

SURVEY OF ORGANIC RESEARCH AND EXTENSION ACTIVITIES AT THE UNIVERSITY OF CALIFORNIA



University of California
Agriculture and Natural Resources
Sustainable Agriculture Research & Education Program

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This report may also be viewed and downloaded on the UC SAREP Web site at:
<http://www.sarep.ucdavis.edu/organic/organicsurvey04.htm>

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EXECUTIVE SUMMARY

Organic farming in California has experienced dramatic increases in acres, number of farms, and farm gate value over the past decade. We conducted an email survey on the present status of organic farming research and extension at the University of California to identify organic expertise and organic research and extension activities, to provide a basis for analysis of organic farming research and extension activities at UC, and to assist UC and others to prioritize future research needs, organize education programs, and coordinate fundraising.

In March-May 2004, a 3-page email survey was sent to 1,003 academic personnel at the University of California including 363 faculty and 112 Extension Specialists at the College of Agricultural and Environmental Sciences and the School of Veterinary Medicine in UC Davis, 114 faculty and Extension Specialists in UC Berkeley, 109 faculty and Extension Specialists in UC Riverside, 8 faculty in UC Santa Cruz, 231 UC farm advisors throughout the state of California, 66 UC Organic Farming Research Workgroup academic members including UC and USDA-ARS researchers.

Survey recipients were asked to report contact information, years involved in organic farming research and extension, percentage of their work time (Full Time Equivalent, %FTE) dedicated to organic research, location of organic research activities, major crops or livestock, areas of organic research expertise, current and pending organic research and extension grants, and future organic research needs over the next 3 to 5 years. Respondents were asked to define their own research and extension programs as related to organic agriculture. Such work was described in the survey instrument as being conducted in fully compliant organic field and processing systems, or as component research not specifically conducted in compliant production situations, but relevant to aspects of such systems. This definition of organic research and extension is broader than others have used such as researchers with non-profit organizations or other educational institutions and may tend to increase the number of self reported organic researchers and educators. Data were entered into an MS Access database.

Ninety-five people responded to the survey out of 1,003 surveys sent out resulting in a 9.5% survey response rate. Just over 90% of UC academic personnel queried did not respond. Of the 95 respondents, 81 respondents (8.1% of the 1,003 surveys distributed) self-reported that they are involved in organic research and extension, and 14 respondents reported that they are not working in organic. Of the 81 respondents working in organic, thirty-seven (45%) were farm advisors, 32 (40%) were campus academics, and 12 (15%) were research/education associates. Farm advisors responded at a higher rate (16%) than campus faculty and specialists (4.5%). Possible reasons for this lower response rate among campus faculty may include lack of organic research emphasis or support and/or reluctance to self report activities characterized as related to organic production. Seventy-seven of the respondents reported they have worked for an average of 12.2 years in organic farming research and extension and characterized this effort, on average, to be approximately 22% of their time. Theoretically, this translates into a total of 17 FTE in support of organic farming research and extension. However it should be noted that currently there are no positions with %FTE reported as entirely dedicated to organic farming research and extension. All the self-reported activity is part of current positions with titles other than organic research and extension. Most respondents are conducting their organic research and extension activities in the Central Valley and on the Central Coast and South regions, and their organic research and extension is principally conducted with fruits, vegetables, and nut crops.

Of 74 respondents, the majority reported that they are most engaged in organic pest management research and extension (51), followed by organic soil management research and

extension (27), integrated cropping systems (25), and organic economics/marketing (20). Of the 81 respondents conducting organic research and extension, only 36 (44%) reported current funding for organic farming research and extension. These 36 respondents represent 3.6% of all personnel surveyed. They listed 68 current research projects that totaled \$5,165,575 and 20 pending grants that totaled \$2,379,860. Major funding agencies included USDA and US EPA federal research programs, state agencies such as CDFA and CALFED, and UC programs, such as SAREP, and private philanthropic foundations.

Out of the total of 95 respondents, including 14 who reported they are not working in organic research and extension, seventy-two specified 157 major organic research needs for California agriculture as being important to address in the next 3 to 5 years. Organic pest management was mentioned most frequently (56), followed by organic soil management (26), organic economics/marketing (21), integrated organic cropping systems (18), organic animal/livestock production (11), and organic social relations (7). This result probably reflects in general the research emphases of respondents in California, but is also similar to research needs of organic growers in a recent national survey.

Our survey results suggest that 17 FTE valued at about \$1.6 million are working in organic agriculture. Adding the total amount of current grants funds in organic research and extension from the survey to this figure gives an estimated total investment of \$6,742,393. This figure represents approximately 2% of total ANR expenditures for FY 2003/2004 (taking into account federal and state funds including Agricultural Experiment Station and Cooperative Extension sources, County, and private funds and competitive grants). The declared farm gate value of organic agriculture relative to all of agriculture in California in 2003 was about 1.2% and the percent of cropland in organic production was just under 2%. In these quantitative terms, the current level of self-reported research and extension investment is commensurate with the declared farm gate value in California of organic agriculture.

However, in light of the industry's rapid retail sector growth (20% per year), suspected underreporting of sales, and a total declared value of over \$2 billion in organic processing sales in California in 2004) this public sector investment, which constitutes only 1.9% of the overall declared farm gate sales value of California organic agriculture, could be larger, especially from such a key public sector research and development entity. California appears to have fewer personnel engaged in organic research and extension (compared with the value of the industry) than Washington State, according to a similar survey conducted there. However, it has a similar percentage of its personnel engaged in organic agriculture as USDA- ARS researchers nationally.

Although this survey provides some insight into the breadth and depth of UC research and extension addressing organic agriculture, there are limitations that need to be observed in interpretation of the data. Since the response rate was under 10%, we cannot assume that survey respondents are representative of the population of UC and USDA researchers who were asked to participate. It is also probable that respondents had varying understandings of the definition of organic agriculture and how their work relates to it. This would affect how they reported the extent of their related research and extension activities, and could lead to over- or under- reporting.

The results of this survey can be used as a baseline for further measurement of progress in personnel and funding dedicated to organic farming research and extension at the University of California.

Introduction

There is growing interest in organic farming in the U.S. and California. Organic farming in California has experienced dramatic increases in the number of farms and acreage in the 1990s (Klonsky et al. 1998, 2002; Swezey & Broome 2000). According to the most recent analysis of the California Department of Food and Agriculture (CDFA) organic registrants' database, the number of registered organic farms in California increased by almost 30% during the twelve-year period 1992-2003 from 1,273 to 1,765 growers. Over the same period of time acreage quadrupled increasing from 42,000 acres in 1992 to almost 172,000 acres in 2003 (Klonsky 2005).

Along with the rapid growth in organic farms and acreage, organic agriculture has sustained a high rate of market expansion over the last 10 years. Self-declared farm gate sales in California in 2003 increased to over four times their declared value in 1992. The absolute increase was \$255 million from about \$75 million in 1992 to almost \$330 million in 2003 (Klonsky 2005). Preliminary estimates from the CDFA Organic Program database indicate that declared farm gate value exceeded \$355 million in 2004 (K. Klonsky pers.comm.). Data from the California Department of Health Services processor/retailer registrant database indicates that the declared processor/retailer sales value of organic commodities in California exceeded \$2.2 billion in 2004 (Kennelly pers. comm.). It is widely assumed that due to the self-reported nature of the California organic registrant database and the registration fee structure, the value of California organic farm gate and processing/retail production and sales is probably greatly under-reported. Total farm gate value of all of California agriculture in 2003 was \$27.8 billion, therefore the declared farm gate value of all California organic agriculture can be calculated as 1.2% of this total value (CDFA 2004).

In California, organic agriculture is now regulated by the CDFA (as a state organic program) and by the United States Department of Agriculture (USDA). The California Organic Food Act (COFA), originally signed into law in 1990, and then superseded by the California Organic Products Act (COPA) of 2003, provides protection to producers, processors, handlers, and consumers in that foods produced and marketed as organic must meet specific standards. As part of the regulatory process, COPA requires annual registration of all processors, growers and handlers of commodities labeled as organic. State registration is separate from, and does not act as a substitute for organic certification. Registration of farm operations is mandated by state law and is administered by CDFA while certification is mandated by federal law and is conducted by certification organizations accredited by the USDA.

The national Organic Food Production Act (OFPA) of 1990 required USDA to develop national organic standards for organically produced agriculture and to develop an organic certification program. The final regulations for implementation of the OFPA were published in the Federal Register in December 2000. The new rule took effect April 21, 2001 and marked the beginning of the transition period. Full compliance with the rule was required by October 20, 2002 at which time products began to use the National Organic Program organic label. The final rule includes a list of allowed synthetic and prohibited non-synthetic materials as well as labeling requirements. OFPA requires all growers grossing \$5,000 or more to obtain certification from a USDA accredited certification organization.

The University of California has made significant research and educational contributions to support the market expansion of organic agriculture through its research and extension activities (Swezey & Broome 2000). Over the past 20 years research in biological control, soil quality, cover crops, composting, crop breeding, non-chemical pest management, and organic farming systems have provided important research based information relevant to organic farming. More recently peer-reviewed manuals on specific organic cropping systems and Internet-based databases and short courses have directly supported organic growers and growers interested in making a transition to organic production (see <http://www.sarep.ucdavis.edu/Organic/index.htm>).

In order to identify organic expertise in the University of California and to characterize specific activities for organic research and extension, UC Sustainable Agriculture Research and Education Program (SAREP) conducted an email survey on the present status of organic farming research and extension in March-May 2004. In the survey, academic staff at four agricultural campuses and farm advisors for the counties as well as UC and USDA ARS academic members of the UC Organic Farming Research Workgroup were asked to describe their research and extension activities either conducted in full organic compliance with field and processing systems, or their activities relevant to particular components of organic farming and processing systems.

It is our intent that survey results can be used to provide an initial characterization of organic farming research and extension activities at the UC, and will assist UC and others to prioritize research needs, organize education programs, and coordinate fundraising efforts.

Materials and Methods

1. Population of the Target Group for the Survey

On March 24, 2004, an email survey was sent directly and via controlled faculty group emails to UC Davis faculty in the College of Agricultural and Environmental Sciences (316) and the School of Veterinary Medicine (47) as well as to UC Davis Extension Specialists (112), to UC Berkeley faculty and Extension Specialists (114), to UC Riverside faculty and Extension Specialists (109), and to a selected group of UC Santa Cruz faculty (8). The UC ANR directory (<http://ucanr.org/direct.cfm>) was used to obtain the lists of campus faculty in the Agricultural Experiment Station and Cooperative Extension.

In addition, the same email survey was sent to UC farm advisors/county directors (231) throughout the State of California via Regional Directors' email list managers, including 45 in North Coast & Mountain region, 96 in Central Valley region, and 90 in Central Coast & South region.

The survey was sent to all academic members (66) of the UC Organic Farming Research Workgroup out of a total of 99 current members, which includes UC faculty, Extension Specialists, Academic Coordinators, Post Doctoral Researchers, and UC staff, as well as, several USDA ARS researchers. Almost all of the workgroup members are also included in one of the UC categories of campus faculty or county cooperative extension agent

or research associate, therefore these individuals were only sent the survey as a member of the workgroup and did not receive duplicate copies and were only counted once as a survey recipient.

The total population of the target group for this survey was 1,003 (Table 1) and this email survey was followed up by phone calls and several email reminders in April and May.

Table 1. Population of the Target Group for the Survey

	Campus/Region	Number of Recipients
Faculty/Extension Specialists	• UC Davis	475
	• UC Berkeley	114
	• UC Riverside	109
	• UC Santa Cruz	8
	Subtotal	706
Farm Advisors/County Directors	• North Coast and Mountain	45
	• Central Valley	96
	• Central Coast and South	90
	Subtotal	231
UC Organic Farming Research Workgroup		66
TOTAL		1,003

2. Information Requested in the Survey

The 1,003 survey recipients were asked to fill out a 3-page survey questionnaire which asked them for contact information, their occupation, years involved in organic farming research and extension, %FTE dedicated to organic research, location of research activities, and the focus of their work (major crops or livestock).

Recipients were also asked to categorize their areas of expertise by selecting among the following choices: organic soil management, integrated organic cropping systems, organic pest management, organic animal/livestock production, organic economics/marketing, organic social relations, organic food quality, organic post harvest handling/processing, and other.

In an effort to quantify resources dedicated to organic research, the survey recipients were asked to provide their current and pending research/extension grants. They were also asked about future organic research needs for California agriculture that should be addressed over the next 3 to 5 years (Table 2).

Table 2. List of Information Requested

Area	Information Requested
1. Contact Information	<ul style="list-style-type: none"> • Name • Title • Department • Mailing Address • Email Address • Telephone Number • Web Site

2. Occupation	<ul style="list-style-type: none">• Extension/Educator• Researcher• Both
<hr/>	
3. Years involved in Organic Farming Research and Extension	
<hr/>	
4. Percentage of Full Time Equivalent (%FTE) Spent on Organic Farming Research and Extension	
<hr/>	
5. Interest in the UC Organic Farming Research Workgroup (Yes or No)	
<hr/>	
6. Location of Organic Farming Research and Extension	
<hr/>	
7. Crops/Livestock Products Worked with	
<hr/>	
8. Areas of Expertise	<ul style="list-style-type: none">• Organic Soil Management• Integrated Organic Cropping Systems• Organic Pest Management• Organic Animal/Livestock Production• Organic Economics/Marketing• Organic Social Relations• Organic Food Quality• Organic Post Harvest Handling/Processing
<hr/>	
9. Organic Research and Extension Grants (Current & Pending)	
<hr/>	
10. Major Organic Research Needs for California Agriculture in the Next 3 to 5 Years	
<hr/>	
11. Organic Farming Publications/Products	

3. Data Analysis

Since the intent of the survey was to provide baseline information through self reporting of expertise in the UC system related to organic production, only the responses from those who said they are working in organic research and extension were included in the analysis. All information was entered into an Access database created by UC Davis Desktop Solutions, sorted and analyzed to produce the data used in the report. For each question, the number of respondents is always presented along with averages and for some questions frequency distributions. Due to the nature of the questions asked and the low survey response rate no additional analyses were conducted.

Responses from personnel who explicitly said they are not working in organic or people who didn't answer related questions were excluded from the analysis. The crop, county, and expertise responses from them were not included since their answers to those questions were not specific to organic. However, all comments on future research needs were included in the interest of obtaining as much information as possible on perceived future research needs.

Survey Results

1. Respondents

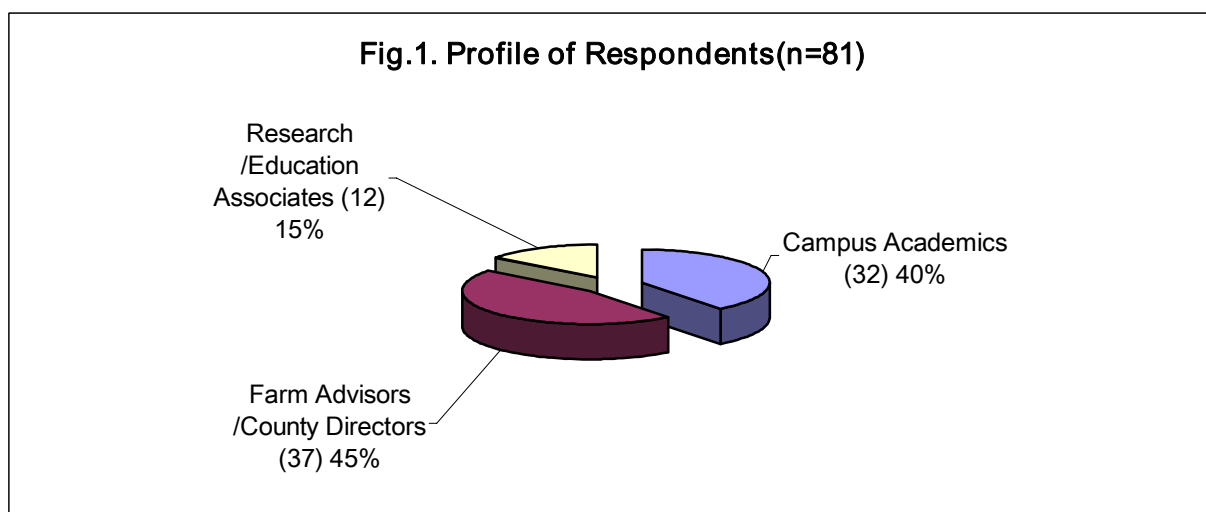
Of the 1,003 recipients of the email survey, 95 people responded to the survey (9.5% response rate for the survey). Of those 95 respondents, 81 respondents (8.1%) answered that they were currently involved in what they described as organic research and extension and

supplied information on their specific activities (Table 3). Fourteen people responded that they are not currently working in organic research and extension.

Table 3. Profile of Respondents Working in Organic Research and Extension

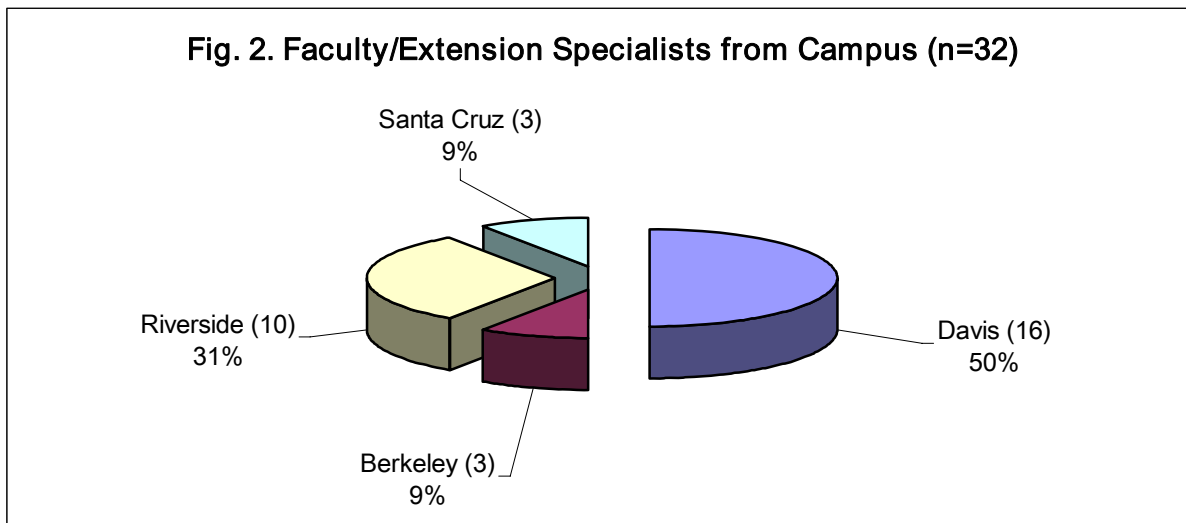
		Title/Campus/Region	Number of Respondents
Campus Academics	Title	Professors	16
		Extension Specialists	16
		(Subtotal)	(32)
	Campus	UC Davis	16
		UC Berkeley	3
		UC Riverside	10
		UC Santa Cruz	3
		Subtotal	32
Farm Advisors/County Directors	North Coast and Mountain		6
	Central Valley		20
	Central Coast and South		11
	Subtotal		37
Research/Education Associates			12
TOTAL			81

The respondents conducting organic research and extension consist of 37 farm advisors/county directors (45%), 32 campus academics (40%) including faculty and extension specialists, and 12 research/education associates (15%) including academic coordinators, postdoctoral researchers, and staff with advanced degrees (Fig.1). Overall 4.5% of campus academics (professors and specialists) responded to the survey (32 out of 706 survey recipients) and 16% of UCCE farm advisors responded to the survey stating that they were working in organic research and extension (37 out of 231 survey recipients).

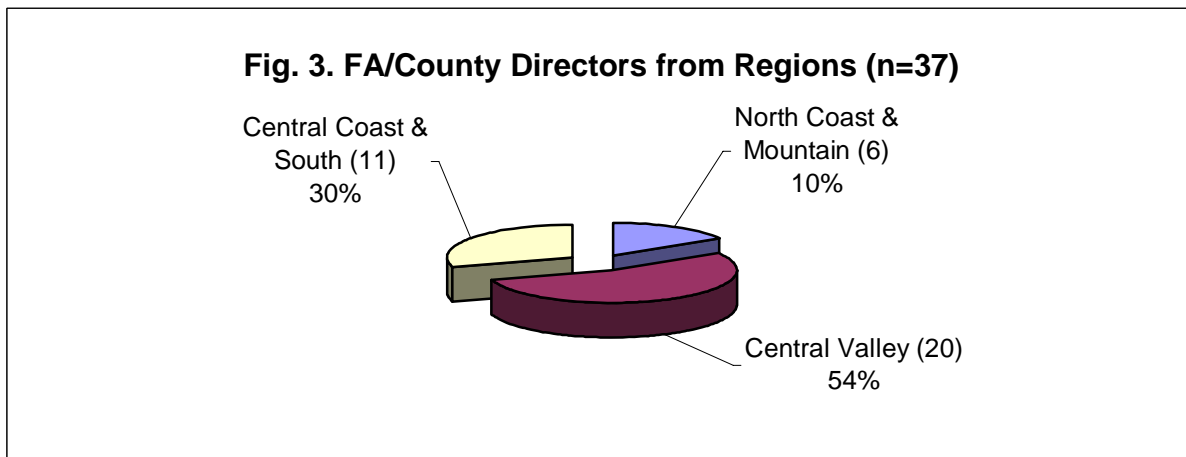


Out of the 32 campus academics, 16 (50%) were professors and 16 (50%) were extension specialists. Among the campuses, 16 respondents (50%) were from UC Davis, 10 (31%) were

from UC Riverside, 3 (9%) were from UC Berkeley, and 3 (9%) were from UC Santa Cruz (Fig. 2).

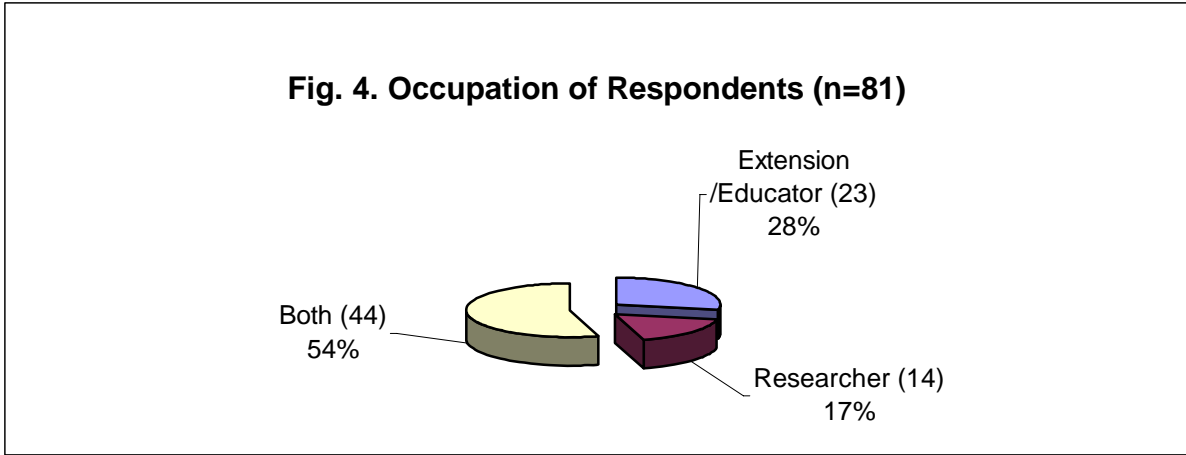


Out of 37 farm advisors/county directors, 20 (54%) were from the Central Valley region, 11 (30%) were from the Central Coast & South region, and 6 (16%) were from the North Coast & Mountain region (Fig. 3).



2. Occupations

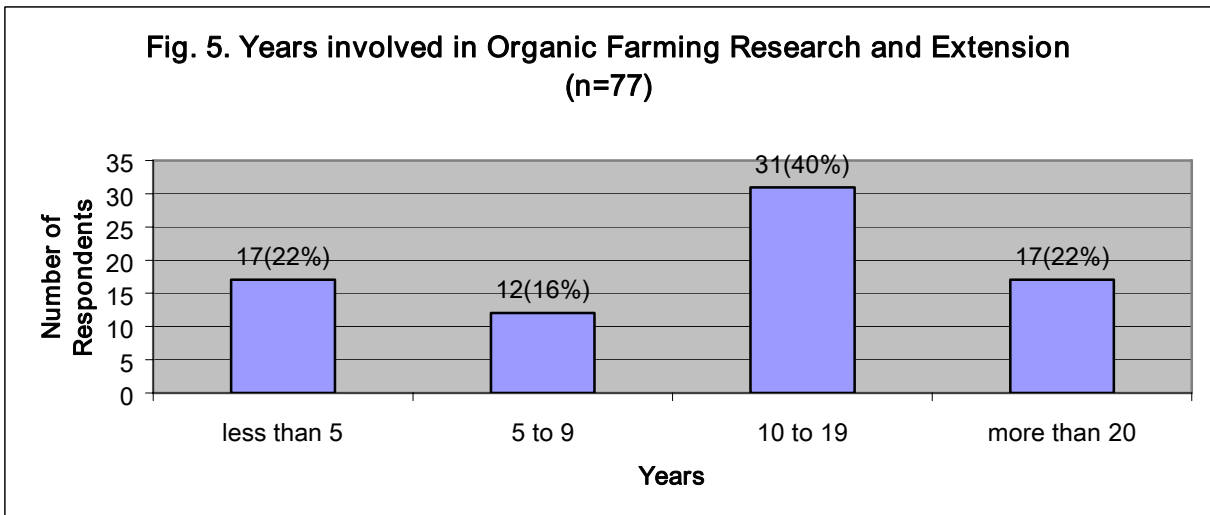
Out of 81 respondents who specified their occupations, 23 people (28%) chose extension/educator, and 14 people (17%) chose researcher, and 44 respondents (54%) described themselves as both extension/educator and researcher (Fig. 4).



3. Years Involved in Organic Farming Research and Extension

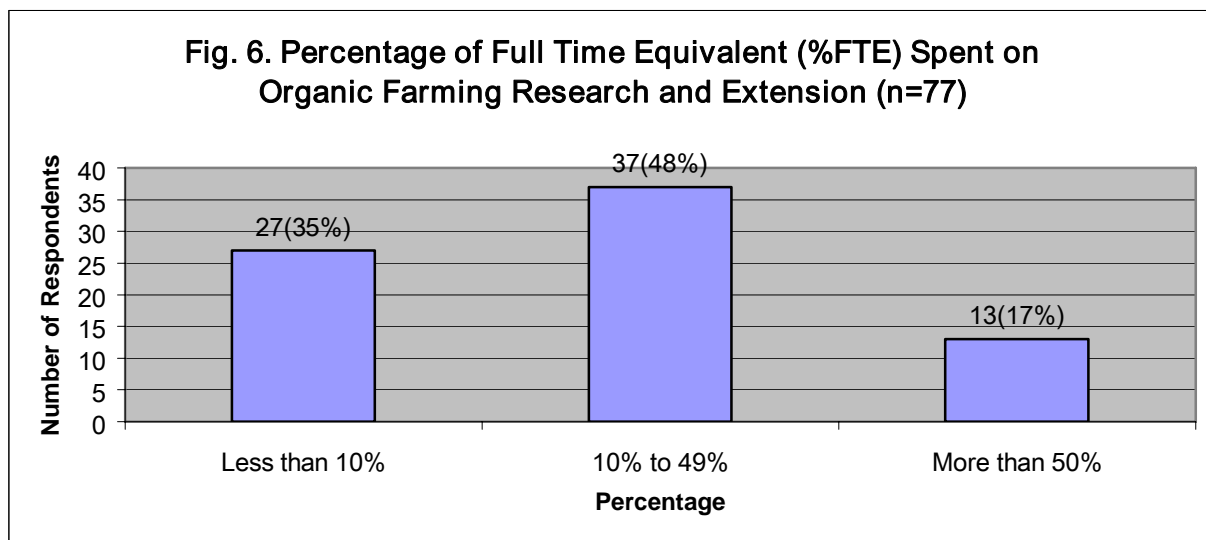
On average, the 77 respondents who answered this question reported that they have been involved in organic farming research and extension for 12.2 years. A sub-group of forty-eight respondents (62%) have been involved in organic farming research and extension for more than 10 years, on average for 17.1 years, and another sub-group of twenty-nine (38%) have been involved in organic farming research and extension for less than 10 years, on the average for 4.1 years.

Of those who have been involved in organic farming research and extension for more than 10 years, seventeen had started to work on organic more than 20 years ago, with an average of 23.7 years of experience. On the other hand, of those who averaged less than 10 years, seventeen started to work on organic less than 5 years ago, with an average of 2.4 years of experience (Fig. 5).



4. Percentage of Full Time Equivalent (%FTE) Spent on Organic Farming Research and Extension

Out of 77 respondents who specified their worktime or Percentage of Full Time Equivalent (%FTE), they estimated that they spent an average of 22% of their FTE on organic farming research and extension. This means that overall a theoretical total of 17 FTE is spent on organic research and education by the respondents. However, no individual respondent reported 100% of their FTE as devoted to organic farming research and extension. And no one at this time at the University of California has a title or position description that dedicates 100% of their FTE to organic, although this is the case in other States. Twenty-seven respondents (35%) spent less than 10% of their time on organic farming research and extension; on average they spent 4% of their time. On the other hand, thirty-seven respondents (48%) answered that they spent 10 to 49% of their time on organic farming research and extension, and they averaged 18% FTE. Thirteen respondents (17%) spent more than 50% of their time on organic farming research and extension, with their average FTE being 68% (Fig. 6).



5. Location of Organic Farming Research and Extension

Eleven respondents out of the 79 who answered this question reported working statewide. Out of 68 respondents who specified the name of the county, the number of researchers varied from a high of 21 respondents who conducted their organic research and extension in Yolo County, probably representing UC Davis faculty located there as well as UC Cooperative Extension, followed by 13 in Fresno County, the county with the highest farm gate value in the state. There were 12 respondents in Riverside County, again probably related to the location of UC Riverside in that county, and 9 in Monterey County, the country with the third highest overall farm gate value and highest declared organic farm gate value in the state. The counties with the lowest number of respondents, down to only 1 respondent, were in the

smaller agricultural counties like Modoc County, Nevada County, etc. (Table 4, Fig. 7). Researchers could specify more than one county and frequently did.

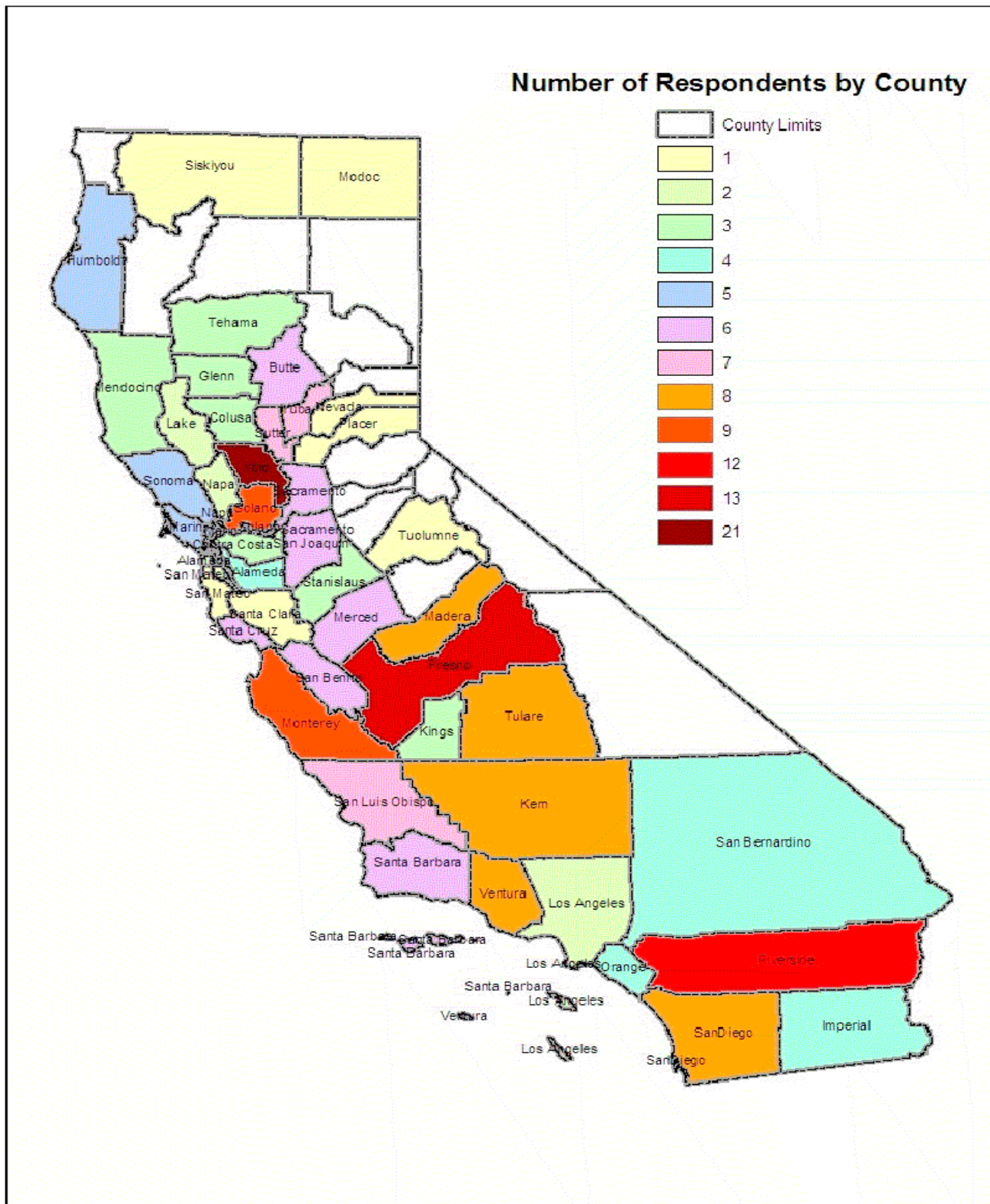
Table 4. Location of Organic Farming Research and Extension by County and Region (n=68)

Region	County	Number of Respondents	County	Number of Respondents
North Coast & Mountain	Sonoma	5	Marin	5
	Humboldt	5	Mendocino	3
	Napa	2	Shasta	2
	Lake	2	Placer	1
	Modoc	1	Siskiyou	1
	Nevada	1	Tuolumne	1
			Subtotal	29
Central Valley	Yolo	21	Fresno	13
	Solano	9	Kern	8
	Madera	8	Tulare	8
	Yuba	7	Sutter	7
	Merced	6	Sacramento	6
	Butte	6	San Joaquin	6
	Glenn	3	Colusa	3
	Stanislaus	3	Tehama	3
	Kings	3	Subtotal	120
Central Coast & South	Riverside	12	Monterey	9
	San Diego	8	Ventura	8
	San Luis Obispo	7	San Benito	6
	Santa Barbara	6	Santa Cruz	6
	Alameda	4	Imperial	4
	Orange	4	San Bernardino	4
	Contra Costa	3	Los Angeles	2
	San Francisco	2	San Mateo	1
	Santa Clara	1	Subtotal	87

- The state's counties are divided into 3 geographical regions based on the same groupings used in the UC ANR Cooperative Extension Website (<http://ucanr.org/ce.cfm>).
- Respondents could choose more than one county.

On a regional basis, most of the respondents stated that they worked in multiple counties that are located in the Central Valley, 120, followed by counties in the Central Coast & South, 87, and then counties in the North Coast & Mountain region with 29.

Fig. 7. Geographical Distribution of Organic Farming Research and Extension



6. Crops/Livestock Products Worked with

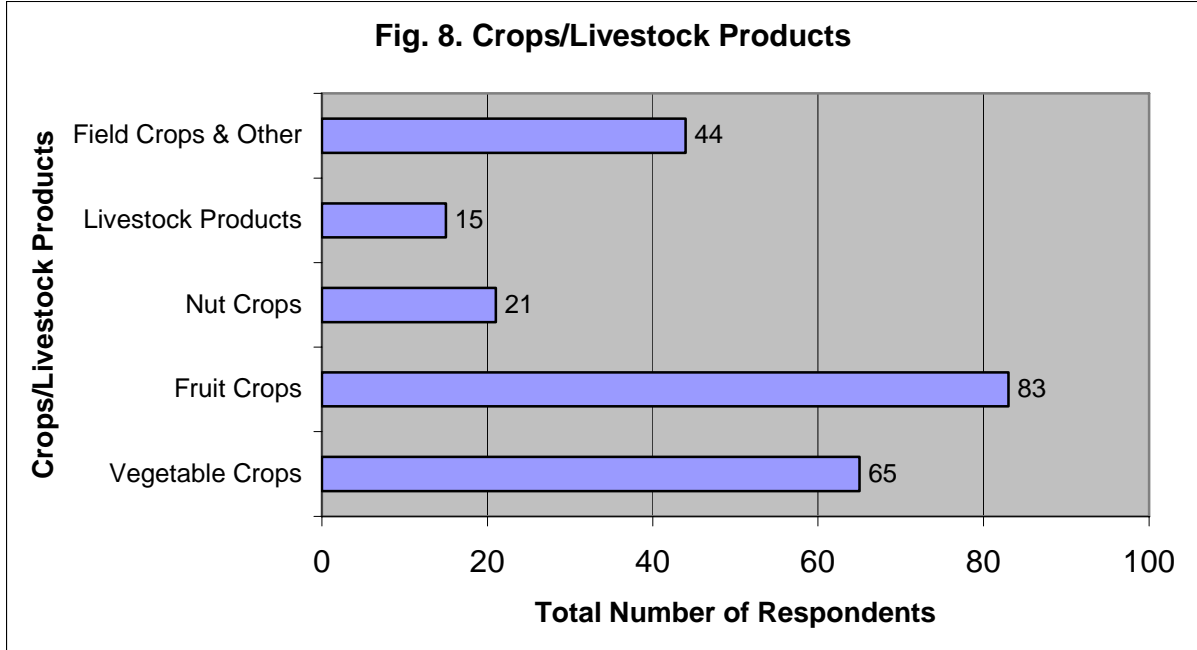
Three respondents, out of the 74 who answered this question, described themselves as working with all crops/livestock products. Out of 71 respondents who specified the name of the crops/livestock products, 23 work with vegetables, and 13 with fruit. In terms of specific fruit, 15 respondents work with tomatoes, 9 with strawberries, 8 with citrus, and 8 with wine-grapes. These crops are followed by 8 respondents who work with corn, 7 with almonds, 7 with walnuts. Seven respondents work with dairy on down to 1 with livestock-all, prune, and artichokes etc. (Table 5).

Table 5. Crops/Livestock Products (n=71)

Group	Crops/Livestock	Respondents	Crops/Livestock	Respondents
Vegetable Crops	Vegetables	23	Tomatoes	15
	Lettuce	6	Broccoli	3
	Beans	3	Melons	3
	Spinach	2	Asparagus	2
	Celery	2	Cauliflower	1
	Onions	1	Artichokes	1
	Beets	1	Carrots	1
	Peppers	1	Subtotal	65
Fruit Crops	Fruits	13	Strawberries	9
	Citrus	8	Grapes, wine	8
	Grapes, all	6	Apples	6
	Berries	5	Avocados	5
	Olives	4	Pears	5
	Stone Fruits	4	Peaches	2
	Cherries	2	Kiwifruit	2
	Grapes, table	2	Prunes	1
	Pomegranate	1	Subtotal	83
Nut Crops	Almonds	7	Walnuts	7
	Nuts	4	Pistachios	3
			Subtotal	21
Livestock Products	Dairy	7	Beef	4
	Poultry	2	Livestock, all	1
	Sheep	1	Subtotal	15
Field Crops & Other	Corn	8	Alfalfa	6
	Ornamentals	6	Cotton	5
	Wheat	5	Field Crops	3
	Forage	3	Oilseeds	2
	Sugar beets	2	Rice	2
	Safflower	1	Potatoes	1
			Subtotal	44

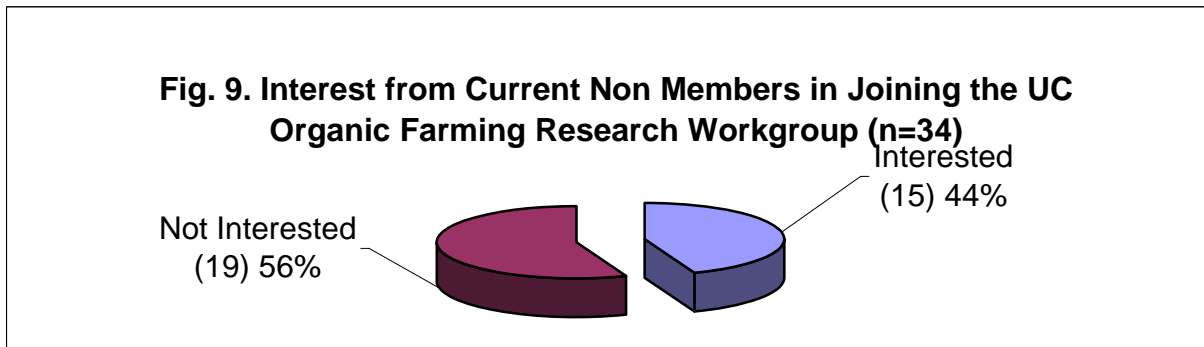
- Grouping of crops/livestock products is based on the CDFA classification system for agricultural commodities (Klonsky et al 1998, 2002).
- Respondents could choose more than one crop/livestock product.

When we grouped the respondents specified crops/livestock products into larger categories, we found that most, 83, were conducting their work with fruit crops, followed by vegetable crops, 65, then field crops and other, 44, and nut crops, 21 (Fig. 8).



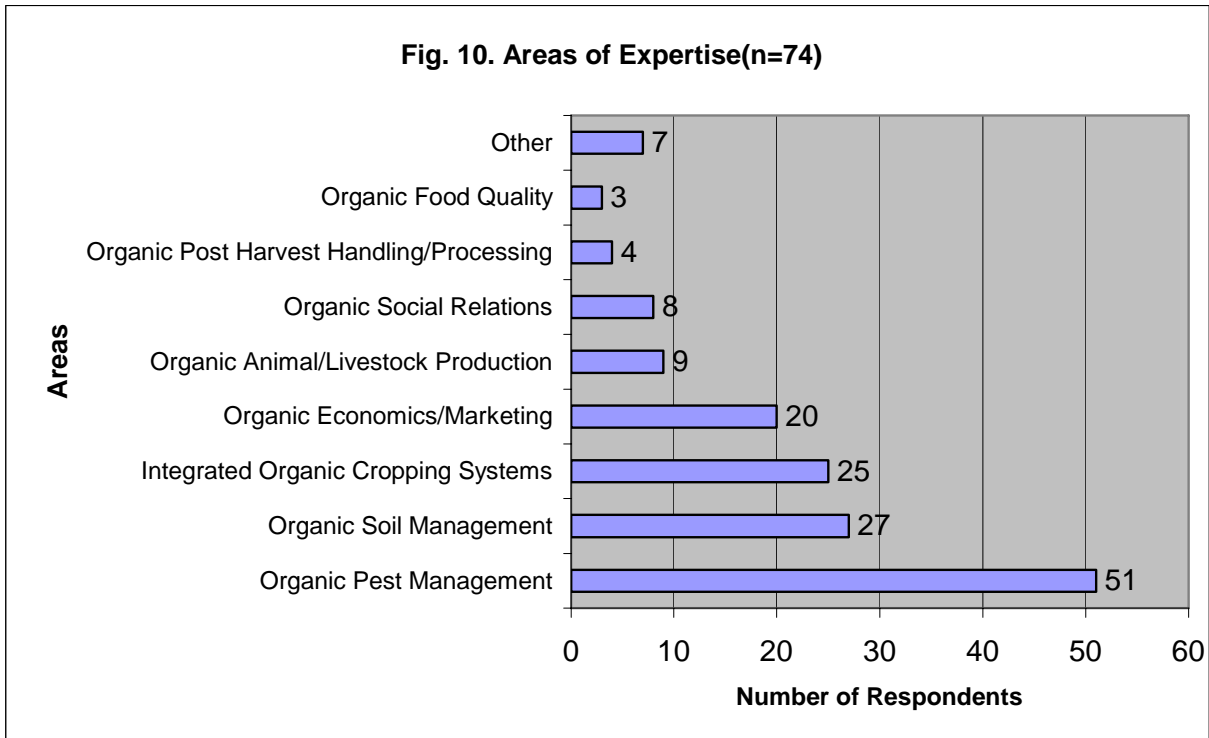
7. Interest in the UC Organic Farming Research Workgroup

There were 44 responses from the current members of the UC Organic Farming Research Workgroup out of 66 current academic members who were sent surveys. This represents a response rate of 67% within that subgroup. Out of 34 respondents who are not currently a member of the Workgroup, 15 people (44%) answered that they would like to be a member of the Workgroup whereas 19 respondents (56%) stated they were not interested in being a workgroup member. There were no specific reasons given for this, other than comments that respondents were too busy to attend meetings (Fig. 9).



8. Areas of Expertise

For this question, respondents could check more than one area of expertise. Out of 74 respondents who answered this question, 51 respondents (69%) are working in the area of organic pest management, 27 (36%) are working in the area of organic soil management, 25 (34%) are working in the area of integrated organic cropping systems, 20 (27%) are working in the area of organic economics/marketing. Fewer respondents are working in the area of organic animal/livestock production (12%), organic social relationships (11%), organic post harvest handling/processing (5%), organic food quality (4%), or other (9%) areas (Fig. 10).



Fifty-one respondents (67%) who are working in the area of organic pest management indicated they were working on such topics as weed/disease management, biological control of insect pests, and non-chemical weed control among other topics (Table 6-1).

Table 6-1. Current Reported Research/Extension Topics in Organic Pest Management

- Weed/disease management
- Biological control of insect pests
- Non-chemical weed control
- Epidemiology and cultural and biological controls of fungal pathogens, use of weather data to time disease intervention
- Generalist predators, bio-intensive IPM, enhancing bio-control through habitat modification
- Plant-feeding nematodes

-
- Regulatory issues relating to pesticides
 - Mating disruption, trap-cropping, monitoring
 - Managing root knot nematodes with cultural controls
 - Selecting cover crops that provide the most desirable control of as many pests as possible
 - Mustard-driven bio-fumigation
 - Powdery mildew in cucurbits, oak root fungus, codling moth control
 - Non-chemical alternatives for post-harvest insect control
 - Breeding of tolerance or resistance to ascochyta blight and fusarium wilt in garbanzo
 - Disease resistant citrus rootstocks
 - Biological control of filth flies, cultural control of livestock and poultry pests
 - Composting to reduce nuisance flies
 - Host plant resistance; organic-compatible repellents
 - Pest occurrence as a function of soil management
-

Twenty-seven respondents (36%) who are working in the area of organic soil management indicated they were working on such topics as fertility management, organic fertilizers and compost/green manures among other topics (Table 6-2).

Table 6-2. Current Reported Research/Extension Topics in Organic Soil Management

-
- Fertility management
 - Organic fertilizers, compost/green manures
 - Earthworm biology, mulch use
 - Nematodes, soil food web
 - Soil fertility with cover crops, cover crop mineralization
 - Research on the use of fish fertilizer products
 - Providing all essential nutrients in sufficient amounts efficiently and as economically as possible
 - Soil & foliar applied nutrient management in mandarins
 - Organic nutrient and disease management, dry farm systems
 - Compost research and educations projects
 - Changes in soil quality/productivity over time
-

Twenty-five respondents (33%) who are working in the area of integrated organic cropping systems indicated they were working on such topics as cover cropping and conservation tillage among other topics (Table 6-3).

Table 6-3. Current Reported Research/Extension Topics in Integrated Organic Cropping Systems

-
- Cover cropping
 - Conservation/reduced tillage
 - Cover crop seeding rate and varietal effects on subsequent vegetable crop production
 - General information about organic regulations and multiple crop production
-

under organic production systems

- Whole farm planning to address environmental issues
 - Conducting on-farm research at local CSA
 - How to effectively use legumes to provide nitrogen and other cover crops to provide soil cover to increase water infiltration and reduce erosion, manage frost control and yet reduce competition with the primary crop for optimum yield
 - Strawberry/vegetable/cover crop rotation, dry-farmed intercropped grapes and olives
 - Exploration of F1 hybrid seed production in common bean
 - Cropping systems at LTRAS, including organic
-

Twenty respondents (26%) who are working in the area of organic economics/marketing indicated they were working on such topics as market development and promotion, cost of production studies, and direct-marketing among other topics (Table 6-4).

Table 6-4. Current Reported Research/Extension Topics in Organic Economics/Marketing

- Market development & promotion
 - Cost study
 - Direct marketing
 - Cost of producing organic milk, consumer attitudes to organic milk
 - Economic feasibility of organic, resource use for organic, cost of production, size and growth of the organic industry
 - Agricultural tourism
 - Consumer demand, industry structure and performance, impact of regulation
 - Working with local groups on “Buy Local” campaigns and marketing of natural meat products
 - Farm-to-school direct marketing program
 - Public education on organic production through farmers' markets
 - Alternative food networks, local histories, rural-urban relationships
 - Encouraging use of local organic agriculture through extension nutrition and food preservation activities
-

Nine respondents (12%) who are working in the area of organic animal/livestock production indicated they were working on such topics as organic dairy and grass-fed beef among other topics (Table 6-5).

Table 6-5. Current Reported Research/Extension Topics in Organic Animal/Livestock Production

- Organic dairy, grass-fed beef/livestock
 - Working on a series of organic dairy educational workshops, and development of a local natural meat cooperative
 - When growing forage crops for livestock, select the most desirable, effective and efficient fertilizing materials for forages to maximize animal growth and performance
 - Cultural control of insect pests, organic pesticides
 - Extension on grass-fed/natural beef production
 - Grazing research, using saline drainage water for forage and grassland production
-

Eight respondents (11%) who are working in the area of organic social relationships indicated they were working on such topics as sustainability of local agricultural operations and alternative food networks among other topics (Table 6-6).

Table 6-6. Current Reported Research/Extension Topics in Organic Social Relationships

-
- Sustainability of local agricultural operations
 - Post-secondary sustainable agriculture educators workgroup coordination
 - Development of educational materials for post secondary students
 - Survey of county producers-needs for diversification include organic as value added
 - Integrated indicators of food system sustainability
 - Institutional relations of niche marketing and artisanal products
 - Alternative food networks, local histories, changes in production practices
-

Among the respondents, 4 are working in organic post harvest handling/processing area, 3 are working on organic food quality, and 7 are working in another area, including such topics as on-farm conservation and restoration of native flora and fauna, sustainable forestry, and food security (Table 6-7).

Table 6-7. Current Major Research/Extension Topics in Organic Post Harvest Handling/Processing, Organic Food Quality, and Other

Organic Post Harvest Handling/Processing

- Microbial food safety and post-harvest pathology
- Non-chemical alternatives for post-harvest insect, disease and physiological disorder control

Organic Food Quality

- Comparison of H₂O metabolites in organic and conventional produce
- Quality of organic apples and sensory analysis of olive oil
- Relationship between soil management and food quality

Other

- On-farm conservation and restoration of native flora and fauna
 - Programmatic extension services for organic growers
 - Sustainable Forestry
 - Organic vegetables crop production and organic vegetable seed production
 - The root system of California semi-dwarf bread wheat is too small to allow optimum water and nutrient uptake, and hence fulfill potential grain yield. It may apply to other genetically dwarfed crops such as beans.
 - Value added production and vertical integration
 - Pest and disease control, varieties, rootstocks, water management, and nutrition
 - Food security and urban gardening
-

9. Current/Pending Research/Extension Grants

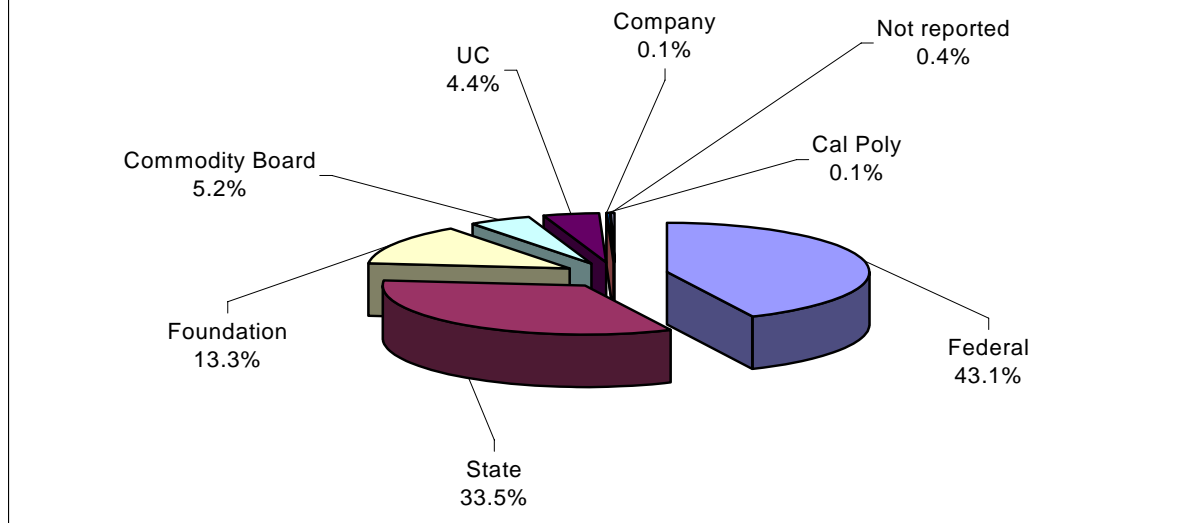
Out of a total of 81 respondents, only 36 (3.6% of personnel surveyed) responded to this question listing current and pending grants. They listed 68 current research projects that totaled \$5,165,575 and 20 pending grants that totaled \$2,379,860 (Table 7).

Table 7. Current/Pending Grants for Organic Farming Research and Extension

Current/Pending	Type of Funding Agency	Amount of Fund	Number of Grants
Current	Federal	\$2,226,595	16
	State	\$1,730,073	7
	Foundation	\$686,410	6
	Commodity Board	\$267,900	9
	UC	\$224,997	25
	Company	\$6,000	1
	Cal Poly	\$5,000	1
	Not reported	\$18,600	3
	Current total	\$5,165,575	68
Pending	Federal	\$2,010,872	9
	State	\$161,988	3
	Commodity Board	\$21,000	2
	UC	\$8,000	2
	Company	Not Reported	1
	Not reported	\$178,000	3
	Pending total	\$2,379,860	20
TOTAL		\$7,545,435	88

Major funding agencies included USDA (14 grants) and US EPA (2 grants) that together provided \$2,226,595 in federal funds, state agencies such as CDFA and CALFED (joint state and federal) provided 7 grants totaling \$1,730,073. Philanthropic foundations provided just less than 15% of the funds awarded and supported 7 projects totaling \$686,410. Commodity boards awarded 9 grants that totaled \$267,900. UC programs combined (UC SAREP, Kearny Foundation for Soil Science, Specialty Crops, etc.) funded the largest number of grants, 24, totaling \$224,997 (foundation funds passing through UC SAREP are not included in the funding total dispersed by UC as they were included under the foundations) (Fig. 11).

Fig. 11. Funding Agencies and the Percentage of Total Funds for Current Grants



The funds from the different organizations go to various areas of organic research and extension, but most of the current grants are focused on the area of non-chemical pest control and weed management, biologically integrated farming systems, soil nutrient management, transition to organic production, and workshops for organic growers (Table 8).

Table 8. Current Organic Farming Research and Extension Grants (funding agency and amount of funds in parentheses)

<Federal: 16 Grants, \$2,226,595>

- Non-chemical Control of Insect Pests in Fruits and Nuts Using Electromagnetic Energy (USDA IFAFS, \$145,191)
- Biologically-based Control for the Areawide Management of Invasive Weeds (ARS/USDA, \$143,000)
- Development and Analysis of Production Input Expenditure Studies Risk Management Agency (USDA, \$925,100)
- Organic Dairy Educational Workshops (USDA, Western SARE, \$39,377)
- Enhancing Biologically Integrated Farming Systems (BIFS) for Lettuce on the Central Coast Of California (US EPA Region 9, Food Quality Protection Act, \$196,000)
- Weather Driven Disease Models for California Strawberries (US EPA, \$49,737)
- Sustainable Weed Management, Cooperative Agreement with ARS # 58-5306-2-707 (USDA ARS, \$156,000)
- Control of *Lygus hesperus* Using Trap Crops in Organic Strawberry Production (USDA-SARE, \$31,280)
- Organic Farming Principles, Practices, and Materials: Resources for Western Region Extension and USDA Professionals (USDA-SARE PDP, \$101,907)

-
- Grower Directed Research and Extension for Weed Management (USDA, \$180,000)
 - Development and Dissemination of a Pest Resistant Cowpea Cover Crop Cultivar (USDA, Western SARE, \$140,000)
 - Control of Curly Top Virus Using Trap Crops and Repellents against the Vector, Beet Leafhopper (USDA/DANR, \$69,183)
 - Tuolumne County Grassfed Beef (USDA, \$45,320)
 - Soil N Transformations, Plant N Uptake, and Nitrate Loss After Irrigation Events (USDA-NRI, Soils and Soil Biology, amount not reported)
 - Transition to Organic Vegetable Production by Large-Scale Conventional Farmers (USDA Sustainable Agriculture Research and Education, amount not reported)
- <State: 7 Grants, \$1,730,073>**
- Influence of Earthworm Activity on C Stabilization in Organic versus Conventional Irrigated Tomato Systems (CDFA/Kearney, \$79,960)
 - Radio Frequency Energy to Control Fruit Fly Pests in Tropical Fruit (CDFA, \$70,000)
 - The Ecological and Economic Costs and Benefits of Alternative Agricultural Practices (CALFED, \$1,420,000)
 - Vegetative Conservation Practices for Water Quality and Habitat Diversity on Pajaro Valley Farms (SWRCB, \$48,331)
 - Organic Farming Information Resources for California Growers (CDFA Block Grant Specialty Crops Program, \$100,000)
 - Nutrient Management and Soil Microbial Ecology for Organically-Grown Fresh-Market Tomatoes (California Specialty Crops Research Program, amount not reported)
 - Biological Control of *Lygus hesperus* Knight: Planting, Maintenance of Nursery Site for the Production of Parasites in the Genus *Peristenus* (CDFA, \$11,782)
- <Foundations: 6 Grants, \$686,410>**
- Organic Products Website (Marin Comm. Foundation, \$37,000)
 - Producer Survey (Marin Comm. Foundation, \$10,000)
 - Meeting the Research and Education Needs of Organic and Transitional Farmers in Northern California with Humboldt, Marin, Ventura, and Small Farm Program advisors (Clarence E. Heller Foundation, \$450,000)
 - Consolidation of the UC-SAREP Statewide Organic Research and Education Initiative (Columbia Foundation, \$120,000)
 - Meeting the Research and Education Needs of Organic and Transitional Farmers in Northern California (True North Foundation, \$49,810)
 - Taking the Future (Marin Community Foundation, \$19,600)
- <Commodity Boards: 9 Grants, \$267,900>**
- Survey for Soft Scale Parasitoids in Interior Southern California (CA Citrus Research Board, \$39,000)
 - Management of Bean Thrips (CA Citrus Research Board, \$19,000)
 - Dodder Control in Tomatoes with Resistant Varieties (California Tomato Research Institute, \$5,000)
 - Avocado Cultural Practices for Pest Control (California Avocado Commission, CAS, \$160,000)
 - Avocado Root Rot (California Avocado Commission, amount not reported)
 - The Effect of Different Farming Systems and Tillage on Corky Root of Tomato (California Tomato Research Institute, \$9,900)
 - Hot-water Treatments for Control of Vine Mealybug on Dormant Grape Cuttings (Nut Tree, Fruit Tree and Grapevine Improvement Advisory Board, \$25,000)
 - Reduced Risk Pyriproxyfen & Organically Acceptable Oils for Scale Control in
-

Kiwifruit (California Kiwifruit Commission, amount not reported)

- Soil Health in an Organic Strawberry/Vegetable Rotation System (NASGA - North American Strawberry Growers Association, \$10,000)

<University of California: 25 Grants, \$224,997>

- Aggregate Dynamics Control Carbon Sequestration and Resource Use Efficiency (Kearney Foundation of Soil Science, \$69,997)
- Fertility Study (DANR Lab, \$2,500)
- Composting Manure to Control Nuisance flies (DANR, \$28,000)
- Defining and Protecting California's Rural Amenities (Gianinni Foundation, \$16,000)
- Mulch Pests and Disease (UC Hansen Trust, \$10,000)
- Adopters and Nonadopters of Organic Production Systems (Small Farm Center, \$20,000)
- Building Food Security (CF-3 UCD) (Kellogg-CF3 UC Davis, \$25,000)
- Building Food Security Workgroup (DANR, \$15,000)
- Soil Food Webs, Carbon Flow, and Soil Carbon Storage in Legume-Vegetable Rotations (Kearney Foundation of Soil Science, amount not reported)
- Impacts of Plant Community Composition on Soil Carbon Processes in Grasslands (Kearney Foundation of Soil Science, amount not reported)
- Optimizing Soil Management for Cool-Season Vegetables Workgroup (UC DANR, amount not reported)
- Placer & Nevada Counties Organic Farming Education Project (UC SAREP, *)
- Development, Testing & Dissemination of Experimental Sustainable Agriculture Learning Activities for Visitors of College & University Farms (Kellogg-CF3 UC Davis, \$28,500)
- Funding Organic and Sustainable Farm Advisor in Marin County (UC SAREP, *)
- Organic Farming Program UCCE Humboldt County (UC SAREP, *)
- Organic Olive Oil Production (UC SAREP, *)
- Diabrotica Management in Vegetables (UC SAREP, *)
- Blueberry Variety Trial under Organic Production System (UC SAREP, *)
- Organic Marketing Directory for San Diego County (UC SAREP, *)
- Organic Vegetable Production in Monterey County (UC SAREP, *)
- Efficient Nutrient Management in Organic Production Systems (UC SAREP, *)
- Various Soil and Pest Management Projects, Wine Grapes (UC SAREP, *)
- Organic Program in Ventura County (UC SAREP, *)
- Nutrition and Vegetation Management Comparisons in a No-till Organic Cling Peach System (Gerber Products Co., UC SAREP, *)
- Cost of Producing Organic Milk (UC SAREP, \$10,000)

<Company, Cal Poly SLO and not reported: 5 Grants, \$29,600>

- "Spray and Pray" on Fungicides, Growth Regulators and Insecticides (pesticide manufacturers, \$6,000)
 - Consumer Attitudes to Organic Milk (Cal Poly, \$5,000)
 - Olive Fruit Fly (source not reported, \$10,000)
 - Pesticide Use Reduction Education (source not reported, \$8,600)
 - Vertebrate Pest Control for Organic Production Systems (source and amount not reported)
-

Note: * funding amount included in Foundation grants to UC SAREP

In addition to 68 current projects totaling \$5,165,575, 20 grants totaling \$2,379,860 are pending at the time of survey (Table 9).

Table 9. Pending Organic Farming Research and Extension (funding agency and amount of funds in parentheses)

<Federal: 9 Grants, \$2,010,872>

- Novel Post-harvest Insect Control in Nuts Using Radio Frequency Energy (USDA CSREES Western Regional IPM, \$149,635)
- Improved Quarantine Treatments for Tropical Fruit Using Thermal Energy (USDA-NRI, \$338,388)
- Cultural Control of Poultry Ectoparasites (USDA CSREES Western Regional IPM, \$268,000)
- An Evolving IPM Program for San Joaquin Valley Citrus: Quantitative Evaluation of Augmentative Release for Citricola Scale Suppression (USDA CSREES WR IPM, \$148,922)
- Weed Control Using Buried Drip Irrigation (USDA CSREES Western Regional IPM, \$120,000)
- USDA CSREES Managed Ecosystems Proposal Entitled “Refining and Extending Biologically Integrated Farming Systems (BIFS) for Vegetable Crops on the Central and South Coast of California” (USDA CSREES NRI, \$798,531)
- Control of Curly Top Virus Using Trap Crops and Repellents Against the Vector, Beet Leafhopper (USDA/DANR, \$69,814)
- The Organic Seed Partnership (CSREES –OREI, \$42,582)
- No title (USDA, Western SARE, \$75,000)

<State: 3 Grants, \$161,988>

- Seasonal Population Dynamics of Glassy-winged Sharpshooter Egg Parasitoids: Variability Across Sites and Host Plants (Calif. Dept. of Food & Agric. Pierce’s Disease and Glassy-winged Sharpshooter Board, \$123,000)
- Biological Control of *Lygus hesperus* Knight: Planting, Maintenance of Nursery Site for the Production of Parasites in the Genus *Peristenus* (CDFA, \$8,988)
- UC Davis School Gardens Project’s Regional Resource Center for Garden Based Learning (California Department of Education, \$30,000)

<Commodity Boards: 2 Grants, \$21,000>

- Hot-water Treatment Project (Nut Tree, Fruit Tree and Grapevine Improvement Advisory Board (IAB), \$13,000)
- Pruning for Management of Almond Leaf Scorch (Almond Board, \$8,000)

<University of California: 2 Grants, \$8,000>

- Building Food Security Workgroup (DANR, \$4,000)
- Food Security for Farm Workers (CA Communities UCD, \$4,000)

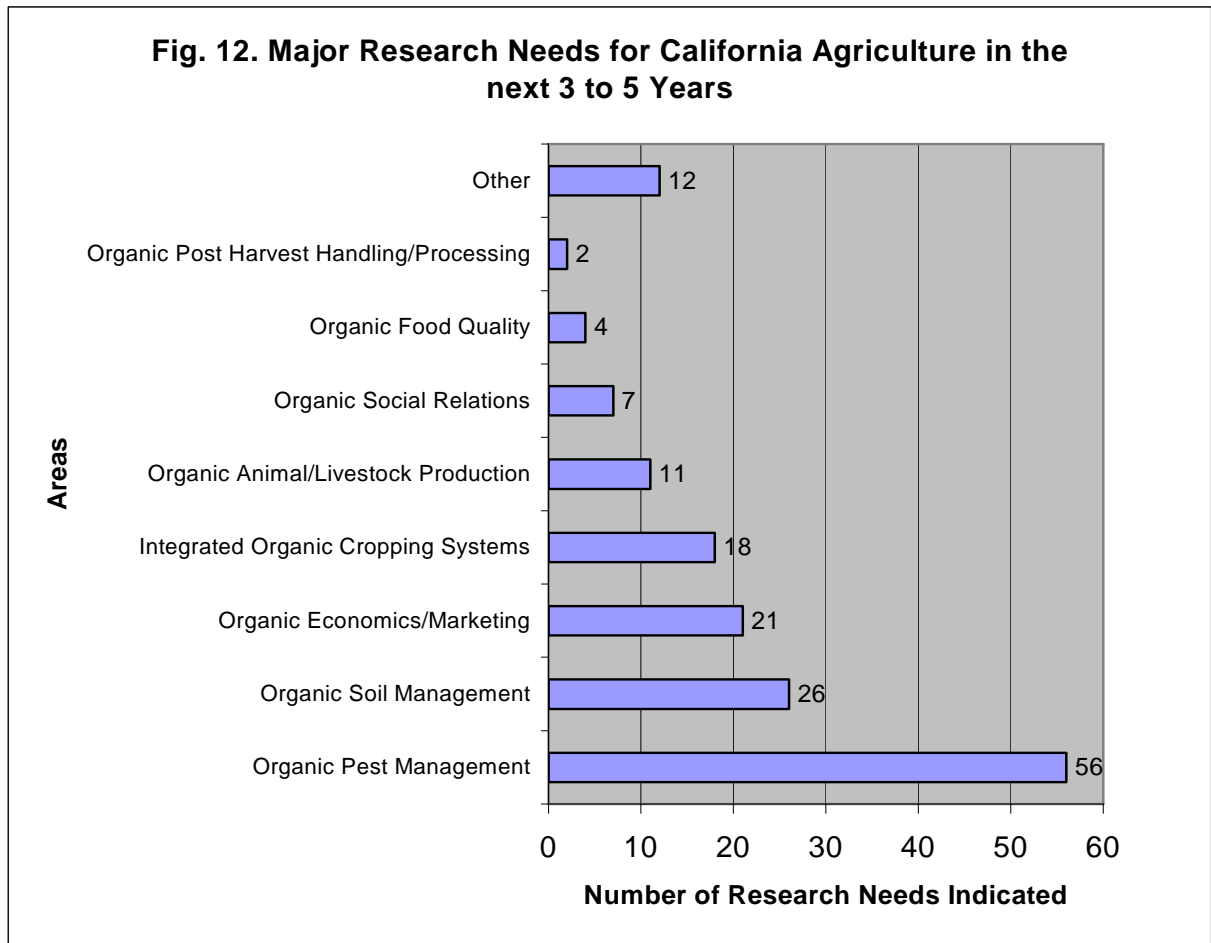
<Company and not reported: 4 Grants, \$178,000>

- Organic Pear Research (Company, -)
 - Olive Fruit Fly Control (not reported, \$18,000)
 - Organic Olive Growing (not reported, \$120,000)
 - Pesticide Use Reduction Education (not reported, \$40,000)
-

10. Major Organic Research Needs for California Agriculture in the Next 3 to 5 Years

Out of a total of 95 respondents, including the 14 respondents who are not working in organic, 72 specified 157 major organic research needs as being important to address in the next 3 to 5 years. The area identified most frequently by the respondents as being important was organic pest management (36%), followed by organic soil management (17%), organic economics/marketing (13%), integrated organic cropping systems (11%), organic animal/livestock production (7%), organic social relations (4%), organic food quality, (3%), organic post harvest handling/processing (1%), and other (8%) (Fig.12).

The long list of future research needs indicates that researchers and extension workers recognize that there is abundant additional research to be conducted in the next 3 to 5 years to support the organic industry.



Organic pest management was the most frequently identified research area and included weed, disease, arthropod, and vertebrate pest challenges in general, and for particular farming systems. Researchers listed particular cultural and biological practices such as bio-fumigation,

increasing biodiversity on farm, as well as developing and testing of organically compliant pesticides (Table 10-1).

Table 10-1. List of Organic Pest Management Research Needs (all individual responses shown to indicate frequency)

-
1. Avocado root rot
 2. Avocado thrips and mites
 3. Biofumigants to control soil pests
 4. Citrus citricola scale where current biological control is not effective and for which there is no organically acceptable chemical control
 5. Disease control and organic amendments
 6. Disease control fungicides for organic tree crop diseases
 7. Disease control in organic farming systems using cultural controls
 8. Disease control in tree fruit
 9. Disease management - more effective methods for organic
 10. Disease management in organic strawberries - rotational programs for
 11. Disease management via canopy microclimate manipulation
 12. Disease resistance - induced with organic amendments and microorganisms
 13. Disease suppression
 14. Diseases
 15. Farm field diversity research for insect control, including insectary and trap crops and rotational sequences
 16. Insect and disease control - effective alternatives
 17. Insect control
 18. Insect pest control - *Diabrotica undecimpunctata ssp. undecimpunctata* and symphylans, two major pests
 19. Insect pests - reevaluation of cultural control and operational management programs to control
 20. Insect pests e.g. cucumber beetles, squash bugs, aphids, symphylans
 21. Insecticides and herbicides (which act like organic materials, but are synthetic) approved for organic use
 22. Nematode control
 23. Non-chemical alternatives to best farming and handling practices
 24. Olive fruit fly control for small scale and back yard growers
 25. Pear codling moth, oriental fruit moth
 26. Pest control
 27. Pest control
 28. Pest control – i.e. vertebrate pest control, allowed products and practices not clear
 29. Pest control - more effective methods for organic
 30. Pest control and efficacy evaluation of ‘organically’ labeled materials
 31. Pest control
 32. Pest management
 33. Pest management - effective
 34. Pest management - effective organic
 35. Pest management
 36. Pesticide products that are labeled for organic use
 37. Pesticides - organically compliant
 38. Pesticides (Organic) and their environmental impacts (e.g. copper sprays)
 39. Spider mites
 40. Vertebrate pests (birds, squirrels, rabbits, gophers)
-

-
41. Weed control
 42. Weed control
 43. Weed control
 44. Weed control - economical options
 45. Weed control using machine vision-guided cultivation
 46. Weed control
 47. Weed control
 48. Weed control
 49. Weed intrusion in organic alfalfa since weeds are the largest threat to forage quality (they typically increase yield but decrease quality).
 50. Weed Management
 51. Weed management in organic production systems.
 52. Weed management
 53. Refining pest management options for wine growers: soil improvement research
 54. Organic fungicides for control of brown rot, scab, and shot hole on almonds
 55. Organic fungicides for control of Botryosphaeria and Alternaria on Pistachios
 56. Weed management
-

Organic soil management was the second most frequently identified research area and included such topics as fertility and plant nutrition, tillage, fertility management and environmental protection, and composting (Table 10-2).

Table 10-2. List of Organic Soil Management Research Needs (all individual responses shown to indicate frequency)

-
1. Beneficial organisms
 2. Carbon and nutrient cycling and losses - quantification of
 3. Compost regulations within NOP that are science based
 4. Composts - their use
 5. Fertility
 6. Fertility improvement with reduced water quality (TMDL) impacts
 7. Fertility in organic crop rotations including corn and wheat
 8. Fertility of soil without synthetic chemicals
 9. Fertility
 10. Fertilization practices in organic production systems - clearly establish guidelines for efficient
 11. Fertilizers - organic
 12. Microbial ecology and its role in agricultural production
 13. Nitrogen - optimize efficiency; e.g. release rates/timing of organic N sources vs. crop needs
 14. Nitrogen fertilization
 15. Nutrient balances
 16. Nutrient management
 17. Nutrient management to reduce off farm runoff, increase nutrient use efficiency and improve utilization of cover crops
 18. Nutrition management and weed control
 19. Plant nutrition & fertility
 20. Soil carbon management
 21. Soil health and organic production
 22. Soil health
 23. Soil microbes to manage weeds
 24. Tillage and soil disturbance
-

-
25. Use of cover cropping with legumes, manures, composts to provide the larger amount of nitrogen to grow high yielding almonds, walnuts, and other high nitrogen demand crops
 26. Tillage practices
-

Organic economics/marketing was the third most frequently identified research area and topics included marketing challenges, cost controls, and international competition (Table 10-3).

Table 10-3. List of Organic Economics/Marketing Research Needs (all individual responses shown to indicate frequency)

-
1. Advertising
 2. Competitiveness
 3. Cost control
 4. Cutting costs
 5. Economic Sustainability
 6. Economics of organic demand, people want no pesticides but not paying higher prices
 7. Education and support of next generation of organic farmers.
 8. Expanding markets
 9. GMO contamination - can we/ how do we prevent it?
 10. International competition
 11. Livestock small market processing and distribution
 12. Market access and related issues for Small Scale Producers
 13. Market structure and performance of organic sector
 14. Market supply and demand linkages - supply exceeding demand
 15. Marketing
 16. Marketing of organic crops
 17. Marketing
 18. Marketing
 19. Marketing/cost
 20. Organic farming and genetic engineering interactions - Bt
 21. Small farm cost
-

Integrated organic cropping systems was the fourth most frequently mentioned and included such research topics as integrated and whole farming systems, cover cropping, crop thinning, organic transitional assistance and conservation tillage (Table 10-4).

Table 10-4. List of Integrated Organic Cropping Systems Research Needs (all individual responses shown to indicate frequency)

-
1. Conservation tillage
 2. Cover cropping
 3. Crop rotations
 4. Crop specific issues - i.e. blueberry, avocados, and other crop production under organic production systems
 5. Irrigation
 6. Irrigation and water conservation
 7. Poly-cultural production methods
-

-
8. Systems research funding that is long term
 9. Systems research often requires collaborative, interdisciplinary work among specialists
 10. Systems research often requires studies to be long-term
 11. Systems research that is interdisciplinary
 12. Systems research that is on-farm participatory
 13. Systems Studies
 14. System-wide organic management of research land so that experimental plots can be evaluated within the context of a whole system. To be effective, organic systems research needs institutional support including a long-term commitment of land and adequate funding
 15. Thinning agents for organic tree fruit - compliant
 16. Transition from traditional farming to organic farming
 17. Transitioning to organic - strategies
 18. Tree crops and berries in general - organic production systems
-

Organic animal/livestock production was mentioned numerous times and topics such as research into proper management of livestock parasites, animal welfare and organic standards and manure management were raised (Table 10-5).

Table 10-5. List of Organic Animal/Livestock Production Research Needs (all individual responses shown to indicate frequency)

-
1. Animal - beef production for organic need research on parasiticides and ability of local beef producers in coastal climates to convert to a organic production system
 2. Animal health care - Organic
 3. Animal health
 4. Animal nutrition
 5. Animal welfare with respect to the organic standards, some of the practices of organic animal production are as primitive and scientifically indefensible as mainstream production. These practices diminish the meaning of the organic label
 6. Biological and cultural controls of flies on dairy or poultry operations
 7. Biological and cultural controls of poultry ectoparasites
 8. Livestock parasite management
 9. Livestock production systems to help producers make a successful transition to organic livestock production
 10. Manure management
 11. Range management practices that are organic
-

Several researchers work in the area of organic social relationships where they see future research needs should include social justice and sustainable agriculture, increasing links between producers and academics, studying agricultural transformations and alternatives to the dominant industrial paradigm, research on farm size and scale issues and increased funding for organic research (Table 10-5).

Table 10-5. List of Organic Social Relationships Research Needs

-
1. Agricultural transformations and alternatives to the dominant industrial paradigm, organic too "focused"
 2. Closer links between producers and academics
-

-
3. Farm size and scale and organic (single-family farms)
 4. Farmer Participation. The needs of organic farmers can best be met if producers are involved in all stages of research including identification of research needs, planning, data collection, analysis, and dissemination. On-farm research is one mechanism for promoting collaborative work between farmers and academic researchers. Producer involvement can also be encouraged at research stations.
 5. Funding for research
 6. Grower participation key to extend best management practices and specific strategies applied to solve their pest problems. (In farm field research)
 7. Social justice and sustainable agriculture
-

Finally, some of the respondents indicated several other topics as future research needs in the area of organic food quality, organic post harvest handling/processing, and others (Table 10-7).

Table 10-7. List of Organic Food Quality (OFQ), Organic Post Harvest Handling/Processing (OPHHP), and Other

<OFQ>

1. Crop production methods for foods that may reduce problems with blood sugar regulation and obesity
2. Health attributes of organic food - the proven and provable
3. Health benefits of organic meat
4. Quality of organic products

<OPHHP>

1. Post-harvest handling.
2. Post-harvest quality and safety

<Other>

1. Breeding for the root system of crop plants
 2. Farm advisors and/or field technicians who have expertise on both animal and row crop organic production
 3. Production guidelines for major California commodities
 4. Production manuals, short courses, and other educational efforts designed specifically to meet the needs of organic producers
 5. Research station land that is certified organic and set aside for long-term organic systems research
 6. Seed production - Organic
 7. UC campus-based specialists that specialize in organic systems
 8. UC Cooperative Extension advisors that specialize in organic systems
 9. UC institutional support via a centralized interdisciplinary program designated to coordinate organic research efforts
 10. Urban pesticide use reduction
 11. Varieties that are suitable for organic systems
 12. Wildlife enhancement on-farm
-

Discussion

Although this survey provides some insight into the breadth and depth of UC research and extension addressing organic agriculture, there are limitations that need to be observed in interpretation of the data. Since the response rate was under 10%, we cannot assume that survey respondents are representative of the population of UC and USDA researchers who were asked to participate. It is also probable that respondents had varying understandings of the definition of organic agriculture and how their work directly or indirectly relates to it. This would affect how they reported the extent of their related research and extension activities, and could lead to over- or under- reporting. It is also probable that with an email survey, respondents may not have noticed the survey due to the current overload of email in-boxes. Other problems may include professional considerations or bias concerning this industry which could affect a respondent's willingness to reply. Despite these challenges we feel that useful and meaningful information was obtained from the survey and the data analysis which we present in this report.

Personnel, Full Time Equivalent (FTE) Contribution

According to this survey, 81 researchers and educators out of 1,003 queried (8.1%), 79 from the University of California, but also 2 researchers with the USDA, self-report that they are involved in research and extension projects that are relevant to organic farming in the state. The 77 respondents who quantified their percentage full time equivalent (% FTE) spent on organic research and extension activities, estimated that they spend an average of 22% FTE which represents a theoretical total of 17 FTE. Thus the equivalent of 1.7% of respondents (17 FTE out of 1003 queried) are engaged in organic research and extension. It should be noted that no individual respondent reported a 100% allocation of their time to organic research and extension. In fact, there are no current UC positions that dedicate 100% of the person's time to organic agriculture, although there are such positions at other Land Grant Universities in states such as Iowa, and other institutions in California such as the USDA ARS. It should also be noted that as this is self-reported activity in organic agriculture, the relevance of individual researcher's work to the organic industry is also open to interpretation.

Research Topics / Commodity and Region Analyses

Most University of California and USDA researchers/educators who participated in the survey are engaged in organic pest management, followed by soil management, integrated cropping systems, and economics/marketing. Their current research and extension activities approximate nationally-surveyed organic farmer research needs as identified by the Organic Research Foundation (OFRF) in their national survey of organic farmers (OFRF 1999). In the Third Biennial National Organic Farmers' Survey, farmers ranked the category "weed management" as their number one research priority among thirty-two research topics, followed by "relationship between fertility management and crop health, pest & disease resistance", "soil biology", "crop rotation" and "cover cropping". Organic farmers also indicated in their own words "weed control" as their top research priority, followed by "applied organic fertility management".

Survey results show that organic research and extension efforts are principally conducted in vegetables, and fruit and nut crops. These results correspond with the relative significance of these crops to California's agricultural economy. According to an analysis of the CDFA organic registrant database, vegetables, and fruit and nut crops were the most important organically grown crops by all three measures: number of farmers, acreage, and sales. CDFA data from 2003 show that 79% of organic farmers in California grew these crops. In terms of land area, they were 53% of the total organic acreage that same year. And in dollar figures, vegetables, and fruit and nut crops represented 83% of total sales by organic farmers. (Klonsky, 2005).

The regional distribution of organic expertise revealed through the survey in the spring of 2004 also corresponds with the relative importance of organic farming in different areas of California based on 2003 data from the CDFA organic registrant database. Most of the respondents are active in Central Valley counties, followed by Central Coast & South counties, and North Coast & Mountain counties. This distribution is fairly similar to the CDFA data on the acreage of organic farms and value of organic agriculture in these same regions. The San Joaquin Valley had one-third of the state's total organic acreage and \$76 million in sales (23 percent of the state total), although only 12 percent of the growers. The Sacramento Valley contained 22 percent of the state's organic acreage and the third highest percent of state sales, at 15 percent. The Central Coast, while only having 14 percent of the total acreage, generated the highest sales at \$101 million (30% of the state total), but only 13 percent of the growers. The highest number of growers farm on the South Coast, 22% of state total and generate 12 percent of total state sales (Klonsky, 2005).

Grant Analysis and Research Needs

Because of the low response rate on the question of actual grant funds focused on organic research and extension it is hard to know how good an estimate this is of grant-funded work in the State. We know at least \$5,165,575 has been reported as currently available by 36 researchers supporting 68 projects. The main funders of organic research appear to be federal agencies, principally USDA but also US EPA, followed by California State agencies in partnership with federal agencies such as CALFED and CDFA, followed by private philanthropic foundations, followed by various commodity boards and then several University of California funding programs, including UC SAREP.

Respondents identified 157 future research needs (over the next 3 to 5 years) with organic pest management mentioned most frequently, followed by organic soil management, organic economics/marketing, integrated organic cropping systems, organic animal/livestock production, and organic social relations. This list of future research needs will be very useful for prioritizing future cooperative projects and will be conveyed to funders and others interested in positioning California's industry to take advantage of the value added aspects of organic agriculture.

Assessing UC Investment in Organic Agriculture

As previously stated, survey results show a combined personnel effort of 17 FTE directed to organic agriculture. This shows that some UC researchers and educators see this is an important area of work and are taking the initiative in responding to the needs of clientele in the state. Is this an appropriate level of investment in this sector? Should we be looking for opportunities to increase this number? There are several ways we can evaluate the current situation.

Monetary Analysis. One approach is to look at the investment in monetary terms, and compare that to the relative farm gate value of organic agriculture in California. The 17 FTE figure reported in our survey translates into about \$1,576,818. This amount is based on an average salary and support funds of \$92,754 for advisor and specialist FTEs (pers. comm. ANR AVP R. Standiford). This figure does not include AES salaries, which would increase the average salary; however that figure was not currently available through ANR. Adding the total amount of current grants funds in organic research and extension from the survey to this figure gives an estimated total investment of \$6,742,393. This figure represents approximately 2% of total ANR expenditures for FY 2003/2004 (taking into account federal and state funds including Agricultural Experiment Station and Cooperative Extension sources, County, and private funds and competitive grants).

The farm gate value of organic agriculture relative to all of agriculture in California in 2003 is about 1.2% and the percent of cropland in organic production is just under 2% (Table 11). However, it is widely assumed that due to the self-reported nature of the California organic registrant database and the registration fee structure, the value of California organic farm gate production is probably greatly under-reported.

Table 11. Comparison of Estimated UC Investment in Organic Agriculture to Relative Importance of Organic Farming in California Agricultural Economy in 2003/2004.

	Estimated Monetary Investment in FY 2003/2004	Value of Organic Agriculture in California in 2003	Acres in Organic Production in California in 2003 (cropland)
Amount in Organic	\$ 6,742,393	\$ 330 million	172,233
Total Amount	\$ 336,396,000	\$ 27.8 billion	9.5 million
Reported Organic as Percent of Total	2%	1.2%	1.8%

In these quantitative terms, the current estimate of self-reported UC investment in organic agriculture (2% of total expenditures) would seem to be commensurate with the current reported farm gate value of organic agriculture. But is this sufficient, and is the overall effort organized effectively to meet the current and future needs of organic producers? These are

more challenging questions to answer. Given the suspected under-reported nature of the production value data bases and the fact that the organic retail marketplace is expanding more rapidly than conventional food markets (20% per year for the past five years vs. 3%), the level of public sector investment in organic research and development will need to increase in order to be keep pace and provide the high quality, science-based information that organic producers are looking for. There also may be opportunities to better coordinate the research and extension activities of personnel working in organic production. This could help integrate the expertise of personnel into a broader range of activities and projects, focus the organic research and extension effort on high priority topics and issues, and enhance the relevance and applicability of the work to the immediate needs of producers and the industry.

Comparison to Other Surveys. Another approach to assessing UC investment in organic agriculture is to compare our results to those of other institutions and states. There are four such surveys where similar information has been obtained: Washington State University, Illinois, Organic Farming Research Foundation, and USDA/ARS.

Washington State University researchers conducted an email survey in 2001 where 58 respondents cited 90 projects or activities focused on organic farming (Miles et al. 2002). Similar to our survey, they found that most research being conducted was in the area of pest management and soil management. The value of Washington State agriculture was \$5.3 billion in 2002 (ERS 2004), with organic sales being \$20 million, which represents 0.4% of the total value of agriculture in the state. In California, organic agriculture represents a higher percentage of the total value (1%), so one would expect a higher number of individuals working in organic production. How much higher and what number would be needed to match the effort represented in the Washington State survey? Using Washington's ratio of personnel-to-value of organic, California should have about 145 public research sector individuals working in organic to represent a similar investment.

In Illinois, Duram and Larson (2001) conducted a survey of organic farmers and land grant researchers to assess among other issues how well what researchers were doing related to grower needs. Their sample size was fairly small, 92 USDA SARE researchers, 79 sustainable farmers and 123 organic farmers, and response rates ranged from 29-49% among the groups. They reported that there were significant differences in what researchers were doing compared to what organic growers felt they needed. In particular they found that organic and sustainable farmers were more interested in soil structure, texture and marketing than were USDA SARE funded researchers. In addition, organic farmers wanted to see more research on composting/using organic waste, organic farming in general, cover crops, herbs and spices, and honeybees.

On a national level, in 1995 and 1996, the non-profit Organic Farming Research Foundation (OFRF) using the USDA's CRIS database estimated that less than 0.1% of federal agricultural research dollars were funding organic farming research. Their "strong organic" category included 34 projects that received a total of \$1.5 million in federal funding in FY1995. Their "weak organic" added an additional 240 projects out of 30,000, but still remained, in their analyses, too low as a percentage of the value of organic agriculture. OFRF has also conducted their second "State of the States" report on activity in support of organic

farming at land grant universities. They focus on actual research lands that are certified or at least managed organically as the measure for assessing land grant activity. They found that organic research occupies only 0.13% of available research acreage in the land grant system (up from 0.07% in 2001), while 0.3-2% of U.S. farmland is certified organic, depending on crop type. Certified organic research acreage is only 0.06% of the total research acreage available, up from 0.02% in 2001. In their analysis, California did not rank as well as Iowa, Ohio, North Carolina or others in having certified organic research lands, particularly based on the high value and acreage of organic agriculture in California.. However, they did not actually quantify the number of faculty and their percent of time spent on organic research or extension, or relate this to the total number of faculty in each State; it would be valuable if they could do this in the future. They did provide valuable and detailed information on specific researchers and their projects.

USDA/ARS researchers conducted a survey evaluating their scientists' interest in organic agriculture and found 188 scientists who responded that they were interested in this sector of the agricultural economy (10% of respondents) and approximately 80 scientists (5% of respondents) have worked with organic growers (Jawson and Bull, 2002). These figures appear to be similar to our survey as a percentage of a research institutions' scientists interested and involved in organic agriculture. USDA/ARS (particularly the Salinas research center) has several researchers in California who have organic agriculture research explicitly prioritized in their position descriptions.

Other UC Activity in Organic Agriculture. In addition to the individual research and extension efforts revealed through our survey, recent planning documents by ANR reveal that it has prioritized organic agriculture as one of seventeen priorities in agricultural production, and as ranking “moderate” in importance as a core issue (UC ANR 2003; UC ANR 2004). Over the past 20 years, UC has created a number of programs that address organic farming. Swezey and Broome (2000) have estimated that between 1987 and 2000 UC SAREP had awarded almost \$7 million in state funded and extramural grants of which 20% was deemed directly relevant to organic farming and 62% indirectly relevant to organic farming in the state. This estimate included partial support for two important farming systems comparison trials at UC Davis; the Sustainable Agriculture Farming Systems (SAFS) 12 year USDA SARE co-funded trials with an organic treatment, and the 100 year Long Term Research Agricultural Systems (LTRAS) project which also included an organic treatment. Important information and outreach events as well as peer-reviewed publications have come out of both projects. In addition, faculty at UC Santa Cruz have conducted organic research and educational programs for 20 years, both on-farm and in the context of research plots at the Center for Agroecology and Sustainable Food Systems. The UC Davis Student Experimental Farm also conducts organic research and offers student internship opportunities at the smaller organic farm/garden scale. Finally, as the survey results reveal there has been a significant new investment of foundation resources in support of California organic research and education, coordinated and administered by UC SAREP, which since 2000 has supported county based research and education programs around the State under the Organic Initiative (see: <http://www.sarep.ucdavis.edu/Organic/index.htm>)

In 2000, SAREP organized the Organic Farming Research Workgroup. The purpose of this workgroup is to enhance communication and interaction among individuals involved in

research and extension related to organic farming. Specific objectives are to share resources, prioritize research needs, and coordinate fundraising efforts. The workgroup is open to both UC and non-UC partners involved in organic farming research and extension activities. The workgroup has held an annual meeting in each of the last three years, and assisted with the organizing of foundation and State funded research and extension initiatives. Workgroup members' survey response rate was predictably much higher than the overall survey rate at 67%, given their interest in the topic. However, this workgroup was never ratified (made permanent) by ANR and its ratification petition was not funded in 2004. With appropriate support, the workgroup could continue to play an important role in coordinating and focusing the efforts of UC personnel and others working in organic agriculture and can use these survey results to increase its impact, improve coordination among researchers and institutions, and obtain additional funding to provide greater support for California organic agriculture.

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Appendices

1. Email Cover Letter and Survey Form

Organic Farming Research and Extension Activities at UC

Dear UC academic staff in Cooperative Extension and the Agricultural Experiment Station:

The UC Sustainable Agriculture Research and Education Program (SAREP) is conducting a short email survey on the present status of organic farming research and extension in the UC system to identify organic expertise and to characterize specific activities. Organic farming is now regulated by the USDA and CDFA and has sustained a market expansion rate of 20% per year over the last 10 years. This survey will assist U C as a whole in prioritizing research needs, organizing education programs, and coordinating fundraising efforts. We hope to produce a brief report that outlines our results, to be posted on the SAREP Web site along with an on-line database.

In your survey response, please include research either conducted in full organic compliance with field and processing systems (on certified ground with compliant materials etc) or research relevant to particular components of organic farming and processing systems (e.g. pest management employing cultural and biological controls, compliant chemical treatments, organic soil management, irrigation management, post harvest treatments, market analysis, market development, social relations etc.).

Please take a moment to fill out the short survey form attached, and email it back to Chulgoo Kang (cgkang@ucdavis.edu) at your earliest convenience. We hope that it may be possible to simply cut and paste information from your CV. Thank you so much for your cooperation.

If you have any questions about this survey, please contact Chulgoo Kang at 752-7541 or by email at cgkang@ucdavis.edu.

Sean Swezey, Director <findit@cats.ucsc.edu>
Jenny Broome, Associate Director <jcbroome@ucdavis.edu>
Chulgoo Kang, Visiting Researcher <cgkang@ucdavis.edu>

UC SAREP
One Shields Ave.
Davis, CA 95616
Phone: 530.752.7556
www.sarep.ucdavis.edu

UC Organic Research and Extension Survey

Return form to: Chulgoo Kang at cgkang@ucdavis.edu

1. Contact Information

Name: _____

Title: _____

Department: _____

Address: _____

City: _____

State: _____

Zip code: _____

Email address: _____

Telephone: _____

Web site: _____

2. Occupation (check one or both):

Extension / educator

Researcher

3. How long have you been involved in organic farming research and extension? _____ years

4. What percentage of your time (%FTE) do you spend on organic research and extension? _____%

5. Would you like to be a member of the UC Organic Farming Research Workgroup?

YES

NO

(If yes, the information you provide here in this survey will be posted on the Organic Farming Research Workgroup online directory. For more information, see www.sarep.ucdavis.edu/organic/workgroup.htm. You can see current members by clicking on "list all members." Detailed listings for each individual are available by clicking on that person's name.)

6. Counties where you conduct your research and extension activities:

7. Crops / livestock products you work on:

8. Areas of expertise:

(you may check more than one area)

Organic Soil Management

Research / extension topics: _____

Integrated Organic Cropping Systems

Research / extension topics: _____

Organic Pest Management

Research / extension topics: _____

Organic Animal / Livestock Production

Research / extension topics: _____

Organic Economics / Marketing

Research / extension topics: _____

Organic Social Relations

Research / extension topics: _____

Organic Food Quality

Research / extension topics: _____

Organic Post Harvest Handling/Processing

Research / extension topics: _____

Other

Research / extension topics: _____

9. Please list Current Organic Research / Extension Grants

Project Title	Funding Agency	Year Started / Ended (e.g. 2002-2005)	Total Amount
TOTAL			

* * if you prefer not to provide funding details for each project please consider still providing total funds, that would be helpful in summarizing resources going to organic research and extension.

10. Please list Pending Organic Research / Extension Grants

Project Title	Funding Agency	Year Started / Ended (e.g. 2002-2005)	Total Amount
TOTAL			

* if you prefer not to provide funding details for each project please consider still providing total funds, that would be helpful in summarizing resources going to organic research and extension.

11. What are the major organic research needs you see as being important to address in the next 3-5 years?

12. Organic Farming Publications / Products

(Please list all your journal citations, publications, or other educational products related to organic farming. You can cut and paste from your CV.)

Thank you for completing this survey.

(If you are unable to fill this survey out please consider attaching your CV and we will try to fill it out for you. We may need to contact you to verify information.)

2. Directory of Current Organic Researchers and Extension Workers in California
--from survey respondents and workgroup members (* indicates workgroup member)

Name (Contact Information)	County	Crop	Areas of Expertise (Topics)
<p>Adamchak, Raoul * Market Garden Coordinator UC Davis StudentFarm/Pomology One Shields Ave. Davis, CA 95616 530-754-7891 rwadamchak@ucdavis.edu</p>	<p>Yolo County</p>	<p>Vegetable Crops</p>	<p>Organic Soil Management Organic Pest Management Other (organic vegetable crop production and organic vegetable seed production)</p>
<p>Arpaia, Mary Lu Extension Subtropical Horticulturist UC Kearney Ag. Center 9240 S. Riverband Ave. Parlier, CA 93648 559-646-6561 arpaia@uckac.edu www.ucavo.ucr.edu</p>	<p>San Diego, Riverside, Orange, Ventura, Santa Barbara, San Luis Obispo, Kern, Tulare, Fresno Counties</p>	<p>Subtropical fruit crops, mainly citrus and avocado</p>	<p>Organic Post Harvest handling/Processing (avocado and citrus)</p>
<p>Baumgartner, Kendra * Research Plant Pathologist Plant Pathology Dept. UC Davis One Shield Ave. Davis, CA 95616 530-754-7461 kbaumgartner@ucdavis.edu</p>			<p>Organic Soil Management Integrated Organic Cropping System Organic Pest Management</p>
<p>Bolda, Mark Farm Advisor 1432 Freedom Blvd. Watsonville, CA 95076 831-763-8040 mpbolda@ucdavis.edu</p>	<p>Santa Cruz, Monterey, San Benito Counties</p>	<p>Strawberries and Caneberries</p>	<p>Organic Pest Management</p>
<p>Brennan, Eric * Research Horticulturist USDA-ARS 1636 E. Alisal St. Salinas, CA 93905 831-755-2822 ebbrennan@ucdavis.edu</p>	<p>Monterey, San Benito, Santa Cruz Counties</p>	<p>Vegetable Crops, cover crops</p>	<p>Organic Soil Management (cover cropping, compost) Integrated Organic Cropping System (cover crop seeding rate and varietal effects on subsequent vegetable crop production) Organic Pest Management (weed control)</p>

Survey of Organic Research and Extension Activities at the University of California

Name (Contact Information)	County	Crop	Areas of Expertise (Topics)
<p>Brittan, Kent Farm Advisor 70 Cottonwood Street Woodland, CA 95695 530-666-8143 klbrittan@ucdavis.edu http://ucce.ucdavis.edu/counties/ceyolo/index.cfm</p>	<p>Yolo, Solano, Sacramento Counties</p>	<p>Corn, Wheat and Oilseed crops</p>	<p>Integrated Organic Cropping System Organic Pest Management</p>
<p>Broome, Janet C. * Associate Director UC SAREP One Shields Ave. Davis, CA 95616 530-754-8547 jcbroome@ucdavis.edu www.sarep.ucdavis.edu</p>	<p>Statewide, Monterey, Santa Cruz, Mendocino, and Napa Counties</p>	<p>Strawberries, wine grapes</p>	<p>Integrated Organic Cropping System Organic Pest Management (epidemiology and cultural and biological controls of fungal pathogens, use of weather data to time disease intervention)</p>
<p>Bugg, Robert L. * Senior Analyst, UC SAREP One Shield Ave. Davis, CA 95616 530-754-8549 rlbugg@ucdavis.edu www.sarep.ucdavis.edu</p>	<p>Yolo, Solano, Mendocino, Monterey, San Benito, Ventura, Humboldt Counties</p>	<p>Vineyards, almonds, walnuts, lettuce, peppers</p>	<p>Organic Soil Management (earthworm biology, cover crops) Integrated Organic Systems (cover crops) Organic Pest Management (generalist predators, biointensive IPM, enhancing biocontrol through habitat modification) Other (on-farm conservation and restoration of native flora and fauna)</p>
<p>Butler, Leslie J.(Bees) * Specialist in Extension Agricultural and Resource Economics, UC Davis One Shields Ave. Davis, CA 95616 530-752-3681 ljbutter@ucdavis.edu</p>	<p>All counties in California with dairy operations</p>	<p>Dairy, dairy feed crops</p>	<p>Organic Economics /Marketing (cost of producing organic milk, consumer attitudes to organic milk)</p>
<p>Caprile, Janet * Farm Advisor, Contra Costa 75 Santa Barbara Rd. 2nd Floor Pleasant Hill, CA 94523 925-646-6540 jlcaprile@ucdavis.edu</p>	<p>Contra Costa, Alameda Counties</p>	<p>Fruits & nuts: apples, apricots, cherries, grapes, pears, stone fruit, walnuts Vegetables: sweet corn, tomatoes</p>	<p>Organic Soil Management (cover crops, fertility management) Integrated Organic Cropping Systems (esp. for apple & pear) Organic Pest Management (esp. codling moth, fruit & nut pests)</p>

Survey of Organic Research and Extension Activities at the University of California

Name (Contact Information)	County	Crop	Areas of Expertise (Topics)
<p>Chaney, William E. * Entomology Farm Advisor UCCE Monterey County 1432 Abbott Street Salinas, CA 93901 831-759-7359 wechaney@ucdavis.edu http://cemonterey.ucdavis.edu</p>	<p>Monterey, Santa Cruz, San Benito Counties</p>	<p>Cool season vegetables: lettuce, celery, spinach, broccoli, cauliflower, asparagus, onions, radicchio</p>	<p>Organic Pest Management (aphids, leafminers, symphylans)</p>
<p>Daane, Kent M. * Associate UCCE Specialist Insect Biology, ESPM 201 Wellman Hall Berkeley, CA 94720 559-646-6573 Daane@uckac.edu</p>	<p>Riverside, Kern, Kings, Tulare, Fresno, Madera, Stanislaus, Sacramento, Napa, Sonoma, Tehama, Butte, Glenn, San Luis Obispo, Monterey Counties</p>	<p>Pistachio, grape (all), almonds, olives, stone fruit</p>	<p>Integrated Organic Cropping Systems (cover cropping)</p> <p>Organic Pest Management (biological control of insect pests, IPM general)</p>
<p>Daugovish, Oleg * Farm Advisor 669 County Square Drive Suite 100, Venture, CA 93003 805-645-1454 odaugovish@ucdavis.edu http://ceventura.ucdavis.edu/Vegetable%5Fcrops</p>	<p>Ventura County</p>	<p>Strawberries and vegetables</p>	<p>Organic Soil Management (mustard- derived biofumigation)</p> <p>Integrated Organic Cropping Systems (cover crops)</p> <p>Organic Pest Management (mustard- derived biofumigation)</p> <p>Organic Economics /Marketing (farm- to-school direct marketing program)</p>
<p>Ehler, Lester E. * Professor and Entomologist Entomology, UC Davis One Shields Ave. Davis, CA 95616 530-752-0484 leehler@ucdavis.edu http://entomology.ucdavis.edu/faculty/facpage.cfm?id=ehler</p>	<p>Sacramento, Yolo, Solano Counties</p>	<p>Sugar beet, tomato, alfalfa</p>	<p>Organic Pest management</p>

Survey of Organic Research and Extension Activities at the University of California

Name (Contact Information)	County	Crop	Areas of Expertise (Topics)
<p>Eicher, Annie * Organic Farming Program Coordinator, UCCE Humboldt County 5630 South Broadway Eureka, CA 95503 707-445-7351 aleicher@ucdavis.edu http://cehumboldt.ucdavis.edu</p>	<p>Humboldt County</p>	<p>Row crops, field crops, including strawberries, cantaloupe, potatoes, tomatoes, corn, lettuce, carrots, beets, alfalfa, and dairy, “natural” meat products)</p>	<p>Organic Soil Management (the use of fish fertilizer products)</p> <p>Integrated Organic Cropping Systems (on-farm research at local CSA)</p> <p>Organic Pest Management (garden symphylan, corn earworm)</p> <p>Organic Animal/Livestock Production (a series of organic dairy educational workshops, development of a local natural meat cooperative)</p> <p>Organic Economics /Marketing (“buy Local” campaigns and marketing of natural meat products)</p> <p>Organic Social Relations (study of sustainability of local agricultural operations, including social aspects)</p>
<p>Elkins, Rachel County Director/Pomology Farm Advisor, Lake Co. 883 Lakeport Blvd. Lakeport, CA 95453 707-263-6838 rbelkins@ucdavis.edu http://celake.ucdavis.edu</p>	<p>Lake, Mendocino Counties</p>	<p>Tree fruit and nut crops</p>	<p>Organic Pest Management (codling moth, oak root fungus)</p>
<p>Epstein, Lynn * Professor, Plant Pathology Hutchison Hall Davis, CA 95616 530-754-7916 lepstein@ucdavis.edu www.plpnem.ucdavis.edu/plp.people/bio_info/Epstein.htm</p>	<p>Yolo County</p>	<p>Tomatoes</p>	<p>Organic Pest Management (effect of different “farming systems”, including organic with and without conservation tillage, on incidence of root diseases on tomato)</p>
<p>Faber, Ben * Farm Advisor Ventura/Santa Barbara Co. 669 County Square Dr. Ventura, CA 93003 805-645-1462 bafaber@ucdavis.edu ceventura.ucdavis.edu</p>	<p>Ventura, San Diego, Santa Barbara, San Luis Obispo Counties</p>	<p>Subtropical tree crops and nurseries, including avocado, citrus, cherimoya</p>	<p>Organic Soil Management (mulch use)</p> <p>Organic Pest Management (cultural practices for control of avocado pests)</p>

Survey of Organic Research and Extension Activities at the University of California

Name (Contact Information)	County	Crop	Areas of Expertise (Topics)
<p>Fairfax, Sally K. Professor of Forest ESPM S&E 135 Giannini Hall Berkeley, CA 94720 510-642-7627 sally@nature.berkeley.edu</p>	<p>9 bay area counties</p>	<p>Niche products and land conservation</p>	<p>Organic Social Relations (institutional relations of niche marketing and artisanal products)</p>
<p>Fake, Cindy * Horticulture & Small Farms Advisor, Placer/Nevada Co. 11477 Avenue Auburn, CA 95603 530-889-7385 cefake@ucdavis.edu ceplacervevada.ucdavis.edu</p>	<p>Placer & Nevada Counties</p>	<p>Tree fruit, winegrapes, ornamental & nursery crops, vegetables</p>	<p>Organic soil Management (soil and foliar applied nutrient management in mandarins)</p> <p>Organic Pest Management (powdery mildew in cucurbits)</p> <p>Organic Economics /Marketing (public education on organic production through farmers' markets)</p>
<p>Fennimore, Steven * Extension Specialist Vegetable Crops, UC Davis 1636 East Alisal St. Salinas, CA 93905 831-755-2896 SAFennimore@ucdavis.edu</p>	<p>Monterey, Santa Barbara, Ventura, Santa Cruz, Riverside, San Benito</p>	<p>Lettuce, strawberries, spinach, celery, broccoli</p>	<p>Organic Pest Management (weed management)</p>
<p>Ferris, Howard * Professor, Nematology UC Davis, I Shields Ave. Davis, CA 95616 530-752-8432 hferris@ucdavis.edu http://plpnemweb.ucdavis.edu/nemaplex/nemaplex.htm</p>	<p>Yolo County</p>	<p>Tomato, corn, beans, safflower</p>	<p>Organic Soil Management (nematodes, soil food web)</p> <p>Organic Pest Management (plant- feeding nematodes)</p>
<p>Fouche, Benny * Farm Advisor, San Joaquin County 420 S Wilson Stockton, CA 95205 209-468-2085 bfouche@ucdavis.edu</p>	<p>San Joaquin County</p>	<p>Vegetable crops and small fruits</p>	<p>Organic Pest Management</p>

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<p>Gaskell, Mark * Farm Advisor, UCCE 624 West Foster Rd. Santa Maria, CA 93455 805-934-6240 mlgaskell@ucdavis.edu cesantabarbara.ucdavis.edu</p>	<p>Santa Barbara and San Luis Obispo Counties</p>	<p>Fruits and vegetables</p>	<p>Organic Soil Management</p>
<p>Gerry, Alec C. Assistant Veterinary Entomologist and Extension Specialist UC Riverside Riverside, CA 92521 909-827-7054 alec.gerry@ucr.edu</p>	<p>Statewide</p>	<p>Beef, dairy, poultry</p>	<p>Organic Pest Management (composting to reduce nuisance flies)</p> <p>Organic Animal/Livestock Production (cultural control of insect pests, organic pesticides)</p>
<p>Gliessman, Steve Professor of Agroecology Environmental Studies UC Santa Cruz Santa Cruz, CA 95064 831-459-4051 gliess@ucsc.edu www.agroecology.org</p>	<p>Santa Cruz, Monterey, San Benito, San Luis Obispo, Santa Barbara Counties</p>	<p>Strawberries, diverse vegetables, grapes, and olives</p>	<p>Organic Soil Management (organic nutrient and disease management, dry farm systems)</p> <p>Integrated Organic Cropping Systems (strawberry/ vegetable/cover crop rotations, dry-farmed intercropped grapes and olives)</p> <p>Organic Pest Management (allelopathic weed management)</p> <p>Organic Economics /Marketing (direct marketing)</p> <p>Organic Social relations (integrated indicators of food system sustainability)</p>
<p>Goodell, Peter B. * IPM Advisor, UC Statewide IPM Program Kearney Ag Center 9240 So Riverbend Ave. Parlier, CA 93648 559-646-6515 ipmpbg@uckac.edu</p>	<p>Kern, Kings, Tulare, Fresno, Merced, Madera Counties</p>	<p>Cotton, alfalfa, associated rotational crops</p>	<p>Integrated Organic Cropping Systems (whole farm planning to address environmental issues)</p> <p>Pest Management applicable to Organic Production (managing alfalfa to mitigate Lygus movement, introduction of biological control against Lygus, managing root knot nematodes with cultural controls, alternative whitefly management approaches)</p>

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<p>Grafton-Cardwell, Beth IPM Specialist and research Entomologist, UCR Entomology Kearney Ag. Center 9240 S. Riverbend Ave. Parlier, CA 93648 559-646-6591 bethgc@uckac.edu www.uckac.edu/citrusent/</p>	<p>Kern, Madera, Fresno, Tulare Counties</p>	<p>Citrus</p>	<p>Organic Pest Management (biological control, pheromones, oils, organically registered insecticides)</p>
<p>Guthman, Julie * Assistant Professor Community Studies UC SC 1156 High St. Santa Cruz, CA 94705 831-459-2726 jguthman@ucsc.edu</p>	<p>Statewide</p>	<p>Social issues</p>	<p>Organic Social Relations</p>
<p>Hasey, Janine * Farm Advisor, Sutter/Yuba 142A Garden Highway Yuba City, CA 95991 530-822-7515 jkhasey@ucdavis.edu cesutter.ucdavis.edu</p>	<p>Sutter, Yuba & Butte Counties</p>	<p>Peaches, kiwifruit & walnuts</p>	<p>Organic Soil Management (cover cropping, compost & weed control) Organic Pest Management (scale control in kiwifruit; organic mite control, oriental fruit moth & peach twig borer control)</p>
<p>Haviland, David Entomology Farm Advisor, Kern County 1031 S. Mount Vernon Bakersfield, CA 93307 661-868-6215 dhaviland@ucdavis.edu http://cekern.ucdavis.edu</p>	<p>Primarily Kern County</p>	<p>Grapes</p>	<p>Organic Pest Management</p>
<p>Holtz, Brent Pomology Farm Advisor, Plant Pathologist, Madera County 328 Madera Ave. Madera, CA 93637 559-675-7879 baholtz@ucdavis.edu</p>	<p>Madera, Merced County</p>	<p>Almonds, pistachios, stone fruits, apples</p>	<p>Organic Soil Management Integrated Organic Cropping Systems Organic Pest Management</p>

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<p>Horwath, William R. * Professor, LAWR 3226 Plant & Env. Sci. Bldg., One Shields Ave. Davis, CA 95616 530 754-6029 wrhorwath@ucdavis.edu http://lawr.ucdavis.edu/faculty/horwath</p>	<p>Yolo, San Joaquin, Merced, Tulare, Colusa, Butte, Shasta, Eldorado Counties</p>	<p>Corn, rice, tomato, cotton and forestry</p>	<p>Organic Soil Management Integrated Organic Cropping Systems Other (sustainable forestry)</p>
<p>Ingels, Chuck Farm Advisor, Sacramento 4145 Branch Center Rd. Sacramento, CA 95827 916-875-6913 caingels@ucdavis.edu cesacramento.ucdavis.edu</p>	<p>Sacramento</p>	<p>Pears</p>	<p>Organic Pest Management (codling moth control)</p>
<p>Jackson, Louise E. * Professor, CE Specialist Land, Air and Water Resources UC Davis Davis, CA 95616 530-754-9116 Lejackson@ucdavis.edu groups.ucanr.org/jacksonlab/</p>	<p>Monterey, Yolo Counties</p>	<p>Lettuce, tomatoes, other vegetables</p>	<p>Organic Soil Management Integrated Organic Cropping Systems</p>
<p>Jolly, Desmond * Extension, Ag. Economist Agricultural and Resource Economics, UC Davis 1 Shields Ave Davis, CA 95616 530-752-7774/8136 dajolly@ucdavis.edu sfcenter@ucdavis.edu</p>	<p>Statewide</p>	<p>Fruits and vegetables</p>	<p>Organic Economics /Marketing (consumer demand, industry structure and performance, impact of regulation)</p>

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<p>Kaffka, Steve Director, Center for Integrated Farming System Agronomy and Range Science One Shields Ave. Davis, CA 95616 530-752-8108 skaffka@ucdavis.edu ltras.ucdavis.edu</p>	<p>Fresno, Imperial, Yolo Counties</p>	<p>Oilseeds, sugar beets, forages, corn, wheat, tomatoes, alternative crops</p>	<p>Organic Soil Management (changes in soil quality/productivity over time)</p> <p>Integrated Organic Cropping Systems (cropping systems at LTRAS, including organic)</p> <p>Organic Pest Management (pest occurrence as a function of soil management)</p> <p>Organic Animal/Livestock Production (grazing research, using saline drainage water for forage and grassland production)</p> <p>Organic Food Quality (relationships between soil management and food quality)</p>
<p>Karlik, John F. Farm Advisor, UCCE 1031 S. Mt. Vernon Ave. Bakersfield, CA 93307 661-868-6220 jfkarlik@ucdavis.edu</p>			
<p>Klonsky, Karen * Extension Specialist Agricultural and Resource Economics, UC Davis One Shields Ave. Davis, CA 95616 530-752-3563 klonsky@primal.ucdavis.edu www.coststudies.ucdavis.edu</p>	<p>Northern California, Central Coast, Central Valley</p>	<p>All crops</p>	<p>Integrated Organic Cropping Systems</p> <p>Organic Economics /Marketing (economic feasibility of organic, resource use for organic, cost of production, size and growth of the organic industry)</p>
<p>Laemmlen, Franklin County Director, Vegetable & Pest management Advisor 624-A West Foster Rd Santa Maria, CA 93455 805-934-6240 fflaemmlen@ucdavis.edu cesantabarbara.ucdavis.edu</p>	<p>Santa Barbara and San Luis Obispo Counties</p>	<p>Cool season vegetables, cut flowers (field grown) and landscape ornamentals</p>	<p>Organic Pest Management</p>

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<p>Lanini, Tom * Extension Weed Ecologist Vegetable Crops and Weed Science, UC Davis One Shields Ave. Davis, CA 95616 530-752-4476 lanini@vegmail.ucdavis.edu http://veghome.ucdavis.edu/Faculty/lanini/lanini.htm</p>	<p>Statewide</p>	<p>Vegetables, agronomic, orchards, and vineyards</p>	<p>Organic Pest Management (non-chemical weed control)</p>
<p>Lobo, Ramiro E. * Farm Advisor, San Diego Co. MS 0-18 555 Overland Ave. San Diego, CA 92123 858-694-3666 relobo@ucdavis.edu cesandiego.ucdavis.edu</p>	<p>San Diego County</p>	<p>Small scale vegetable, blueberry, avocado and miscellaneous orchard crops</p>	<p>Integrated Organic Cropping Systems (general information about organic regulations and multiple crop production under organic production systems)</p> <p>Organic Economics /Marketing (market development and promotion, direct marketing, agricultural tourism, San Diego Grown 365 Branding Program)</p>
<p>Long, Rachael Farm Advisor, UCCE 70 Cottonwood St. Woodland, CA 95695 530-666-8734 rflong@ucdavis.edu http://ceyolo.ucdavis.edu</p>	<p>Yolo County</p>		
<p>Markegard, Gary County Director, Humboldt 5630 South Broadway Eureka, CA 95503 707-445-7251 gmarkegard@ucdavis.edu cehumboldt.ucdavis.edu</p>	<p>Humboldt County</p>	<p>Beef, sheep, swine, goats, horses, pasture and range</p>	<p>Organic Animal/Livestock Production (grass fed beef)</p>
<p>Mauk, Peggy A. County Director/Subtropical Horticulture Advisor 21150 Box Springs Rd Ste.202 Moreno Valley, CA 92557 909/683-6491 pamauk@ucdavis.edu http://ceriverside.ucdavis.edu</p>	<p>Riverside, San Bernardino Counties</p>	<p>Tree crops, primarily citrus, dates, and avocado</p>	<p>Organic Pest Management (control of citrus pests)</p>

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<p>McGiffen, Milt * Botany and Plant Sciences UC Riverside Riverside, CA 92521 909-560-0839 milt@ucr.edu</p>	<p>All California, South of Sacramento</p>	<p>Vegetable crops</p>	<p>Organic Soil Management Integrated Organic Cropping Systems Organic Pest Management Organic Economics /Marketing</p>
<p>McGourty, Glenn * Viticulture and plant science Farm Advisor UCCE Mendocino and Lake Co. 579 Low Gap Road Ukiah, CA 95482 707-463-4495 Gtmcgourty@ucdavis.edu</p>	<p>Mendocino, Lake Counties</p>	<p>Wine grapes, nursery and cut flowers, vegetable crops, landscapes</p>	<p>Organic Soil Management Integrated Organic Cropping Systems Organic Pest Management (leafhoppers, powdery mildew, blue green sharp shooters) Organic Economic/Marketing (regional marketing efforts)</p>
<p>Metz, Diane Nutrition, Family & Consumer Sciences Advisor, Solano Co. 501 Texas Street Fairfield, CA 94533 707-421-6792 DLMetz@ucdavis.edu</p>	<p>Solano, Yolo Counties</p>		<p>Organic Economics /Marketing (encouraging use of local organic agriculture through extension nutrition activities and food preservation activities) Other (food security and urban gardening)</p>
<p>Melnicoe, Rick * Director, Western IPM Center Environmental Toxicology One Shields Ave. Davis, CA 95616 530-754-8378 rsmelnicoe@ucdavis.edu www.wripmc.org</p>	<p>Statewide</p>	<p>All in general crop</p>	<p>Organic Pest Management (regulatory issues relating to pesticides)</p>

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<p>Meyer, Roland * Extension Soils Specialist LAWR Dept, UC Davis 1 Shields Ave. Davis, CA 95616 530-752-2531 rdmeyer@ucdavis.edu</p>	<p>Humboldt, Sonoma, Sutter, Yuba Counties</p>	<p>Alfalfa, cantaloupe, kiwi, peach, potato, strawberry, tomato</p>	<p>Organic Soil Management (proving all essential nutrients in sufficient amounts efficiently and as economically as possible)</p> <p>Integrated Organic Cropping Systems (how to effectively use legumes to provide nitrogen and other cover crops to provide soil cover to increase water infiltration and reduce erosion, manage frost control and yet reduce competition with the primary crop for optimum yield)</p> <p>Organic Pest Management (select cover crops that provide the most desirable control of as many pests as possible)</p> <p>Organic Animal/Livestock Production (when growing forage crops for livestock, select the most desirable, effective and efficient fertilizing materials for forages to maximize animal growth and performance)</p> <p>Organic Economics/Marketing (the economics of crop inputs is a major consideration in the design of all research trials)</p>
<p>Mitcham, Elizabeth Specialist and Pomologist Pomology, 1045 Wickson 1 Shields Ave. Davis, CA 530-752-7512 ejmitcham@ucdavis.edu postharvest.ucdavis.edu</p>	<p>San Joaquin, Yolo Counties</p>	<p>Walnuts, sweet cherry, strawberry, table grapes, apples, pears, almonds, pistachios, blueberry, tropical fruit</p>	<p>Organic Pest Management (non-chemical alternatives for post-harvest insect control)</p> <p>Organic Post Harvest Handling /Processing (non-chemical alternatives for postharvest insect, disease and physiological disorder control)</p>

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<p>Mitchell, Jeffrey * UCD Cooperative Extension Associate Vegetable Crops and Weed Science Kearney Ag Center 9240 S. Riverbend Avenue, Parlier, CA 93648 559- 646-6565 mitchell@uckac.edu</p>	<p>Yolo, Fresno, San Luis Obispo</p>	<p>Tomatoes, melons, broccoli</p>	<p>Organic Soil Management (cover crop systems) Integrated Organic Cropping Systems (reduced tillage)</p>
<p>Miyao, Gene Farm Advisor, UCCE 70 Cottonwood Street Woodland, Ca 95695 530-666-8143 emmiyao@ucdavis.edu</p>	<p>Yolo, Solano, Sacramento Counties</p>	<p>Vegetable crops- processing tomatoes</p>	
<p>Molinar, Richard * Farm Advisor, UCCE 1720 S Maple Ave. Fresno, CA 93702 559-456-7555 rhmolinar@ucdavis.edu www.sfc.ucdavis.edu cefresno.ucdavis.edu</p>	<p>Fresno County</p>	<p>Specialty vegetables and small fruits</p>	<p>Organic Pest Management Organic Economics /Marketing (SJV organic conference)</p>
<p>Moratorio, Mario * Small Farms and Urban Horticulture Advisor, Yolo/Solano Co. 501 Texas Street Fairfield, CA 94533 707-421-6793 msmoratorio@ucdavis.edu</p>	<p>Yolo, Solano Counties</p>	<p>Pest management strategies and marketing</p>	<p>Organic Pest Management (entomology, pest management, leafhopper egg parasite biology)</p>
<p>Morse, Joseph Professor of Entomology UC Riverside Riverside, CA 92507 909-787-5814 joseph.morse@ucr.edu</p>	<p>Tulare, Kern, Fresno, Madera, Riverside, Ventura, San Diego, San Luis Obispo</p>	<p>Citrus, avocado</p>	<p>Organic Pest Management</p>

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<p>Mullens, Bradley A. Professor, Entomology UC Riverside Riverside, CA 92521 909-787-5800 mullens@mail.ucr.edu</p>	<p>Riverside, San Bernardino, San Diego Counties</p>	<p>Poultry and dairy</p>	<p>Organic Pest Management (biological control of flies, cultural control of livestock and poultry pests)</p>
<p>Nader, Glenn Livestock & Natural Resources Farm Advisor, ANR Central 142-A Garden Hwy Yuba City, CA 95991 530-822-7515 ganader@ucdavis.edu</p>	<p>Butte, Sutter, Yuba Counties</p>	<p>Livestock</p>	<p>Organic Animal/Livestock Production (grass fed livestock)</p>
<p>Niederholzer, Franz Assistant Farm Advisor 142-A Garden Hwy Yuba City, CA 95991 530-822-7515 fjniederholzer@ucdavis.edu</p>	<p>Yuba and Sutter Counties</p>	<p>Prunes, almond, olives, citrus, pears, apples, pomegranates</p>	
<p>Norton, Jay County Director, Farm Advisor 2. South Green Street Sonora, CA 95370 209-533-5686 jbnorton@ucdavis.edu cetuolumne.ucdavis.edu</p>	<p>Tuolumne County</p>	<p>Grassfed beef, other livestock and small farm crops; not necessarily certified organic, but production and marketing “natural” beef and other products. Vegetables and fruits</p>	<p>Organic Soil Management (compost research and educations projects)</p> <p>Organic Animal/livestock Production (extension on grass-fed /natural beef production)</p> <p>Organic Economics /Marketing (marketing grass-fed natural beef)</p>
<p>Norton, Maxwell Farm Advisor, UCCE 2145 Wardrobe Merced, CA 95340 209-385-7403 mnorton@ucdavis.edu cemerced.ucdavis.edu</p>	<p>Merced County</p>	<p>Tree fruit and winegrapes</p>	

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<p>Paine, T. D. Professor, Entomology UC Riverside Riverside, CA 92521 909-787-5835 timothy.paine@ucr.edu</p>	<p>Riverside, Orange, San Diego, Ventura, Los Angeles, San Bernardino, Alameda, Fresno, Contra Costa Counties</p>	<p>Woody ornamental nursery stock, ornamental trees and shrubs, urban and recreational forests</p>	<p>Organic Pest Management (biological control)</p>
<p>Putnam, Dan Extension Agronomist Agronomy and Range Science, UC Davis One Shields Ave. Davis, CA 95616 530-752-8982 dhputnam@ucdavis.edu http://alfalfa.ucdavis.edu</p>	<p>Fresno, Imperial, Yolo, San Joaquin, Siskiyou, Modoc Counties</p>	<p>Alfalfa, berseem clover</p>	<p>Organic Animal/Livestock Production</p>
<p>Quirt, Steve * Organic & Sustainable Agriculture Coordinator UCCE Marin 1682 Novato Blvd. Suite 150B Novato, CA 94947 415-499-4204 wsquirt@ucdavis.edu growninmarin.org</p>	<p>Marin</p>	<p>Row crops, added value dairy, dairy, livestock, aquaculture</p>	<p>Organic animal/Livestock Production Organic Economics /Marketing Organic Social Relations Organic Post Harvest Handling/Processing</p>
<p>Rausser, Gordon C. Professor, Agricultural and Resource Economics 207 Giannini Hall Berkeley, CA 94720 510-642-6591 rausser@are.berkeley.edu</p>	<p>Statewide</p>	<p>Fruits and vegetables</p>	<p>Organic Economics /Marketing</p>
<p>Reed, Barbara Dairy Advisor, UCCE PO Box 697 Orland, CA 95963 530-865-1107 bareed@ucdavis.edu</p>	<p>Glenn, Butte, Tehama, Colusa, Shasta, Sutter Yuba Counties</p>	<p>Dairy cattle and dairy production</p>	<p>Other (value added production and vertical integration)</p>

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<p>Rilla, Ellie * County Director, UCCE 1682 Novato Blvd, Suite 150B Novato, CA 95472 415-499-4204 erilla@ucdavis.edu cemarin.ucdavis.edu</p>	<p>Marin County</p>	<p>All crops</p>	<p>Organic Economics /Marketing (website highlighting 40 local producers and featuring organic products; start – up and organization incubation of organic producers association)</p> <p>Organic Social Relations (survey of county producers-needs for diversification include organic as value added)</p>
<p>Roose, Mikeal Professor of Genetics, Botany & Plant Science, UC Riverside Riverside, CA 92521 909-787-4137 roose@ucr.edu www.plantbiology.ucr.edu</p>	<p>Riverside, Tulare, Kern, Orange, Ventura, San Joaquin, San Diego</p>	<p>Citrus and asparagus</p>	<p>Organic Pest Management (disease resistant citrus rootstocks)</p>
<p>Scow, Kate * Professor, LAWR, UC Davis 1 Shields Ave. Davis, CA 95616 530-752-4632 kmscow@ucdavis.edu</p>	<p>Yolo County</p>	<p>Almonds, rice, tomatoes, wheat, walnuts, grapes</p>	
<p>Shrestha, Anil * IPM Weed Ecologist UC Statewide IPM Program Kearney Ag. Center 9240 S. Riverbend Ave. Parlier, CA 93648 559-646-6534 anil@uckac.edu www.weedbiology.uckac.edu</p>	<p>Fresno, Tulare, Merced, Madera, Yuba, Sutter, Yolo, Stanislaus County</p>	<p>Cotton, Corn, Tomato, Grape, Almond, Walnut, Wheat, Barley, Oats, Dry Bean</p>	<p>Integrated Organic Cropping Systems (conservation tillage)</p> <p>Organic Pest Management (weed management)</p>
<p>Six, Johan Associate Professional Researcher Agronomy and Range Science UC Davis, One Shields Ave. Davis, CA 95616 530-752-1212 jwsix@ucdavis.edu</p>	<p>Yolo County</p>	<p>Tomato and corn</p>	<p>Organic Soil Management</p> <p>Integrated Organic Cropping Systems</p>

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<p>Smith, Richard Farm Advisor, Vegetable Crops & Weed Science, UCCE 1432 Abbott Street Salinas, CA 93901 831-759-7350 rifsmith@ucdavis.edu http://cemonterey.ucdsavis.edu</p>			<p>Organic Soil Management (soil fertility with cover crops, cover crop mineralization)</p> <p>Organic Pest Management (weed management, vineyard floor management impacts on soil microbiology)</p> <p>Organic Economics/Marketing (organic lettuce and broccoli cost study)</p>
<p>Sokolove, Jennifer Post-Doctoral Fellow Environmental Science, Policy, and Management 135 Giannini Hall, #3312 Berkeley, CA 94720 510-642-5958 jensok@nature.berkeley.edu</p>	<p>San Francisco, Alameda, Marin, Sonoma Counties</p>	<p>Beef, cheese, dairy, lettuce, oysters)</p>	<p>Organic Economics/Marketing (alternative food networks, local histories, rural-urban relationships)</p> <p>Organic Social Relations (alternative food networks, local histories, changes in production)</p>
<p>Stapleton, Jim IPM Plant Pathologist Statewide IPM Program UC Kearney Ag. Center Parlier, CA 93648 559-646-6500 jim@uckac.edu www.uckac.edu/</p>	<p>Central Valley counties</p>	<p>Horticulture and nursery crops, including vegetables, strawberries, and blueberries</p>	<p>Organic Soil Management (compost/green manures)</p> <p>Integrated Organic Cropping Systems (mulches/conservation tillage)</p> <p>Organic Pest Management (non-chemical pest management /solarization /biofumigation)</p>
<p>Suslow, Trevor V. * Extension research Specialist Vegetable Crops, UC Davis One Shields Ave. 95616 530-754-8313 tvsuslow@ucdavis.edu http://ucgaps.ucdavis.edu http://ucfoodsafety.ucdavis.edu http://vric.ucdavis.edu http://postharvest.ucdavis.edu</p>	<p>Statewide, but concentrating in Central Coast, San Joaquin Valley, San Diego Region</p>	<p>Diverse edible horticultural commodities</p>	<p>Organic Post Harvest Handling /Processing (microbial food safety and post harvest pathology)</p>

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<p>Swezey, Sean L. * Specialist, University of California Santa Cruz (Former Director, UC SAREP) Department of Environmental Studies University of California Santa Cruz, CA 95064 (831) 459-4367 Phone (831) 332-6231 cell findit@ucsc.edu www.sarep.ucdavis.edu</p>	<p>Santa Cruz, Monterey, Madera Counties</p>	<p>Strawberries, apples, cotton, artichokes</p>	<p>Organic Pest Management (mating disruption biological control, trap-cropping, monitoring)</p> <p>Other (programmatic CA extension services for organic growers)</p>
<p>Van Horn, Mark * Director, Student Farm, Pomology, UC Davis I Shields Ave. Davis, CA 95616 530-752-7645 mxvanhorn@ucdavis.edu http://studentfarm.ucdavis.edu</p>	<p>Yolo, Solano, Humboldt Counties</p>	<p>Mixed vegetables, Walnuts, Vineyards</p>	<p>Organic Soil Management (cover crops, composting & compost use)</p> <p>Organic Pest Management (symphytan management)</p> <p>Organic Social Relations (post-secondary sust ag educators workgroup coordination; development of educational materials for post secondary students)</p> <p>Organic Food Quality (comparison of II^o metabolites in organic and conventional produce)</p>
<p>Vossen, Paul * Farm Advisor, UCCE 133 Aviation Blvd. Santa Rosa, CA 95403 707-565-2621 pmvossen@ucdavis.edu cesonoma.ucdavis.edu</p>	<p>Sonoma, Marin Counties</p>	<p>Specialty crops; apples, pears, stone fruits, berries, table grapes, chestnut, oil olives, citrus, all vegetable crops</p>	<p>Organic Soil Management (use of organic fertilizers)</p> <p>Organic Pest Management (apple scab, olive fruit fly, codling moth)</p> <p>Organic Economics /Marketing (organic apple and olive cost study)</p> <p>Organic Food Quality (quality of organic apples and sensory analysis of olive oil)</p>

Survey of Organic Research and Extension Activities at the University of California

Name (Contact Information)	County	Crop	Areas of Expertise (Topics)
<p>Waines, J. Giles Professor of Genetics Botany & Plant Sciences UC Riverside, Riverside, CA 92521 909-787-3706 giles.waines@ucr.edu</p>	<p>Riverside County</p>	<p>Wheat, common beans, garbanzo</p>	<p>Integrated Organic Cropping Systems (exploration of F1 hybrid seed production in common bean)</p> <p>Organic Pest management (breeding for tolerance or resistance to Ascochyta blight and Fusarium wilt in garbanzo)</p> <p>Other (The root system of California semi-dwarf bread wheat is too small to allow optimum water and nutrient uptake, and hence fulfill potential grain yield. This applies to organic and non- organic systems. It may apply to other genetically dwarfed crops such as beans.)</p>
<p>Walker, Greg Associate Professor, Entomology UC Riverside, Riverside, CA 92521 909-787-5808 walker@citrus.ucr.edu</p>	<p>Riverside, Imperial, Fresno Counties</p>	<p>Cotton, tomatoes, alfalfa</p>	<p>Organic Pest Management (host plant resistance; organic-compatible repellents)</p>
<p>Wilen, Cheryl IPM Advisor, UC IPM Program 5555 Overland Ave. Suite 4101 San Diego, CA 92123 858-694-2846 cawilen@ucdavis.edu</p>	<p>San Diego, Orange, LA, Riverside Counties</p>	<p>Ornamental plant</p>	