V(A). Planned Program (Summary)

Program # 4

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%		3%	
136	Conservation of Biological Diversity	1%		3%	
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	Diseases and Nematodes Affecting Plants	20%		35%	
213	Weeds Affecting Plants	13%		3%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	1%		0%	
215	Biological Control of Pests Affecting Plants	3%		11%	
216	Integrated Pest Management Systems	41%		8%	
305	Animal Physiological Processes	0%		4%	
311	Animal Diseases	1%		3%	
312	External Parasites and Pests of Animals	1%		2%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		1%	
721	Insects and Other Pests Affecting Humans	2%		2%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		3%	
723	Hazards to Human Health and Safety	0%		2%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	73.9	0.0	89.0	0.0
Actual Paid	6.6	0.0	9.7	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**
938924	0	1125479	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
938924	0	1125479	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
25651165	0	76099521	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

UC ANR's integrated research and extension activities will conduct 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 of 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.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	105114	0	0	0

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

Patent Applications Submitted

Year: 2014

Actual: 5

Patents listed

1. USE OF CMQ, A SYNTHETIC PLANT DEFENSE ELICITOR, FOR THE DEVELOPMENT OF PESTICIDES
2. AVOCADO ROOTROT RESISTANT ROOTSTOCKS-PP4: AVOCADO ROOTSTOCK NAMED 'ZENTMYER'
3. AVOCADO ROOTROT RESISTANT ROOTSTOCKS-PP14: AVOCADO VARIETY NAMED 'UZI'
4. AVOCADO ROOTROT RESISTANT ROOTSTOCKS-PP27: AVOCADO VARIETY NAMED 'STEDDOM'
5. A MOLECULAR METHOD FOR UNIVERSAL DETECTION OF CITRUS VIROIDS

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	208	273	481

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Classes/Short Courses Conducted

Year	Actual
2014	46

Output #2

Output Measure

- Workshops Conducted

Year	Actual
2014	34

Output #3

Output Measure

- Demonstrations and Field Days Conducted

Year	Actual
2014	19

Output #4

Output Measure

- Newsletters Produced

Year	Actual
2014	19

Output #5

Output Measure

- Web Sites Created or Updated

Year	Actual
2014	18

Output #6

Output Measure

- Research Projects Conducted

Year	Actual
2014	217

Output #7

Output Measure

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

Year	Actual
2014	3

Output #8

Output Measure

- Manuals and Other Printed Instructional Materials Produced

Year	Actual
2014	28

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	Decreased incidence of endemic and invasive pests and diseases.
11	Public workers adopt practices that improve detection and prevention of aquatic pests.
12	Growers reduce fungicide sprays, saving time and money and helping improve air quality.
13	Growers cease unnecessary sprays, saving time and money.
14	Decreased prevalence of European Grapevine Moth (EGVM) in California.
15	Policy makers apply new knowledge and designate additional pests and disease as significant threats to the California grape industry.

16	Strawberry growers adopt pest management practice that reduces the environmental impact of fumigants.

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.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	852

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	Diseases and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
312	External Parasites and Pests of Animals

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.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	614

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	Diseases and Nematodes Affecting Plants
213	Weeds Affecting Plants

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.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	135

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	Diseases and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
312	External Parasites and Pests of Animals

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
2014	234

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	Diseases 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.

   Not Reporting on this Outcome Measure

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

2014	115

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	Diseases 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

Decreased incidence of endemic and invasive pests and diseases.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Diseases and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #11

1. Outcome Measures

Public workers adopt practices that improve detection and prevention of aquatic pests.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Aquatic invasive species cause significant economic and ecological problems. Quagga and zebra mussels clog water supply systems and deplete plankton. Tiny New Zealand mudsnails displace

native snails. Invasive bullfrogs and clawed frogs voraciously consume native species and carry a disease that has decimated native frog populations. Dense mats of invasive waterweeds slow water flow in streams and irrigation channels, block boats, and kill native species by blocking out sunlight and causing oxygen levels to fall. However, much of the damage can be reduced if people who work in aquatic habitats are trained. They can help lower the risks of spreading invasive species to new areas and serve as eyes and ears for resource agencies with a mission to manage and control these pests.

What has been done
In spring 2013, UCCE advisors in Southern California conducted six workshops for 181 staff members of local public works, parks, watersheds and flood control agencies as well as for staff members of a UC Research and Extension Center. The participants learned how to recognize 25 aquatic invasive species, decontaminate their field gear, plan their work to reduce risks of spreading these pests, and report sightings to resource agencies. Forty-nine percent of the participants were minorities and 29 percent were women. Through hands-on exercises, they practiced identifying species, detecting them in mud, inspecting boats and decontaminating boots. The advisors distributed decks of laminated reference cards (with photographs and information), which they created, at workshops. More than 14,000 people learned about aquatic invasive pests from the advisors' blog articles that were based on their workshops.

Results
The participants significantly increased their ability to identify aquatic invasive species and their environmental impacts, their knowledge of how to report sightings, and their skills on how to decontaminate their gear and avoid spreading these pests. According to survey results, 80 to 90 percent of participants reported learning this information for the first time at one of the workshops. Within the first few following months, agencies reported having made changes. Two agencies implemented new or improved their existing decontamination protocols for field gear and planned their work accordingly to prevent the spread of aquatic pests. Two agencies educated the public on how to prevent the spread of pests by posting signs and talking to visitors at lakes. Five aquatic pest sightings were reported to field supervisors and a New Zealand mudsnail infestation was reported to three natural resources agencies. Altogether, these actions will help to prevent the spread of pests in areas where the workshops were conducted - all 2.5 million acres.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #12

1. Outcome Measures

Growers reduce fungicide sprays, saving time and money and helping improve air quality.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Powdery mildew is the number one grapevine disease in California, and sulfur is the most common fungicide used to manage it. Growers like sulfur because of its low cost and ease of application, and because it doesn't promote powdery mildew resistance. Used alone, sulfur requires frequent application, and can cause phytotoxicity and health concerns. Other fungicides, when combined with sulfur, can promote fungicide resistance. Growers can reduce these problems by implementing the UC Powdery Mildew Risk Index (PMI), which helps pinpoint the best times to apply fungicides.

What has been done
A UCCE viticulture advisor met regularly with San Joaquin Valley grape growers, focusing on powdery mildew disease. Using local weather data from the Fresno-Madera Weather Network, the advisor has shown growers how to implement and organize the PMI to develop spray programs using fungicides of their choice.

Results
Once growers see the exceptional results enabled by the PMI, they often commit entire vineyards to the new program. On 40-acre plots, growers can reduce costs, per eliminated application, of $149 when using dusting sulfur, $282 when using wettable sulfur, and $689 when using a sterol inhibitor such as fenarimol. Many growers have eliminated three sprays when conditions were right.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Diseases and Nematodes Affecting Plants

Outcome #13

1. Outcome Measures

Growers cease unnecessary sprays, saving time and money.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
California is well known for producing a wide range of specialty vegetable crops that contribute to agricultural diversity, including parsley. Parsley is widely used in dried spice mixes, soups and other prepared foods. Significant acreage in parsley is also dedicated to fresh-market uses in salads and other recipes. In the past few years, growers began to observe unfamiliar disease issues in their parsley fields, contributing to loss of quality and reduced yields. Because parsley growers do not have an industry research board to address such concerns, a formal and organized grant program was not available to address these issues.

What has been done
UCCE stepped in to initiate investigations into these new parsley problems, collaborating with farmers and pest control advisers to understand the extent of the problems and to obtain samples of the diseased crops. UCCE was successful in isolating and identifying several pathogens those were responsible for causing the disease symptoms. Working with USDA researchers, they found that three new diseases were present in California parsley crops: bacterial leaf spot, Stemphylium leaf spot, and Apium virus Y disease. The team subsequently studied these three pathogens to determine the range of susceptible crops and the possible source of the pathogens.

Results
Key research findings will enable growers to manage the problems. Previous to this research, some growers were spraying symptomatic fields because they believed that a disease called late blight was responsible. Based on UCCE findings, growers now know that late blight was not involved and that these applications are not useful for the new problems. Growers have ceased making these sprays, eliminating the use of unnecessary chemicals and saving costs. This

research helped resolve a significant growing problem for this $18 million California crop.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Diseases and Nematodes Affecting Plants

Outcome #14

1. Outcome Measures

Decreased prevalence of European Grapevine Moth (EGVM) in California.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The European Grapevine Moth (EGVM) is a recently introduced pest to Napa County, the state of California, and North America. The 2010 growing season was the first time that vineyard owners, managers, and pest control advisors in Napa County were tasked with managing this insect. In 2010, 50% of the vineyard acreage in Napa County was treated with insecticides targeting this insect. Management efforts continue as the regulatory program attempts to eradicate this insect from California. There is an abundance of information in the literature about EGVM but all of this has to be verified for California.

What has been done
UCCE launched several applied research efforts as well as a strong outreach component. UCCE is studying the life cycle and host range of this insect in Napa, verifying the degree-day model, trapping and reporting trap catches and monitoring eggs to time insecticide sprays, and determining the efficacy of various combinations of insecticides. UCCE programs provide information on insect identification, biology, life cycle, and appropriate treatments in a timely fashion to growers, managers, and advisers. UC Advisors were a critical resource for scientific expertise and information during the course of the ongoing EGVM program, and continue to

educate regulators, growers, and the general public about best management practices for management of EGVM in California.

Results
UCCE research, education and outreach have contributed to the following environmental improvements: 150,760 California vineyard acres were affected by EGVM regulatory program in 2010; by the fall of 2014, that number had been reduced to 49,312 acres. At the peak of the EGVM regulatory program, it affected growers in 10 California counties; as of 2014, that number has been reduced to two counties. In 2010, a total of 100,959 moths were captured in traps across California; in 2014, only one moth was caught in traps across California.

4. Associated Knowledge Areas

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

Outcome #15

1. Outcome Measures

Policy makers apply new knowledge and designate additional pests and disease as significant threats to the California grape industry.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Vineyard managers, owners, viticulturists and pest control advisors in California have a commitment to agricultural sustainability in the face of three new significant pest management challenges: vine mealybug and brown marmorated stink bug and red blotch disease. More information is needed to learn to manage these.

What has been done
During 2014, UCCE provided guidance and input into revamping the process by which the California Department of Food and Agriculture?s Pierce?s Disease/Glassy-winged Sharpshooter

(PD/GWSS) Board evaluates and designates pests and diseases as important.

Results
The UCCE input was critical in securing the PD/GWSS Board designating these two additional pests and one disease as significant threats to the California grape industry. State and federal funds, as well as grower assessments, fund PD/GWSS Board research projects. This funding can now be leveraged to develop management practices and to conduct outreach and education for these additional two pests and one disease.

4. Associated Knowledge Areas

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

Outcome #16

1. Outcome Measures

Strawberry growers adopt pest management practice that reduces the environmental impact of fumigants.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
California produces 90% of the strawberries in the United States. Since the 1960s growers have relied on the soil fumigant methyl bromide. In2005 under the Montreal Protocol, developed countries banned methyl bromide to protect the stratospheric ozone layer, except for "critical use" exemptions. California strawberry growers have been operating under these exemptions, given the lack of alternatives that are both effective and affordable. In 2013 California strawberries alone accounted for 73% of the total exemptions nationwide. The exemptions continue to shrink. Soil-borne pest control in strawberries is increasingly difficult without methyl bromide and is a priority issue in non-fumigated production.

What has been done

UC ANR academics have developed strong external stakeholder engagement with commercial strawberry growers and the California Strawberry Commission. UC research is critical to finding cost effective and environmentally sustainable alternatives to methyl bromide. UCCE evaluates chemical and non-chemical tools for soil borne pest control in strawberries. UCCE provides outreach on this topic in 15 counties, including all those with strawberries as a leading commodity: Monterey, Ventura, Santa Barbara, San Luis Obispo and Santa Cruz.

Results

Fifty eight growers have adopted the practice of using impermeable films to retain fumigants to control soil-borne diseases in strawberries, which has greater efficacy and minimizes emissions, thus reducing environmental impact.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Diseases and Nematodes Affecting Plants

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

During FY 2014, California continued to face its worst drought in decades. Water supply and quality for agricultural, urban, and environmental systems has become one of the state's biggest challenges. UC ANR has focused efforts to serve as a resource both in offering everything from near-term management advice to farmers and ranchers to the innovative work being carried out by researchers on a vast array of issues from drought resistant crops to snow sensors to climate change.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UC ANR's quantitative and qualitative 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 2014, especially the research developments. In

addition, significant success stories are reported as qualitative outcomes under the State Defined Outcomes section.