V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Endemic and Invasive Pests and Diseases

☑ 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	1%		0%	
111	Conservation and Efficient Use of Water	0%		1%	
133	Pollution Prevention and Mitigation	0%		2%	
135	Aquatic and Terrestrial Wildlife	2%		4%	
136	Conservation of Biological Diversity	1%		2%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		2%	
206	Basic Plant Biology	1%		2%	
211	Insects, Mites, and Other Arthropods Affecting Plants	13%		13%	
212	Pathogens and Nematodes Affecting Plants	20%		38%	
213	Weeds Affecting Plants	15%		3%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	0%		1%	
215	Biological Control of Pests Affecting Plants	4%		9%	
216	Integrated Pest Management Systems	39%		8%	
305	Animal Physiological Processes	0%		3%	
311	Animal Diseases	1%		3%	
312	External Parasites and Pests of Animals	1%		1%	
402	Engineering Systems and Equipment	0%		1%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		1%	
721	Insects and Other Pests Affecting Humans	2%		3%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		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	67.9	0.0	103.2	0.0
Actual Paid Professional	63.7	0.0	94.7	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
1290655	0	1413782	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1290655	0	1413782	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
71468928	0	71468928	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

UC ANR's integrated research and extension activities conducted research projects, workshops, education classes and demonstrations, as well as one-on-one interventions. In addition, the programs will use PSAs, newsletters, mass media, web sites and collaborations with other agencies and organizations to create and deliver programs

2. Brief description of the target audience

- Farmers
- Ranchers
- Rangeland owners/managers
- Landscaping professionals
- Owners/operators of allied agricultural industries
- General public
- Crop and pest consultants

3. How was eXtension used?

UC ANR academics used eXtension to participate in and contribute to Communities fo Practice, to answer "Ask an Expert" questions, and for other networking purposes. The Division looks forward to the re-invention into a system of greater value to California Extension. The Division looks forward to the re-invention into a system of greater value to California Extension. The Division looks forward to the re-invention into a system of greater value to California Extension. The The Division looks forward to the re-invention into a system of greater value to California Extension.

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	106832	0	0	0

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

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

1. NEMATODE RESISTANT GRAPE ROOTSTOCK 9407-14

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	213	425	638

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Classes/Short Courses Conducted

Year	Actual
2013	72

Output #2

Output Measure

- Workshops Conducted

Year	Actual
2013	49

Output #3

Output Measure

- Demonstrations and Field Days Conducted

Year	Actual
2013	30

Output #4

Output Measure

- Newsletters Produced

Year	Actual
2013	9

Output #5

Output Measure

- Web Sites Created or Updated

Year	Actual
2013	9

Output #6

Output Measure

- Research Projects Conducted

Year	Actual
2013	238

Output #7

Output Measure

- Videos, Slide Sets and Other AV or Digital Media Educational Products Created

Year	Actual
2013	19

Output #8

Output Measure

- Manuals and Other Printed Instructional Materials Produced

Year	Actual

2013	16

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will gain knowledge of integrated pest management strategies and techniques.
2	Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will gain knowledge of pesticide and pharmaceutical efficacy and optimal use.
3	Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will adopt recommended prevention, detection and monitoring, and treatment practices for integrated pest management.
4	Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will realize lower costs for pest prevention and management.
5	Farm, ranch, rangeland, landscaping, and boat owner/operators and managers, allied industry professionals, and members of the public participating in the programs, will gain knowledge of prevention, detection, and treatment strategies and techniques for management of invasive species.
6	Farm, ranch, rangeland, and landscaping owner/operators and managers, and allied industry professionals, participating in the programs, will adopt treatment practices for invasive species.
7	Farm owner/operators and managers, Pest Control Advisers, and other allied industry professionals, participating in the programs, gaining knowledge on how to recognize and identify pests and diseases, and about detection and monitoring systems.
8	Farm owner/operators and pest control advisers, participating in the pest management programs, will adopt pesticide and pharmaceutical efficacy and optimal use.
9	Farm, ranch, rangeland, and boat owner/operators, pest control advisers, and other allied industry professionals, participating in the pest and disease management programs, more willing to adopt recommended strategies and techniques to control endemic and invasive pests and diseases.
10	Schools staff, participating in the School Turf IPM program, gained knowledge and skills to reduce pesticide use and runoff to improve community and environmental health.
11	Farm and landscaping owner/operators and managers, and Pest Control Advisors and other allied industry professionals, participating in pest management education programs, gained knowledge of pest management techniques, including Integrated Pest Management strategies.
12	Farm owners/operators and managers, and Pest Control Advisors and other allied industry professionals, participating in pest management education programs, gained skills to detect, monitor, and treat pests.
13	Farm owner/operators and managers, and Pest Control Advisors and other allied industry professionals, participating in pest management education programs, adopted recommended pest management practices, including integrated pest management strategies.
14	Retail nurseries and garden centers, participating in UC IPM education programs, extend IPM to customers.

Outcome #1

1. **Outcome Measures**

   Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will gain knowledge of integrated pest management strategies and techniques.

   Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

   Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will gain knowledge of pesticide and pharmaceutical efficacy and optimal use.

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

   Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will adopt recommended prevention, detection and monitoring, and treatment practices for integrated pest management.

   Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

   Farm, ranch, rangeland, and landscaping owner/operators and managers and allied industry professionals, participating in the programs, will realize lower costs for pest prevention and management.

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

   Farm, ranch, rangeland, landscaping, and boat owner/operators and managers, allied industry professionals, and members of the public participating in the programs, will gain knowledge of prevention, detection, and treatment strategies and techniques for management of invasive species.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	723

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
312	External Parasites and Pests of Animals

Outcome #6

1. Outcome Measures

Farm, ranch, rangeland, and landscaping owner/operators and managers, and allied industry professionals, participating in the programs, will adopt treatment practices for invasive species.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	67

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
312	External Parasites and Pests of Animals

Outcome #7

1. Outcome Measures

Farm owner/operators and managers, Pest Control Advisers, and other allied industry professionals, participating in the programs, gaining knowledge on how to recognize and identify pests and diseases, and about detection and monitoring systems.

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Farm owner/operators and pest control advisers, participating in the pest management programs, will adopt pesticide and pharmaceutical efficacy and optimal use.

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Farm, ranch, rangeland, and boat owner/operators, pest control advisers, and other allied industry professionals, participating in the pest and disease management programs, more willing to adopt recommended strategies and techniques to control endemic and invasive pests and diseases.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	655

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
215	Biological Control of Pests Affecting Plants

216	Integrated Pest Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals

Outcome #10

1. Outcome Measures

Schools staff, participating in the School Turf IPM program, gained knowledge and skills to reduce pesticide use and runoff to improve community and environmental health.

2. Associated Institution Types

- 1862 Extension
- 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)
Since the enactment of the Healthy Schools Act (HSA) in 2001, both UC Cooperative Extension (UCCE) and the California Department of Pesticide Regulation (DPR) have worked with school districts to provide information about integrated pest management (IPM). IPM strategies include modifying horticultural practices, such as changing mowing heights and managing irrigation appropriately. These practices can reduce the amount of pesticides used on school grounds to help schools meet HSA standards and provide a safe and healthy environment for students, teachers and staff. DPR has coordinated numerous workshops for school districts covering general landscape and building IPM topics; however, attendees requested more detailed training about turf IPM since they manage turf playgrounds and sports fields. UCCE has extensive experience in this area, and thus was called upon to help schools implement this policy.

What has been done
Working closely with DPR, UCCE advisors from multiple counties and specialists conducted hands-on training for school landscape staff throughout California. At each workshop, school staff was provided UC ANR resources to assist them in implementing IPM at their schools. Trainers helped the participants interpret the results of their soil tests, discussed identification and management of weeds and other pests, and conducted irrigation evaluations. Most of the training involved hands-on involvement by the participants at school fields such as measuring irrigation output, soil sampling, and weed identification and management.

Results

Seventy-five public school staff members across the state were trained. Post-training evaluation revealed that there was a strong improvement in knowledge related to IPM in turf. Most significantly, the trainees recognized that many turf problems could be ameliorated through appropriate turf culture such as managing irrigation, mowing and fertilization rather than the use of pesticides. Additionally, by demonstrating how to evaluate and improve irrigation systems, the trainees also learned about the impact of appropriately managing water to avoid runoff and improve water quality. The program was such a success that DPR is continuing their partnership with UCCE and expanding the School Turf IPM training to additional areas in the state.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #11

1. Outcome Measures

Farm and landscaping owner/operators and managers, and Pest Control Advisors and other allied industry professionals, participating in pest management education programs, gained knowledge of pest management techniques, including Integrated Pest Management strategies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1225

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants

212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #12

1. Outcome Measures

Farm owners/operators and managers, and Pest Control Advisors and other allied industry professionals, participating in pest management education programs, gained skills to detect, monitor, and treat pests.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	215

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #13

1. Outcome Measures

Farm owner/operators and managers, and Pest Control Advisors and other allied industry professionals, participating in pest management education programs, adopted recommended pest management practices, including integrated pest management strategies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	189

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #14

1. Outcome Measures

Retail nurseries and garden centers, participating in UC IPM education programs, extend IPM to customers.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
IPM is an eco-system-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, and modification of cultural practices. Pesticides are used only after monitoring indicates they are needed, and pest control materials are selected and applied. To extend these pest management practices that minimize risks to humans, nontarget organisms, and the environment, UC IPM conducted outreach and education to retail stores. Garden center and nursery employees are often the first people consumers ask for pest control information.

What has been done
Over the past two years, UC IPM has trained about 150 employees representing 60 retail stores and 22 Northern California counties in regional train-the-trainer workshops. In 2012-2013, 22 stores in 9 counties also displayed a UC IPM interactive touch-screen kiosk to help customers solve their pest problems. In addition, IPM Advocates are another major initiative to improve IPM in retail stores. These IPM consultants to retail stories, certified through a collaboration with Bay Area Stormwater Management Agencies, expanded their reach to now serve 80 Northern California retail garden centers and nurseries.

Results
Recent surveys confirm that retailers are passing IPM information along to consumers who UC ANR probably wouldn't reach. 2013 follow-up surveys show that 91% of those who responded have used materials from the training to educate other store employees or customers. Surveys, prepared by the California Department of Pesticide Regulation which funded the program, indicate that over 76% of participating stores used the UC IPM website for identifying pests and solving problems, over 70% increased shelf space for green or less-toxic pest management products, and over 76% increased sales of green products in 2012.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

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
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UC ANR's notable, qualitative impact statements, as well as the quantitative outcomes recorded from the evaluation studies, are reported under the State Defined Outcomes section.

Key Items of Evaluation

The Report Overview's federal Planned Program summary of accomplishments highlights UC ANR's most significant work during FY 2013, especially the research developments. In addition, the State Defined Outcomes section captures UC ANR's clientele behavior change outcomes, which demonstrate important program successes resulting from the research and extension network.