to use of biological control to combat invasive plant specie
4	Improved technologies and practices Develop technologies that enhance the ability of the U.S pear and apple industry to suppress this disease. Develop economical chemical control programs for susceptible cultivars Develop novel control approaches to other diseases of plants. Changes in behavior, practices, decision-making, policies with respect to invasive species and biological control. Develop epidemic modeling at large scales
5	In the long term: <ul style="list-style-type: none"> • Risk management of fire blight pathogen could lead to larger export markets for U.S. grown pears. • Pest impacts on social, economic, environmental, and civic conditions are continuously updated and published in collaboration with ecologists, economists, manager • Provide more sustainable approaches for managing plant disease.

Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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V(H). Planned Program (External Factors)

External factors which affected outcomes

Natural Disasters (drought, weather extremes, etc.)

Economy

Appropriations changes

Public Policy changes

Government Regulations

Competing Public priorities

Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Before-After (before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}