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A Statistical Profile of Horticultural Crop Farm Industries in California

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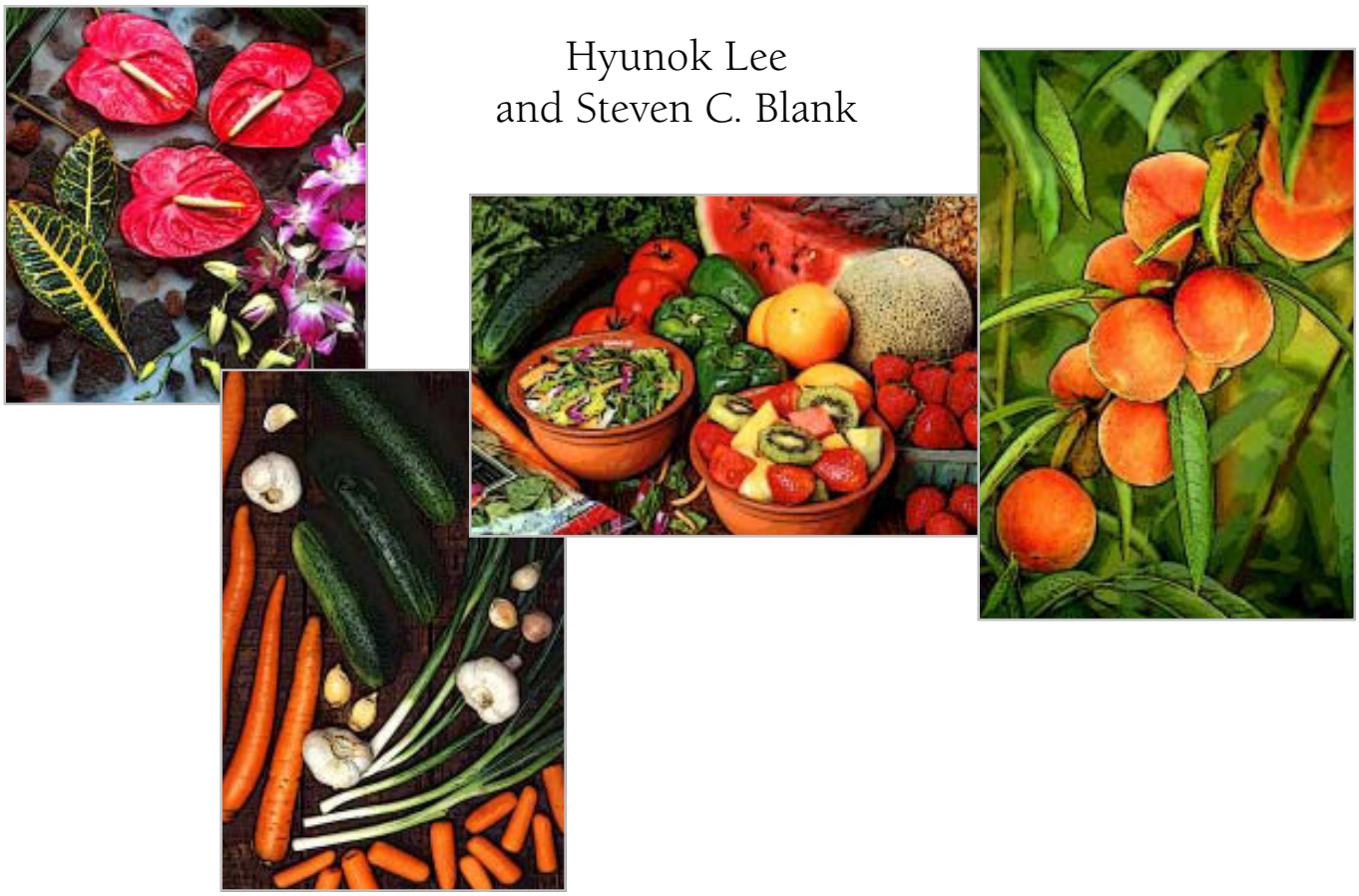

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EXECUTIVE SUMMARY

Horticultural crops provide 60 percent of total farm revenue in California agriculture, and California provides 37 percent of the horticultural crop value in the United States. Clearly, these industries comprise an important part of the agricultural economy. This study provides a detailed statistical profile of California's horticultural crop industries at the farm level, based on a survey of specialty crop growers that was conducted during the spring of 2002. The Risk Management Agency of the United States Department of Agriculture supported the research, and the California Office of the National Agricultural Statistics Service helped conduct the survey.

Specialty crops, also referred to as horticultural crops, include tree and vine (fruit/nut) crops, vegetables, and ornamental crops. The statistical profile of California's horticultural farm industries presented here is the most comprehensive ever undertaken for these industries, drawing on survey data collected from approximately one-third of all horticultural crop producers in the state.

Specialty crops are diverse. They differ in their product characteristics, production processes, and market environments. Such heterogeneity extends to risk characteristics of the crops and to the ways farmers cope with various risks. As a preliminary step to development of effective risk management tools, it is important to better understand factors that affect these risks. This report is intended to provide such information to help us understand specialty crop industries, the sources of risk, and behavioral risk responses in these industries. The following summary of results is organized by topic.

Farm Size and Regional Profile

About 86 percent of the farms surveyed produced primarily (in terms of revenue share) orchard and vine crops, 5 percent produced vegetable crops, and 9 percent produced ornamental crops. About 25 percent of the farms were located in coastal areas, 13 percent in the Sacramento Valley, and 47 percent in the San Joaquin Valley. The remaining 15 percent were in the northern mountain areas, the Sierra Nevada, the Southern coast, and the deserts. Average farm size was 203 acres, but the median farm comprised only 34 acres. There were relatively few very large farms and many very small farms. The average number of acres per farm varied substantially among the three crop categories: fruits/nuts, vegetables, and ornamental crops. The average land holding by vegetable growers, 1,106 acres, far exceeded the average of 157 acres for fruits/nuts and 200 acres for ornamental crops. These land figures include land planted to secondary crops (as well as field crops). When we examined land planted only in primary crops, our data showed that fruit/nut and vegetable farmers held, on average, about 50 percent of their land in primary crops (for definition, see page 7). However, land for ornamental crops, on average, accounted for only 10 percent of the average 200 acres per farm.

Crop Diversification

Crop diversification has long been recognized as an important risk management tool. Our data showed that crop diversification was much less common for orchard farms than for vegetable farms. About 70 percent of fruit/nut farmers were single-crop growers as opposed to 26 percent for vegetable farms. The scope of diversification also differed. Fruit/nut farmers predominantly diversified their crops with other varieties of fruits and nuts; only 20 percent of them used crops other than fruits and nuts for diversification. Vegetable farmers, on the other hand, frequently used other crops for diversification; only one-third of the vegetable farms were diversified among only vegetable crops. Our survey also indicated that primary crop acreage increases with crop diversification for both fruit/nut and vegetable crops. Farms growing five or more vegetables were, on average, four times larger in vegetable acreage than farms growing a single vegetable crop.

In California, 6 percent of specialty crop farmers had some organic or transitional-organic land. In terms of crop category, these farms represented 6 percent of orchard farms, 14 percent of vegetable farms, and 4 percent of ornamental crop farms. Our data showed that these farms also engaged in conventional farming and that they devoted, on average, about one-third of their

primary crop lands to organic farming. Judging from acreage assigned to primary crops, the farms were about average in acreage for fruit/nut farms but much smaller than average conventional vegetable farms.

Marketing

Marketing is an important component of risk management. Marketing channels vary by product use (processing versus fresh). Processing crops are delivered in bulk directly to processing plants, whereas fresh-use crops are sent to operations to be sorted, packaged, cooled (or refrigerated), and distributed through marketing channels.

California producers were highly specialized in terms of use. Most fruit/nut farms produced mainly for processing use (71 percent) and most vegetable farms produced mainly for fresh use (67 percent). Only 7 percent of specialty crop farmers supplied both processing and fresh market outlets.

In processed-use markets, contracts played a major role (they were used by 57 percent of fruit/nut farmers and 88 percent of vegetable farmers) with contracts with a predetermined price being the most prevalent form. In fresh-use markets, grower/shippers, which combine the packing/shipping business with field production under one ownership, provide a form of vertically integrated business. Our survey showed that grower/shippers accounted for 13 percent of vegetable farmers and 3 percent of orchard farmers and that they mainly supply mass merchandisers (e.g., discount chains). The other fresh-market growers tended to use diverse marketing channels, including selling directly to consumers, marketing through cooperatives and independent shippers, and selling directly to commercial buyers. For fresh vegetable markets, "directly to consumers" (farmers markets, you-pick operations, roadside stands) was the most commonly used outlet (31 percent), not by volume of production but by number of farms using this marketing channel.

Yield, Price, and Profit Fluctuations

We investigated year-to-year yield variations using yield information for the preceding five years. Taking the average of the five annual yields as an individual's normal yield, we calculated the percent deviation from the normal yield and then arrived at sample mean deviations for sample categories. Our data indicated that annual yield deviated, on average, 15 percent for fruits/nuts and 8 percent for vegetables over the previous five years. For price and profit fluctuations, we elicited information on the range of the highest fluctuation experienced over the same five year period (from the level that the respondent considered normal). For both price and profit, the median of the accumulated distribution fell in the 25–49 percent range for fruits/nuts and the 10–24 percent range for vegetables, indicating that prices as well as profits tend to fluctuate less for vegetables than for fruits/nuts.

In response to a list of options as the main cause for the lowest profit, "poor yield," "low market price due to high domestic production," and "low market price due to imports" were the three most often cited causes for all crops except ornamentals. They accounted for 70 percent of the responses for fruit/nut and vegetable farmers. For fruit/nut crops, poor yield was the most cited reason for the lowest profit (31 percent), but for vegetables, low market price due to high production was cited most (29 percent), followed by low market price due to imports (21 percent). This underscores the relative importance of production risks for orchard crops and of market risks for vegetable crops.

Risk Management

Two sources of risk, adverse temperature and output price fluctuation, were listed as most important; input price fluctuation, pests, and disease were considered to be moderately important.

Crop insurance was a preferred risk management tool for orchard and vineyard farmers, and crop diversification was preferred by vegetable and ornamental crop growers. Diversified marketing was reported to be the second most preferred tool for all three crop categories.

We also surveyed farmers about the availability of risk management tools. As expected, their preferences were closely linked to availability. The most available tools were crop insurance for orchard crops (49 percent of farmers said it was available to them) and crop diversification for vegetables (40 percent) and ornamental crops (28 percent). Orchard and vineyard farmers reported

relatively limited availability of other risk management tools.

Crop Insurance

About 53 percent of fruit/nut farmers, 31 percent of vegetable farmers, and 13 percent of ornamental crop farmers said they had purchased crop insurance in the preceding five years and most of those farmers had purchased it for all five years

Single-peril insurance is mostly offered by private firms, most commonly for damage from frost, rain, and hail. This insurance was purchased by about 20 percent of fruit/nut farmers and about 10 percent of vegetable farmers.

Many farmers suggested that a higher yield guarantee would improve crop insurance. Further, most farmers strongly suggested the need for crop insurance that compensates in value terms, but they expressed no strong preference among compensations based on gross sales, profits, or production costs.

Financial Characteristics

Financial variables examined were off-farm incomes, gross sales, debts, and assets. Clearly, the portion of household income risk attributable to variation in farm income decreased as the share of off-farm income rose. For our sample, an average of 63 percent of income came from off-farm sources. A sizable segment of farmers, as many as 25 percent, derived less than 1 percent of their income from farming in the year sampled. This is consistent with the observation that many of the farms were quite small, many farms operated at a loss in any given year, and there was a relatively large number of so-called "hobby" farms in California.

Gross agricultural sales averaged about $0.4 million per farm for the entire sample. Vegetable farms averaged $1.1 million in sales, followed by ornamental crop farms with $0.8 million, and orchard farms with $0.3 million. About 6 percent of fruit/nut farms had sales of more than $1 million, compared to 29 percent for vegetable farms and 13 percent for ornamental farms.

Agricultural sales were negatively correlated with off-farm income share and positively correlated with acreage. Revenue per acre decreased as acreage increased. Given that specialty crops vary widely in unit value and in value per acre, this indicated that farms with fewer acres tended to grow crops with a high value per acre.

Farms in our sample had an average of $1.4 million in assets and $0.6 million in debts. The average debt-to-asset ratio was close to 0.5. This ratio is much higher than the 0.16 debt-to-asset ratio reported by the United States Department of Agriculture for all American agriculture in 2003. When viewing assets and debts as financial inputs necessary to generate revenue, the ratio of financial input to gross sales was highest for vegetables and lowest for orchard crops.

INTRODUCTION

This study provides a detailed statistical profile of an important segment of California agriculture, the horticultural crop industry. The information provided is based on a unique survey of growers of horticultural crops, also known as specialty crops, that was conducted during the spring of 2002 at the request of the Risk Management Agency (RMA) of the United States Department of Agriculture (USDA). This report presents data about horticultural industries in California and about the risk management attitudes, approaches, and needs of farmers producing these commodities.

Specialty crops are diverse. These crops can best be defined by exclusion—as all agricultural crops excluding grain crops (wheat, barley, rice, corn, etc.), oilseeds (soybeans, rapeseed, etc.), cotton, peanuts, and tobacco. The bulk of specialty crops consist of fruits and nuts, vegetables, and ornamental crops (nursery products, cut flowers, etc.).

The industries featured in this study accounted (at the farm level) for more than $16 billion of gross farm revenue in 2001. This value was more than 90 percent of the state's total crop value and 60 percent of total agricultural value produced in California at the farm level. These industries are also important nationally. California accounts for 37 percent of the total value of horticultural crop production in the United States. In the past, these industries have expanded steadily in California, adding more than 300,000 acres between 1992 and 1997 (1997 Census of Agriculture). In the future, California's horticultural industries are expected to continue to expand in size and importance.

For the most part, horticultural growers have not been major recipients of farm program subsidies and have had relatively little government support compared to growers of commodities such as grains, oilseeds, cotton, sugar, and dairy products. Some horticultural crops have been eligible for USDA crop insurance programs and ad hoc disaster assistance, promotion assistance, and miscellaneous support, but the degree of subsidy has been small—typically around 5 percent of total value, compared to 30 to 50 percent and higher for grains, oilseeds, and cotton (Sumner and Hart, Lee).

Horticultural crops differ from other kinds of crops in their product characteristics, production processes, and market environments and thus in their risk characteristics. The design of public policy for these crops must reflect management of their unique risks. Knowledge of market variables and grower risk behavior is essential to developing effective risk management tools for horticultural crops. Unfortunately, while studies on traditional crops abound, little research has been done on horticultural crops. The objective of this survey was to generate wide-ranging statistical information that can be used broadly to better understand the horticultural crop industry, its sources of risk, and typical responses to those risks. The statistical profile of California's horticultural producers presented here is the most exhaustive ever undertaken for this group. It draws on survey data collected from approximately one-third of all horticultural crop producers in the state.

This report presents a large volume of information concisely. To do so, we (1) summarize the methodology used to collect and tabulate the data; (2) provide an overview of the seven topics addressed; and (3) discuss the primary results. The discussion is organized by issue and includes a narrative describing the main findings for each topic. Selected figures and tables are included. The narrative is supplemented with a data section in the Appendix, which is organized into three parts. The first provides the response rate for each question in the survey. The second contains data tables organized by commodity category. The tables supplement the information presented in the narrative section with further disaggregated analysis. The last part of the Appendix provides the actual survey instrument.

DATA COLLECTION AND AGGREGATION

Data Collection Procedure

The first stage of the study, the survey of specialty crop growers, involved developing a questionnaire. The questionnaire was developed specifically for specialty crop growers based on the format of a survey instrument used previously (Blank and McDonald 1993), with input from RMA and from researchers who conducted an identical study in Florida, Pennsylvania, and New York. The California Agricultural Statistical Service (CASS, which is a regional office of USDA's National Agricultural Statistical Service (NASS)) assisted in formatting the questionnaire to facilitate its implementation. The final version of the survey instrument is presented in Appendix 3.

We established the sample frame by defining a minimum number of acres required for a farm to qualify for the study using information from CASS's database. To be included in the study, a farm had to have at least five acres of perennial crops (mainly tree or vine crops) or at least two acres of annual specialty crops (mainly vegetables, strawberries, or melons). This limit was designed to exclude very small farms that were unlikely to be commercial operations. The acreage criterion was applied to CASS's database, which contains information on more than 60,000 farms in California (the total number of farms and ranches in the state is estimated by USDA at about 80,000). A total of 31,864 farms met the acreage limit with the crops selected for the survey.

CASS conducted two rounds of mailings and one round of telephone interviews to collect completed surveys. In total, the two survey mailings garnered 7,391 responses. Those mailings were followed by telephone interviews of growers who had not responded by mail, which collected an additional 7,746 responses. In total, 15,137 responses were received (a 46 percent response rate). Relatively few farmers answered all 25 survey questions, which required responses in 192 cells. Under some "usability" criteria on the completeness of the answers, some responses were discarded.[1] In total, 10,410 observations were entered into an electronic database file that was then transferred to the authors.

Our primary analysis used only the horticultural-crop-based sample, which consisted of 10,200 observations.[2] Among noncrop categories, aquaculture producers provided the largest number of observations, allowing some statistical analysis of that industry. We provide data tables for aquaculture in Appendix 2 but omitted aquaculture from the narrative analysis.

Note that sample size used in our analysis varies depending on the question being analyzed. Survey responses varied in degree of completeness, and valuable information could have been lost if only fully completed responses were used. (In Appendix 1, the response rate for each survey question is reported.) Thus, to maintain the maximum sample size, different subsamples were used, depending on the usability and appropriateness of the data provided, in analyzing particular issues. Information on sample size is included in most of the table presentations.

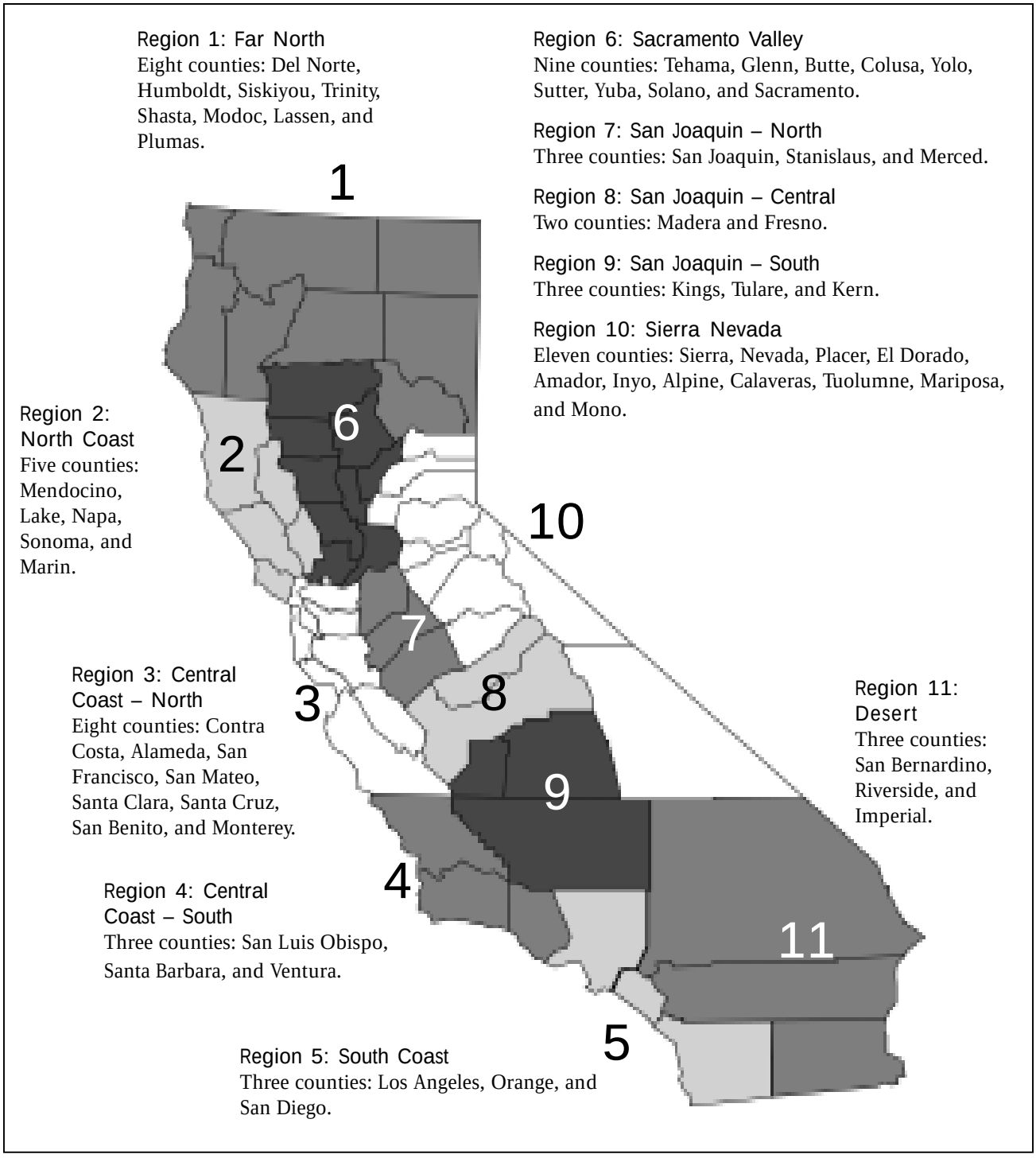
California Geography and Regional Aggregation

Several mountain ranges in California create the dominant Central Valley and smaller coastal valleys where much of the state's agricultural production is concentrated. The large Central Valley consists of the Sacramento Valley, which lies north of the San Francisco Bay Delta, and the San Joaquin Valley, which lies south of the delta. The Central Valley is encircled by the Cascade ranges and Klamath Mountains to the north, the Sierra Nevada Mountains to the east, the coastal ranges to the west, and the Tehachapi Mountains to the south. The coastal ranges also create a long strip of valleys, including, for example, Napa Valley and Salinas Valley.

[1] We identified 12 survey questions that we considered essential. To be considered complete, a survey had to provide answers to those questions. (If a question asked the respondent to rank choices, we considered the question answered if the respondent provided a rank for at least three items). We established these criteria to minimize unnecessary data entry effort.

[2] USDA's broad definition of specialty crops includes commodities in aquaculture and apiculture. Thus, our original data observations included a small number of these noncrop producers. To keep the consistency of land-based crop data, we excluded these noncrop commodities from our main data analysis (as reported in the narrative analysis). Further, to restrict the focus to specialty crops, observations were excluded if the largest revenue crop was a field crop.

Figure 1. Aggregation of Counties into Eleven Regions



(Johnston, *http://geoimages.berkeley.edu/GeoImages/BainCalif/CalClickMap.html*).

Climates in the region are affected by the cool currents of the Pacific Ocean and various mountain ranges. Temperatures in coastal regions are relatively mild while inland areas are hotter. Almost all of the state's rain and snowfall occurs during late fall and winter (November through March). The majority of California's water supply originates in the northern mountain regions of the state. Land for specialty crops is nearly all irrigated via ground water and various district, state, and federal water storage and distribution systems (Parker and Howitt).

California has 58 counties. In our analysis, we aggregated the counties into 11 regions with similar

geographic and climatic characteristics as shown in Figure 1. The Sacramento Valley and San Joaquin Valley (Regions 6–9) are together referred to as the Central Valley.

Commodity Aggregation

California's specialty crops include more than 200 individual crops. To facilitate a manageable analysis, crop aggregation was needed. Crop codes were developed using three levels of classification. First, all the commodities were assigned to one of five basic categories: (1) field crops, (2) fruits and nuts, (3) vegetables, (4) ornamental crops, and (5) noncrop commodities. The last category included a small number of apiary and aquaculture farmers, but for category-specific analyses, we considered only aquaculture farmers because there were too few apiary farmers for any statistical analysis. Fruits/nuts, vegetables, and ornamentals, which were our focus, were then further divided into subcategories of similar types of crops (such as berries). The third level of classification identified specific crops. Our data analysis used mostly the first two levels of classification. See Table 1 for a detailed description of the classifications.

While classification of fruits and nuts into the second level is self-evident, such classification of vegetables needs discussion. A wide variety of vegetables appears in the

Table 1. Commodity Aggregations

Category	Subcategory	Specific Crop
Field Crops (F)	Field Grains	Rice, wheat, corn, rye, barley, tricale, etc.
Fruits and Nuts (Fn)	Berries	Strawberries, blueberries, raspberries, etc.
	Citrus	Oranges, tangerines, grapefruits, lemons, etc.
	Grapes	Wine grapes, table grapes, raisin grapes Other grapes (use not specified)
	Nuts	Almonds, walnuts, pistachios, other tree nuts
	Apples and Pears	Apples, pears
	Stone Fruits	Apricots, cherries, nectarines, peaches, plums, prunes, pluots
	Tropicals	Avocados, olives, other (bananas, cherimoya, dates, figs, guavas, kiwifruit, loquats, mangos, jujube)
	Botanical Name	
Vegetables (Vg)	V1: Legumes	Beans, peas, various sprouts
	Alliums	Garlic, leeks, onions, shallots
	V2: Brassicas	Cabbages, argula, kale, mustard greens, cauliflower, broccoli, Brussels sprouts, radishes, turnips, etc.
	Chenopods	Chard, spinach, beets, sugar beets, etc.
	Composites	Lettuces, endive, chicory, artichokes, etc.
	V3: Cucurbits	Cucumbers, gourds, melons, pumpkins, etc.
	V4: Solanaceous	Tomatoes, peppers, eggplants, tomatillo
	V5: Succulents	Asparagus, mushrooms, etc.
	Umbells	Celery, parsley, herbs, carrots, etc.
	V6: All Unspecified Vegetables	
Ornamentals (Or)	Floriculture, Nursery, Christmas Trees	
Aquaculture (Aq)	Aquaculture	

data and choosing transparent and intuitive yet manageable groups was difficult. Following USDA guidelines, nine botanical classifications of vegetables were aggregated into six groups, guided by climatic growing conditions (e.g., cool weather versus warm weather vegetables) and by the number of observations available.

TOPICS ADDRESSED

The narrative and tables are presented in seven topical sections.

- farm size and regional profile
- crop diversification
- marketing
- yield, price, and profit fluctuations
- risk management
- crop insurance
- financial characteristics

Farm Size and Regional Profile discusses regional distributions of production for commodity categories and subcategories. It also provides mean acreage and acreage distributions. Mean acreages have relatively large standard deviations. To supplement this information, the distribution of farmers by acreage class has been included. Information provided on this topic pertains to Questions 1 through 6 (Cells 1–48).

Crop Diversification provides information on patterns of crop diversification across crop categories and subcategories. For example, do farmers of perennial crops diversify into annual crops in the same way that annual crop farmers diversify into perennial crops, or do they tend to diversify within the same crop category? This section also includes information on organic farming. Information provided in this section was obtained primarily from Questions 4 and 5 (Cells 5–47).

Marketing issues include whether a crop is designated for processing or fresh use, the types of marketing channels used, and whether a farmer's operation involves both growing and shipping or growing only. Marketing channels typically differ according to end use (processing versus fresh). Whether an operation grows and ships or only grows concerns crops intended for fresh use only; shipping and packaging are not issues for crops destined for processing, which are typically delivered to the plants in bulk. This section also explores the issue of whether price is predetermined through a contract before the time of sale. This section pertains to Questions 6, 7, and 8 (Cells 48–63) in the survey.

Yield, Price, and Profit Fluctuations for the preceding five-year period were explored next. Respondents were asked to provide actual yields for those five years; identify the highest fluctuation in yield, price, and profits during the same period; and indicate the main cause for their lowest profits. From this information, we examined fluctuation patterns that could exist specific to a region or crop category and linked the information with the main source of the lowest profit. Information presented for this topic was obtained from Questions 9, 10, and 11 (Cells 64–100).

Risk Management examined farmers' perceptions of risk and, in particular, the extent to which risk management tools are available and used. Respondents were asked to rank ten risk sources in order of importance and eight risk management tools in the order of preference. For each risk management tool, the survey also asked about its availability and whether it had been used by the farmer. Also included was information on their receipt of government disaster payments or loans. This section used data from Questions 12, 13, and 14 (Cells 101–152).

Crop Insurance was one of the risk management tools covered in the previous section, but it was then given more extensive coverage. This section summarized information on respondents' history of crop insurance purchases, reasons why they did or did not purchase crop insurance, and suggestions for improving the role of crop insurance. Information presented includes the mean ranking and distribution of ranks. The relevant survey section for this data was Questions 15 through 22 (Cells 153–188).

Financial Characteristics deals with off-farm income, gross agricultural sales, assets, and debts to provide the distributions of these variables and examine the existence of any systematic distribution patterns. Questions 23, 24, and 25 (Cells 189–192) in the survey were relevant to this section.

MAJOR SURVEY RESULTS

To highlight the results, we limited our analysis to the three primary crop categories—fruits/nuts, vegetables, and ornamental crops. The basic data set used in this analysis included only specialty crop farmers by excluding respondents whose primary commodity (Cell 48) was listed as a noncrop or a field crop. (Appendix 2 includes a section dealing with aquaculture.) With this exclusion, our basic data set consisted of 10,200 observations. Note, however, that much smaller samples were used in the analysis of many of the issues (observation numbers are indicated in the tables and figures). In the following discussion we highlight only the major results for each topic. A fuller description of the data used for most charts and figures in this narrative can be found in Appendix 2.

A. Farm Size and Regional Profile

As a starting point, we present an overview of our sample and distributions of acreage and farms by region and by crop category. At the end of this section, we compare these distributions of survey respondents to those reported in the 1997 Census of Agriculture (USDA 1999) to illustrate the representativeness of the farms surveyed.

Table A1 presents the share of farms and mean acres per farm by region and by crop category. Standard deviations are provided to give readers some sense of the variation in acreage. The three San Joaquin Valley regions accounted for 47 percent of the sample, the Sacramento Valley added another 13 percent, and the four coastal regions added 33 percent. The Far North, Sierra Nevada, and Desert regions comprised a substantial portion of the state's land area, but only 7 percent of specialty crop growers in the sample were located in those regions and the average acreage per farm in those regions was below the state average. Fruit/nut growers represented about 86 percent of the sample; therefore, any data analysis on all crops tends to be dominated by the characteristics of fruit and nut farms.

As shown in Table A1, mean acres varied considerably across crop categories but much less across regions. The average acreage for vegetable farms (1,106 acres) was substantially larger than the averages for fruit/nut and ornamental farms. On the other hand, average farm acres across regions were within the narrow range of 100–280 acres (except for the mountainous Sierra Nevada region). The standard deviations for all acreage distributions reported in Table A1 were relatively high, meaning that the distributions were spread widely. To compare the degree of spread between distributions, the ratio of the standard deviation to the mean (i.e., the coefficient of variation or CV) was calculated. The CV was seven for the whole sample and much higher in some regions. The South Coast's CV of 15 was the largest. Of the crop categories, ornamentals had the largest variation in acreage.

Table A2 provides the distribution of farms across finer crop classifications (subcategories) for each of the three

Table A1. Distributions of Surveyed Farms by Region and Crop Category

	Distribution	Mean Acres per Farm	Standard Deviation
All	**n = 10,200**	**203**	**1,412**
By Region			
Far North	1%	121	367
North Coast	12%	100	420
Central Coast – North	5%	248	991
Central Coast – South	8%	132	534
South Coast	8%	274	4,128
Sacramento Valley	13%	280	916
San Joaquin – North	17%	185	754
San Joaquin – Central	17%	208	819
San Joaquin – South	13%	268	1,263
Sierra Nevada	2%	62	133
Desert	4%	149	614
By Crop Category			
Fruits and Nuts	86%	157	676
Vegetables	5%	1,106	4,944
Ornamentals	9%	75	522

Table A2. Distributions of Farms by Crop Category and by Crop

Crop Category	Distribution
Fruits and Nuts	
Berries	2%
Citrus	12%
Grapes	33%
Nuts	31%
Apples and Pears	2%
Stone Fruits	9%
Tropicals	11%
Vegetables	
V1: Beans, peas, garlic, onions, leeks	12%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	16%
V3: Melons, cucumbers, squash, other gourd family	15%
V4: Tomatoes, peppers, eggplants, tomatillo	31%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs	15%
V6: Other unspecified vegetables	12%
Ornamentals	
Floriculture	24%
Nursery	67%
Christmas Trees	9%

main crop categories. Observations were classified into a subcategory based on farmers' responses on their primary crops.[3] Some facts stand out. Grape farms and nut farms each comprised more than 30 percent of all fruit/nut farms, and nurseries comprised 67 percent of all ornamental farms. While almost one-third of vegetable farms grew tomatoes (for both fresh and processed use), the rest of the subcategories of vegetables were fairly evenly distributed.

Table A3 provides the cumulative distributions by acreage class, which indicated that median per-farm acreage was between 21 and 30 acres for fruits/nuts and about 70 acres for vegetables. The same distributions are provided pictorially in Figure A1. About 40 percent of both fruit/nut and vegetable farms were concentrated around the land classes of 20 acres or less. Such high density of relatively small farms was common in the farm acreage distributions. However, what is unusual in Figure A1 is the relatively high density observed near the tails of the distributions, at acreage ranges of 101–300 for fruits/nuts (17 percent) and of 201 acres or more for vegetables (38 percent). Nevertheless, fruits/nuts and vegetables showed very different patterns in the very large acreage classes—only 3 percent of fruit/nut farms in the sample were larger than 500 acres, compared to 24 percent of vegetable farms.

Finally, the survey data were compared with data from the 1997 Census of Agriculture conducted by USDA to examine how closely the survey represented the overall population of growers. Table A4 presents selected summary statistics from both sources. Given that vegetable farmers in our survey represented 5 percent of respondents but were 8 percent of farmers in the census,

Table A3. Cumulative Distribution (Percent) of Farms by Acreage Class

Acres	Fruits and Nuts	Vegetables	Acres	Fruits and Nuts	Vegetables
0–10	22%	28%	71–80	76%	53%
11–20	42%	39%	81–90	78%	53%
21–30	51%	42%	91–100	80%	56%
31–40	61%	44%	101–200	89%	62%
41–50	66%	46%	201–500	97%	76%
51–60	70%	48%	501–1,000	99%	88%
61–70	73%	50%	1,000 and greater	100%	100%

[3] The primary crop was defined in the survey as the crop for which the farmer had the highest percentage of sales.

Table A4. Comparison of Specialty-Crop Survey (2002) with Census (1997) Data

General Characteristics	Census Number (Share)		Specialty Crop Survey Number (Share)	
No. of Farms				
All Crop Categories	43,055	(100%)	10,200	(100%)
Fruits and Nuts	35,422	(82%)	8,785	(86%)
Vegetables	3,348	(8%)	459	(5%)
Ornamentals	4,285	(10%)	965	(9%)
Mean Acres per Farm[a]				
Fruit and Nut Land per Fruit and Nut Farm	117		110	
Vegetable Land per Vegetable Farm	550		477	
Ornamentals Land per Ornamentals Farm	46		75	
Mean Sales per Farm[a]				
Fruits and Nuts ($1,000)	221		330	
Vegetables ($1,000)	1,201		1,112	
Ornamentals ($1,000)	516		814	
No. of Farms with Sales of $50,000 or More[a]				
Fruits and Nuts	14,216	(40%)	3,798	(43%)
Vegetables	2,458	(73%)	299	(65%)
Ornamentals	1,922	(45%)	471	(49%)

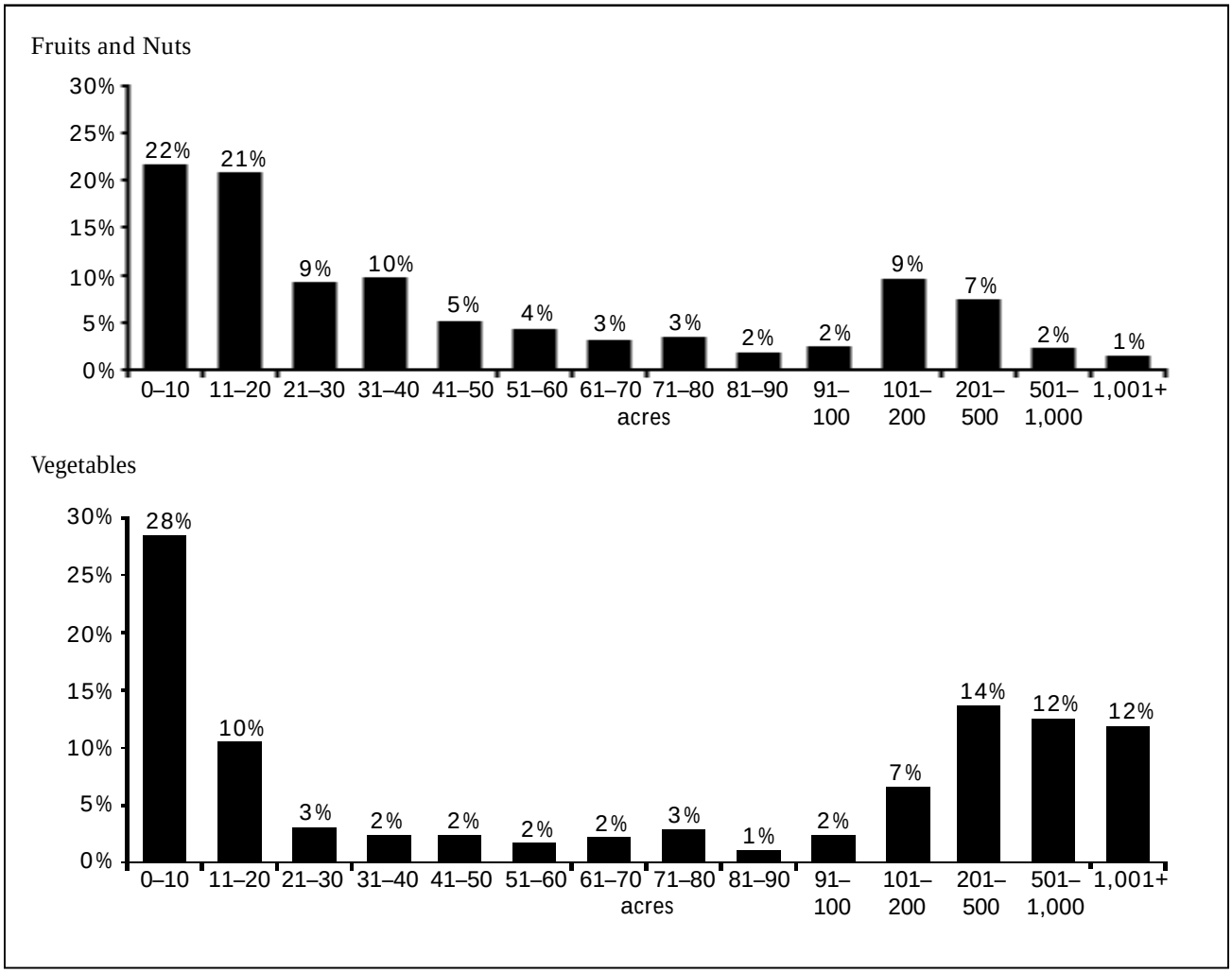
Distribution by Acreage Class

Acreage Class	Fruits and Nuts		Vegetables		Ornamentals	
	Census	Survey	Census	Survey	Census	Survey
1–9	30.4%	21.5%	31.4%	28.4%	58.1%	75.7%
10–49	39.7%	44.2%	21.2%	17.8%	29.6%	16.3%
50–69	5.9%	7.2%	3.9%	3.6%	2.8%	3.51%
70–99	5.8%	7.1%	3.6%	5.9%	2.1%	
100–499	14.6%	16.6%	16.5%	20.1%	5.6%	
500–999	2.1%	2.1%	9.2%	12.4%	1.1%	3.59%
1000 and more	1.6%	1.3%	14.2%	11.7%	0.8%	

[a] Even though our basic sample consisted of 10,200 observations, the calculations of mean acres and mean sales used subsets of the basic sample because some observations had incomplete information on crop-specific acreage and sales data.
Source for census data: *www.nass.usda.gov/census/census97/volume1/us-51/us2_o2.pdf*.

our sample tended to under-represent vegetable farmers. The acreage class distribution indicated that this under-representation was especially noticeable in the largest acreage class. We had a very close match with the census data for fruits/nuts, indicated by mean acres, mean sales, and acreage distributions. For ornamental crops, the sample appears to have a higher representation of farmers with relatively small acreage than does the census, as indicated by the distribution by acreage class presented at the bottom of the table.

Figure A1. Distribution by Acreage Class



B. Crop Diversification

Crop diversification is well recognized as a risk management tool (Blank 1996; Boehlje and Lins; Pope and Prescott). However, little information is available concerning the extent of diversification or the mix of crops used in diversification by horticultural producers. As a risk-reducing tool, crop diversification plays a role in pricing crop insurance and is likely to be incorporated as a discount factor in future crop insurance premiums. To implement degree of diversification into the crop insurance premiums structure, decision makers need to know the extent to which crops have been diversified. This section sheds some light on the issue.

Figure B1 shows the share of fruit/nut and vegetable farmers who grew a single crop. Seventy percent of fruit/nut farmers were single-crop growers as opposed to 26

Figure B1. Shares of Single-Crop Growers for Fruits/Nuts and Vegetables

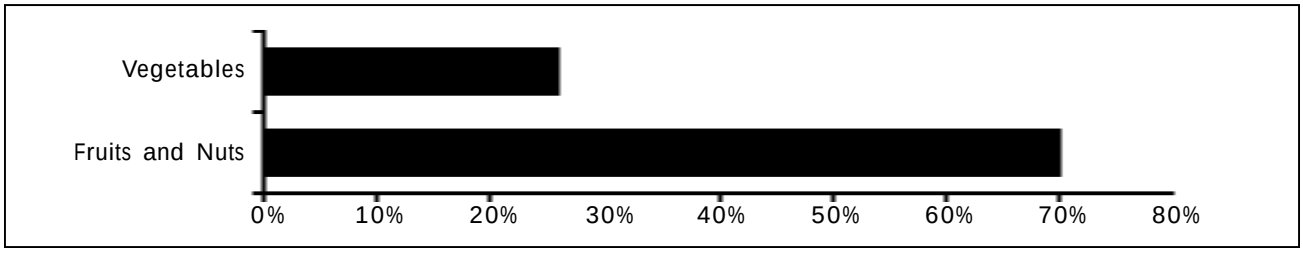


Table B1. Diversification Pattern and Mean Acres

	Share of Farms	Mean Acres per Farm
Fruits and Nuts (n = 8,669)[a]		*Average Acres in Fruits and Nuts*
No Diversification (Single Crop)	70%	67
Diversification		
Diversified Only with Fruits/Nuts (Average No. of Crops = 2.56)	24%	225
Diversified with Non-Fruits/Nuts (Field, Vegetable, and/or Ornamentals)	6%	159
Vegetables (n = 437)[a]		*Average Acres in Vegetables*
No Diversification (Single Crop)	26%	299
Diversification		
Diversified Only with Vegetables (Average No. of Crops = 3.59)	26%	632
Diversified Only with Field Crops	26%	547
Diversified Only with Fruits and Nuts	11%	144
Diversified with Field Crops and Fruits and Nuts	9%	842
Diversified with Ornamental Crops and Other	2%	15

[a] The number of observations, n = 8,669, is less than the total number of basic observations, n = 8,785 (reported in Table A4) because some observations had incomplete information for acreage and diversification. The same is true for vegetables. Of the 459 vegetable farms used in the basic set, data for 437 farms included complete diversification information.

percent of vegetable farmers. This implied that crop diversification was more common for vegetable growers than for fruit/nut growers, which was consistent with our expectation that diversifying into multiple crops is more manageable for annual crops than for perennial crops. The tendency toward single-crop production, however, varied by crop. For example, for fruits/nuts the share of single-crop farmers ranged between 35 and 83 percent, depending on the crop. As shown in Figure B2, grapes were most commonly a single crop (83 percent), while stone fruits were least frequently so (35 percent).

Table B1 presents the diversification patterns and mean acreages. The patterns and extents of diversification for fruit/nut and vegetable farms were very different. Of the 30 percent of fruit/nut farms that were diversified, most (26 percent) were diversified with other fruit/nut crops. However, of the 74 percent of diversified vegetable farms, only 26 percent were diversified using other vegetable crops; 48 percent were diversified with crops in other categories. This indicated that fruit/nut farmers rarely diversify into other crop categories and that diversification across crop categories is more common for vegetable farms, particularly with field crops. Furthermore, even among the growers who diversified within their own crop category, the scope of diversification was smaller for fruit/nut farming, as indicated by the average number of crops, 2.56 for fruits/nuts and 3.59 for vegetables (Table B1).

Table B1 also presents mean acreages. Note that the acreage figures in the table are for land that was planted in fruits/nuts or vegetables only. We did this to exclude often extensive field-crop areas and to examine the scale of farmers' operations for their primary crops relative to various patterns of crop diversification. A cursory observation of the acreage figures indicated that primary crop acreage increased with crop diversification for both fruits/nuts and vegetables (Pope and Prescott).

Also, farms that diversified within a crop category were relatively large. We revisit this issue with more detailed vegetable data later in this report.

Table B2 shows the pattern of crop mix for fruit/nut farms, which are diversified predominantly with other fruit/nut crops. The table lists the two types of crops most commonly used for diversification in each subcategory. Judging by the percent of farmers, growers of berries, citrus, stone fruits, and tree nuts have made substantial

use of same-category crop diversification. For tree nuts and stone fruits, the diversification patterns were symmetric with substantial cross-diversification between the two groups. The diversification trends for citrus and tropical crops were interesting. While 66 percent of sampled tropical crop growers diversified with citrus, only 28 percent of citrus farmers (their primary crop was citrus) diversified with tropical crops (60 percent diversified within citrus).

We now turn to vegetables. Table B3 summarizes the pattern of diversification for farmers who grew only vegetables (about half of the vegetable farmers) and shows the distributions of those farmers by the number of vegetables grown. While half of the vegetable-only farmers produced a single crop, 9 percent produced more than six different vegetable crops. When we shifted from all vegetables to the subcategories, diversification patterns varied considerably. This was illustrated with Groups V2 and V5, which showed the highest and lowest levels of diversification. Table B3 also provides mean vegetable acreages for vegetable-only farmers. There was a tendency for farmers with more acres of vegetables to grow a larger variety of vegetable crops, suggesting that large-scale commercial farms engaged in more diversified vegetable production. In other words, the "scope" of diversification was positively related to the scale of the operation.

This report does not include a discussion of crop diversification for ornamental crops because of a lack of information. The finest level of diversification we could investigate with the data for ornamental crops was diversification patterns across the three subgroups in the category: floriculture, nursery products, and Christmas trees. Our data indicated that ornamental growers rarely diversified across these groups.

Table B2. Diversification Pattern of Growers Who Diversified within Fruits and Nuts

Primary Crop	Category of Crops Used to Diversify	Share of Total Farms
Berries	Berries	41%
	Stone Fruits	24%
Citrus	Citrus	60%
	Tropicals	28%
Grapes	Stone Fruits	31%
	Nuts	27%
Nuts	Nuts	41%
	Stone Fruits	27%
Apples and Pears	Apples and Pears	23%
	Stone Fruits	23%
Stone Fruits	Stone Fruits	52%
	nuts	30%
Tropicals	Tropical Crops	14%
	Citrus	66%

Organic farming information is summarized in Table B4. The table combines acres of "organic" and "transitional-organic" plantings and presents the combined area as "organic acreage" (to be certified as organic, land must have been under organic practices

Figure B2. Share of Single-Crop Fruit and Nut Growers by Crop

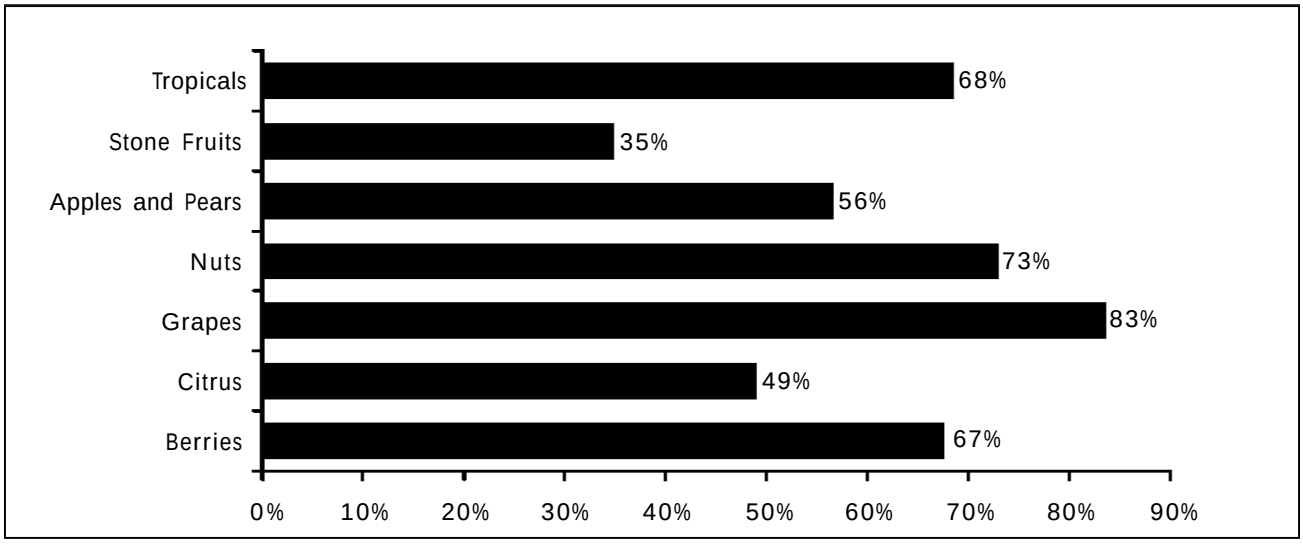


Table B3. **Distribution of Vegetable-Only Farmers by the Number of Different Vegetable Crops Grown**

Number of Vegetables Grown		One[a]	Two	Three	Four	Five	Six or More
All Vegetables	n = 228 (100%)	49%	18%	9%	10%	5%	9%
Mean Vegetable Acres		299	455	321	483	1,280	1,065
By Crop							
V1: Beans, peas, garlic, onions, leeks		50%	31%	4%	8%	8%	0%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes		18%	18%	11%	21%	8%	23%
V3: Melons, cucumbers, squash, other gourd family		58%	19%	12%	8%	0%	4%
V4: Tomatoes, peppers, eggplants, tomatillo		22%	38%	19%	5%	8%	8%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs		77%	3%	8%	3%	5%	5%
V6: Other unspecified vegetables		90%	3%	0%	5%	0%	3%

[a] Where the number of vegetables grown is listed as one, the farm grew only a single crop with no diversification.

Table B4. **Distribution of Organic Farms and Mean Acreage**

	Total Number of Farms	Percent of Farms with Organic Land	Mean Acres per Organic Farm: Total Land in Primary Crops	Mean Acres per Organic Farm: Land in Organic Crops
Fruits and Nuts			**Fruit and Nut Acres**	
All Fruit and Nut Crops	8,790	6%	146	45
By Crop				
Berries	144	15%	70	19
Citrus	1,021	6%	358	32
Grapes	2,887	5%	151	66
Nuts	2,776	5%	66	40
Apples and Pears	218	17%	58	37
Stone Fruits	798	5%	187	44
Tropicals	946	7%	160	34
Vegetables			**Vegetable Acres**	
All Vegetable Crops	443	14%	153	66
By Crop				
V1: Beans, peas, garlic, onions, leeks	51	6%	13	13
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	71	21%	350	75
V3: Melons, cucumbers, squash, other gourd family	67	9%	18	20
V4: Tomatoes, peppers, eggplants, tomatillo	137	13%	395	66
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs	65	12%	22	14
V6: Other unspecified vegetables	52	27%	120	119

for three years, and during that three-year period, the land is referred to as transitional-organic land). Table B4 shows that 14 percent of vegetable growers practiced organic farming, compared to 6 percent of fruit/nut growers, although organic fruit/nut farms were more numerous. Most organic farmers also grew conventional crops and, on average, they devoted more land to conventional production than to organic production.

C. Marketing

This section summarizes the survey results on types of output use (i.e., processing or fresh), marketing channels, and types of operations (e.g., vertical integration into a packing/shipping business). Figure C1 shows the distribution of farmers by type of use for their fruits/nuts and vegetables (ornamentals are supplied almost exclusively for fresh use). The two types, "mainly fresh" and "mainly processing," were defined to include cases in which more than 80 percent of output volume was designated to the listed use. For fruits/nuts, 71 percent of farmers were characterized as mainly processing and 23 percent as mainly fresh. These figures were almost reversed for vegetables—67 percent of vegetable farmers specialized in fresh-use crops and 26 percent in processing-use crops. For both fruits/nuts and vegetables, only 7 percent of farms supplied both fresh and processing uses (a minimum of 20 percent of their volumes went to each use). This implied that production of fruits/nuts and of vegetables in California tends to be specialized for either processing or fresh use.[4] Also, these figures were consistent with the common observation that, for both vegetables and fruits/nuts, specific uses dictate the varieties grown. For example, Cling peaches are typically destined for canning and the Roma variety of tomatoes is usually made into paste.

Relevant marketing channels are determined by whether the crop goes to the fresh market or for processing since the two uses require different postharvest handling techniques. Once harvested, processing crops are shipped directly to a processing plant. Fresh-use crops are usually sorted, packed, and refrigerated before being shipped to wholesale or retail buyers. This implies that specific marketing channels emerge to accommodate the postharvest handling required for each use.

Figure C1. Use-Type (Processing/Fresh) Distribution

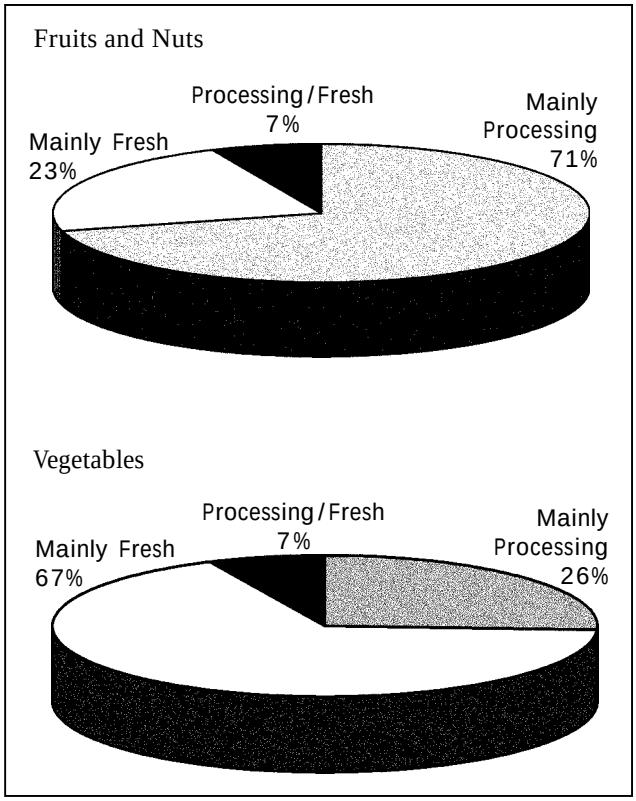
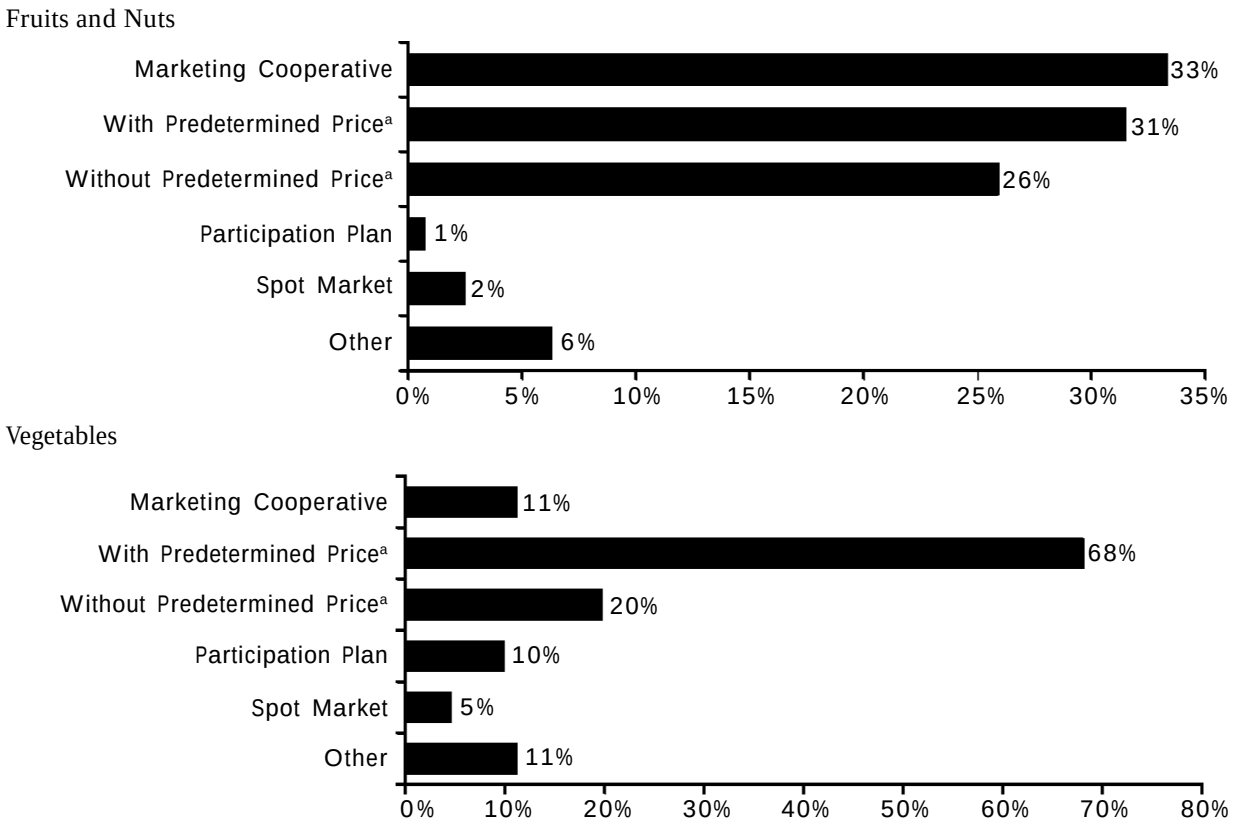


Figure C2 lists the marketing channels available for processing crops and the share of farms that used those channels. For fruits/nuts, marketing cooperatives and contracts with a processor (both with and without a predetermined price) were the most widely used marketing channels, accounting for 90 percent of the farms. However, for processed vegetables, marketing cooperatives played a relatively small role. Instead, contracts with a processor arranged at a predetermined price predominated. While contracts with processors were an important marketing avenue for both the fruit/nut and the vegetable categories, the patterns of pricing arrangements with processors were distinctly different. For fruits/nuts, contracts with and without predetermined prices were almost equally important (31 percent and 26 percent), whereas for processed vegetables, contracts with processors were mostly arranged under predetermined prices (68 percent versus 20 percent).

[4] We further investigated the case of tree nuts (for which use is not immediately clear). Ninety-three percent of tree nut farmers reported that all of their crops were designated for processing and only 4 percent of tree nut farmers reported mainly fresh use (for more detail, see Table Fn.C1 in Appendix).

Figure C2. Marketing Channels for Processed Crops



[a] The pricing method was arranged through a contract with a processor.
Note: The percentage sum over all marketing channels exceeded 100 percent because some farmers use multiple channels.

Table C1. Selected Marketing Channels for Processed Fruit and Nut Crops[a]

		Specific Marketing Channels		
	Total Observations	Marketing Cooperative	Sold to a Processor under Contract with a Predetermined Price	Sold to a Processor under Contract without a Predetermined Price
Citrus	150	53%	9%	30%
Grapes	2,548	17%	52%	19%
Nuts	2,447	51%	11%	33%
Apples and Pears	55	13%	38%	27%
Stone Fruits	373	36%	35%	23%
Tropicals	349	26%	36%	29%

[a] Data include farms where processing use was greater than 80 percent of volume.

Given the importance of processing use for fruits/nuts, we further investigated their marketing channels by disaggregating the category and looking at subgroups of the crop, as shown in Table C1. Marketing patterns were substantially different for specific subgroups. Cooperatives were especially important for citrus crops (53 percent of citrus growers used cooperatives) and tree nuts (51 percent), and predetermined price contracts were particularly prevalent for grapes (52 percent). The bulk of the grape growers produced wine grapes and, according to a recent survey, 90 percent of wine grape growers in California have either written or oral contracts with

Table C2. Fresh-Use Crops: Number of Grower/Shippers

	Total No. of Farms Supplying Fresh Use Crops	Share of Farms That Are Grower/Shippers	Share of Farms That Are Growers Only
Total	2,772	9%	91%
Fruits and Nuts	2,462	3%	97%
Vegetables	310	13%	87%

wineries (Goodhue et al.). Overall, the data in Table C1 underscored the prevalent role of contracts in the processed fruit/nut industry. For vegetables, crop-specific marketing channels did not deviate much from the overall marketing pattern reported in Figure C2 and disaggregated information is not presented here.

Postharvest handling is a crucially important component in marketing fresh-use crops. Thus, large commercial growers sometimes integrate field production with postharvest packing and shipping activities under the same owner. These growers are often referred to as grower/shippers (as opposed to growers only). Table C2 indicates that 9 percent of the fresh-use growers who responded to the survey were grower/shippers. The vegetable industry had the largest proportion of grower/shippers (13 percent); next was the ornamental industry (11 percent), followed by fruit/nut operations (3 percent). There is no parallel notion of postharvest handling for ornamentals and, thus, the remainder of the grower/shipper discussion mostly relates only to fruits/nuts and vegetables.

Grower/shippers operate on large scales and usually supply large-scale buyers such as grocery chains and mass-merchandisers (discount stores), often at a pre-negotiated price. Negotiating the price before market conditions are known has important implications for price risk. Even though the net effect of prefixing the price depends on the structure of market power, a contract with a fixed price tends to reduce price risk. Our survey indicated that 51 of 75 fruit/nut grower/shippers sold, on average, 85 percent of their products at a predetermined price. However, for vegetables, the data indicated that only one grower/shipper sold product at a predetermined price.

Table C3. Marketing Channels for Fresh-Use Crops (Grower-Only)[a]

		Distribution of Farmers Using Specific Marketing Channels[b]				
	Total Observations	Direct to Consumers	Marketing Cooperatives	Independent Shipper/ Brokers	Direct to Commercial Buyers	Other
Fruits and Nuts						
All Fruit and Nut Crops	2,311	10%	35%	40%	11%	4%
By Crop						
Berries	112	19%	11%	48%	20%	3%
Citrus	785	5%	54%	30%	9%	2%
Grapes	167	8%	16%	43%	17%	16%
Nuts	222	15%	41%	28%	13%	3%
Apples and Pears	139	32%	11%	42%	14%	2%
Stone Fruits	353	10%	8%	68%	10%	4%
Tropicals	533	7%	39%	38%	11%	4%
Vegetables						
All Vegetable Crops	327	31%	6%	31%	28%	4%

[a] The percentages in this table are based on farmers who were growers only (i.e., excluded grower/shippers) and produced fresh-use crops.
[b] The row sum may exceed 100 percent because some farmers use more than one marketing outlet.

While grower/shippers typically supply their crops directly to large retailers or wholesalers, the grower-only group tends to market its crops through contracts with shippers or other means. As shown in Table C3, the two major outlets for fruits/nuts are marketing cooperatives and independent shipper/brokers. On the other hand, for vegetables, cooperatives have a minor role, and major roles are played by three marketing channels: direct marketing to consumers (e.g., farmers markets, roadside selling, you-pick operations), independent shipper/brokers, and direct marketing to commercial buyers.

Comparing marketing channels between processed and fresh-use crops, two observations stand out. With no single dominant marketing channel, fresh-use crops are generally marketed through various channels. Nevertheless, for fruits/nuts, the importance of cooperatives is significant—cooperatives are widely used in marketing both fresh and processed fruits/nuts.

D. Yield, Price, and Profit Fluctuations

Production risk is closely linked to yield risk (Smith and Mandac). As a way to measure yield risk, fluctuations in yields were investigated. The survey asked for information on actual annual yields from 1997 to 2001, and complete five-year yield data were obtained from about 45 percent of the respondents (46 percent of fruit/nut growers and 42 percent of vegetable growers). Using the five-year yield data, average yield deviations in percentage were calculated and are reported in Table D1. To arrive at average yield deviations, for each observation we first calculated the simple average using the five-year yields. The percentage deviation from the average yield was then computed for each year (absolute values were used for calculating percentage deviations). The all-year average deviation was the average of the five-year yield deviations. Table D1 presents the sample mean of all-year deviations by crop category and by crop-specific group. (Yield measurement is not relevant to ornamental crops so that category was not included in the table.) The mean values of the all-year deviations indicated that vegetable yields fluctuated less (8 percent) than fruits/nuts in aggregate (15 percent). This was consistent with our intuition. Unlike many perennial crops, vegetables have short growing seasons. In California, they are planted and harvested continuously throughout the year, which results in relatively smooth yield fluctuations on an annual basis. Crop-specific deviations are also presented in Table D1 (no particular regional patterns were found). Except for tropical and V5 crops (carrots, celery, asparagus, mushrooms, and herbs), the deviations tended to be around the mean. We also investigated the deviation at the regional level. No particular regional pattern was observed for fruits/nuts. For vegetables, less variation was observed in all of the coastal areas except the north coastal region (for further information, see the table labeled All.D1 in Appendix 2).[5]

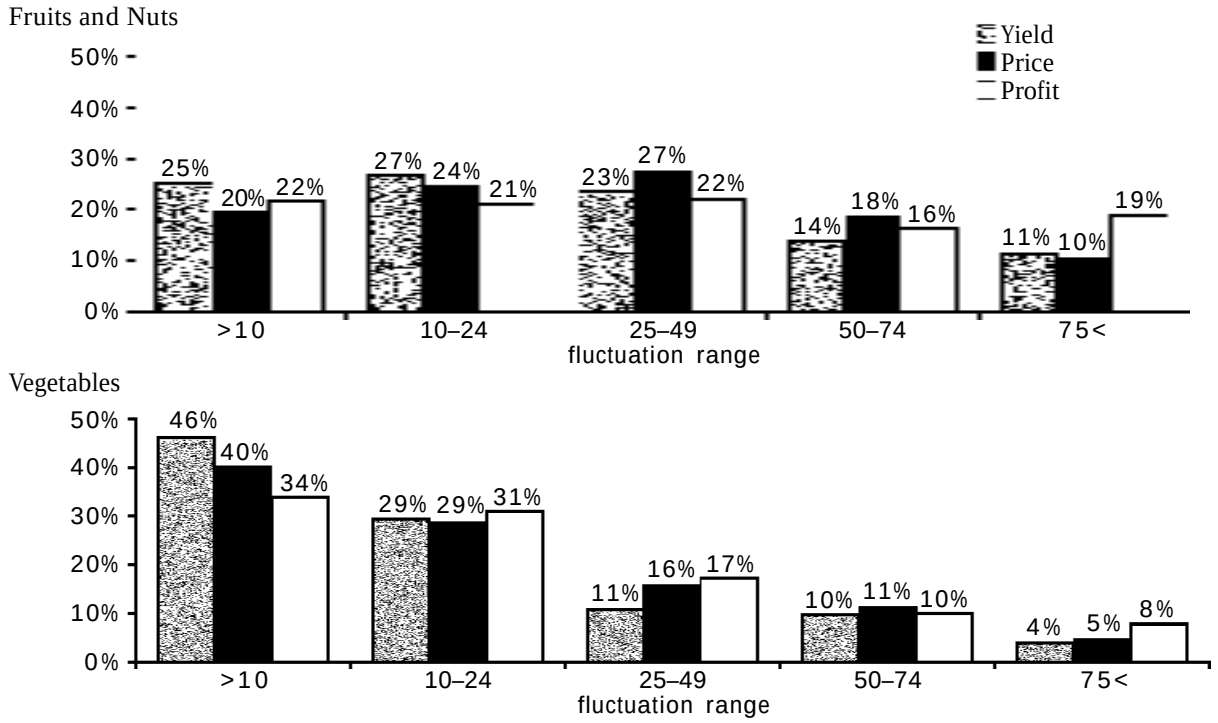
Table D1. Yield Variation: All-Year Average of Yield Deviation (Percent) from the Five-Year Average[a]

	Yield Deviation	All-Year Mean[b]
All Fruit and Nut Crops	n = 4,057	15%
Berries		10%
Citrus		15%
Grapes		13%
Nuts		16%
Apples and Pears		15%
Stone Fruits		16%
Tropicals		21%
All Vegetable Crops	n = 195	8%
V1: Beans, peas, garlic, onions, leeks		9%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes		6%
V3: Melons, cucumbers, squash, other gourd family		9%
V4: Tomatoes, peppers, eggplants, tomatillo		7%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs		12%
V6: Other unspecified vegetables		6%

[a] Data include only the observations that included yields for all five years.
[b] Yield deviations were calculated by taking absolute value.

[5] Given that only half of the sample provided the five-year yield information, we examined the possibility of selectivity problems related to this subsample by performing a cross-check of the data. We did not find any selectivity, at least from the data distributional characteristics.

Figure D1. Shares of Farms: Largest Yield, Price, and Profit Fluctuation in Last Five Years



Fruits and Nuts: The numbers of observations used were 6,765 for yield, 5,773 for price, and 5,456 for profit.
Vegetables: The numbers of observations used were 372 for yield, 343 for price, and 330 for profit.

Respondents were asked to indicate the range of the highest fluctuation in yield, price, and profit experienced in the past five years. Figure D1 reports the resulting distributions of farms by fluctuation range. The yield distribution was consistent with the information in Table D1. Vegetables showed higher densities at lower fluctuation ranges than fruits/nuts. As was true for yields, vegetables fluctuated less than fruits/nuts with regard to prices and profits. However, profits in general tended to fluctuate more than yields or prices, as demonstrated by the fact that more farms were associated with higher fluctuations and fewer farms with lower fluctuations. Given that profit is a function of yield and price, some relationship between these three variables was expected. To investigate this relationship, we estimated the level of correlation between them. Estimated correlation coefficients were 0.38 between yield and price, 0.41 between yield and profits, and 0.64 between price and profits, with all p-values below 0.0001. The fluctuation of profits had a stronger correlation with the price fluctuation than with the yield fluctuation, indicating that profits are more sensitive to price fluctuations than to yield variations.

Producers were asked to indicate what they thought was the main cause for their lowest profits by selecting from one of seven causes listed. Table D2 reports the distribution of those responses. Poor yields, low market price due to high domestic production, and low market price due to imports were the three most cited causes for low profits for both fruits/nuts and vegetables. The primary importance of those factors, however, differed by crop category. For fruits/nuts, poor yield was the most frequently cited reason, indicating the importance of risk related to natural conditions. For vegetables, low market prices due to high production was the most cited cause, followed by low market prices due to imports, indicating the relative importance of market conditions in vegetable industries.[6]

[6] Grower magazines and newsletters are often sources of market information for growers. Even though we believe that the majority of growers are well informed about the market, the reported statistics were based on growers' perceptions and we do not claim that they have accurate information about whether the low output price was due to high domestic production or imports.

The crop-specific distributions (not reported) reinforced the general patterns just described. Two groups of crops represented the extremes: 44 percent of tropical crop growers chose "poor yields" as the cause for their lowest profits, and 51 percent of V2 (lettuce, broccoli, etc.) farmers chose "low price due to high production" as the cause (Table Vg.D3 in Appendix 2). It is worth pointing out that the primary concern of V2 vegetable growers was "the good year's large harvest," not the bad year's poor harvest.

Table D2 also presents the distributions of farmers' main causes for their lowest profits by use and by grower/shipper status. Two interesting observations stand out from those distributions. Even though quality was not generally a dominant concern, it was considerably more important for fresh-use crops than for processed-use crops. Second, responses to the two causes of low market prices seemed to differ by crop use. Growers supplying mainly processing crops were more concerned about price declines from high domestic production than from increased imports (31 percent versus 13 percent), but no such distinction was found for fresh-crop growers (19 percent versus 18 percent). Next, the information was sorted by grower/shipper status because grower/shippers' vertically integrated, large-scale operations likely entail risk implications that are different from those of the majority of farmers, who engage only in crop production. Sixty percent of grower/shippers chose low market prices as a main cause of low profits compared to 43 percent of grower-only farmers (Table D2), indicating that low market prices are a larger concern for grower/shippers.

Finally, we evaluated the issue of whether there was any pattern in processor pricing methods (i.e., contracts with processors with or without predetermined prices). This question, which was included in the survey under marketing channels, dealt with growers producing only processing crops. As expected, for both fruit/nut and vegetable farmers, low market prices were chosen as a main cause for the lowest profit less often among growers who received a predetermined price than among those did not (not reported in the table). The regional distribution was also examined (but not reported) and

Table D2. Shares of Farms: Main Cause for Lowest Profit by Crop Category, Use, and Grower/Shipper Status

	Total Observations (n)	Poor Yield	Poor Quality	High Input Cost	Low Market Price due to Domestic Production	Low Market Price due to Increased Imports	Inability to Market Crop due to Quarantine	Other
		Percent of Farmers Who Gave this Category as Main Cause of Lowest Profit						
All Crops	9,169	29%	4%	7%	27%	16%	1%	17%
By Crop Category								
Fruits and Nuts	7,898	31%	4%	6%	28%	16%	1%	15%
Ornamentals	840	12%	6%	19%	15%	15%	1%	33%
Vegetables	431	19%	5%	14%	29%	21%	0%	13%
By Use[a]								
Mainly Processing	5,690	32%	3%	6%	31%	13%	0%	15%
Mainly Fresh	2,951	25%	6%	10%	19%	18%	1%	20%
By Grower/Shipper Status								
Grower/Shipper	118	21%	6%	6%	33%	27%	0%	7%
Grower Only	2,487	28%	6%	7%	21%	22%	1%	15%

[a] "Mainly processing" (or "Fresh") was indicated by the output volume share being greater than 80 percent.

indicated that in the Far North, North Coast, and Sierra Nevada regions, particularly high proportions of respondents listed poor yields as a main cause for low profits.

E. Risk Management

This section includes mainly a discussion of ranking questions related to risk management. The specific topics analyzed are ranking of risk sources in order of importance, preference ranking of risk management tools, availability and utilization of risk management tools, and the history of receiving government disaster payments or loans.

Figure E1 presents the mean ranking for each risk source listed in the survey. Ten risk sources were listed, and respondents were asked to rank the sources from one (the most important risk source) to ten. In general, as a risk source became less important, fewer respondents provided a ranking for it. Among the listed sources, adverse temperature and output price fluctuation were the two highest ranked sources, with average rankings of 2.0 and 2.3, respectively. The next most common sources were diseases, input price fluctuation, and pests, with the mean ranks ranging between 3.0 and 4.0.

Mean ranks at more disaggregated levels were also examined (although not reported). Those ranking patterns were similar to the overall pattern, with no distinct dissimilarities among the three crop categories. Further examination of the mean ranks within the vegetable category showed a slightly pronounced pattern for the V4 class (tomatoes, peppers, and eggplants). Output price fluctuation received the mean rank of 1.6, input price fluctuation and pests both received 1.9, and adverse temperature received 2.3, indicating the relative importance of price fluctuations and pests for these growers compared to growers of other crops.

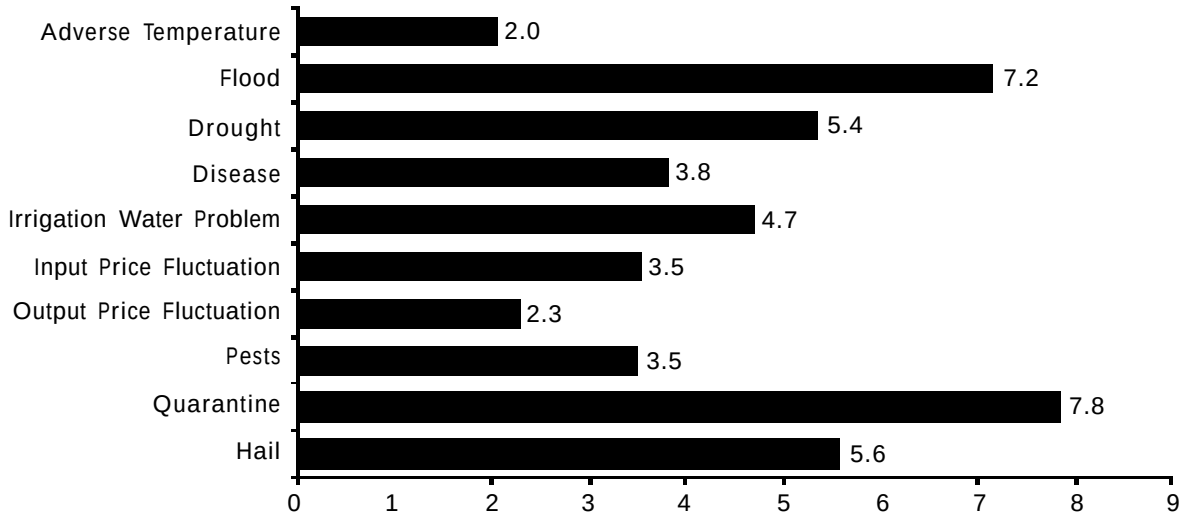
When the mean ranks by region were examined, adverse temperature remained one of the most important risk sources in all regions. Given that risks related to irrigation water and hail can vary by region in California, the regional pattern of rankings of drought, irrigation water supply problems, and hail were examined. As expected, water-related risks varied more by region than did other risk sources, ranging from 3.2 for irrigation water problems for South Coast growers to 5.8 for drought for the Sacramento Valley. Overall, water-related sources were relatively more important in regions such as the South Coast, Sierra Nevada, and Desert, where adequate supplies of irrigation water are known problems. Hail was a relatively low-priority concern (mean ranking of below seven) everywhere except the Central San Joaquin region (with a mean ranking of 3.93).

Next, growers' preferences for risk management tools and the availability and their use of those tools were examined. Table E1 presents the mean preference ranking of various risk management tools. Rankings for all crops indicated that crop insurance was most preferred, followed by diversified marketing and multiple commodities. However, preferences by specific crop category showed different patterns. The difference was most obvious with regard to crop insurance and multiple commodities; fruit/nut farmers strongly preferred crop insurance, whereas vegetable and ornamental crop farmers had a strong preference for multiple commodities. One explanation for this difference may be the level of availability of these tools; i.e., farmers may feel that a tool is "less preferred" when that tool is "less available."

Given that preferences can be affected by availability, the availability of each risk management tool was investigated. Table E2 reports the rate of availability as a ratio of the number of farmers who said the tool was available to them compared to the total number of respondents for that question. Again, the largest differences across crop categories arose with the two tools previously mentioned, crop insurance and diversification across multiple crops. Crop insurance was available to 49 percent of fruit/nut producers, 29 percent of vegetable growers, and 18 percent of ornamental crop producers. Responses for the availability of diversification into multiple crops showed almost the reverse: 17 percent for fruits/nuts, 40 percent for vegetables, and 28 percent for ornamental crops. These responses were consistent with our casual observations that, generally, fewer crop insurance programs are available for vegetables than for fruits/nuts and that diversifying into new crops is naturally more difficult for perennial crop growers than for annual crop growers. Diversified marketing was available to between 16 and 26 percent of growers across the three crop categories. Forward contracts were more available for vegetable growers (21 percent) than for fruit/nut growers (13 percent).

The interpretation of availability requires some caution. While interpreting the availability of

Figure E1. **Mean Ranking of Risk Sources in Order of Importance**[a]



[a] The numbers of observations used in tabulating mean rank varied for risk sources. In general, more respondents provided the rank for relatively more important sources. For example, the rank for adverse temperature, which was found to be most important, was provided by 7,781 respondents, and the rank for quarantine was provided by 2,824 respondents (for more information, refer to Table All.E1 in the Appendix).

crop insurance and government programs is straightforward, evaluating the availability of other risk tools such as crop/location diversification is not clear-cut. How individuals view the availability of such tools reflects, to some extent, their preferences for various tools. In this respect, the availability rates reported here are possibly downward-biased and can be understood as lower bound for the rates.

The second column in Table E2 reports the utilization rate, calculated as a ratio of the number of users to the number of farmers who said the tool was available. Most utilization rates, except for a few less important tools, exceeded 60 percent. This indicated that as long as the tools were available, the majority of growers made use of them to manage risk. Utilization rates were generally higher for vegetable farmers than for fruit/nut growers.

Diversification into multiple commodities deserves special attention, with its utilization rate of 87 percent being the highest reported. Crop diversification was the mostly preferred, most widely available (40 percent), and most frequently used (87 percent) risk management tool for vegetable growers. In fact, 87 percent of utilization

Table E1. **Mean Ranking of Preference for Risk Management Tools**[a]

	Crop Category			
	All Crops	Fruits and Nuts	Vegetables	Ornamentals
Crop Insurance	2.1	1.9	3.1	3.4
Different Regions	4.8	4.9	3.9	3.7
Multiple Commodities	3.0	3.2	2.1	2.1
Government Programs	3.9	3.8	4.1	4.7
Hedging with Futures or Options	5.7	5.7	5.6	6.0
Forwarding Contracting	3.6	3.5	3.5	3.8
Diversified Marketing	2.9	3.0	2.9	2.4
Others	2.6	2.6	2.7	2.1

[a] The number of observations differed for each tool considered and ranged from 5,793 for crop insurance (all crops) to 2,064 for hedging (all crops). For more information, refer to Table All.E3 in the Appendix.

given 40 percent availability implies that 35 percent (87 percent times 40 percent) of vegetable farmers were practicing crop diversification as a risk reducing tool. Using only the observations that indicated the tool was available, the preference ranking was re-examined and the results are reported in the last column of Table E2. These mean rankings were positively correlated with the utilization rates and the ranks were higher than those in Table E1.

F. Crop Insurance

The topics explored in this section include information on farmers' crop insurance purchases, private insurance

Table E2. Shares of Farms: Availability and Utilization of Risk Management Tools

	Availability Rate (Percent)[a]	Utilization Rate (Percent)[b]	Mean Ranking
Fruits and Nuts			
Crop Insurance	49%	69%	1.8
Different Regions	7%	39%	3.7
Multiple Commodities	17%	63%	2.4
Government Programs	15%	60%	3.0
Hedging with Futures or Options	3%	27%	4.5
Forward Contracting	13%	67%	2.4
Diversified Marketing	16%	60%	2.4
Other	3%	75%	2.4
Vegetables			
Crop Insurance	29%	71%	2.6
Different Regions	15%	47%	3.0
Multiple Commodities	40%	87%	2.0
Government Programs	20%	67%	3.1
Hedging with Futures or Options	7%	52%	5.0
Forward Contracting	21%	77%	2.8
Diversified Marketing	25%	79%	2.7
Other	3%	62%	2.8
Ornamentals			
Crop Insurance	18%	37%	3.0
Different Regions	11%	45%	3.0
Multiple Commodities	28%	78%	1.6
Government Programs	4%	36%	3.9
Hedging with Futures or Options	2%	19%	4.9
Forward Contracting	9%	66%	2.8
Diversified Marketing	26%	73%	2.1
Other	4%	74%	2.1

[a] The availability rate was calculated as the ratio of the number of observations with availability divided by the total number of observations.
[b] The utilization rate was calculated based on the number of observations with availability. The utilization rates are not provided by crop due to the small number of observations that reported using the tool.

Table F1. History of Crop Insurance Purchases

	Fruits and Nuts	Vegetables	Ornamentals
Purchased at Least Once in Last Five Years	53%	31%	13%
Purchased All Five Years[a]	64%	71%	48%

[a] The numbers in this row were based on observations in which the farmer purchased insurance at least once in the last five years.

purchases, reasons for purchasing and not purchasing crop insurance, and suggestions for modifying crop insurance.

Table F1 reports the percent of farmers that purchased any crop insurance within the last five years. Crop insurance here refers to government crop insurance as well as to private coverage such as frost insurance. Purchase rates varied considerably across crop categories. Table F1 shows that crop insurance was purchased most extensively by fruit/nut farmers (53 percent), followed by vegetable farmers (31 percent), and ornamental crop farmers (13 percent). The table also presents the percent of crop insurance buyers who made purchases in all five years covered by the survey. The majority of the buyers purchased insurance all five years, indicating the high likelihood of continuous purchases by farmers once they chose to purchase.

Table F2 shows the extent of peril-specific crop insurance purchases by growers across crop categories. Peril-specific insurance policies are offered mostly by private firms, while multi-peril insurance is provided by the government. Among fruit/nut growers in general, frost (freeze) insurance was the most frequently purchased single-peril coverage. This was particularly the case for citrus growers; more than one-third of that group purchased frost insurance. However, rain insurance was the most popular with grape growers (likely for raisin grapes) with about one quarter of them purchasing the coverage. Finally, hail insurance was the most common coverage purchased by stone fruit growers (32 percent). In general, vegetable growers tended to purchase less single-peril crop insurance than fruit/nut growers. Crop-specific information showed that, among vegetable growers, growers of V4 crops (tomatoes, peppers, and eggplants) used single-peril coverage fairly frequently, especially rain insurance (34 percent). It is likely that such high rates were observed for V4 growers relative to other vegetable growers because of the potential damage that late rains can do to the market acceptability of these crops (i.e., the "marketable" yield). Single-peril insurance was rarely used by growers of ornamentals.

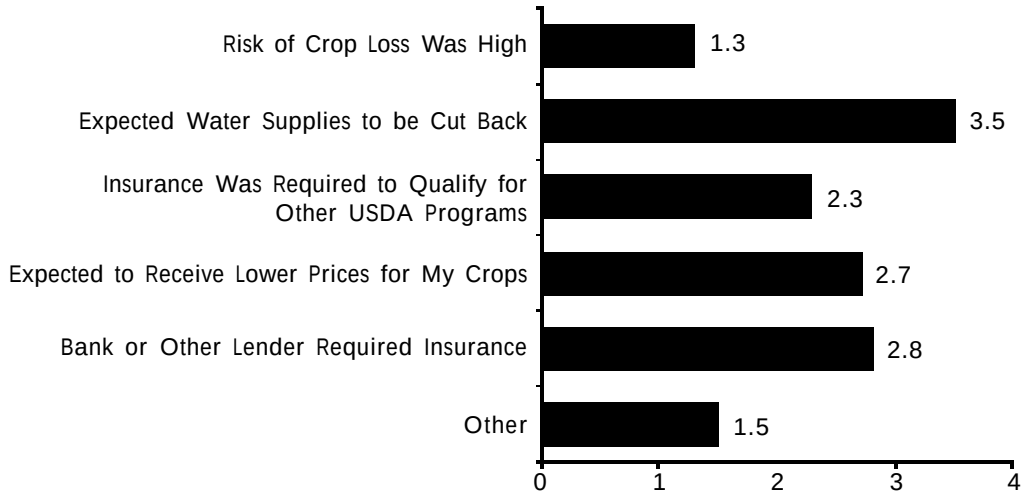
Respondents were asked to rank their reasons for purchasing crop insurance. Figure F1 presents the mean ranking for the reasons listed in the survey. No information is reported separately by crop category because no obvious distinctions were observed across crop categories. "Crop loss" still ranked first as a reason for purchasing crop insurance, in part indicating the prevalence of

Table F2. Purchase of Private (Single-Peril) Crop Insurance

		Share of Farmers that Purchased Peril-Specific Insurance			
	Total[a]	Fire	Frost or Freeze	Rain	Hail
All Fruits and Nuts	n = 8,791	5%	20%	17%	17%
Citrus	n = 1,021	5%	36%	10%	18%
Grapes	n = 2,888	5%	21%	24%	21%
Nuts	n = 2,776	5%	16%	14%	14%
Stone Fruits	n = 798	5%	25%	25%	32%
All Vegetables	n = 443	9%	9%	14%	9%
V4: Tomatoes, peppers, eggplants, tomatillo	n = 137	15%	17%	34%	18%
Ornamentals	n = 936	4%	3%	3%	3%

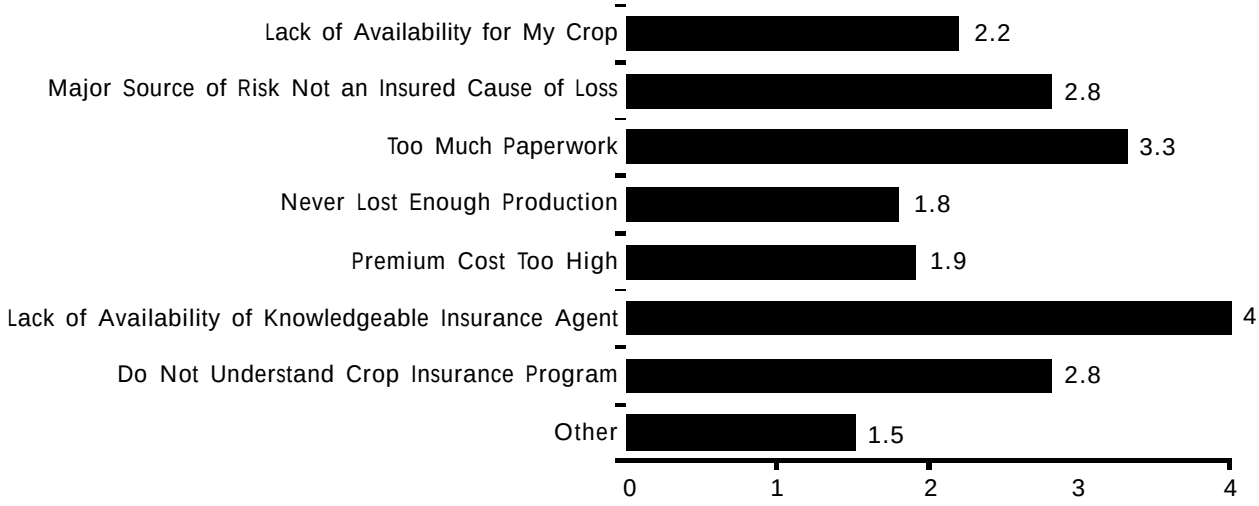
[a] The sum of the farmers over all perils is not equal to the total number because many respondents did not answer this question.

Figure F1. **Mean Ranking of Reasons for Purchasing Crop Insurance**[a]



[a] The number of observations used differed for each reason and ranged from 3,602 for "risk of crop loss was high" to 1,044 for "expected water supplies to be cut back."

Figure F2. **Mean Ranking of Reasons for Not Purchasing Crop Insurance**[a]



[a] The number of observations used differed for each reason and ranged from 2,722 for "have never lost enough production" to 1,167 for "lack of knowledgeable insurance agent."

yield-based crop insurance. The second highest ranking reason was "required to qualify for USDA programs." Some linkage exists between crop insurance participation and USDA farm program benefits (Lee et al.). Farmers who wish to remain eligible for some USDA program benefits must obtain catastrophic insurance or higher levels of coverage. Given the relatively few government programs available for specialty crop growers, this ranking may be associated with the specialty crop growers who have diversified into field crops. However, it is worth mentioning that not even one-quarter of potential respondents (in this case, insurance buyers) provided the rank for the reason for purchasing crop insurance except for "crop loss," which was chosen by more than three-quarters of the insurance buyers. This indicated that many felt that any reason other than crop loss was remotely related.

Reasons for not purchasing crop insurance and their mean ranking are presented in Figure F2. "Never lost enough production" and "premium is too high" ranked highest among the choices offered except "other." This reflected the relatively low degree of yield variability in many specialty crops grown in California. "Lack of availability for my crop" was next. Particularly among vegetable growers, lack of availability was ranked as the primary reason for not purchasing crop insurance, with a mean rank of 1.6 (not shown in the figure). Further, "major source of risk is not an insured cause of loss" and "do not understand the program" were not trivial. Finally, for almost all crop categories, "other" ranked as the primary reason for not insuring. This may imply that there is substantial "catch up" to be done for both growers and insurance providers—that more efforts are needed to inform growers about crop insurance and for authorities to learn the unique reasons why growers of particular crops do not purchase insurance.

Table F3 provides the average ranking of suggestions to improve crop insurance.[7] Suggestions listed were mostly related to compensation schemes. For fruit/nut and vegetable farmers, "raising the yield guarantee," "compensating for revenue or profit," and "guaranteeing cash production costs" ranked high, while for ornamental growers, "compensating for revenue or profit" and "guaranteeing placement costs of an inventory" ranked high. For fruit/nut farmers, guaranteeing the cost of establishing an orchard was not as preferred as compensation of cash production costs, and a compensation scheme for ornamentals needs to be devised to accommodate their production systems because traditional yield-based production is not relevant to them. Overall, it was clear that specialty crop growers were more concerned with revenue and profit variability than they were with yield variability. This attitude is common among farmers in California's irrigated agricultural industry.

Recent research on crop insurance has consistently identified some level of demand, but that demand has been influenced by numerous factors (Coble et al.; Makki and Somwaru). A decade ago, research focused primarily on yield risk as the key determinant of demand for crop insurance. Studies of that period focusing on specialty crops found that growers' reluctance to insure was based on the fact that price variance was often more significant than yield variance (Dismukes, Allen and Morzuch; Weisensel and Schoney). This prompted the first assessments of revenue insurance as an alternative (Turvey). In recent years, revenue insurance has received wide attention. However, the few studies of specialty crop producers' demand for revenue insurance have shown a need for more detailed, crop specific analyses of market and grower factors (Miller, Kahl and Rathwell; Richards).

G. Financial Characteristics

The final section of analysis focuses on four financial variables: off-farm income share, gross agricultural sales, assets, and debts (from 2001). Previous research has shown that these factors have a significant influence on

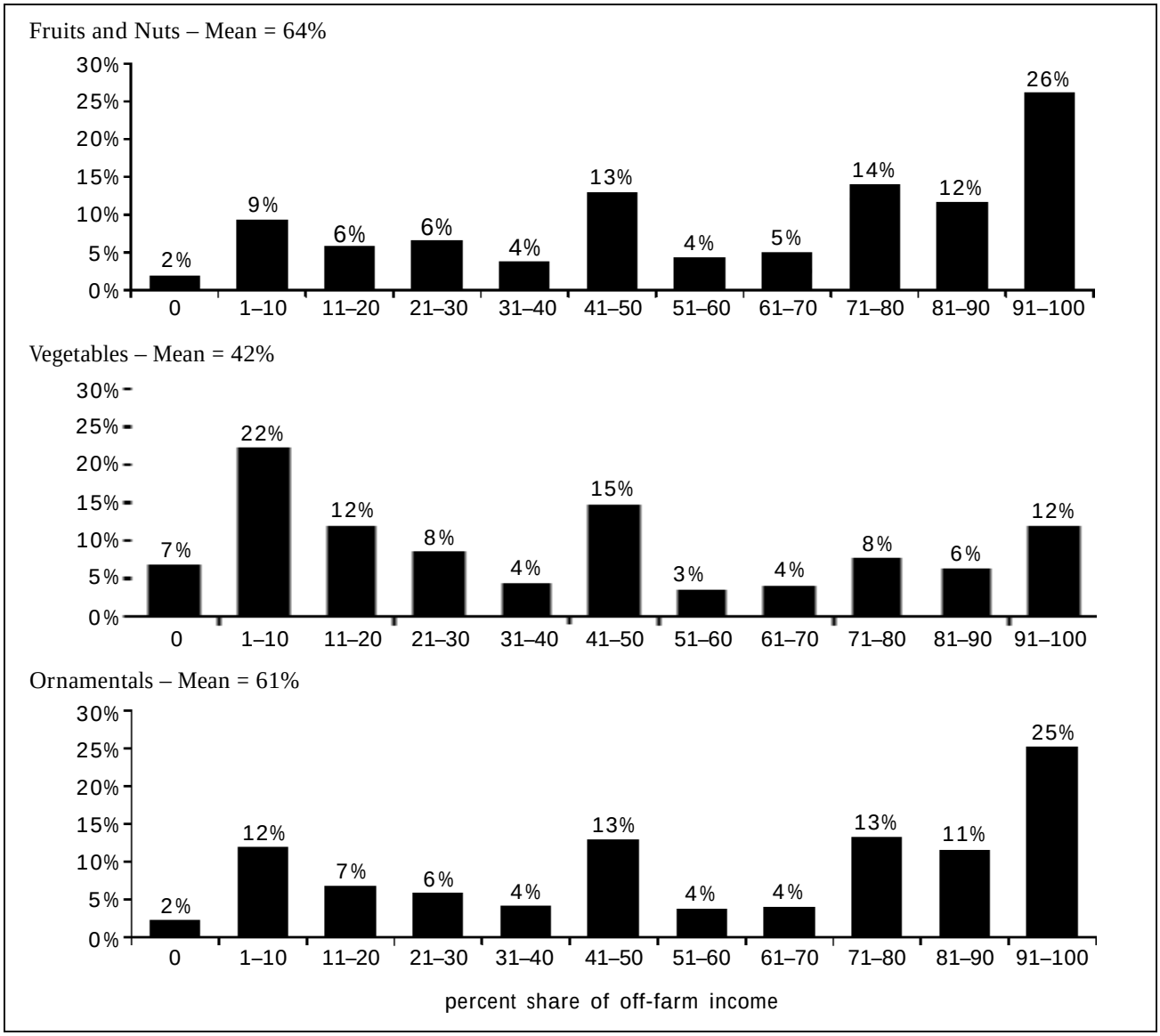
Table F3. **Mean Ranking of Suggestions to Modify Crop Insurance**[a]

Suggestions for Modifying Crop Insurance	Fruits and Nuts	Vegetables	Ornamentals
Compensate for a Higher Level of Production Loss	2.0	2.2	2.7
Compensate for a Loss of Gross Sales	2.3	2.5	2.3
Compensate for a Loss of Profit	2.1	2.4	2.5
Guarantee Cash Production Costs	2.4	2.2	3.0
Guarantee Costs of Establishing an Orchard or Vineyard	3.6	4.5	3.8
Guarantee Replacement of a Crop Inventory	3.5	3.4	2.3
Other	1.5	1.4	1.2

[a] The number of observations used differed for each suggestion and ranged from 3,840 for "compensate for a higher level of production loss" to 2,343 for "guarantee costs of establishing an orchard or vineyard."

[7] Note that a higher production guarantee would be possible only at a higher premium. It is possible that stating such conditions explicitly could alter the ranking. However, given our earlier results that average yield fluctuations were 8 percent for vegetables and 15 percent for fruits/nuts (Table D1), it was not surprising to see "higher production guarantee" commanding a relatively high ranking (regardless of premium levels).

Figure G1. Distribution of Off-Farm Income Share (Year 2001)



farmers' risk attitudes and, thus, on their risk management practices. For example, off-farm income supports most farms in the United States (USDA 2001). The cushion from off-farm income makes many of those farms less sensitive to income risk (Blank 2002), thus decreasing the demand for risk management tools (Briys and Schlesinger). In other words, off-farm income substitutes for other risk management tools to some extent.

Figure G1 presents the distribution and mean of off-farm income shares by crop category. The "share" refers to the percentage of total household income that comes from off-farm sources. The mean share for the entire survey was 63 percent (indicating that 37 percent of household income came from farming activities). In general, there seemed to be a common pattern in the distribution for each crop category. Each distribution showed relatively heavy densities at the 1 to 10 percent range and then in the mid-range at 41 to 50 percent. The density started to increase at the 71 to 80 percent range. Note that the 91 to 100 percent range showed the highest density among all ranges for both fruits/nuts (26 percent) and ornamentals (25 percent).[8] However, the distribution

[8] The category of farmers with an off-farm income share of between 91 and100 percent normally includes hobby farmers. However, in the survey we asked for the off-farm income share in 2001. Thus, this category included both farmers who had a disastrous year in 2001 and those who engaged in farming as a hobby.

Table G1. Mean Gross Agricultural Sales, Assets, and Debts

	Gross Ag. Sales ($1,000) Mean	Standard Deviation	Assets ($1,000) Mean	Standard Deviation	Debts ($1,000) Mean	Standard Deviation
All	413	(1,855)	1,415	(5,373)	582	(3,207)
By Crop Category						
Fruits and Nuts	330	(1,675)	1,373	(5,251)	598	(3,204)
Observations	n = 7,163		n = 4,553		n = 2,590	
Vegetables	1,112	(1,885)	1,889	(6,916)	940	(5,504)
Observations	n = 382		n = 237		n = 166	
Ornamentals	818	(2,922)	1,575	(5,625)	395	(2,018)
Observations	n = 815		n = 512		n = 529	

of farms in the vegetable category deviated from the other two categories. The distribution of vegetable farmers showed greater density in the ranges with relatively low off-farm income shares, indicating that vegetable growers tend to spend less time on off-farm activities and get more of their income from farming than do fruit/nut or ornamental growers.

Table G1 provides average values of gross agricultural sales, assets, and debts. Along with mean dollar figures, the table also reports the standard deviations in parentheses. There were substantial differences across crop categories. Consistent with the earlier findings on mean acreage, vegetable growers' mean gross sales were much higher than those of other categories—nearly three times that of fruits/nuts and one and a half times that of ornamentals. The standard deviations of the mean gross sales were relatively large, indicating substantial variation in sales figures across farms. Nevertheless, judging from the values of the coefficients of variation, it was possible to infer that the variation in gross sales was less severe for vegetable farms.

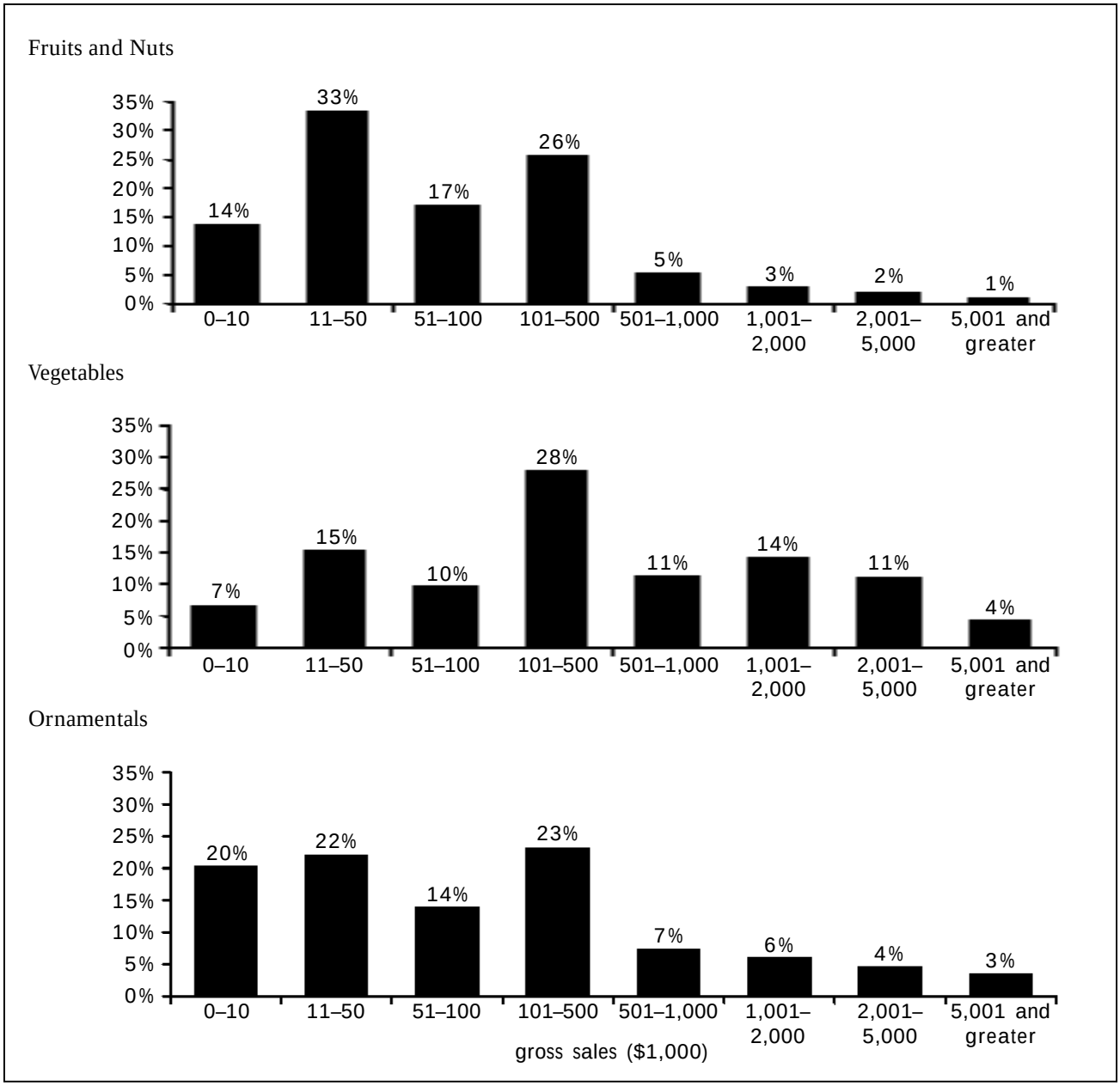
Vegetable operations also had the highest mean values for assets and debts.[9] The reported mean values of assets and debts gave debt/asset ratios of 0.42 for fruits/nuts and 0.50 for vegetables. (These are both much higher than the 0.15 debt-to-asset ratio reported by the USDA for all of American agriculture in the same year (USDA).) More importantly, when viewing assets and debts as financial inputs necessary to generate revenue, the ratio of gross sales revenue to the sum of assets and debts was highest for vegetables and lowest for fruits/nuts. This implies that one unit of financial inputs is associated with a higher level of revenue for vegetables than for fruits/nuts, or equivalently, one unit of revenue is associated with a lower level of financial inputs for vegetables than for fruits/nuts. This cursory observation may be linked to the relatively high (low) intensiveness of financial (or capital) inputs required, or the relatively low (high) performance of financial inputs in fruit/nut (vegetable) production.

The mean gross sales by region varied substantially. Gross sales data by crop category and by region indicated that the lowest gross sales were in the Far North region for both the fruit/nut and the vegetable categories, as expected because of those region's lack of suitability for such crops (livestock operations are dominant in the region). The highest mean sales for the fruit/nut category were the Central Coast – North's $0.6 million (the bulk of these sales are most likely from strawberry growers in the Salinas Valley of Monterey County); for the vegetable category, the highest mean sales were the Sacramento Valley's $1.8 million.

Figure G2 provides the distribution of gross agricultural sales by crop category. The median and mean

[9] Particular caution was required to process the asset data. We found a number of seemingly inconsistent responses to asset questions. Criteria for consistency and reasonableness were set and observations that did not meet the criteria were excluded.

Figure G2. **Distribution of Gross Agricultural Sales**



gross sales diverged considerably; the median was only about one-tenth of the mean value due to inclusion of some extremely high sales values for a few very large-scale operations combined with the large number of small-scale farms. In the vegetable category, there were relatively higher proportions of farmers in higher sales ranges. The proportions of farmers with more than $1 million in sales were 6 percent for fruits/nuts, 29 percent for vegetables, and 13 percent for ornamentals.

Figures G3 and G4 provide the mean gross sales by off-farm income share and by acreage class, respectively. Mean gross agricultural sales were negatively correlated with off-farm income share and positively correlated with acreage, confirming our expectation that higher agricultural revenues were generated by farms with larger acreage and farmers with less off-farm work. However, when sales revenue was computed as per-acre revenue, Figure G4 suggests that revenue per acre decreases as acreage increases. This is not counter-intuitive, given that specialty crops vary widely in unit value (and, thus, in value per acre) and the survey results indicated that smaller sized farms were, in general, associated with higher crop values.

Figure G3. Mean of Gross Agricultural Sales ($1,000) by Off-Farm Income Share

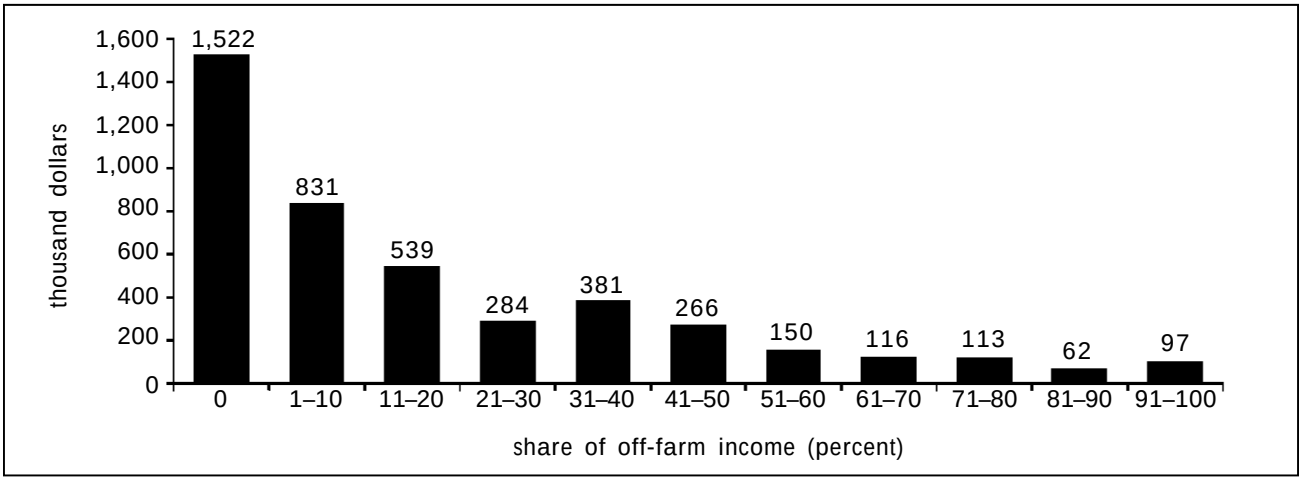
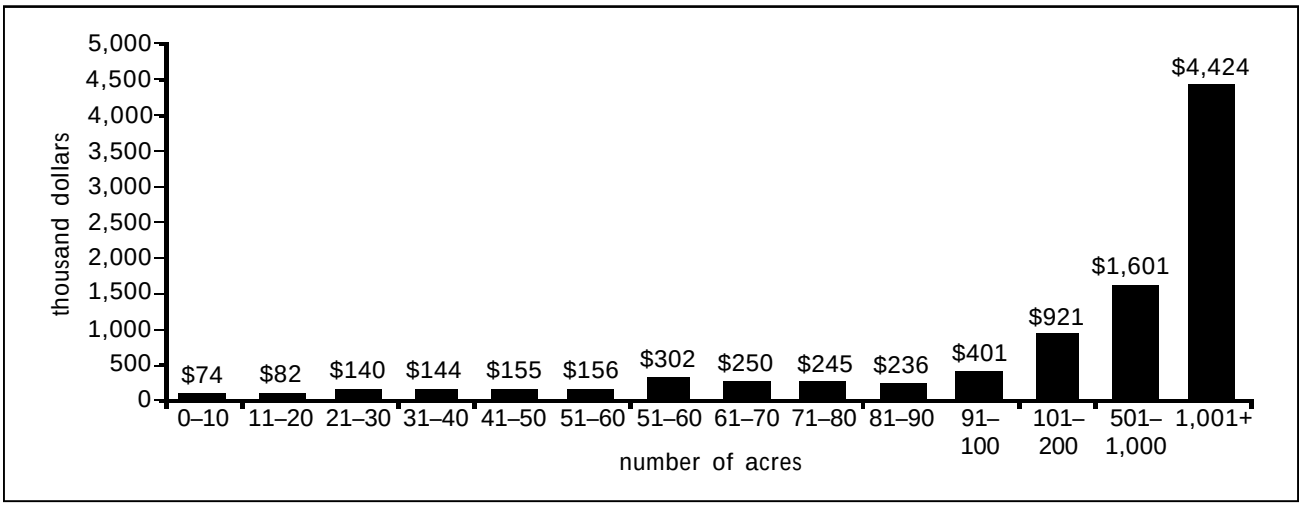


Figure G4. Mean of Gross Agricultural Sales ($1,000) by Acreage Class



SUMMARY AND IMPLICATIONS

This section first summarizes a few major empirical findings of the study. The discussion then turns to a few implications for risk management policy focused on California horticultural crop producers' demand for crop insurance. Finally, we consider some suggestions for further research.

Summary

The main purpose of this report was to provide detailed and unique survey-based information on the fruit/nut, vegetable, and ornamental crop industries of California. The main findings from these survey data are as follows.

California has fewer vegetable farms but, measured by gross sales and other dimensions, they are larger operations than fruit/nut farms are.

Diversification (i.e., the number of crops grown) increases with farm size, measured by acres. Fruit/nut farms are, on average, less diversified than vegetable farms, and when fruit/nut farmers diversify, they tend to use similar crops.

About 6 percent of fruit/nut and vegetable farms have some organic (or transitional-organic) land. These organic farmers represent 6 percent of fruit/nut farms, 14 percent of vegetable farms, and 4 percent of ornamental crop farms. Many of these farms also engage in conventional farming, and they devote, on average, about one-third of their primary crop land to organic farming.

California farms tend to grow produce for either processing or fresh use but not for both. About 71 percent of the sampled fruit/nut farms produced mainly for processing use. About 67 percent of sampled vegetable farms produced mainly for fresh use.

Contracts play a major role in marketing for specialty/horticultural crops. They are particularly important in markets for crops designated for processing. Nearly 60 percent of fruit/nut farmers and 90 percent of vegetable farmers marketed their processing commodities through contract arrangements. The majority of these contracts provided for a predetermined price.

About 13 percent of vegetable farms but only 3 percent of orchard farms are grower/shippers. These farms tend to be larger than average and supply to mass merchandisers. The grower-only group tends to use more diverse marketing channels. Among the various channels, "directly to consumers" (farmers markets, you-pick operations, roadside stands) was used by the largest share of farms (31 percent), but the farms tended to be smaller than average.

Yield variability is an important risk factor for growers. Orchard and vineyard crop yields tend to fluctuate more than vegetable yields. Orchard and vineyard crop yields deviated an average of 15 percent for the five-year moving-average yield, compared to an average of 8 percent for vegetable crop yields.

Despite considerable yield variation from year to year for these California crops, price variability is listed by growers as the most important risk source. Growers list price declines due to industry-wide overproduction as the number one concern.

Growers use diversification and some marketing channels to manage risk. Crop insurance is less available for vegetable crops than it is for fruit, vine, and nut crops. Vegetable producers view crop insurance as a "less preferred" risk management tool. When asked about crop insurance programs, many farmers suggested that a "higher yield guarantee" would improve crop insurance. Further, most farmers strongly suggested the need for crop insurance that compensates in value terms, but they expressed no strong preference among compensations based on gross sales, profit, or production costs.

Implications

The information provided in this study and the data set that underlies it will prove useful to agricultural business firms, including individual farms, as well as to government policy advisors and program designers. The study results provide a benchmark to industries that allows them to compare operations to the averages and medians for specific crops or locations. It also allows agricultural marketing and other service and supply firms to better understand their own potential supply and customer base for planning and product development. Such detailed data have not been available previously. The data are being used in risk management education efforts for growers and in summary form to provide objective data about grower operations and attitudes.

The data and results also have implications for public policy and implementation of public policy, especially relative to risk management. Some examples are provided here. We find that many growers use crop diversification to smooth their revenue streams, but some growers find diversification more difficult or costly. Even if more diversified farms tend to have less variability in farm income, the degree and form of diversification affects the probability and magnitude of losses. The importance of diversification and its variation across specific industries points to the conditions under which yield insurance may be of interest and where it is less important to a farm's annual revenue and thus less appealing as a risk management tool. The covariance between price and individual farm yield is another crucial piece of information in assessing farm revenue risk related to either price or yield variability. USDA's Risk Management Agency has been developing whole-farm revenue insurance products. The appropriate design of such products requires this kind of data.

Our analysis shows that no one risk management tool fits all growers. Some risk-related patterns may be observed broadly in certain segments of farms. However, those patterns change when smaller subcategories of crop producers are analyzed because risks and the way growers manage them depend on many complex factors. One implication is that insurance products that are designed and targeted for individual crops may miss the whole-farm interactions. In reality, an insurance product for a specific crop would work differently for different growers depending on their characteristics outside the specific crop.

It is also vital to better understand the risk management tools that growers currently use when designing public policy to help farmers manage risk. In many cases, public policy for risk management can be effectively designed to accommodate and complement rather than substitute for or conflict with the risk tools that growers already value and use.

Overall, the results of this survey suggest that one must proceed with caution when attempting to develop government-sponsored risk management programs. Programs may fail to meet objectives and may have serious unintended consequences unless the full set of opportunities and constraints facing farmers is well understood and the differences across farms are incorporated in the program design. This study shows the complexity of risk-related costs and revenues associated with the fruit, nut, vegetable, and ornamental horticulture industries in California.

The data summarized in this report also can be useful for further research. These data, together with information on grower costs and returns, can help analysts better understand variations among horticultural crop industries in California and elsewhere. Researchers are also pursuing more detailed analyses of the data. For example, these data are ideal for measuring patterns of diversification and, in some cases, vertical integrations and for examining the multivariate patterns of these with alternative measures of farm size. Assessing other, more detailed relationships among the variables is also on the research agenda. This report does not attempt to disentangle the various causal relationships among the data. Such research is on the horizon.

Finally, this survey provides a one-time cross-section on many important variables. Periodic re-surveys would allow researchers to track the path of adjustment and allow assessment of industry dynamics with rich, repeated cross-sectional information.

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APPENDIX 1
Response Rates

Relatively few farmers answered all 25 survey questions. Respondents found some questions easier to answer than others. In this section, we report the response rate for each survey question based on the 10,410 observations comprising our basic data set. We also report distribution information on the rate of response when it is relevant.

Q1. What is your farm size?
Response rate: 100 percent based on 10,410 observations.

Q2. Where is your largest operation located?
Response rate: 100 percent based on 10,410 observations.

Q3. Years of farming?
Response rate: 95 percent (9,845 observations) based on 10,410 observations.

Q4. What are your major crops?
Response rate: 99 percent based on 10,358 observations. Our data set include 52 observations of noncrop farmers (mostly in apiculture and aquaculture). This question was designed for crop farmers and thus the response rate was calculated based on crop farmers only.

Q5 (a). Do you have organic farming?
Response rate: 99.7 percent (10,386 observations) based on 10,410 observations.

Q5 (b). What are your organic crops?
Response rate: 100 percent based on 637 observations of organic farmers.

Q6. What is your primary specialty crop?
Response rate: 99 percent (10,298 observations) based on 10,410 observations.

Q6a. What are the crop shares of processing and fresh use?
Response rate: 97 percent (10,111 observations) based on 10,410 observations.

Note: For each observation, both processing and fresh output shares had to sum to 100 percent. When the percentages did not add up to 100 percent, we regarded those observations as nonresponses (five observations greater than 100 percent and 32 observations less than 100 percent).

Q6b. What are the marketing channels for your processed use crop?
Response rate: 99 percent based on 7,119 observations.

Note: The output share designated to each of the marketing channels had to add up to 100 percent. However, this sum was greater than 100 percent for 15 observations and less than 100 percent for 56 observations. These were regarded as nonresponses.

Q7. Are you a grower-shipper (relevant to fresh use)?
Response rate: 97 percent based on the 3,837 fresh-crop growers.

Q7a. If you are a grower/shipper, what is the output share sold at predetermined price?
Response rate: 82 percent (460 observations) based on 560 observations of grower/shippers.

Q8. If you are a grower only, what are your marketing channels?
Response rate: 99 percent based on 3,173 observations.

Note: The output share designated to each of the marketing channels had to add up to 100 percent. However, this sum was greater than 100 percent for 10 observations and less than 100 percent for 35 observations. These were regarded as nonresponses.

Q9. What are your actual yields per acre for 1997–2001?

The notion of per-acre yield was not relevant to two classes of farmers, noncrop farmers and ornamentals farmers. Thus, the response rate was calculated based on the set of 9,341 observations that excluded noncrop and ornamentals farmers. Furthermore, many people did not answer for all five years. Thus, we calculated the response rate for each year separately.

Year	Observations	Response Rate (Percent) Based on 9,341 Observations
2001	6,522	70%
2000	5,868	63%
1999	5,435	58%
1998	4,962	53%
1997	4,760	51%

Q10a. What is the largest yield fluctuation for the last five years?

Response rate: 77 percent (7,929 observations) based on 10,298 observations.

Q10b. What is the largest annual price fluctuation for the last five years?

Response rate: 67 percent (6,894 observations) based on 10,298 observations.

Q10c. What is the largest profit fluctuation for the last five years?

Response rate: 64 percent (6,549 observations) based on 10,298 observations.

Q11. What is the main reason for the lowest profit?

Response rate: 98 percent (10,055 observations) based on 10,298 observations.

Q12. Rank the importance of the sources of risk.

Rank	Observations	Response Rate (Percent) Based on 10,410 Observations
1	9,463	91%
2	7,358	71%
3	5,315	51%
4	3,604	35%
5	2,564	25%

Q13. Rank the preference of the risk management tools.

Fewer responses were provided as the ranking became lower. Therefore, we report the response rate by rank.

Rank	Observations	Response Rate (Percent) Based on 10,410 Observations
1	6,834	66%
2	4,249	41%
3	2,776	27%
4	1,836	18%
5	1,415	14%

Q14. Have you received government disaster payments or loans?

Response rate: 91 percent (9,450 observations) based on 10,410 observations.

Q15. Have you purchased any crop insurance within the past five years?

Response rate: 97 percent (10,138 observations) based on 10,410 observations.

Q15a. How many years have you purchased crop insurance within the last five years?

Response rate: 99 percent (4,792 observations) based on 4,845 observations where Question 15 was answered "yes."

Q16. Have you purchased single-peril crop insurance for the last five years?
Response rate: 100 percent based on 4,845 observations where Question 15 was answered "yes."

Q17. Rank the reasons for purchasing crop insurance.
Response rates were calculated based on the farmers who had purchased crop insurance before.

Rank	Observations	Response Rate (Percent) Based on 4,845 Observations[a]
1	3,969	82%
2	1,840	38%
3	939	19%
4	632	13%
5	556	12%

[a] Number of respondents who answered "yes" to Question 15.

Q18. Rank the reasons for not purchasing crop insurance.

Rank	Observations	Response Rate (Percent) Based on 5,293 Observations[a]
1	5,935	100%
2	2,729	52%
3	1,464	28%
4	618	16%
5	556	12%
6	552	10%
7	490	9%

[a] Number of respondents who answered "no" to Question 15.

Q19. How can crop insurance serve your needs better?

Rank	Observations	Response Rate (Percent) Based on 10,410 Observations
1	5,755	55%
2	3,796	37%
3	2,610	25%
4	1,781	17%
5	1,366	13%
6	1,196	12%

Q20. Has risk management become more important?
Response rate: 89 percent (9,303 observations) based on 10,410 observations.

Q21. Have you become more familiar with crop insurance?
Response rate: 90 percent (9,383 observations) based on 10,410 observations.

Q22. How many risk management education meetings and seminars have you attended?
Response rate: 26.6 percent (2,771 observations) based on 10,410 observations.

Q23. What is the share of nonfarm income?
Response rate: 69.6 percent (7,243 observations) based on 10,410 observations.

Q24. What are the gross sales of agricultural commodities?
Response rate: 87.6 percent (9,123 observations) based on 10,410 observations.

APPENDIX 2
Data Tables

All Crops

All.A1–A2. Size and Regional Profile

Table All.A1. Size and Regional Profile – Number of Farms, Average Acres per Farm, and Average Years of Farming by Region and Crop Category

	Number of Farms		Total Acres per Farm		Years of Farming	
	Obs. (n)	Percent Distribution Based on n = 10,200	Mean Acres	Standard Deviation	Mean Years	Standard Deviation
By Region						
All Regions	10,200	100%	203	1,412	25.1	15.5
Far North	89	1%	121	367	22.5	15.3
North Coast	1,211	12%	100	420	22.6	15.4
Central Coast – North	541	5%	248	991	24.8	16.3
Central Coast – South	793	8%	132	534	23.5	15.0
South Coast	811	8%	274	4,128	23.0	13.9
Sacramento Valley	1,322	13%	280	916	25.1	15.2
San Joaquin – North	1,776	17%	185	754	26.6	15.7
San Joaquin – Central	1,718	17%	208	819	26.9	16.0
San Joaquin – South	1,327	13%	268	1,263	26.4	15.9
Sierra Nevada	237	2%	62	133	24.3	15.9
Desert	373	4%	149	614	23.8	14.1
By Crop Category						
Fruits and Nuts	8,785	86%	157	676	25.4	15.7
Vegetables	459	5%	1,106	4,944	25.5	14.7
Ornamentals	956	9%	75	522	22.3	14.3

Table All.A2. **Size and Regional Profile – Number of Farms, Average Acres per Farm, and Average Years of Farming by Crop Category/Region**

		Total Acres per Farm		Years of Farming	
	Number of Farms in the Region	Mean Acres	Standard Deviation	Mean Years	Standard Deviation
Fruits and Nuts					
All Regions	8,785 (86%)	157	676	25.4	15.7
Far North	37	54	97	23.3	14.8
North Coast	1,091	106	438	22.6	15.5
Central Coast – North	301	145	366	25.4	18.3
Central Coast – South	633	129	549	23.7	15.4
South Coast	457	51	156	23.3	12.7
Sacramento Valley	1,215	204	623	25.1	15.3
San Joaquin – North	1,678	123	367	26.6	15.8
San Joaquin – Central	1,641	175	666	27.1	16.0
San Joaquin – South	1,281	260	1,278	26.5	15.9
Sierra Nevada	167	68	133	25.2	16.8
Desert	282	77	250	24.0	13.8
Vegetables					
All Regions	459 (5%)	1,106	4,944	25.5	14.7
Far North	19	124	190	25.8	16.3
North Coast	34	83	218	20.5	11.8
Central Coast – North	85	742	1,535	25.1	14.3
Central Coast – South	59	297	721	23.8	14.5
South Coast	27	3,983	19,200	23.3	15.9
Sacramento Valley	54	1,929	2,331	29.8	12.8
San Joaquin – North	64	1,397	1,929	28.5	14.7
San Joaquin – Central	54	1,300	2,604	23.6	15.5
San Joaquin – South	19	986	976	26.3	16.4
Sierra Nevada	6	179	290	18.7	14.4
Desert	38	805	1,662	27.6	15.5
Ornamentals					
All Regions	956 (9%)	75	522	22.3	14.3
Far North	33	193	573	19.4	15.1
North Coast	86	35	164	23.1	15.8
Central Coast – North	155	92	815	23.5	13.2
Central Coast – South	101	52	157	22.2	12.6
South Coast	327	63	600	22.6	15.3
Sacramento Valley	53	67	297	20.4	14.7
San Joaquin – North	34	316	679	22.6	10.3
San Joaquin – Central	23	15	27	20.4	15.4
San Joaquin – South	27	110	208	21.7	14.2
Sierra Nevada	64	35	106	22.5	13.4
Desert	53	55	200	19.6	13.6

All.B1–B2. Crop Diversification

Table All.B1. Crop Diversification – Mean Acres in Crop Diversification by Crop Category

Major Crops	Observations (n)	Mean Acres per Farm	Standard Deviation
Fruits and Nuts			
Field Crops	354	383	623
Fruits and Nuts	8,664	111	554
Vegetables	138	118	227
Ornamentals	69	10	31
Vegetables			
Field Crops	152	861	1,363
Fruits and Nuts	90	127	236
Vegetables	426	495	1,333
Ornamentals	11	57	164
Ornamentals			
Field Crops	12	374	520
Fruits and Nuts	55	178	1,077
Vegetables	26	648	2,239
Ornamentals	952	52	491

Table All.B2. Crop Diversification – Number of Organic Farms and Average Organic Acres per Farm by Region and Crop Category

	Farms with Organic or Transitional-Organic Land				Organic Land			Transitional Organic Land		
	Number of Farms		Total Acres / Farm		Mean Acres / Farm			Mean Acres / Farm		
	Obs.	*Percent*[a]	*Mean*	*Std Dev.*	*Obs.*	*Mean*	*Std Dev.*	*Obs.*	*Mean*	*Std Dev.*
By Region										
All Regions	612	6%	229	1,120	461	44	117	191	42	107
Far North	16	18%	29	45	10	4	2	3	41	28
North Coast	144	12%	143	651	109	47	138	41	14	14
Central Coast – North	53	10%	243	658	46	49	138	11	39	63
Central Coast – South	59	7%	102	292	48	52	215	17	86	287
South Coast	62	8%	99	274	54	40	138	13	32	55
Sacramento Valley	89	7%	272	799	63	50	86	36	43	65
San Joaquin – North	45	3%	356	1,345	29	36	62	20	44	60
San Joaquin – Central	50	3%	255	669	32	46	36	21	45	50
San Joaquin – South	42	3%	871	3,460	29	47	70	13	63	92
Sierra Nevada	24	10%	70	126	19	35	70	6	28	27
Desert	28	8%	104	255	22	23	33	10	67	184
By Crop Category										
Fruits and Nuts	508	6%	213	1,109	383	40	87	163	45	114
Vegetables	65	14%	454	1,464	50	74	224	18	29	44
Ornamentals	39	4%	63	196	28	46	188	10	13	14

[a] Numbers for this column were calculated based on the entire sample in each relevant category. For example, 6% = 612/10,200 where 10,200 was the sample size of all regions, and 18% = 16/89 where 89 was the size of the subsample Far North.

All.C1–C4. Marketing

Table All.C1. **Marketing – Processing versus Fresh Use: Number of Farms by Use and Average Volume Share by Region and Crop Category**

	Total Observations (n)	Farms Reporting Having Some Crops		Average Volume Share Designated	
		Processing	Fresh[a]	To Processing by Farms with Some Processing	To Fresh by Farms with Some Fresh
By Region					
All Regions	10,854	65%	35%	92%	92%
Far North	89	28%	72%	92%	100%
North Coast	1,211	87%	15%	98%	86%
Central Coast – North	541	46%	62%	86%	95%
Central Coast – South	793	53%	65%	75%	88%
South Coast	811	19%	88%	68%	97%
Sacramento Valley	1,322	86%	17%	98%	83%
San Joaquin – North	1,776	89%	14%	98%	85%
San Joaquin – Central	1,718	81%	23%	96%	91%
San Joaquin – South	1,327	61%	53%	81%	93%
Sierra Nevada	237	57%	47%	93%	94%
Desert	373	35%	78%	69%	93%
By Crop Category					
Fruits and Nuts	8,785	79%	29%	93%	88%
Vegetables	459	34%	75%	82%	95%
Ornamentals	941	1%	99%	54%	100%

[a] The sum of percentages for Fresh and Processing can be greater than 100 percent because some farms supply their crops for both fresh and processing uses.

Table All.C2. **Marketing – Marketing Channels for Processing-Use Crops: Number of Farms Using Specific Marketing Channels and Average Volume Share for Each Marketing Channel by Crop Category**

Marketing Channel (Processed Use)	No. of Farms	Percent of Farms	Mean Share of Volume Marketed
All Crops (based on n = 7,055)			
Marketing Cooperative	2,475	35%	95%
Sold under Contract with a Predetermined Price	2,257	32%	93%
Sold under Contract without a Predetermined Price	952	28%	92%
Spot Market	339	5%	65%
Participation Plan	100	1%	54%
Other	550	8%	85%
Crop Category[a] – Fruits and Nuts (based on n = 6,940)			
Marketing Cooperative	2,453	35%	96%
Sold under Contract with a Predetermined Price	2,145	31%	93%
Sold under Contract without a Predetermined Price	1,916	28%	93%
Spot Market	319	5%	66%
Participation Plan	89	1%	57%
Other	515	7%	85%
Crop Category[a] – Vegetables (based on n = 156)			
Marketing Cooperative	17	11%	66%
Sold under Contract with a Predetermined Price	104	67%	93%
Sold under Contract without a Predetermined Price	30	19%	80%
Spot Market	15	10%	62%
Participation Plan	7	4%	44%
Other	18	12%	75%

[a] Most ornamental crops are sold fresh and thus were not included here.

Table All.C3a. **Marketing – Number of Grower/Shippers (Fresh Only)**

Grower/Shipper Distribution (Fresh-Use Only)	Operation Type	No. of Farms	Percent of Farms in Category
All Crops	Grower/Shipper	338	9%
	Grower Only	3,336	91%
By Crop Category			
Fruits and Nuts	Grower/Shipper	75	3%
	Grower Only	2,386	97%
Ornamentals	Grower/Shipper	217	24%
	Grower Only	671	76%
Vegetables	Grower/Shipper	46	14%
	Grower Only	279	86%

Table All.C3b. **Marketing – Number of Grower/Shippers and Volume (Percent) Sold at Predetermined Price by Crop Category**

Crop Category	Number of Grower/Shippers	Mean Share of Volume (Percent) Sold at Predetermined Price
Fruits and Nuts	48 (of 75)	71%
Ornamentals	167 (of 217)	86%
Vegetables	32 (of 46)	64%

Table All.C4. **Marketing – Marketing Channels of Fresh-Use Crops (Growers Only): Number of Farms Using Specific Marketing Channels and Average Volume Share by Crop Category**

Marketing Channel (Fresh Use)	No. of Farms	Percent of Farms in Category[a]	Mean Share of Volume Traded by Marketing Channel
All Crops (Based on n = 3,799)			
Direct to Consumers	807	21%	75%
Marketing Cooperative	891	23%	93%
Independent Shipper/Brokers	1,202	31%	91%
Direct to Commercial Buyers	811	21%	81%
Other	213	5%	75%
By Crop Category			
Fruits and Nuts (Based on n = 1,845)			
Direct to Consumers	359	13%	68%
Marketing Cooperative	861	32%	95%
Independent Shipper/Brokers	1,013	38%	93%
Direct to Commercial Buyers	339	13%	81%
Other	118	4%	79%
Ornamentals (Based on n = 931)			
Direct to Consumers	339	38%	82%
Marketing Cooperative	11	1%	43%
Independent Shipper/Brokers	85	10%	78%
Direct to Commercial Buyers	374	42%	85%
Other	82	9%	73%
Vegetables (Based on n = 303)			
Direct to Consumers	109	32%	78%
Marketing Cooperative	19	6%	51%
Independent Shipper/Brokers	104	30%	89%
Direct to Commercial Buyers	98	29%	68%
Other	13	4%	54%

[a] The percent sum over the marketing channels in each category can be greater than 100 percent because some farmers use multiple marketing channels.

All.D1–D3. Yield, Price, and Profit Fluctuations

Table All.D1. Yield, Price, and Profit Fluctuations – Yield Deviation (Percent) from Individual Five-Year Averages: Sample Mean for 1997–2001, Sample Mean for 1999 by Region, and Sample Mean for 1997–2001 by Crop Category

		Individual's Yield Deviation from Own Five-Year Average	
	No. of Observations[a] (n)	Mean	Standard Deviation
Sample Mean for 1997–2001			
2001	4,402	20%	30%
2000	4,402	17%	23%
1999	4,402	16%	23%
1998	4,402	17%	23%
1997	4,402	18%	27%
Sample Mean for 1999 by Region[b]			
Far North	16	21%	30%
North Coast	565	12%	15%
Central Coast – North	196	15%	32%
Central Coast – South	309	17%	30%
South Coast	234	16%	20%
Sacramento Valley	566	16%	22%
San Joaquin – North	813	17%	23%
San Joaquin – Central	898	15%	22%
San Joaquin – South	579	20%	25%
Sierra Nevada	87	16%	20%
Desert	139	14%	21%
Sample Mean for 1997–2001 by Crop Category[c]			
Fruits and Nuts			
2001	4,057	17%	20%
2000	4,057	15%	18%
1999	4,057	14%	17%
1998	4,057	15%	18%
1997	4,057	16%	19%
Vegetables			
2001	195	11%	17%
2000	195	8%	14%
1999	195	7%	10%
1998	195	8%	13%
1997	195	8%	13%

[a] Yield deviations were calculated using the observations that provided all five-year yields.
[b] We selected only one single year (the mid-year of the five-year period) for presentation.
[c] There was no consistent yield measure for ornamental crops and thus they were excluded.

Table All.D2. **Yield, Price, and Profit Fluctuations – Largest Yield Fluctuation: Number of Farms per Fluctuation Range by Crop Category**

Fluctuation Range (Percent)	Yield		Price		Profit	
	No. of Farms (n)	Percent of Farms	No. of Farms (n)	Percent of Farms	No. of Farms (n)	Percent of Farms
All Crops						
0–9	2,217	28%	1,682	25%	1,621	25%
10–24	2,084	27%	1,674	25%	1,443	22%
25–49	1,706	22%	1,693	25%	1,355	21%
50–74	1,013	13%	1,124	17%	967	15%
75 or More	819	10%	628	9%	1,082	17%
Total	7,839	100%	6,801	100%	6,468	100%
By Crop Category						
Fruits and Nuts						
0–9	1,692	25%	1,131	20%	1,177	22%
10–24	1,801	27%	1,413	24%	1,150	21%
25–49	1,581	23%	1,574	27%	1,201	22%
50–74	930	14%	1,062	18%	895	16%
75 or More	761	11%	593	10%	1,033	19%
Total	6,765	100%	5,773	100%	5,456	100%
Ornamentals						
0–9	357	51%	415	61%	334	49%
10–24	175	25%	162	24%	192	28%
25–49	79	11%	64	9%	95	14%
50–74	48	7%	25	4%	39	6%
75 or More	43	6%	19	3%	22	3%
Total	702	100%	685	100%	682	100%
Vegetables						
0–9	168	45%	136	40%	110	33%
10–24	108	29%	99	29%	101	31%
25–49	46	12%	55	16%	59	18%
50–74	35	9%	37	11%	33	10%
75 or More	15	4%	16	5%	27	8%
Total	372	100%	343	100%	330	100%

Table All.D3. **Yield, Price, and Profit Fluctuations – Main Cause for Lowest Profit by Crop Category, Use, and Grower/Shipper Status (Percent of Farmers Who Answered)**

	Total Obs. (n)	Poor Yield	Poor Quality	High Input Cost	Low Market Price due to High Domestic Production	Low Market Price due to Increased Imports	Inability to Market a Crop due to Quarantine	Other
All Crops	9,169	29%	4%	7%	27%	16%	1%	17%
By Crop Category								
Fruits and Nuts	7,898	31%	4%	6%	28%	16%	1%	15%
Ornamentals	840	12%	6%	19%	15%	15%	1%	33%
Vegetables	431	19%	5%	14%	29%	21%	0%	13%
By Use[a]								
Mainly Processing	5,690	32%	3%	6%	31%	13%	0%	15%
Mainly Fresh	2,951	25%	6%	10%	19%	18%	1%	20%
By Grower/Shipper Status								
Grower/Shipper	118	21%	6%	6%	33%	27%	0%	7%
Grower Only	2,487	28%	6%	7%	21%	22%	1%	15%

[a] Mainly Processing (or Mainly Fresh) was indicated by an output volume share greater than 80 percent.

All.E1–E5. Risk Management

Table All.E1. Risk Management – Ranking of Risk Sources (in Order of Importance): Mean Ranking by Crop

	Mean Ranking of Risk Sources									
	Adverse Temperature	Floods	Drought	Disease	Irrig. Water Supply Problems	Input Price Fluctuation	Output Price Fluctuation	Pests	Quarantine	Hail
All Crops										
Mean Ranking	2.0	7.2	5.4	3.8	4.7	3.5	2.3	3.5	7.8	5.6
Observations (n)	7,781	3,084	3,786	4,900	4,083	5,042	6,791	5,639	2,824	3,849
By Region										
Far North	1.9	7.0	4.3	2.9	3.8	3.6	3.4	2.7	8.1	6.1
North Coast	1.7	7.3	5.0	2.8	4.6	4.4	3.6	3.2	8.4	6.6
Central Coast – N.	2.1	6.3	5.2	3.3	4.7	3.4	2.5	3.3	7.9	7.1
Central Coast – S.	1.9	6.7	5.1	3.6	4.9	4.0	2.4	3.1	7.1	7.7
South Coast	2.4	7.8	4.1	3.9	3.5	3.4	2.5	3.3	6.4	7.0
Sacramento Valley	2.0	6.1	5.8	3.8	5.5	3.4	2.2	3.6	8.2	5.7
San Joaquin – N.	2.0	7.2	5.9	3.8	5.4	3.3	2.0	3.6	8.3	5.5
San Joaquin – Cen.	2.2	7.8	5.9	4.6	4.5	3.2	1.8	4.0	8.1	3.9
San Joaquin – S.	2.1	7.9	5.6	4.6	4.5	3.4	2.0	3.6	7.8	5.0
Sierra Nevada	1.9	7.8	3.9	3.2	4.0	4.3	3.4	3.0	8.4	5.2
Desert	2.0	7.3	4.8	3.7	3.8	3.4	2.3	3.2	5.8	7.8
By Crop Category										
Fruits and Nuts	2.0	7.3	5.4	3.9	4.7	3.5	2.2	3.5	7.9	5.4
Vegetables	2.4	6.1	5.5	3.6	4.6	3.3	2.3	3.5	8.2	6.7
Ornamentals	2.1	6.8	4.5	3.4	4.4	3.3	2.9	3.3	6.9	6.7
By Use										
Processing	2.0	7.1	5.4	3.6	4.8	3.5	2.2	3.5	8.2	5.5
Fresh Market	2.1	7.2	5.1	4.0	4.4	3.5	2.4	3.5	7.2	5.6
Both	2.3	7.3	5.7	4.2	5.1	3.7	2.0	3.6	7.3	6.0
By Grower/Shipper Status										
Grower/Shipper	2.2	7.3	5.9	3.9	5.1	3.4	2.5	3.7	7.4	5.7
Grower Only	2.1	7.2	5.1	4.1	4.5	3.6	2.3	3.5	7.3	5.7

Table All.E2. **Risk Management – Ranking of Risk Sources (in Order of Importance): Distribution of Ranks by Risk Source**

		Mean Ranking of Risk Sources									
Rank		Adverse Temper-ature	Floods	Drought	Disease	Irrig. Water Supply Problems	Input Price Fluctu-ation	Output Price Fluctu-ation	Pests	Quar-antine	Hail
Total Responses		7,780	3,075	3,784	4,897	4,083	5,041	6,791	5,637	2,813	3,842
1	Obs. (n)	4,117	98	227	606	479	747	3,224	727	72	308
	Distribution	53%	3%	6%	12%	12%	15%	47%	13%	3%	8%
2	Obs. (n)	1,615	226	460	933	571	1,362	1,597	1,222	129	515
	Distribution	21%	7%	12%	19%	14%	27%	24%	22%	5%	13%
3	Obs. (n)	972	136	378	887	538	881	757	1,290	71	425
	Distribution	12%	4%	10%	18%	13%	17%	11%	23%	3%	11%
4	Obs. (n)	455	133	385	820	468	626	457	939	106	351
	Distribution	6%	4%	10%	17%	11%	12%	7%	17%	4%	9%
>4	Obs. (n)	621	2,482	2,334	1,651	2,027	1,425	756	1,459	2,435	2,243
	Distribution	8%	81%	62%	34%	50%	28%	11%	26%	87%	58%

Table All.E3. **Ranking of Preference for Risk Management Tools: Mean Ranking by Region, Crop Category, Use, and Grower/Shipper Status**

	Mean Ranking of Risk Management Tools							
	Crop Insurance	Different Regions	Multiple Commodities	Government Programs	Hedging with Futures or Options	Forward Contracting	Diversified Marketing	Other
All Crops								
Mean Ranking	2.1	4.8	3.0	3.9	5.7	3.6	2.9	2.6
Observations (n)	5,793	2,425	3,514	3,400	2,064	3,060	3,667	1,676
By Region								
Far North	3.5	4.6	2.4	4.0	6.5	3.8	2.3	1.8
North Coast	2.3	4.8	3.8	4.9	5.8	2.5	3.0	2.6
Central Coast – North	3.0	4.4	2.7	4.5	5.8	3.2	2.6	2.6
Central Coast – South	2.1	4.4	2.9	4.4	6.1	3.9	2.9	2.9
South Coast	2.7	4.1	2.4	4.6	5.9	4.2	2.6	2.0
Sacramento Valley	2.0	5.0	2.9	3.6	5.6	3.6	3.0	2.5
San Joaquin – North	1.9	4.8	3.2	3.9	5.5	3.5	3.1	2.8
San Joaquin – Central	1.9	4.9	3.0	3.5	5.6	3.9	3.0	2.7
San Joaquin – South	1.8	5.0	2.9	3.5	5.6	4.1	3.1	3.0
Sierra Nevada	2.6	4.9	2.9	4.0	6.0	3.2	2.6	2.0
Desert	2.4	4.2	3.3	4.2	5.7	3.5	2.2	1.7
By Crop Category								
Fruits and Nuts	1.9	4.9	3.2	3.8	5.7	3.5	3.0	2.6
Vegetables	3.1	3.9	2.1	4.1	5.6	3.5	2.9	2.7
Ornamentals	3.4	3.7	2.1	4.7	6.0	3.8	2.4	2.1
By Use								
Processing	2.0	5.0	3.3	3.8	5.6	3.2	3.0	2.6
Fresh Market	2.3	4.4	2.6	4.0	5.9	4.2	2.7	2.4
Both	2.1	4.5	2.8	4.1	5.9	4.3	3.1	3.3
By Grower/Shipper Status								
Grower/Shipper	2.9	4.3	2.4	4.7	5.9	3.6	2.3	3.0
Grower Only	2.2	4.5	2.7	4.1	6.0	4.5	2.9	2.5

Table All.E4. Risk Management – Rates of Availability and Utilization of Risk Management Tools and Mean Ranking of Preferences

	Availability		Utilization[a]		Preference[b]	
Risk Management Tool	No. of Farms that Answered Available	Rate of Availability Based on All (n = 10,200)	No. of Farms (n) that Utilized Tool	Rate of Utilization	Observations that Provided Ranking	Mean Ranking
Crop Insurance	4,583	45%	3,094	68%	4,068	1.9
Different Regions	804	8%	326	41%	711	3.6
Multiple Commodities	1,964	19%	1,320	67%	1,816	2.3
Government Programs	1,418	14%	848	60%	1,276	3.0
Hedging with Futures	304	3%	89	29%	252	4.6
Forwarding Contracting	1,298	13%	881	68%	1,193	2.4
Diversified Marketing	1,789	18%	1,127	63%	1,675	2.4
Other	283	3%	209	74%	261	2.4

[a] The rate of utilization was calculated based on the farms that reported that the tool was available.
[b] Preference rankings were based on availability.

Table All.E5. Status of Receipt of Government Disaster Payments or Loans by Region and Crop Category

		Receipt of Government Disaster Payments or Loans		
		Received	Not Qualified	Unaware
All Crops				
Observations (n)		2,859	3,663	2,746
Row Percent		31%	40%	30%
By Region				
Far North	Observations (n)	19	39	26
	Distribution	23%	46%	31%
North Coast	Observations (n)	124	468	480
	Distribution	12%	44%	45%
Central Coast – North	Observations (n)	81	235	172
	Distribution	17%	48%	35%
Central Coast – South	Observations (n)	208	282	216
	Distribution	29%	40%	31%
South Coast	Observations (n)	85	350	302
	Distribution	12%	47%	41%
Sacramento Valley	Observations (n)	534	422	267
	Distribution	44%	35%	22%
San Joaquin – North	Observations (n)	538	632	441
	Distribution	33%	39%	27%
San Joaquin – Central	Observations (n)	521	677	379
	Distribution	33%	43%	24%
San Joaquin – South	Observations (n)	646	337	233
	Distribution	53%	28%	19%
Sierra Nevada	Observations (n)	51	76	87
	Distribution	24%	36%	41%
Desert	Observations (n)	50	145	143
	Distribution	15%	43%	42%
By Crop Category				
Fruits and Nuts	Observations (n)	2,654	3,075	2,240
	Distribution	33%	39%	28%
Vegetables	Observations (n)	146	160	125
	Distribution	34%	37%	29%
Ornamentals	Observations (n)	59	428	381
	Distribution	7%	49%	44%

All.F1–F6. Crop Insurance

Table All.F1. Crop Insurance: Purchase History and Average Number of Purchases for the Last Five Years by Crop

Crop Insurance Purchased in the Last Five Years	Response	Observations	Percent of Farms
All Crops			
	Yes	4,766	48%
	No	5,179	52%
Crop Category			
Fruits and Nuts	Yes	4,496	53%
	No	4,057	47%
Vegetables	Yes	139	31%
	No	313	69%
Ornamentals	Yes	131	14%
	No	809	86%

Average Number of Purchases for the Last Five Years		One	Two	Three	Four	Five
All Crops						
	Observations (n)	372	465	510	365	2,999
	Percent of Farms[a]	8%	10%	11%	8%	64%
Crop Category						
Fruits and Nuts	Observations (n)	345	440	468	352	2,841
	Percent of Farms	8%	10%	11%	8%	64%
Ornamentals	Observations (n)	17	15	25	11	61
	Percent of Farms	13%	12%	19%	9%	47%
Vegetables	Observations (n)	10	10	17	–	99[b]
	Percent of Farms	7%	7%	13%	–	73%

[a] Percentages were based on the farmers who had purchased crop insurance at least once in the past five years.
[b] Four- and five-time purchasers were combined together because there were so few four-time purchasers (not reported).

Table All.F2. **Crop Insurance – Number of Farmers Who Purchase Single-Peril Insurance against a Specific Peril by Crop**

		Peril					
	Total Observations	Fire	Frost or Freeze	Rain	Hail	Other	None
All Crops							
Observations (n)	10,200	521	1,843	1,601	1,598	404	2,366
Percent		5%	18%	16%	16%	4%	23%
By Crop							
Fruits and Nuts							
Observations (n)	8,785	439	1,775	1,511	1,534	370	2,216
Percent		5%	20%	17%	17%	4%	25%
Vegetables							
Observations (n)	459	41	38	63	40	11	59
Percent		9%	8%	14%	9%	2%	13%
Ornamentals							
Observations (n)	956	41	30	27	24	23	91
Percent		4%	3%	3%	3%	2%	10%
By Use[a]							
Mainly Processing							
Observations (n)	6,341	331	1,188	1,210	1,092	245	1,623
Percent		5%	19%	19%	17%	4%	26%
Mainly Fresh							
Observations (n)	3,228	150	501	308	407	130	600
Percent		5%	16%	10%	13%	4%	19%
Processing/Fresh							
Observations (n)	631	40	154	83	99	29	143
Percent		6%	24%	13%	16%	5%	23%

[a] Mainly Processing (or Fresh) was indicated by an output volume share greater than 80 percent.

Table All.F3. **Crop Insurance – Mean Ranking and Distribution of Reasons for Purchasing Crop Insurance by Crop Category and Use**

	Risk of Crop Loss Was High	Expected Water Supplies to Be Cut Back	Insurance Req'd to Qualify for Other USDA Programs	Expected to Receive Lower Prices for Crops	Bank or Other Lender Required Insurance	Other
All Crops						
Mean Rank	1.3	3.5	2.3	2.7	2.8	1.5
No. of Observations that Provided Ranks	3,602	1,044	1,698	1,468	1,290	1,164
By Crop Category						
Fruits and Nuts						
Mean Rank	1.3	3.5	2.3	2.6	2.8	1.5
Observations (n)	3,414	960	1,593	1,376	1,194	1,047
Vegetables						
Mean Rank	1.5	3.4	2.3	2.9	3.2	2.0
Observations (n)	112	56	78	60	63	31
Ornamentals						
Mean Rank	1.5	2.9	2.8	2.8	2.8	1.2
Observations (n)	76	28	27	32	33	86
By Use[a]						
Mainly Processing						
Mean Rank	1.3	3.5	2.4	2.6	2.6	1.5
Observations (n)	2,427	674	1,100	965	903	712
Mainly Fresh						
Mean Rank	1.4	3.4	2.1	2.7	3.1	1.5
Observations (n)	915	293	452	394	296	372
Processing/Fresh						
Mean Rank	1.3	3.4	2.1	2.5	3.1	1.6
Observations (n)	260	77	146	109	91	80

[a] Mainly Processing (or Fresh) was indicated by an output volume share greater than 80 percent.

Table All.F4. **Crop Insurance – Mean Ranking of Reasons for Not Purchasing Crop Insurance by Crop Category and Use**

	Not Available for My Crop	Major Source of Risk Not Insured Cause of Loss	Too Much Paper-work to Apply	Never Lost Enough Prod'n or Revenue to File Claim	Premium Cost Too High	Couldn't Find Know-ledgable Insurance Agent	Do Not Understand Crop Insurance Program	Other
All Crops								
Mean Rank	2.2	2.8	3.3	1.8	1.9	4.0	2.8	1.5
No. of Obs. that Provided Ranks	2,425	1,566	1,499	2,722	2,849	1,167	2,171	2,011
By Crop Category								
Fruits and Nuts								
Mean Rank	2.3	2.8	3.2	1.8	1.9	4.0	2.7	1.5
Obs. (n)	1,849	1,278	1,247	2,288	2,450	935	1,770	1,747
Vegetables								
Mean Rank	1.6	3.0	3.9	2.4	2.5	4.0	3.0	1.7
Obs. (n)	205	100	85	131	125	83	132	78
Ornamentals								
Mean Rank	1.9	2.7	3.3	1.9	2.3	3.5	2.8	1.6
Obs. (n)	371	188	167	303	274	149	269	186
By Use[a]								
Mainly Processing								
Mean Rank	2.6	2.8	3.3	1.7	1.8	4.1	2.8	1.5
Obs. (n)	1,169	922	879	1,713	1,767	652	1,205	1,332
Mainly Fresh								
Mean Rank	1.8	2.9	3.2	2.0	2.1	3.7	2.6	1.6
Obs. (n)	1,082	533	520	841	926	425	825	582
Processing/Fresh								
Mean Rank	2.1	2.9	3.5	2.0	2.3	4.0	2.8	1.8
Obs. (n)	174	111	100	168	156	90	141	97

[a] Mainly Processing (or Fresh) was indicated by an output volume share greater than 80 percent.

Table All.F5. Crop Insurance – Mean Ranking of Suggestions to Modify Crop Insurance by Crop

	Compensate for a Higher Level of Production Loss	Compensate for a Loss of Gross Sales	Compensate for a Loss of Profit	Guarantee Cash Production Costs	Guarantee Costs of Establishing Orchard or Vineyard	Guarantee Replace-ment Costs of a Crop Inventory	Other
All Crops							
Mean Ranking	2.1	2.3	2.2	2.5	3.7	3.4	1.5
Observations that Provided Ranks	3,840	3,282	3,515	3,289	2,343	2,611	2,654
By Crop Category							
Fruits and Nuts							
Mean Rank	2.0	2.3	2.2	2.5	3.6	3.5	1.5
Obs. (n)	3,446	2,888	3,132	2,906	2,105	2,207	2,212
Vegetables							
Mean Rank	2.2	2.5	2.4	2.2	4.5	3.4	1.5
Obs. (n)	178	162	169	175	88	136	128
Ornamentals							
Mean Rank	2.7	2.3	2.5	3.0	3.8	2.3	1.3
Obs. (n)	216	232	214	208	150	268	314
By Use[a]							
Mainly Processing							
Mean Rank	2.0	2.4	2.2	2.5	3.5	3.5	1.5
Obs. (n)	2,499	2,026	2,217	2,042	1,499	1,536	1,597
Mainly Fresh							
Mean Rank	2.3	2.3	2.2	2.6	3.9	3.1	1.5
Obs. (n)	1,088	1,022	1,048	1,001	679	896	929
Processing/Fresh							
Mean Rank	2.3	2.2	2.1	2.4	3.9	3.8	1.7
Obs. (n)	253	234	250	246	165	179	128

[a] Mainly Processing (or Fresh) was indicated by an output volume share greater than 80 percent.

Table All.F6. **Crop Insurance – Importance of Risk Management and Familiarity with Crop Insurance Compared with Five Years Ago**

		Risk Management Is Becoming More Important		Becoming More Familiar with Crop Insurance	
	Response	Obs. (n)	Percent of Farms	Obs. (n)	Percent of Farms
All Crops					
	Yes	5,041	55%	5,120	56%
	No	4,088	45%	4,089	44%
By Crop Category					
Fruits and Nuts	Yes	4,455	57%	4,669	59%
	No	3,381	43%	3,243	41%
Vegetables	Yes	266	62%	197	46%
	No	161	38%	230	54%
Ornamentals	Yes	320	37%	254	29%
	No	546	63%	616	71%

All.G1–G4. Financial Characteristics

Table All.G1. Financial Characteristics – Off-Farm Income Share (Percent), Gross Agricultural Sales, Assets, and Debts: Mean Values by Region and Crop Category

	Off-Farm Income Share		Gross Ag. Sales		Assets		Debts	
	Mean (%)	Std Dev.	Mean ($)	Std Dev.	Mean ($)	Std Dev.	Mean ($)	Std Dev.
All								
Mean	63%	33%	$412,817	1,854,687	$1,415,235	5,373,490	$582,191	3,206,599
Obs. (n)	6,651		8,355		5,302		3,291	
By Region								
Far North	65%	34%	$920,473	4,059,360	$1,510,732	5,294,761	$142,211	348,008
North Coast	64%	32%	$325,815	1,099,370	$2,783,341	10,507,516	$924,470	3,060,051
Central Coast – N.	58%	36%	$761,202	1,937,813	$1,646,159	2,926,632	$580,880	1,449,821
Central Coast – S.	65%	32%	$696,340	3,093,924	$1,981,227	4,714,187	$653,165	1,559,505
South Coast	68%	32%	$458,418	2,420,859	$1,017,016	2,162,905	$328,225	1,272,061
Sacramento Valley	61%	33%	$323,894	980,417	$1,261,088	4,302,686	$576,354	3,509,270
San Joaquin – N.	63%	32%	$311,111	1,295,385	$1,184,176	4,218,182	$440,402	1,567,944
San Joaquin – Cen.	63%	33%	$314,182	1,360,128	$1,041,383	3,106,078	$464,177	1,771,200
San Joaquin – S.	60%	32%	$557,383	2,717,588	$1,459,186	6,840,180	$827,639	5,841,383
Sierra Nevada	69%	31%	$110,832	280,956	$614,521	952,716	$128,040	310,154
Desert	68%	33%	$329,969	835,354	$1,330,425	7,266,563	$1,032,591	6,984,674
By Crop Category								
Fruits and Nuts	64%	32%	$329,769	1,675,420	$1,372,641	5,251,438	$597,520	3,204,021
Vegetables	42%	34%	$1,111,873	1,884,959	$1,888,527	6,916,069	$939,828	5,504,406
Ornamentals	61%	34%	$817,913	2,921,573	$1,574,915	5,624,793	$394,742	2,017,626

Table All.G2. **Financial Characteristics – Distribution of Gross Agricultural Sales by Region and Crop Category**

	Gross Agricultural Sales (in $1,000)							
	0–10	11–50	51–100	101–500	501–1,000	1,001–2,000	2,001–5,000	5,001 and Greater
All								
Observations (n)	1,160	2,607	1,364	2,124	471	300	203	103
Percent	14%	31%	16%	25%	6%	4%	2%	1%
Cumulative Percent	14%	45%	62%	87%	93%	96%	99%	100%
By Region								
Far North	20	17	13	8	–	–	0	3
	31%	26%	20%	12%	–	–	0%	5%
North Coast	112	224	152	229	50	23	18	5
	14%	28%	19%	28%	6%	3%	2%	1%
Central Coast – N.	60	79	56	102	47	39	30	8
	14%	19%	13%	24%	11%	9%	7%	2%
Central Coast – S.	80	162	96	193	35	29	22	20
	13%	25%	15%	30%	5%	5%	3%	3%
South Coast	138	214	103	146	30	16	13	11
	21%	32%	15%	22%	4%	2%	2%	2%
Sacramento Valley	180	357	193	264	70	36	31	8
	16%	31%	17%	23%	6%	3%	3%	1%
San Joaquin – N.	181	553	245	365	73	47	20	13
	12%	37%	16%	24%	5%	3%	1%	1%
San Joaquin – Cen.	171	506	265	366	69	42	28	11
	12%	35%	18%	25%	5%	3%	2%	1%
San Joaquin – S.	108	310	178	356	72	50	27	23
	10%	28%	16%	32%	6%	4%	2%	2%
Sierra Nevada	53	70	24	41	6	–	–	–
	27%	36%	12%	21%	3%	–	–	–
Desert	57	115	38	53	18	14	13	–
	18%	37%	12%	17%	6%	5%	4%	–
By Crop Category								
Fruits and Nuts	971	2,371	1,215	1,831	369	198	125	60
	14%	33%	17%	26%	5%	3%	2%	1%
Vegetables	25	58	37	106	43	54	42	16
	7%	15%	10%	28%	11%	14%	11%	4%
Ornamentals	164	178	112	187	59	48	36	27
	20%	22%	14%	23%	7%	6%	4%	3%

Table All.G3. **Financial Characteristics – Distributions of Off-Farm Income Shares by Crop Category**

	Off-Farm Income Share										
	0%	1–10%	11–20%	21–30%	31–40%	41–50%	51–60%	61–70%	71–80%	81–90%	91–100%
All Crops											
Observations (n)	131	650	396	429	244	854	275	314	906	754	1,698
Percent	2%	10%	6%	6%	4%	13%	4%	5%	14%	11%	26%
Cumulative Percent	2%	12%	18%	24%	28%	41%	45%	50%	63%	74%	100%
Fruits and Nuts											
Observations (n)	106	541	336	381	214	756	249	286	821	681	1,541
Percent	2%	9%	6%	6%	4%	13%	4%	5%	14%	12%	26%
Cumulative Percent	2%	11%	17%	23%	27%	39%	44%	49%	62%	74%	100%
Vegetables											
Observations (n)	14	47	25	18	9	31	7	8	16	13	25
Percent	7%	22%	12%	8%	4%	15%	3%	4%	8%	6%	12%
Cumulative Percent	7%	29%	40%	49%	53%	68%	71%	75%	82%	88%	100%
Ornamentals											
Observations (n)	11	62	35	30	21	67	19	20	69	60	132
Percent	2%	12%	7%	6%	4%	13%	4%	4%	13%	11%	25%
Cumulative Percent	2%	14%	21%	26%	30%	43%	47%	50%	63%	75%	100%

Table All.G4. **Financial Characteristics – Distribution of Gross Agricultural Sales by Off-Farm Income Share Class and Acreage Class**

			Gross Agricultural Sales	
	Observations (n)	Distribution (Percent)	Mean ($)	Standard Deviation
Off-Farm Income Share (Percent)				
0%	131	2%	$1,521,647	3,120,446
1–10%	650	10%	$830,869	2,511,536
11–20%	396	6%	$538,674	1,539,439
21–30%	429	6%	$284,314	687,811
31–40%	244	4%	$381,382	1,714,844
41–50%	854	13%	$265,556	1,284,699
51–60%	275	4%	$149,878	337,950
61–70%	314	5%	$115,603	289,943
71–80%	906	14%	$112,900	412,514
81–90%	754	11%	$62,192	157,004
91–100%	1,698	26%	$96,646	322,358
Acreage Class (Total Acreage)				
0–10	2,148	22%	$74,448	212,468
11–20	1,775	19%	$81,994	327,658
21–30	762	8%	$140,429	539,135
31–40	892	9%	$143,940	622,576
41–50	440	5%	$155,114	365,585
51–60	376	4%	$155,968	366,589
61–70	250	3%	$302,429	1,404,148
71–80	314	3%	$250,352	702,887
81–90	137	1%	$244,588	433,546
91–100	220	2%	$235,989	360,976
101–200	894	9%	$401,116	1,100,624
201–500	738	8%	$920,682	2,262,138
501–1,000	302	3%	$1,601,144	2,227,883
More than 1,000	305	3%	$4,424,373	7,436,838

Fruits and Nuts

Fn.A1–A2. Size and Regional Profile

Table Fn.A1. Size and Regional Profile – Number of Farms, Average Total Acres per Farm, and Average Fruit/Nut Acres per Farm by Region and Crop

	No. of Fruit/Nut Farms	Distribution (n)	Mean Fruit/Nut Acres	Standard Deviation
By Region				
Far North	38	0.4%	21	32
North Coast	1,092	12.4%	62	212
Central Coast – North	301	3.4%	101	244
Central Coast – South	633	7.2%	82	442
South Coast	457	5.2%	62	456
Sacramento Valley	1,217	13.8%	116	277
San Joaquin – North	1,680	19.1%	98	326
San Joaquin – Central	1,641	18.7%	137	519
San Joaquin – South	1,281	14.6%	186	1,158
Sierra Nevada	167	1.9%	32	44
Desert	282	3.2%	66	221
By Crop				
Berries	144	1.6%	68	118
Citrus	1,021	11.6%	117	614
Grapes	2,888	32.9%	119	431
Nuts	2,776	31.6%	119	768
Apples and Pears	218	2.5%	77	230
Stone Fruits	798	9.1%	125	255
Tropicals	946	10.8%	56	353

By Acreage Class (Acres)	No. of Fruit/Nut Farms	Distribution (n)	Cumulative Percent
0–10	1,865	21.5%	21.5%
11–20	1,791	20.7%	42.2%
21–30	783	9.0%	51.2%
31–40	826	9.5%	60.7%
41–50	433	5.0%	65.7%
51–60	361	4.2%	69.9%
61–70	262	3.0%	72.9%
71–80	286	3.3%	76.2%
81–90	135	1.6%	77.8%
91–100	193	2.2%	80.0%
101–200	813	9.4%	89.4%
201–500	629	7.3%	96.6%
501–1,000	178	2.1%	98.7%
More than 1,000	114	1.3%	100.0%

Table Fn.A2. **Size and Regional Profile – Distribution of Fruit and Nut Crops by Crop and Region**

	Far North	North Coast	Cen. Coast No.	Cen. Coast So.	South Coast	Sac. Valley	San Joaq. No.	San Joaq. Cen.	San Joaq. So.	Sierra Nevada	Desert
All Fruit and Nut Crops (8,789 Observations)											
Observations (n)	38	1,092	301	633	457	1,217	1,680	1,641	1,281	167	282
Percent of Row	0.4%	12.4%	3.4%	7.2%	5.2%	13.9%	19.1%	18.7%	14.6%	1.9%	3.2%
By Crop											
Berries (144 Observations)											
Observations (n)	3	4	58	21	8	22	–	7	13	–	4
Percent of Row	2.1%	2.8%	40.3%	14.6%	5.6%	15.3%	–	4.9%	9.0%	–	2.8%
Citrus (1,021 Observations)											
Observations (n)	–	–	4	211	88	21	4	109	451	4	125
Percent of Row	–	–	0.4%	20.7%	8.6%	2.1%	0.4%	10.7%	44.2%	0.4%	12.2%
Grapes (2,887 Observations)											
Observations (n)	6	916	115	136	10	67	304	1,038	189	86	20
Percent of Row	0.2%	31.7%	4.0%	4.7%	0.4%	2.3%	10.5%	36.0%	6.6%	3.0%	0.7%
Nuts (2,776 Observations)											
Observations (n)	12	104	55	68	17	668	1,196	295	317	33	11
Percent of Row	0.4%	3.8%	2.0%	2.5%	0.6%	24.1%	43.1%	10.6%	11.4%	1.2%	0.4%
Apples and Pears (218 Observations)											
Observations (n)	6	60	34	6	6	33	13	15	17	23	5
Percent of Row	2.8%	27.5%	15.6%	2.8%	2.8%	15.1%	6.0%	6.9%	7.8%	10.6%	2.3%
Stone Fruits (798 Observations)											
Observations (n)	–	–	29	–	10	247	152	152	182	15	5
Percent of Row	–	–	3.6%	–	1.3%	31.0%	19.1%	19.1%	22.8%	1.9%	0.6%
Tropicals (945 Observations)											
Observations (n)	7	4	6	189	318	159	9	25	112	4	112
Percent of Row	0.7%	0.4%	0.6%	20.0%	33.7%	16.8%	1.0%	2.7%	11.9%	0.4%	11.9%

Note: Cells with less than three observations are indicated by "–".

Fn.B1–B3. Crop Diversification

Table Fn.B1. Crop Diversification – Distribution of Single-Crop versus Multiple-Crop Growers and Average Fruit and Nut Acres by Diversification Pattern

Distribution of Single-Crop versus Multiple-Crop Growers

Diversification	Number of Farms	Percent Based on All Fruit/Nut Farms	Mean Acres Total Land	Fruit and Nut Land
Single Crop	6,076	70%	76	67
Diversified within Fruits and Nuts	2,093	24%	250	225
Diversified into Vegetables and/or Other Crops	500	6%	592	159
Total	8,669			

Distribution of Single-Crop Growers within Fruits and Nuts

	Total Number of Growers	Number of Single-Crop Growers	Share of Single-Crop Growers[a]	Mean Acres of Total Land	Fruit and Nut Land
Berries	144	97	67%	67	66
Citrus	1,021	499	49%	62	56
Grapes	2,887	2,409	83%	97	87
Nuts	2,776	2,024	73%	73	65
Apples and Pears	218	123	56%	52	41
Stone Fruits	798	277	35%	55	48
Tropicals	945	647	68%	31	26

[a] Sixty-seven percent was calculated as 97/144 = 67 percent where 144 was the number of berry farmers.

Table Fn.B2. **Crop Diversification – Diversification Pattern for Growers Who Diversified within Fruits and Nuts by Crop**

Farmer's Main Crop	Diversification	No. of Farms	Percent Based on Farms within Same Main Crop[a]
Berries	Within Berries	12	41%
	With Stone Fruits	7	24%
	With Other Crops	10	35%
Citrus	Within Citrus	297	60%
	With Tropical Crops	139	28%
	With Other Fruits and Nuts	59	12%
Grapes	Within Grapes	82	23%
	With Stone Fruits	110	31%
	With Nuts	97	27%
	With Other Fruits and Nuts	65	19%
Nuts	Within Nuts	201	41%
	With Stone Fruits	130	27%
	With Grapes	96	20%
	With Other Fruits and Nuts	62	12%
Apples and Pears	Within Apples and Pears	22	23%
	With Stone Fruits	22	23%
	With Nuts	20	21%
	With Other Fruits and Nuts	30	33%
Stone Fruits	Within Stone Fruits	244	52%
	With Nuts	143	30%
	With Other Fruits and Nuts	93	18%
Tropicals	Within Tropical Crops	34	14%
	With Citrus	155	66%
	With Other Fruits and Nuts	46	20%

[a] This table uses the data set of multiple-crop growers who diversify only within fruit and nut crops. We report only the first two (or three when the third is substantial) major diversification crops.

Table Fn.B3. **Crop Diversification – Number of Organic Farms and Average Acres of Organic and Transitional-Organic Fruit and Nuts by Crop**

				Mean Acres of Organic Farms				
		No. of Organic Farms		Total Fruit/ Nut Land	Organic Fruit/Nut Land		Transitional Organic Fruit/Nut Land	
	Total Obs.	Obs. (n)	Distribution	Acres	n	Acres	n	Acres
All Fruit and Nut Crops								
	8,790	499	6%	146	375	41	163	45
By Crop								
Berries	144	22	15%	70	20	19	4	13
Citrus	1,021	58	6%	358	43	29	23	28
Grapes	2,887	149	5%	151	104	65	52	59
Nuts	2,776	132	5%	66	97	36	44	42
Apples and Pears	218	36	17%	58	30	40	8	14
Stone Fruits	798	37	5%	187	26	34	12	62
Tropicals	946	65	7%	160	55	24	20	45

Fn.C1–C4. Marketing

Table Fn.C1. Marketing – Distribution of Use Type (Processing versus Fresh) and Average Volume Share Designated to Specific Use by Crop

			Use Type[a]		
		Total Obs.	Mainly Processing	Mainly Fresh	Processing/Fresh
All Fruit and Nut Crops					
Observations (n)		8,791	6,227	1,988	576
Row Percent		100%	71%	23%	7%
By Crop					
Berries	Observations (n)	144	11	111	22
	Row Percent		8%	77%	15%
	Avg Volume Share		99%[b]	96%	
Citrus	Observations (n)	1,021	153	630	238
	Row Percent		15%	62%	23%
	Avg Volume Share		100%	98%	
Grapes	Observations (n)	2,888	2,698	126	64
	Row Percent		93%	4%	2%
	Avg Volume Share		100%	99%	
Nuts	Observations (n)	2,776	2,570	119	87
	Row Percent		93%	4%	3%
	Avg Volume Share		100%	100%	
Apples and Pears	Observations (n)	218	57	82	79
	Row Percent		26%	38%	36%
	Avg Volume Share		98%	99%	
Stone Fruits	Observations (n)	798	377	389	32
	Row Percent		47%	49%	4%
	Avg Volume Share		100%	100%	
Tropicals	Observations (n)	946	361	531	54
	Row Percent		38%	56%	6%
	Avg Volume Share		100%	99%	

[a] Mainly Processing (or Fresh) was indicated by an output volume share greater than 80 percent, and the category of Processing/Fresh included farmers whose crops were not used for Mainly Processing or for Mainly Fresh.

[b] Interpretation of the volume share was as follows: The average output share designated to processing use by the Mainly Processing farmers was 99 percent. The fact that most average volume shares were either 99 percent or 100 percent indicates that farm production was, in general, specified by use.

Table Fn.C2. **Marketing – Marketing Channels for Processing-Use Crops: Number of Farms Using Specific Marketing Channels by Crop**[a]

		Marketing Channels					
	Total Obs.	Cooperative	Sold to Processor under Contract with Predetermined Price	Sold to Processor under Contract without Predetermined Price	Participation Plan	Spot Market	Other
All Fruit and Nut Crops							
Observations (n)	5,933	1,974	1,867	1,535	39	147	371
Distribution[b]		33%	31%	26%	1%	2%	6%
By Crop							
Berries							
Observations (n)	11	–	–	–	–	–	–
Citrus							
Observations (n)	150	79	13	45	–	6	7
Distribution		53%	9%	30%	–	4%	5%
Grapes							
Observations (n)	2,548	421	1,315	479	16	65	252
Distribution		17%	52%	19%	1%	3%	10%
Nuts							
Observations (n)	2,447	1,240	259	801	19	57	71
Distribution		51%	11%	33%	1%	2%	3%
Apples and Pears							
Observations (n)	55	7	21	15	–	–	7
Distribution		13%	38%	27%			13%
Stone Fruits							
Observations (n)	373	136	130	87	–	7	11
Distribution		36%	35%	23%		2%	3%
Tropicals							
Observations (n)	349	90	126	102	–	7	–
Distribution		26%	36%	29%		2%	–

[a] Data for this table include Mainly Processing farms (processing use greater than 80 percent of their volume).
[b] The row sums can be greater than 100 percent because some farmers use multiple channels.
Note: The cells with less than five observations are indicated by "–".

Table Fn.C3. **Marketing – Grower/Shippers (Fresh-Use Only): Number of Grower/Shippers and Volume Sold at Predetermined Price by Crop**

Distribution: Grower/Shippers versus Growers Only			
		No. of Farms	
	Total Observations	**Grower/Shippers**	**Growers Only**
All Fruit and Nut Crops			
Observations (n)	2,462	75	2,387
Row Percent	100%	3%	97%
By Crop			
Berries	127	7%	93%
Citrus	819	2%	98%
Grapes	177	10%	90%
Nuts	201	1%	99%
Apples and Pears	163	2%	98%
Stone Fruits	412	6%	94%
Tropicals	563	1%	99%

Number of Grower/Shippers Selling at Predetermined Price and their Average Output Share		
	No. of Grower/Shippers	**Mean Volume Sold at Predetermined Price**
Grapes	26	93%
Nuts	15	71%
Other	10	82%

Table Fn.C4. Marketing – Marketing Channels for Fresh-Use Crops (Growers Only): Number of Farms Using Specific Marketing Channels by Crop[a]

		Distribution of Farmers Using Specific Marketing Channel				
	Total Obs.	Direct to Consumers	Marketing Cooperative	Independent Shipper/Broker	Direct to Commercial Buyers	Other
All Fruit and Nut Crops						
Observations (n)	2,311	227	803	927	263	91
Distribution[b]		10%	35%	40%	11%	4%
By Crop						
Berries						
Observations (n)	112	21	12	54	22	3
Distribution		19%	11%	48%	20%	3%
Citrus						
Observations (n)	785	42	420	237	68	18
Distribution		5%	54%	30%	9%	2%
Grapes						
Observations (n)	167	14	26	72	29	26
Distribution		8%	16%	43%	17%	16%
Nuts						
Observations (n)	222	33	91	62	29	7
Distribution		15%	41%	28%	13%	3%
Apples and Pears						
Observations (n)	139	44	15	58	19	3
Distribution		32%	11%	42%	14%	2%
Stone Fruits						
Observations (n)	353	35	29	239	36	14
Distribution		10%	8%	68%	10%	4%
Tropicals						
Observations (n)	533	38	210	205	60	20
Distribution		7%	39%	38%	11%	4%

[a] This table uses the observations of mainly-fresh-use growers (more than 80 percent of output designated to fresh use).
[b] The row sums can be greater than 100 percent because some farmers use multiple channels.

Fn.D1–D4. Yield, Price, and Profit Fluctuations

Table Fn.D1. Yield, Price, and Profit Fluctuations – Yield Deviation (Percent) from Individual Five-Year Averages: Sample Mean by Year (1997–2001) and All-Year Sample Mean by Region and Crop[a]

	Observations (n)	Mean Yield Deviation from Five-Year Average[b]
Sample Mean by Year for 1997–2001		
2001	4,057	17%
2000	4,057	15%
1999	4,057	14%
1998	4,057	15%
1997	4,057	16%
All-Year Average	4,057	15%

All-Year Sample Mean by Region	Observations (n)	All-Year Mean Yield Deviation from Five-Year Average[b]
Far North	9	23%
North Coast	552	13%
Central Coast – North	152	13%
Central Coast – South	279	17%
South Coast	218	17%
Sacramento Valley	521	16%
San Joaquin – North	767	15%
San Joaquin – Central	860	13%
San Joaquin – South	563	16%
Sierra Nevada	84	18%
Desert	123	15%

All-Year Sample Mean by Crop	Observations (n)	All-Year Mean Yield Deviation from Five-Year Average[b]
Berries	76	10%
Citrus	433	15%
Grapes	1,536	13%
Nuts	1,215	16%
Apples and Pears	101	15%
Stone Fruits	337	16%
Tropicals	430	21%

[a] Data include only the observations that provided all five-year yields.
[b] We did not differentiate the direction of deviation. All yield deviations were calculated using absolute values.

Table Fn.D2. **Yield, Price, and Profit Fluctuations – Yield Deviation (Percent) from Individual Five-Year Averages: All-Year Sample Mean by Crop/Region**

Crop	Region	Observations (n)	Yield Deviation from Five-Year Average
Berries	Central Coast – North	35	6%
	Central Coast – South	13	5%
	Sacramento Valley	11	19%
Citrus	Central Coast – South	106	13%
	South Coast	33	10%
	San Joaquin – Central	42	17%
	San Joaquin – South	192	17%
	Desert	43	10%
Grapes	North Coast	479	12%
	Central Coast – North	65	16%
	Central Coast – South	59	12%
	Sacramento Valley	24	15%
	San Joaquin – North	155	12%
	San Joaquin – Central	584	12%
	San Joaquin – South	95	13%
	Sierra Nevada	52	15%
	Desert	15	15%
Nuts	North Coast	39	16%
	Central Coast – North	24	15%
	Central Coast – South	16	16%
	South Coast	12	21%
	Sacramento Valley	286	16%
	San Joaquin – North	528	16%
	San Joaquin – Central	146	16%
	San Joaquin – South	146	14%
	Sierra Nevada	14	23%
Apples and Pears	North Coast	32	13%
	Central Coast – North	13	15%
	Sacramento Valley	22	8%
Stone Fruits	Sacramento Valley	106	16%
	San Joaquin – North	73	17%
	San Joaquin – Central	67	14%
	San Joaquin – South	71	15%
Tropicals	Central Coast – South	81	27%
	South Coast	160	18%
	Sacramento Valley	63	22%
	San Joaquin – Central	11	12%
	San Joaquin – South	48	24%
	Desert	58	19%

Note: We do not report all eleven regions. We excluded regions where the number of farms was too few.

Table Fn.D3. **Yield, Price, and Profit Fluctuations – Largest Yield, Price, and Profit Fluctuations: Number of Farms in Ranges of Fluctuation by Crop**

	Yield		Price		Profit	
Fluctuation Range (Percent)	**No. of Obs.**	**Percent of Farms**	**No. of Obs.**	**Percent of Farms**	**No. of Obs.**	**Percent of Farms**
All Fruit and Nut Crops						
0–9	1,692	25%	1,132	20%	1,177	22%
10–24	1,802	27%	1,415	24%	1,150	21%
25–49	1,583	23%	1,575	27%	1,203	22%
50–74	930	14%	1,062	18%	895	16%
75 or More	762	11%	593	10%	1,033	19%
Total	6,769	100%	5,777	100%	5,458	100%
Berries						
0–9	33	29%	19	18%	26	27%
10–24	38	33%	33	32%	23	24%
25–49	22	19%	42	40%	22	23%
50–74	11	10%	4	4%	10	10%
75 or More	10	9%	6	6%	15	16%
Total	114	100%	104	100%	96	100%
Citrus						
0–9	174	23%	92	13%	118	18%
10–24	197	26%	126	18%	94	14%
25–49	165	21%	176	26%	139	21%
50–74	118	15%	138	20%	114	17%
75 or More	116	15%	155	23%	195	30%
Total	770	100%	687	100%	660	100%
Grapes						
0–9	656	29%	447	23%	426	23%
10–24	645	28%	450	23%	367	20%
25–49	555	24%	465	24%	379	21%
50–74	243	11%	395	20%	307	17%
75 or More	176	8%	170	9%	337	19%
Total	2,275	100%	1,927	100%	1,816	100%

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Table Fn.D3. Continued

Fluctuation Range (Percent)	Yield		Price		Profit	
	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms
Nuts						
0–9	482	23%	255	15%	332	20%
10–24	555	27%	462	27%	395	24%
25–49	525	25%	534	31%	392	24%
50–74	310	15%	349	20%	265	16%
75 or More	190	9%	142	8%	257	16%
Total	2,062	100%	1,742	100%	1,641	100%
Apples and Pears						
0–9	28	17%	43	28%	33	24%
10–24	50	30%	32	21%	26	19%
25–49	34	21%	37	25%	23	17%
50–74	22	13%	24	16%	21	15%
75 or More	31	19%	15	10%	34	25%
Total	165	100%	151	100%	137	100%
Stone Fruits						
0–9	155	24%	146	26%	126	23%
10–24	159	24%	141	25%	114	21%
25–49	138	21%	155	27%	122	22%
50–74	101	15%	78	14%	86	16%
75 or More	105	16%	48	8%	95	17%
Total	658	100%	568	100%	543	100%
Tropicals						
0–9	164	23%	130	22%	116	21%
10–24	158	22%	171	29%	131	23%
25–49	144	20%	166	28%	126	22%
50–74	125	17%	74	12%	92	16%
75 or More	134	18%	57	10%	100	18%
Total	725	100%	598	100%	565	100%

Table Fn.D4. **Yield, Price, and Profit Fluctuations – Main Cause for Lowest Profit by Region, Crop, and Processor Pricing Method (with and without Predetermined Price)**

		Main Cause for Lowest Profit (Percent of Farmers Who Answered)						
	Total No. Obs. that Answered Main Cause	Poor Yield	Poor Quality	High Input Cost	Low Market Price due to High Domestic Production	Low Market Price due to Increased Imports	Inability to Market Crop due to Quarantine	Other
All Fruit and Nut Crops	7,902	29%	4%	7%	27%	16%	1%	17%
By Region								
Far North	34	50%	6%	6%	18%	9%	0%	12%
North Coast	976	50%	2%	8%	9%	6%	0%	24%
Central Coast – N.	258	37%	5%	10%	23%	11%	0%	14%
Central Coast – S.	561	38%	6%	4%	14%	22%	1%	17%
South Coast	417	34%	5%	12%	13%	20%	5%	11%
Sacramento Valley	1,099	34%	5%	5%	29%	12%	0%	14%
San Joaquin – N.	1,480	28%	3%	5%	41%	8%	0%	16%
San Joaquin – Cen.	1,510	19%	2%	5%	40%	24%	0%	10%
San Joaquin – S.	1,161	27%	6%	5%	26%	22%	0%	15%
Sierra Nevada	149	41%	7%	9%	11%	5%	0%	27%
Desert	255	26%	7%	5%	23%	25%	1%	13%
By Crop								
Berries	132	24%	5%	8%	33%	18%	1%	11%
Citrus	931	25%	6%	4%	19%	31%	1%	15%
Grapes	2,596	32%	2%	6%	29%	15%	0%	16%
Nuts	2,433	30%	4%	5%	38%	8%	0%	15%
Apples and Pears	199	33%	9%	8%	11%	28%	0%	12%
Stone Fruits	747	28%	8%	8%	27%	13%	1%	15%
Tropicals	865	44%	3%	7%	10%	21%	3%	12%
By Processor Pricing Method								
Sold to Processor under Contract with Predetermined Price	1,828	38%	3%	7%	24%	13%	0%	16%
Sold to Processor under Contract Without Predetermined Price	1,622	27%	4%	5%	33%	16%	1%	15%
By Use[a]								
Mainly Processing	5,581	32%	3%	6%	31%	13%	0.3%	15%
Mainly Fresh	1,839	32%	6%	6%	20%	20%	1.0%	15%

[a] Mainly Processing (or Fresh) was indicated by output volume share greater than 80 percent.

Fn.E1–E5. Risk Management

Table Fn.E1. Risk Management – Ranking of Risk Sources (in Order of Importance): Mean Ranking by Crop

	Mean Ranking of Risk Sources									
	Adverse Temperature	Floods	Drought	Disease	Irrig. Water Supply Problems	Input Price Fluctuation	Output Price Fluctuation	Pests	Quarantine	Hail
All Fruit and Nut Crops										
Mean Ranking	2.0	7.3	5.4	3.8	4.7	3.5	2.2	3.5	7.9	5.4
Observations (n)	6,755	2,639	3,247	4,158	3,501	4,309	5,932	4,805	2,422	3,393
By Crop										
Berries										
Mean Rank	1.9	5.8	6.1	4.3	5.0	3.3	2.1	3.7	8.6	6.1
Observations (n)	105	53	58	68	56	74	104	74	39	52
Citrus										
Mean Rank	1.9	7.7	5.3	4.9	4.4	3.6	1.9	3.7	7.2	6.2
Observations (n)	836	313	423	429	451	534	767	536	315	376
Grapes										
Mean Rank	2.0	7.6	5.5	3.4	4.7	3.7	2.4	3.5	8.2	5.2
Observations (n)	2,247	886	1,093	1,477	1,208	1,428	1,916	1,622	847	1,220
Nuts										
Mean Rank	2.1	6.8	5.4	3.7	4.8	3.4	2.1	3.4	8.5	6.2
Observations (n)	2,039	824	971	1,308	1,015	1,328	1,893	1,488	670	904
Apples and Pears										
Mean Rank	2.2	7.2	5.7	3.7	5.9	3.6	2.3	3.5	8.3	4.4
Observations (n)	171	65	83	106	73	106	140	138	58	108
Stone Fruits										
Mean Rank	2.1	7.2	6.5	4.5	5.7	3.1	2.0	4.1	7.9	3.4
Observations (n)	631	249	260	359	296	419	566	400	225	454
Tropicals										
Mean Rank	2.0	7.3	4.7	4.0	3.9	3.8	2.7	3.2	6.2	6.7
Observations (n)	726	249	359	411	402	420	546	547	268	279

Table Fn.E2. **Risk Management – Ranking of Risk Sources (in Order of Importance): Distribution of Ranks by Risk Source**

		Mean Ranking of Risk Sources									
Rank		Adverse Temper-ature	Floods	Drought	Disease	Irrig. Water Supply Problems	Input Price Fluctu-ation	Output Price Fluctu-ation	Pests	Quar-antine	Hail
Total Responses		6,755	2,639	3,247	4,158	3,501	4,309	5,932	4,805	2,422	3,393
1	Obs. (n)	3,599	72	177	496	392	596	2,874	605	61	287
	Distribution	53%	3%	5%	12%	11%	14%	48%	13%	3%	8%
2	Obs. (n)	1,407	187	369	766	484	1,182	1,412	1,024	108	475
	Distribution	21%	7%	11%	18%	14%	27%	24%	21%	4%	14%
3	Obs. (n)	849	114	318	732	461	751	649	1,109	54	394
	Distribution	13%	4%	10%	18%	13%	17%	11%	23%	2%	12%
4	Obs. (n)	382	98	343	709	404	533	383	807	82	319
	Distribution	6%	4%	11%	17%	12%	12%	6%	17%	3%	9%
5	Obs. (n)	220	144	402	596	398	453	217	581	106	257
	Distribution	3%	5%	12%	14%	11%	11%	4%	12%	4%	8%
6	Obs. (n)	137	188	388	399	403	293	147	279	119	299
	Distribution	2%	7%	12%	10%	12%	7%	2%	6%	5%	9%
7	Obs. (n)	72	272	440	218	348	241	100	193	195	296
	Distribution	1%	10%	14%	5%	10%	6%	2%	4%	8%	9%
8	Obs. (n)	44	396	407	149	332	145	87	131	260	300
	Distribution	1%	15%	13%	4%	9%	3%	1%	3%	11%	9%
9	Obs. (n)	26	503	266	59	151	72	29	48	541	391
	Distribution	0.4%	19%	8%	1%	4%	2%	0%	1%	22%	12%
10	Obs. (n)	18	656	135	31	128	42	34	26	885	368
	Distribution	0.3%	25%	4%	1%	4%	1%	1%	1%	37%	11%

Table Fn.E3. **Risk Management – Rank of Selected Risk Sources That May Be Specific to Region: Mean Ranking by Region**

		Mean Ranks of Risk Sources		
Region		**Drought**	**Irrigation Water Supply Problems**	**Hail**
Far North	Mean Rank	3.5	4.2	5.4
	Observations (n)	12	10	10
North Coast	Mean Rank	5.1	4.7	6.6
	Observations (n)	434	461	380
Central Coast – North	Mean Rank	5.4	5.0	7.2
	Observations (n)	131	128	116
Central Coast – South	Mean Rank	5.1	4.8	7.6
	Observations (n)	264	256	196
South Coast	Mean Rank	4.0	3.2	7.4
	Observations (n)	209	248	132
Sacramento Valley	Mean Rank	5.8	5.5	5.6
	Observations (n)	425	424	453
San Joaquin – North	Mean Rank	5.9	5.5	5.5
	Observations (n)	536	580	621
San Joaquin – Central	Mean Rank	5.9	4.6	3.9
	Observations (n)	573	676	817
San Joaquin – South	Mean Rank	5.5	4.4	4.9
	Observations (n)	486	543	534
Sierra Nevada	Mean Rank	4.0	4.2	5.1
	Observations (n)	70	59	63
Desert	Mean Rank	4.8	3.7	7.7
	Observations (n)	105	114	69

Table Fn.E4. **Risk Management – Ranking of Preferences for Risk Management Tools: Mean Ranking by Region and Crop**

		Risk Management Tools						
	Crop Insurance	Different Regions	Multiple Commodities	Gov't Programs	Hedging with Futures or Options	Forward Contracting	Diversified Marketing	Other
All Fruit and Nut Crops								
Observations (n)	5,224	2,023	2,853	2,975	1,777	2,644	3,044	1,372
Mean Preference Ranking by Region								
Far North	3.3	7.5	4.3	4.0	7.0	6.5	2.8	8.0
North Coast	2.5	5.6	3.5	4.2	5.6	3.1	2.8	2.0
Central Coast – No.	3.0	5.1	3.2	4.4	5.6	3.6	2.7	1.0
Central Coast – So.	2.2	4.0	3.0	4.5	6.8	4.8	2.9	2.1
South Coast	2.5	6.2	2.5	3.5	6.0	4.3	3.4	1.6
Sacramento Valley	1.9	5.3	3.1	3.6	5.8	3.5	2.9	2.2
San Joaquin – N.	1.8	4.7	3.3	3.9	5.3	3.6	3.0	3.1
San Joaquin – Cen.	1.7	4.8	3.4	3.1	5.3	3.9	2.8	2.1
San Joaquin – S.	1.5	5.5	3.1	3.2	5.2	3.5	3.3	2.6
Sierra Nevada	1.4	5.0	4.3	2.8	5.5	2.6	3.6	3.5
Desert	3.1	3.2	2.8	3.7	5.8	4.3	2.8	4.0
Mean Preference Ranking by Crop								
Berries	1.7	3.0	2.0	3.5	8.0	8.0	1.0	1.0
Citrus	1.7	3.9	2.8	4.0	6.0	5.0	6.2	3.2
Grapes	1.8	5.0	3.6	3.0	5.2	3.1	2.7	2.4
Nuts	2.1	5.2	3.2	3.9	5.3	3.6	3.0	2.4
Apples and Pears	2.2	5.4	2.9	4.6	6.2	4.3	2.6	3.5
Stone Fruits	1.6	4.8	2.8	3.2	6.2	4.5	3.4	2.5
Tropicals	1.7	6.1	3.2	3.1	6.6	4.1	3.3	1.0

Table Fn.E5. **Risk Management – Availability and Utilization of Risk Management Tools: Rates of Availability and Utilization and Mean Ranking of Preference by Crop**

	Mean Ranking of Risk Management Tools							
	Crop Insurance	Different Regions	Multiple Commodities	Government Programs	Hedging with Futures or Options	Forward Contracting	Diversified Marketing	Other
All Fruit and Nut Crops (Total Observations = 8,791)								
Obs. with Availability	4,284	627	1,518	1,285	251	1,114	1,427	234
Availability Rate[a]	49%	7%	17%	15%	3%	13%	16%	3%
Utilization Rate[b]	69%	39%	63%	60%	27%	67%	60%	75%
Mean Ranking	1.8	3.7	2.4	3.0	4.5	2.4	2.4	2.4
Berries (Total Observations = 144)								
Obs. with Availability	33	17	22	18	3	7	27	8
Availability Rate	23%	12%	15%	13%	2%	5%	19%	6%
Citrus (Total Observations = 1,021)								
Obs. with Availability	598	96	221	207	37	68	189	32
Availability Rate	59%	9%	22%	20%	4%	7%	19%	3%
Grapes (Total Observations = 2,888)								
Obs. with Availability	1,495	215	417	339	72	546	495	80
Availability Rate	52%	7%	14%	12%	2%	19%	17%	3%
Nuts (Total Observations = 2,776)								
Obs. with Availability	1,246	169	443	385	96	346	393	64
Availability Rate	45%	6%	16%	14%	3%	12%	14%	2%
Apples and Pears (Total Observations = 218)								
Obs. with Availability	91	20	56	42	5	21	50	9
Availability Rate	42%	9%	26%	19%	2%	10%	23%	4%
Stone Fruits (Total Observations = 798)								
Obs. with Availability	474	71	235	173	24	74	153	14
Availability Rate	59%	9%	29%	22%	3%	9%	19%	2%
Tropicals (Total Observations = 946)								
Obs. with Availability	347	39	124	121	14	52	120	27
Availability Rate	37%	4%	13%	13%	1%	6%	13%	3%

[a] Availability rates were calculated as a ratio of the number of observations with availability to the total number of observations.

[b] Utilization rates were calculated based on the number of observations with availability. Crop-specific utilization rates are not provided due to too few number of observations that utilized the tool.

Fn.F1–F6. Crop Insurance

Table Fn.F1. Crop Insurance: Purchase History and Average Number of Purchases for the Last Five Years by Crop

Crop Insurance Purchased in the Last Five Years		Number of Years Purchased	Observations	Distribution
Yes		1	345	8%
Observations	4,496	2	440	10%
Distribution	53%	3	468	10%
No		4	352	8%
Observations	4,062	5	2,841	64%
Distribution	47%			

Mean Number of Purchases by Crop for the Last Five Years

	Observations	Mean		Observations	Mean
Berries	23	3.3	Apples and Pears	100	3.9
Citrus	671	4.4	Stone Fruits	556	4.2
Grapes	1,541	4.2	Tropicals	347	3.0
Nuts	1,208	4.2			

Table Fn.F2. Crop Insurance – Number of Farmers Who Purchase Single-Peril Insurance against a Specific Peril by Crop

		Total Number of Farmers	Fire	Frost or Freeze	Rain	Hail
All Fruit and Nut Crops						
Observations (n)		8,791	439	1,775	1,511	1,534
Percent			5%	20%	17%	17%
By Crop						
Berries	Observations (n)	144	–	6	8	6
	Percent		–	4%	6%	4%
Citrus	Observations (n)	1,021	48	372	106	180
	Percent		5%	36%	10%	18%
Grapes	Observations (n)	2,888	149	605	701	600
	Percent		5%	21%	24%	21%
Nuts	Observations (n)	2,776	134	445	394	382
	Percent		5%	16%	14%	14%
Apples and Pears	Observations (n)	218	10	30	26	39
	Percent		5%	14%	12%	18%
Stone Fruits	Observations (n)	798	43	200	199	254
	Percent		5%	25%	25%	32%
Tropicals	Observations (n)	946	54	117	77	73
	Percent		6%	12%	8%	8%

Table Fn.F3. **Crop Insurance – Mean Ranking and Distribution of Reasons for Purchasing Crop Insurance**

	Risk of Crop Loss Was High	Expected Water Supplies to Be Cut Back	Insurance Req'd to Qualify for Other USDA Programs	Expected to Receive Lower Prices for Crops	Bank or Other Lender Required Insurance	Other
All Fruit and Nut Crops						
Mean Rank	1.2	3.4	2.2	2.6	2.7	1.5
No. of Observations that Provided Ranks	3,414	960	1,593	1,376	1,194	1,048
By Crop						
Berries						
Mean Rank	1.2	3.8	2.3	2.6	4.2	2.3
Observations (n)	19	7	11	11	9	11
Citrus						
Mean Rank	1.3	3.4	1.9	2.5	3.4	1.3
Observations (n)	530	137	275	226	121	158
Grapes						
Mean Rank	1.2	3.5	2.6	2.6	2.6	1.5
Observations (n)	1,181	337	480	442	472	379
Nuts						
Mean Rank	1.2	3.4	2.2	2.5	2.6	1.4
Observations (n)	900	246	430	389	326	265
Apples and Pears						
Mean Rank	1.3	3.9	2.1	2.5	2.2	1.8
Observations (n)	81	22	31	31	35	20
Stone Fruits						
Mean ranking	1.2	3.8	2.0	2.8	2.6	1.8
Observations (n)	458	110	239	175	172	102
Tropicals						
Average Rank	1.4	2.7	2.1	2.7	3.8	1.6
Observations (n)	245	101	127	102	59	113

Table Fn.F4. **Crop Insurance – Mean Ranking of Reasons for Not Purchasing Crop Insurance by Crop**

	Not Available for My Crop	Major Source of Risk Not Insured Cause of Loss	Too Much Paper-work to Apply	Never Lost Enough Prod'n or Revenue to File Claim	Premium Cost Too High	Couldn't Find Know-ledgable Insurance Agent	Do Not Understand Crop Insurance Program	Other
All Fruit and Nut Crops								
Mean Rank	2.3	2.8	3.2	1.7	1.8	4	2.7	1.5
No. of Obs. that Provided Ranks	1,850	1,279	1,248	2,291	2,453	936	1,772	1,748
By Crop								
Berries								
Mean Rank	1.5	3.6	4.4	2.7	2.1	3.7	2.8	3.7
Obs. (n)	73	26	22	38	41	25	36	25
Citrus								
Mean Rank	2.1	2.9	3.1	1.8	1.8	3.9	2.7	1.4
Obs. (n)	211	129	146	217	270	106	195	196
Grapes								
Mean Rank	3.2	2.8	3.3	1.6	1.8	4	2.9	1.4
Obs. (n)	435	454	408	827	830	322	564	591
Nuts								
Mean Rank	2.4	2.7	3.1	1.6	1.8	4.2	2.8	1.5
Obs. (n)	494	394	386	773	765	262	517	605
Apples and Pears								
Mean Rank	1.6	2.4	2.9	2.1	2.2	3.4	2.3	1.6
Obs. (n)	62	37	36	46	71	29	56	47
Stone Fruits								
Mean Rank	2.4	3.1	3.3	1.8	1.8	4.1	2.9	1.6
Obs. (n)	202	111	118	194	248	88	150	144
Tropicals								
Mean Rank	1.4	2.7	2.9	2	2.1	3.5	22.3	1.8
Obs. (n)	373	128	132	196	228	104	254	140

Table Fn.F5. Crop Insurance – Mean Ranking of Suggestions to Modify Crop Insurance by Crop

	Compensate for a Higher Level of Production Loss	Compensate for a Loss of Gross Sales	Compensate for a Loss of Profit	Guarantee Cash Production Costs	Guarantee Costs of Establishing Orchard or Vineyard	Guarantee Replace-ment Costs of a Crop Inventory	Other
All Fruit and Nut Crops							
Mean Ranking	2.0	2.3	2.1	2.4	3.6	3.5	1.5
Observations that Provided Ranks	3,447	2,889	3,133	2,907	2,106	2,208	2,216
By Crop							
Berries							
Mean Rank	2.2	2.4	2.0	2.3	4.5	3.2	2.0
Observations (n)	46	43	51	45	30	41	43
Citrus							
Mean Rank	2.2	2.2	2.1	2.4	4.0	3.6	1.4
Observations (n)	433	383	427	426	238	267	252
Grapes							
Mean Rank	2.0	2.3	2.2	2.5	3.4	3.4	1.6
Observations (n)	1,242	1,026	1,067	981	794	785	666
Nuts							
Mean Rank	2.0	2.4	2.1	2.4	3.5	3.5	1.3
Observations (n)	967	784	891	824	607	621	741
Apples and Pears							
Mean Rank	2.4	2.0	2.0	2.2	3.5	3.9	1.8
Observations (n)	77	76	80	84	55	50	61
Stone Fruits							
Mean Rank	2.0	2.2	2.0	2.4	3.8	3.7	1.7
Observations (n)	384	317	342	312	212	221	192
Tropicals							
Average Rank	1.9	2.2	2.1	2.7	3.7	3.0	1.4
Observations (n)	298	260	275	235	170	223	261

Table Fn.F6. **Crop Insurance – Importance of Risk Management and Familiarity with Crop Insurance Compared with Five Years Ago**

		Risk Management Is Becoming More Important		Becoming More Familiar with Crop Insurance	
	Response	Obs. (n)	Percent of Farms	Obs. (n)	Percent of Farms
All Fruit and Nut Crops					
	Yes	4,456	57%	4,670	59%
	No	3,386	43%	3,248	41%
By Crop					
Berries	Yes	79	63%	60	47%
	No	47	37%	68	53%
Citrus	Yes	593	64%	674	72%
	No	329	36%	266	28%
Grapes	Yes	1,468	57%	1,548	59%
	No	1,116	43%	1,065	41%
Nuts	Yes	1,235	50%	1,275	52%
	No	1,216	50%	1,183	48%
Apples and Pears	Yes	120	61%	115	58%
	No	76	39%	85	43%
Stone Fruits	Yes	546	74%	537	72%
	No	188	26%	208	28%
Tropicals	Yes	415	50%	461	55%
	No	414	50%	373	45%

Fn.G1–G3. Financial Characteristics

Table Fn.G1. **Financial Characteristics – Mean Values of Off-Farm Income Share (Percent), Gross Agricultural Sales, Assets, and Debts by Region and Crop**

	Off-Farm Income Share		Gross Agricultural Sales		Assets		Debts	
	Obs. (n)	Mean (%)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)
All Fruit/Nut Crops	6,240	64%	7,163	$329,769	4,553	$1,372,641	2,596	$597,519
By Region								
Far North	24	65%	23	$78,389	18	$492,956	15	$89,800
North Coast	608	64%	728	$341,489	407	$3,102,166	227	$1,121,098
Central Coast – N.	158	65%	220	$607,672	139	$2,146,819	88	$976,451
Central Coast – S.	404	69%	503	$482,051	312	$1,798,470	171	$566,123
South Coast	336	71%	369	$234,375	205	$870,370	76	$399,519
Sacramento Valley	868	61%	1,049	$252,822	695	$1,257,502	422	$612,029
San Joaquin – N.	1,189	64%	1,417	$237,255	925	$994,750	530	$372,344
San Joaquin – Cen.	1,138	63%	1,396	$297,866	890	$1,037,708	542	$478,801
San Joaquin – S.	869	61%	1,088	$525,404	733	$1,410,843	436	$767,603
Sierra Nevada	109	67%	133	$99,992	78	$769,812	35	$179,079
Desert	208	71%	235	$197,878	149	$835,330	54	$484,366
By Crop								
Berries	62	55%	108	$943,724	66	$660,609	46	$487,725
Citrus	735	65%	867	$384,775	561	$1,373,662	272	$836,360
Grapes	1,795	62%	2,242	$432,251	1,397	$2,176,232	845	$887,724
Nuts	1,977	66%	2,306	$217,954	1,481	$922,464	841	$356,301
Apples and Pears	151	70%	178	$249,399	116	$925,985	75	$531,143
Stone Fruits	523	58%	697	$384,057	471	$1,205,851	303	$488,491
Tropicals	669	67%	765	$186,702	461	$767,196	214	$297,253

Table Fn.G2. **Financial Characteristics – Distributions of Off-Farm Income Shares and Gross Agricultural Sales**

	Observations (n)	Distribution (Percent)	Cumulative Percent
Distribution of Off-Farm Income Shares – Off-Farm Income Share Class			
0%	113	2%	2%
1–10%	571	9%	11%
11–20%	362	6%	17%
21–30%	405	6%	23%
31–40%	227	4%	27%
41–50%	808	13%	39%
51–60%	269	4%	44%
61–70%	303	5%	48%
71–80%	880	14%	62%
81–90%	716	11%	74%
91–100%	1,673	26%	100%
Distribution of Gross Agricultural Sales – Gross Agricultural Sales Class (in $1,000)			
0–10	971	14%	14%
10–50	2,371	33%	47%
50–100	1,215	17%	64%
100–500	1,831	26%	89%
500–1,000	369	5%	95%
1,000–2,000	198	3%	97%
2,000–5,000	125	2%	99%
5,000 and Greater	60	1%	100%

Table Fn.G3. **Financial Characteristics – Mean Agricultural Sales, Mean Assets, and Mean Debts by Off-Farm Income-Share Class and by Fruit and Nut Acreage Class**

	Gross Agricultural Sales		Assets		Debts	
	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)
By Off-Farm Income Share						
0%	92	$1,351,004	68	$2,600,574	64	$1,062,088
1–10%	496	$631,486	370	$2,361,199	241	$850,794
11–20%	310	$428,957	225	$1,933,970	140	$737,191
21–30%	359	$262,856	237	$1,865,528	157	$1,106,204
31–40%	200	$367,356	133	$1,530,352	75	$431,678
41–50%	711	$195,045	484	$947,314	272	$339,425
51–60%	236	$147,876	183	$823,888	113	$224,091
61–70%	269	$120,161	184	$830,865	99	$180,369
71–80%	769	$111,200	505	$674,919	253	$197,676
81–90%	630	$65,096	422	$525,995	188	$158,035
91–100%	1,303	$90,837	933	$591,240	476	$268,871
By Acreage Class (Fruit and Nut Acres)						
0–10	1,382	$22,808	816	$225,017	318	$89,841
11–20	1,450	$42,310	918	$366,248	442	$123,111
21–30	634	$81,225	394	$519,380	204	$171,757
31–40	681	$94,760	447	$598,394	266	$185,170
41–50	365	$136,457	227	$772,428	137	$231,088
51–60	317	$146,059	218	$848,667	148	$244,472
61–70	232	$194,442	153	$929,118	96	$296,273
71–80	249	$188,603	166	$1,019,823	114	$296,093
81–90	119	$263,771	77	$1,380,535	54	$358,793
91–100	165	$219,702	108	$1,169,156	67	$355,970
101–200	742	$395,419	480	$1,880,161	334	$543,761
201–500	555	$950,949	389	$3,565,975	293	$1,370,279
501–1,000	164	$2,172,834	104	$7,126,122	83	$2,264,936
1,000 and Greater	105	$6,840,450	53	$24,888,016	39	$11,257,006

Vegetables

Vg.A1–A2. Size and Regional Profile

Table Vg.A1. Size and Regional Profile – Number of Farms and Average Vegetable Acres per Farm by Region and Crop and Distribution of Vegetable Acreage

	No. of Farms (n)	Distribution	Mean Vegetable Acres	Standard Deviation
By Region				
Far North	17	4%	39	60
North Coast	31	7%	19	35
Central Coast – North	78	18%	650	1,170
Central Coast – South	58	13%	205	384
South Coast	26	6%	993	3,918
Sacramento Valley	54	12%	565	672
San Joaquin – North	63	14%	780	1,442
San Joaquin – Central	54	12%	513	1,133
San Joaquin – South	19	4%	317	348
Sierra Nevada	6	1%	64	140
Desert	37	8%	210	341
By Crop				
V1: Beans, peas, garlic, onions, leeks	51	12%	300	613
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	71	16%	755	1,204
V3: Melons, cucumbers, squash, other gourd family	67	15%	232	783
V4: Tomatoes, peppers, eggplants, tomatillos	137	31%	641	1,130
V5: Carrots, celery, asparagus, mushrooms parsley, other herbs	65	15%	222	451
V6: Other unspecified vegetables	52	12%	465	2,772

By Acreage Class (Vegetable Acres)	No. (n)	Distribution	Cumulative Percent
0–10	126	28%	28%
11–20	46	10%	39%
21–30	13	3%	42%
31–40	10	2%	44%
41–50	10	2%	46%
51–60	7	2%	48%
61–70	9	2%	50%
71–80	12	3%	53%
81–90	4	1%	53%
91–100	10	2%	56%
101–200	29	7%	62%
201–500	60	14%	76%
501–1,000	55	12%	88%
1,000 and Greater	52	12%	100%

Table Vg.A2. Size and Regional Profile – Distribution of Vegetable Crops by Crop and Region

	Far North	North Coast	Cen. Coast No.	Cen. Coast So.	South Coast	Sac. Valley	San Joaq. No.	San Joaq. Cen.	San Joaq. So.	Sierra Nevada	Desert
V1: Beans, peas, garlic, onions, leeks											
Observations	–	–	–	17	–	–	7	11	–	–	6
Row Distribution				33%			14%	22%			12%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes											
Observations	–	–	44	10	–	–	–	–	–	–	5
Row Distribution			62%	14%							7%
V3: Melons, cucumbers, squash, other gourd family											
Observations	–	7	5	5	8	5	10	10	5	–	7
Row Distribution		10%	7%	7%	12%	7%	15%	15%	7%		10%
V4: Tomatoes, peppers, eggplants, tomatillos, parsley, other herbs											
Observations	–	7	12	8	6	38	34	21	–	–	–
Row Distribution		5%	9%	6%	4%	28%	25%	15%			
V5: Carrots, celery, asparagus, mushrooms											
Observations	6	6	10	6	7	–	8	–	6	–	11
Row Distribution	9%	9%	15%	9%	11%		12%		9%		17%
V6: Other unspecified vegetables											
Observations	–	8	6	12	–	4	–	7	–	–	5
Row Distribution		15%	12%	23%		8%		13%			10%

Note: Cells with less than three observations are indicated by "–".

Table Vg.A3. **Size and Regional Profile – Number of Farms and Average Vegetable Acres per Farm for Selected Major Crops**

Primary Crop[a]	Observations (n)	Distribution	Mean Acres	Standard Deviation
Total Observations	281			
Asparagus	14	5%	426	665
Broccoli	5	2%	414	620
Cantaloupe	5	2%	318	333
Carrots	9	3%	172	196
Cauliflower	–	–	416	277
Garlic	–	–	244	239
Lettuce	33	12%	952	1,332
Mushrooms	12	4%	4	2
Onions	20	7%	367	526
Peppers	18	6%	298	496
Spinach	17	6%	1,084	1,400
Tomatoes (Fresh plus Processed)	148	52%	705	1,207

[a] The list of primary crops was selected using the state's crop revenue statistics. The revenue for each of these crops in California exceeded $100 million in 2001.
Note: Cells with less than five observations are indicated by "–".

Vg.B1–B3. Crop Diversification

Table Vg.B1. Crop Diversification – Diversification Patterns across Crop Categories and Average Acres in Crop Diversification

Crops	Number of Farmers (n)	Share of Farmers	Crop Category	Mean Acres
Total	437	100%		
Vegetables Only	228	52%	Vegetables	468
Vegetables and Field Crops	114	26%	Vegetables	547
			Field Crops	888
Vegetables and Fruits/Nuts	50	11%	Vegetables	144
			Fruits/Nuts	888
Vegetables, Field Crops, and Fruits/Nuts	38	9%	Vegetables	842
			Field Crops	663
			Fruits/Nuts	208
Vegetables, Ornamentals, and Other	7	2%	Vegetables	15
			Ornamentals	9

Table Vg.B2. **Crop Diversification – Diversification Patterns (within Vegetables) of Vegetable-Only Farmers: Distribution of Farmers and Average Sales Share by the Number of Vegetable Crops Diversified**

Diversification Patterns Number of Farms Growing Vegetables Only Grouped by the Number of Vegetable Crops per Farm							
		Number of Crops					
	Total Obs.	One	Two	Three	Four	Five	Six or More
All Vegetable Crops							
Observations (n)	228	112	40	21	22	12	21
Row Percent		49%	18%	9%	10%	5%	9%
Mean Acres		299	455	321	483	1,280	1,065
Row Percent By Crop							
V1: Beans, peas, garlic, onions, leeks	26	50%	31%	4%	8%	8%	0%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	61	18%	18%	11%	21%	8%	23%
V3: melons, cucumbers, squash, other gourd family	26	58%	19%	12%	8%	0%	4%
V4: Tomatoes, peppers, eggplants, tomatillos	37	22%	38%	19%	5%	8%	8%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs	39	77%	3%	8%	3%	5%	5%
V6: Other unspecified vegetables	39	90%	3%	0%	5%	0%	3%

Mean Crop Sales Shares Farmers Grouped by Number of Vegetables Being Grown						
	One	Two	Three	Four	Five	Six or More
First Vegetable	97%	65%	54%	46%	45%	30%
Second Vegetable		35%	25%	19%	17%	20%
Third Vegetable			22%	17%	16%	14%
Fourth Vegetable				15%	10%	12%
Fifth Vegetable					10%	10%
Sixth Vegetable						10%

Table Vg.B3. **Crop Diversification – Number of Organic Farms and Average Vegetable Acres per Farm by Crop**

	Total	Number of Organic Farms		Mean Acres of Organic Farms: Total Vegetable Land	Organic Vegetable Land		Transitional Organic Vegetable Land	
	Obs.(n)	*Obs.(n)*	*Distribution*	*Acres*	*Obs.(n)*	*Acres*	*Obs.(n)*	*Acres*
By Region								
All Vegetable Crops	443	64	14%	153	49	61	18	27
By Crop								
V1: Beans, peas, garlic, onions, leeks	51	3	6%	13	–	–	–	–
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	71	15	21%	350	12	93	3	4
V3: Melons, cucumbers, squash, other gourd family	67	6	9%	18	6	20	–	–
V4: Tomatoes, peppers, eggplants, tomatillos	137	18	13%	395	14	58	5	73
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs	65	8	12%	22	6	6	–	–
V6: Other unspecified vegetables	52	14	27%	120	9	177	7	10

Note: Cells with less than three observations are indicated by "–".

Vg.C1–C4. Marketing

Table Vg.C1. Marketing – Distribution of Use Type (Processing versus Fresh) and Average Volume Share Designated to Specific Use by Crop

		Use Type[a] in Terms of Volume of Share Designated			Average Volume Share	
	Total Obs.	To Mainly Processing	To Mainly Fresh	To Processing/ Fresh	Mainly Processing Farms Designating to Processing Use	Mainly Fresh Farms Designating to Fresh Use
All Vegetable Crops						
Observations (n)	443	114	298	31	114	298
Percent		26%	67%	7%	99.4%	99.0%
V1: Beans, peas, garlic, onions, leeks						
Observations (n)	51	18	29	4	18	29
Percent		35%	57%	8%	92.5%	99.4%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes						
Observations (n)	71	2	54	15	2	54
Percent		3%	76%	21%	93%	99.0%
V3: Melons, cucumbers, squash, other gourd family						
Observations (n)	67	4	60	3	4	60
Percent		6%	90%	4%	100.0%	99.9%
V4: Tomatoes, peppers, eggplants, tomatillos						
Observations (n)	137	82	49	6	82	49
Percent		60%	36%	4%	99.5%	99.8%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs						
Observations (n)	65	7	55	3	7	55
Percent		11%	85%	5%	100.0%	99.8%
V6: Other unspecified vegetables						
Observations (n)	52	–	51	–	–	51
Percent		–	98%	–	–	99.7%

[a] Mainly processing (or Fresh) was indicated by an output volume share greater than 80 percent and Processing/Fresh included farmers that were not Mainly Processing or Mainly Fresh.
Note: Cells with less than three observations are indicated by "–".

Table Vg.C2. Marketing – Marketing Channels for Processing-Use Crops: Number of Farms Using Specific Marketing Channels and Average Volume Share for Each Marketing Channel by Crop

		Marketing Channels					
	Total Obs.	Coop-erative	Sold to Processor under Contract with Predetermined Price	Sold to Processor under Contract without Predetermined Price	Partici-pation Plan	Spot Market	Other
All Vegetable Crops							
Observations (n)	153	17	104	30	15	7	17
Distribution (Percent)[a]		11%	68%	20%	10%	5%	11%
Avg Vol. Shares (Percent)		66%	93%	80%	62%	44%	74%
V1: Beans, peas, garlic, onions, leeks							
Observations (n)	23	5	8	9	2	–	2
Distribution (Percent)		22%	35%	39%	9%	–	9%
Avg Vol. Shares (Percent)		75%	100%	82%	95%	–	100%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes							
Observations (n)	20	3	16	5	6	3	3
Distribution (Percent)		15%	80%	25%	30%	15%	15%
Avg Vol. Shares (Percent)		33%	91%	52%	58%	33%	13%
V3: Melons, cucumbers, squash, other gourd family							
Observations (n)	5	–	2	3	–	–	–
Distribution (Percent)		–	40%	60%	–	–	–
Avg Vol. Shares (Percent)		–	100%	100%	–	–	–
V4: Tomatoes, peppers, eggplants, tomatillos							
Observations (n)	88	7	69	11	4	4	7
Distribution (Percent)		8%	78%	13%	5%	5%	8%
Avg Vol. Shares (Percent)		79%	94%	91%	39%	52%	73%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs							
Observations (n)	12	2	7	2	2	0	2
Distribution (Percent)		17%	58%	17%	17%	0%	17%
Avg Vol. Shares (Percent)		50%	82%	50%	65%		100%
V6: Other unspecified vegetables							
Observations (n)	5	–	2	–	–	–	2
Distribution (Percent)		–	40%	–	–	–	40%
Avg Vol. Shares (Percent)		–	100%	–	–	–	100%

[a] The sums over the marketing channels are greater than the total number of farmers in each category because some farmers use multiple channels.

Table Vg.C3. **Marketing – Grower/Shippers (Fresh-Use Only): Number of Grower/Shippers and Volume Sold at Predetermined Price by Crop**

	No. of Fresh-Crop Farmers	Grower/Shippers	Growers Only
Distribution of Grower/Shippers versus Growers Only			
All Vegetable Crops			
Observations (n)	310	41	269
Row Percent		13%	87%
By Category			
V1: Beans, peas, garlic, onions, leeks	32	6%	94%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	65	18%	82%
V3: Melons, cucumbers, squash, other gourd family	59	15%	85%
V4: Tomatoes, peppers, eggplants, tomatillos	52	10%	90%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs	54	15%	85%
V6: Other unspecified vegetables	48	10%	90%
Average Output Share Sold by Grower/Shippers at Predetermined Prices			
Only one grower/shipper sold crops at a predetermined price and the share sold at the predetermined price was 100%.			

Table Vg.C4. **Marketing – Marketing Channels for Fresh-Use Crops (Growers Only): Number of Farmers Using Specific Marketing Channels and Average Volume Share by Crop**

		Distribution of Farmers Using Specific Marketing Channel[a]				
	Total Obs.	Direct to Consumers	Marketing Cooperative	Independent Shipper/Broker	Direct to Commercial Buyers	Other
All Vegetable Crops						
Observations (n)	327	101	19	103	90	14
Distribution (Percent)[a]		31%	6%	31%	28%	4%
Avg Vol. Shares (Percent)		79%	51%	90%	68%	57%
V1: Beans, peas, garlic, onions, leeks						
Observations (n)	33	–	–	13	6	–
Distribution (Percent)		–	–	39%	18%	–
Avg Vol. Shares (Percent)		–	–	99%	96%	–
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes						
Observations (n)	68	15	9	33	15	5
Distribution (Percent)		22%	13%	49%	22%	7%
Avg Vol. Shares (Percent)		63%	48%	89%	53%	64%
V3: Melons, cucumbers, squash, other gourd family						
Observations (n)	61	19	–	14	18	–
Distribution (Percent)		31%	–	23%	30%	–
Avg Vol. Shares (Percent)		90%	–	92%	80%	–
V4: Tomatoes, peppers, eggplants, tomatillos						
Observations (n)	57	27	–	12	20	–
Distribution (Percent)		47%	–	21%	35%	–
Avg Vol. Shares (Percent)		77%	–	79%	62%	–
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs						
Observations (n)	57	15	–	21	17	–
Distribution (Percent)		26%	–	37%	30%	–
Avg Vol. Shares (Percent)		72%	–	89%	60%	–
V6: Other unspecified vegetables						
Observations (n)	51	24	–	10	14	–
Distribution (Percent)		47%	–	20%	27%	–
Avg Vol. Shares (Percent)		89%	–	93%	75%	–

[a] The sums over the marketing channels can be greater than 100 percent because some farmers use multiple channels.
Note: Cells with less than five observations are indicated by "–".

Vg.D1–D3. Yield, Price, and Profit Fluctuations

Table Vg.D1. **Yield, Price, and Profit Fluctuation – Yield Deviation (Percent) from Individual Five-Year Averages: Sample Mean 1997–2001 and All-Year Sample Mean by Region and Crop**

		Yield Deviation from Five-Year Average
Sample Mean by Year (1997–2001)	**Observations (n)**	**Mean**
2001	195	10%
2000	195	6%
1999	195	6%
1998	195	8%
1997	195	8%
All-Year Average	195	8%
All-Year Sample Mean By Region	**Observations (n)**	**All-Year Mean**
Far North	6	8%
North Coast	7	10%
Central Coast – North	39	6%
Central Coast – South	19	6%
South Coast	11	5%
Sacramento Valley	31	5%
San Joaquin – North	34	10%
San Joaquin – Central	26	10%
San Joaquin – South	7	11%
Sierra Nevada	–	–
Desert	13	8%
All-Year Sample Mean By Crop	**Observations (n)**	**All-Year Mean**
V1: Beans, peas, garlic, onions, leeks	19	9%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	42	6%
V3: Melons, cucumbers, squash, other gourd family	20	9%
V4: Tomatoes, peppers, eggplants, tomatillos	77	7%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs	26	12%
V6: Other unspecified vegetables	11	6%

Table Vg.D2. Yield, Price, and Profit Fluctuation – Largest Yield, Price, and Profit Fluctuations: Number of Farms per Fluctuation Range by Crop

	Yield		Price		Profit	
Fluctuation Range (Percent)	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms
All Vegetable Crops						
0–9	166	46%	133	40%	108	34%
10–24	106	29%	95	29%	99	31%
25–49	39	11%	52	16%	55	17%
50–74	35	10%	37	11%	32	10%
75 or More	14	4%	15	5%	25	8%
Total	360	100%	332	100%	319	100%
V1: Beans, peas, garlic, onions, leeks						
0–9	11	28%	12	32%	11	30%
10–24	12	31%	8	22%	11	30%
25–49	8	21%	5	14%	8	22%
50–74	5	13%	12	32%	7	19%
75 or More	3	8%	–	0%	–	0%
Total	39	11%	37	11%	37	12%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes						
0–9	35	57%	23	43%	20	40%
10–24	20	33%	11	20%	12	24%
25–49	2	3%	10	19%	6	12%
50–74	3	5%	7	13%	6	12%
75 or More	1	2%	3	6%	6	12%
Total	61	17%	54	16%	50	16%
V3: Melons, cucumbers, squash, other gourd family						
0–9	22	41%	21	41%	13	26%
10–24	12	22%	15	29%	19	38%
25–49	5	9%	9	18%	7	14%
50–74	10	19%	3	6%	6	12%
75 or More	5	9%	3	6%	5	10%
Total	54	15%	51	15%	50	16%
V4: Tomatoes, peppers, eggplants, tomatillos						
0–9	59	52%	41	39%	30	30%
10–24	33	29%	42	40%	37	37%
25–49	15	13%	14	13%	22	22%
50–74	5	4%	7	7%	6	6%
75 or More	1	1%	2	2%	5	5%
Total	113	31%	106	32%	100	31%

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Table Vg.D2. **Continued**

V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs						
0–9	22	41%	19	39%	16	34%
10–24	16	30%	11	22%	12	26%
25–49	4	7%	9	18%	8	17%
50–74	11	20%	6	12%	4	9%
75 or More	1	2%	4	8%	7	15%
Total	54	15%	49	15%	47	15%
V6: Other unspecified vegetables						
0–9	17	44%	17	49%	18	51%
10–24	13	33%	8	23%	8	23%
25–49	5	13%	5	14%	4	11%
50–74	1	3%	2	6%	3	9%
75 or More	3	8%	3	9%	2	6%
Total	39	11%	35	11%	35	11%

Table Vg.D3. **Yield, Price, and Profit Fluctuation – Main Cause for Lowest Profit by Region, Crop, Use, and Processor Pricing Method (with and without Predetermined Price)**

		Main Cause for Lowest Profit (Percent of Farmers Who Answered)					
	Total No. Obs. that Answered Main Cause	Poor Yield	Poor Quality	High Input Cost	Low Market Price due to High Domestic Prod'n	Low Market Price due to Increased Imports	Other
All Vegetable Crops							
Observations (n)	416	76	22	56	124	86	52
Row Percent		18%	5%	13%	30%	21%	13%
By Region							
Far North	16	31%	6%	13%	0%	13%	38%
North Coast	28	36%	7%	21%	7%	7%	21%
Central Coast – North	74	9%	5%	20%	41%	16%	8%
Central Coast – South	56	20%	9%	5%	27%	27%	13%
South Coast	26	4%	8%	12%	23%	42%	12%
Sacramento Valley	49	16%	4%	16%	37%	18%	8%
San Joaquin – North	59	19%	0%	14%	34%	27%	7%
San Joaquin – Central	49	24%	6%	10%	37%	12%	10%
San Joaquin – South	17	18%	6%	12%	29%	18%	18%
Sierra Nevada	6	67%	0%	17%	0%	0%	17%
Desert	36	11%	6%	8%	28%	28%	19%
By Crop							
V1: Beans, peas, garlic, onions, leeks	46	28%	9%	15%	17%	22%	9%
V2: Lettuce, cabbages, other leafy vegetables, broccoli cauliflower, artichokes, radishes	67	3%	9%	15%	51%	16%	6%
V3: Melons, cucumbers, squash, other gourd family	65	22%	5%	9%	22%	22%	22%
V4: Tomatoes, peppers, eggplants, tomatillos	127	23%	2%	17%	30%	19%	9%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs	63	19%	3%	10%	19%	35%	14%
V6: Other unspecified vegetables	48	13%	8%	13%	38%	10%	19%

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Table Vg.D3. Continued

	Total No. Obs. that Answered Main Cause	Main Cause for Lowest Profit (Percent of Farmers Who Answered)					
		Poor Yield	Poor Quality	High Input Cost	Low Market Price due to High Domestic Prod'n	Low Market Price due to Increased Imports	Other
By Processor Pricing Method							
Predetermined Price	94	15%	6%	19%	34%	18%	7%
No Predetermined Price	24	21%	8%	8%	38%	25%	–
By Use[a]							
Mainly Processing	109	19%	5%	17%	31%	21%	7%
Mainly Fresh	279	19%	5%	13%	27%	21%	16%

[a] Mainly Processing (or Fresh) was indicated by an output volume share greater than 80 percent and Processing/Fresh included farmers that were neither Mainly Processing nor Mainly Fresh.

Vg.E1–E6. Risk Management

Table Vg.E1. Risk Management – Ranking of Risk Sources (in Order of Importance): Mean Ranking by Crop

	Mean Ranking of Risk Sources									
	Adverse Temperature	Floods	Drought	Disease	Irrig. Water Supply Problems	Input Price Fluctuation	Output Price Fluctuation	Pests	Quarantine	Hail
All Vegetable Crops										
Mean Ranking	2.3	6.0	5.5	3.6	4.5	3.2	2.2	3.5	8.1	6.7
Total Obs.(n)	349	163	179	235	212	248	321	262	131	153
By Crop										
V1: Beans, peas, garlic, onions, leeks										
Mean Ranking	3.1	6.4	4.3	3.5	4.1	3.0	1.7	3.3	8.7	6.8
Observations (n)	31	13	19	27	22	25	33	20	7	9
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes										
Mean Ranking	2.6	5.1	5.5	3.5	4.7	3.2	1.9	3.5	7.2	7.2
Observations (n)	60	35	28	38	33	46	58	49	25	29
V3: Melons, cucumbers, squash, other gourd family										
Mean Ranking	2.5	6.2	4.6	3.4	4.1	3.6	2.3	2.7	7.9	6.7
Observations (n)	49	19	29	37	31	31	47	45	18	21
V4: Tomatoes, peppers, eggplants, tomatillos										
Mean Ranking	2.3	6.4	5.8	4.2	2.8	1.9	1.6	1.9	2.4	2.7
Observations (n)	117	61	67	79	80	88	104	88	54	59
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs										
Mean Ranking	2.0	6.2	7.0	3.7	5.0	3.2	2.7	4.4	8.1	6.8
Observations (n)	50	21	20	35	27	38	44	32	17	21
V6: Other unspecified vegetables										
Mean Ranking	1.9	6.1	5.4	2.8	4.5	3.5	2.4	2.9	8.1	6.4
Observations (n)	42	14	16	19	19	20	35	28	10	14

Table Vg.E2. **Risk Management – Ranking of Risk Sources (in Order of Importance): Distribution of Ranks by Crop**

		Mean Ranking of Risk Sources									
Rank		Adverse Temperature	Floods	Drought	Disease	Irrig. Water Supply Problems	Input Price Fluctuation	Output Price Fluctuation	Pests	Quarantine	Hail
Total Responses		349	163	199	235	212	248	321	262	131	153
1	Obs. (n)	143	14	9	36	27	47	158	26	3	7
	Distribution	41%	9%	5%	15%	13%	19%	49%	10%	2%	5%
2	Obs. (n)	91	12	26	41	39	60	67	62	6	13
	Distribution	26%	7%	13%	17%	18%	24%	21%	24%	5%	8%
3	Obs. (n)	47	10	14	45	25	55	34	54	3	6
	Distribution	13%	6%	7%	19%	12%	22%	11%	21%	2%	4%
4	Obs. (n)	28	17	8	37	19	28	27	45	4	14
	Distribution	8%	10%	4%	16%	9%	11%	8%	17%	3%	9%
5	Obs. (n)	19	7	23	33	20	22	17	40	6	8
	Distribution	5%	4%	12%	14%	9%	9%	5%	15%	5%	5%
6	Obs. (n)	7	17	25	18	23	16	4	19	5	15
	Distribution	2%	10%	13%	8%	11%	6%	1%	7%	4%	10%
7–10	Obs. (n)	14	86	94	25	59	20	14	16	104	90
	Distribution	4%	53%	47%	11%	28%	8%	4%	6%	79%	59%

Table Vg.E3. **Risk Management – Ranking of Selected Risk Sources That May Be Specific to Region: Mean Ranking by Region**

		Mean Ranks of Risk Sources		
Region		**Drought**	**Irrigation Water Supply Problems**	**Hail**
Far North	Mean Rank	4.2	3.4	6.5
	Observations (n)	7	7	6
North Coast	Mean Rank	3.6	4.0	7.3
	Observations (n)	11	11	6
Central Coast – North	Mean Rank	5.4	4.4	7.6
	Observations (n)	29	36	30
Central Coast – South	Mean Rank	5.5	5.9	7.9
	Observations (n)	22	23	13
South Coast	Mean Rank	6.2	5.0	7.0
	Observations (n)	13	17	11
Sacramento Valley	Mean Rank	6.2	5.6	6.7
	Observations (n)	26	29	24
San Joaquin – North	Mean Rank	5.7	4.4	6.1
	Observations (n)	31	38	28
San Joaquin – Central	Mean Rank	5.2	3.6	5.3
	Observations (n)	22	28	18
San Joaquin – South	Mean Rank	6.7	5.2	6.5
	Observations (n)	9	9	8
Sierra Nevada	Mean Rank	3.3	1.7	–
	Observations (n)	3	3	–
Desert	Mean Rank	5.5	3.8	7.4
	Observations (n)	6	11	8

Table Vg.E4. **Risk Management – Availability and Utilization of Risk Management Tools: Rates of Availability and Utilization and Mean Ranking of Preference by Crop**

	Mean Ranking of Risk Management Tools							
	Crop Insurance	Different Regions	Multiple Commodities	Government Programs	Hedging with Futures or Options	Forward Contracting	Diversified Marketing	Other
All Vegetable Crops (Total Observations = 443)								
Obs. with Availability	128	66	175	89	31	95	112	13
Availability Rate[a]	29%	15%	40%	20%	7%	21%	25%	3%
Utilization Rate[b]	71%	47%	87%	67%	52%	77%	79%	62%
Mean Ranking	2.6	3.0	2.0	3.1	5.0	2.8	2.7	2.8
By Crop								
V1: Beans, peas, garlic, onions, leeks (Total Observations = 51)								
Obs. with Availability	16	7	23	16	7	11	10	1
Availability Rate	31%	14%	45%	31%	14%	22%	20%	2%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes (Total Obs. = 71)								
Obs. with Availability	7	11	28	4	–	18	18	1
Availability Rate	10%	15%	39%	6%	–	25%	25%	1%
V3: Melons, cucumbers, squash, other gourd family (Total Observations = 67)								
Obs. with Availability	14	8	23	7	7	12	16	1
Availability Rate	21%	12%	34%	10%	10%	18%	24%	1%
V4: Tomatoes, peppers, eggplants, tomatillos (Total Observations = 137)								
Obs. with Availability	72	28	69	54	15	45	40	3
Availability Rate	53%	20%	50%	39%	11%	33%	29%	2%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs (Total Observations = 65)								
Obs. with Availability	11	8	16	5	–	6	15	2
Availability Rate	17%	12%	25%	8%	–	9%	23%	3%
V6: Other unspecified vegetables (Total Observations = 52)								
Obs. with Availability	8	4	16	3	–	3	13	5
Availability Rate	15%	8%	31%	6%	0%	6%	25%	10%

[a] Availability rates were calculated as a ratio of the number of observations with availability to the total number of observations.

[b] Utilization rates were calculated based on the number of observations with availability. Utilization rates by crop are not provided due to too few number of observations that utilized the tool.

Table Vg.E5. **Risk Management – Status of Receipt of Government Disaster Payments or Loans by Crop**

		Receipt of Government Disaster Payments or Loans		
	Total Obs.	Received	Not Qualified	Unaware
All Vegetable Crops				
Observations (n)	414	145	154	115
Row Percent		35%	37%	28%
By Crop				
V1: Beans, peas, garlic, onions, leeks				
Observations (n)	48	27	16	5
Row Percent		56%	33%	10%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes				
Observations (n)	68	16	35	17
Row Percent		24%	51%	25%
V3: Melons, cucumbers, squash, other gourd family				
Observations (n)	62	23	18	21
Row Percent		37%	29%	34%
V4: Tomatoes, peppers, eggplants, tomatillos				
Observations (n)	129	60	42	27
Row Percent		47%	33%	21%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs				
Observations (n)	57	13	24	20
Row Percent		23%	42%	35%
V6: Other unspecified vegetables				
Observations (n)	50	6	19	25
Row Percent		12%	38%	50%

Vg.F1–F6. Crop Insurance

Table Vg.F1. **Crop Insurance: Purchase History and Average Number of Purchases for the Last Five Years by Crop**

Crop Insurance Purchase in Last Five Years		No. of Years Purchased	Observations	Distribution
Yes		1	10	7%
Observations	136	2	10	7%
Distribution	31%	3	17	13%
No		4 or 5	99	72%
Observations	30%			
Distribution	69%			

Mean Number of Purchases by Crop for the Last Five Years by Vegetable Category

		Observations	Average Years
V1:	Beans, peas, garlic, onions, leeks	16	3.9
V2:	Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes	4	4.5
V3:	Melons, cucumbers, squash, other gourd family	19	4.1
V4:	Tomatoes, peppers, eggplants, tomatillos	79	4.4
V5:	Carrots, celery, asparagus, mushrooms, parsley, other herbs	12	4.0
V6:	Other unspecified vegetables	6	3.0

Table Vg.F2. **Crop Insurance – Number of Farmers Who Purchase Single-Peril Insurance against a Specific Peril by Crop**

		Peril			
	Total Number of Farmers	Fire	Frost or Freeze	Rain	Hail
All Vegetable Crops					
Observations (n)	443	41	38	63	40
Percent		9%	9%	14%	9%
By Crop Category					
V1: Beans, peas, garlic, onions, leeks					
Observations (n)	51	5	–	3	–
Percent		10%	–	6%	–
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes					
Observations (n)	71	–	–	–	–
Percent		–	–	–	–
V3: Melons, cucumbers, squash, other gourd family					
Observations (n)	67	6	8	7	6
Percent		9%	12%	10%	9%
V4: Tomatoes, peppers, eggplants, tomatillos					
Observations (n)	137	21	23	46	25
Percent		15%	17%	34%	18%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs					
Observations (n)	65	6	3	5	5
Percent		9%	5%	8%	8%
V6: Other unspecified vegetables					
Observations (n)	52	–	–	–	–
Percent		–	–	–	–

Table Vg.F3. **Crop Insurance – Mean Ranking and Distribution of Reasons for Purchasing Crop Insurance**

	Risk of Crop Loss Was High	Expected Water Supplies to Be Cut Back	Insurance Req'd to Qualify for Other USDA Programs	Expected to Receive Lower Prices for Crops	Bank or Other Lender Required Insurance	Other
Mean Ranking						
Mean Ranking	1.5	3.4	2.3	2.9	3.2	2.0
Observations that Provided Ranks	112	56	78	60	63	31
Ranking Distribution						
Ranking n =	112	56	78	60	63	31
1	69%	11%	44%	13%	13%	65%
2	19%	16%	19%	23%	32%	16%
3	7%	21%	17%	35%	10%	3%
4	3%	30%	8%	15%	19%	3%
5	1%	20%	13%	13%	27%	13%
6	2%	2%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Table Vg.F4. Crop Insurance – Mean Ranking of Reasons for Not Purchasing Crop Insurance by Crop

	Not Available for My Crop	Major Source of Risk Not Insured Cause of Loss	Too Much Paper-work to Apply	Never Lost Enough Prod'n or Revenue to File Claim	Premium Cost Too High	Couldn't Find Know-ledgable Insurance Agent	Do Not Understand Crop Insurance Program	Other
All Vegetable Crops								
Mean Rank	1.6	3.0	3.9	2.4	2.5	4.0	3.0	1.7
No. of Obs. that Provided Ranks	196	99	85	131	123	82	127	75
By Crop Category								
V1: Beans, peas, garlic, onions, leeks								
Mean Rank	1.5	3.6	3.4	1.9	1.8	3.3	2.2	1.0
Obs. (n)	17	10	9	14	11	6	10	3
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes								
Mean Rank	1.3	2.8	4.3	2.7	2.7	4.7	3.4	1.8
Obs. (n)	46	18	13	25	24	14	19	9
V3: Melons, cucumbers, squash, other gourd family								
Mean Rank	1.1	2.7	3.2	2.8	2.8	3.5	2.7	1.8
Obs. (n)	26	9	13	15	19	11	18	10
V4: Tomatoes, peppers, eggplants, tomatillos								
Mean Rank	2.3	3.0	4.2	2.5	2.2	4.2	3.1	1.3
Obs. (n)	43	33	25	41	37	29	42	29
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs								
Mean Rank	1.4	3.1	4.0	2.3	2.8	4.1	3.1	2.0
Obs. (n)	33	14	10	16	16	10	18	18
V6: Other unspecified vegetables								
Mean Rank	1.8	2.9	4.0	2.1	2.9	3.8	3.0	2.8
Obs. (n)	31	15	15	20	16	12	20	6

Table Vg.F5. Crop Insurance – Mean Ranking of Suggestions to Modify Crop Insurance by Crop

	Compensate for a Higher Level of Production Loss	Compensate for a Loss of Gross Sales	Compensate for a Loss of Profit	Guarantee Cash Production Costs	Guarantee Costs of Establishing Orchard or Vineyard	Guarantee Replacement Costs of a Crop Inventory	Other
All Vegetable Crops							
Mean Ranking	2.2	2.5	2.4	2.2	4.5	3.4	1.4
Observations that Provided Ranks	172	157	164	168	86	130	122
By Crop Category							
V1: Beans, peas, garlic, onions, leeks							
Mean Rank	1.6	2.2	2.6	2.0	4.6	3.5	1.0
Obs. (n)	22	17	17	18	5	11	5
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes							
Mean Rank	2.4	2.2	2.2	2.2	4.5	3.4	1.2
Obs. (n)	24	26	22	22	13	20	24
V3: Melons, cucumbers, squash, other gourd family							
Mean Rank	2.5	2.4	2.1	2.1	4.4	3.2	1.7
Obs. (n)	26	21	27	22	13	21	18
V4: Tomatoes, peppers, eggplants, tomatillos							
Mean Rank	1.8	2.6	2.7	2.3	4.6	3.6	1.3
Obs. (n)	66	58	55	68	34	45	41
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs							
Mean Rank	2.9	2.5	2.3	2.2	4.4	3.3	1.7
Obs. (n)	21	22	25	21	13	20	21
V6: Other unspecified vegetables							
Mean Rank	2.4	2.9	1.8	1.9	4.1	3.0	1.5
Obs. (n)	13	13	18	17	8	13	13

Table Vg.F6. Crop Insurance – Importance of Risk Management and Familiarity with Crop Insurance Compared with Five Years Ago

	Risk Management Is Becoming More Important		Becoming More Familiar with Crop Insurance	
Response	Obs. (n)	Percent of Farms	Obs. (n)	Percent of Farms
All Vegetable Crops				
Yes	261	63%	192	46%
No	152	37%	221	54%
By Crop Category				
V1: Beans, peas, garlic, onions, leeks				
Yes	30	65%	21	47%
No	16	35%	24	53%
V2: Lettuce, cabbages, other leafy vegetables, broccoli, cauliflower, artichokes, radishes				
Yes	39	57%	21	32%
No	29	43%	45	68%
V3: Melons, cucumbers, squash, other gourd family				
Yes	34	56%	28	44%
No	27	44%	35	56%
V4: Tomatoes, peppers, eggplants, tomatillos				
Yes	99	75%	82	63%
No	33	25%	48	37%
V5: Carrots, celery, asparagus, mushrooms, parsley, other herbs				
Yes	37	59%	29	45%
No	26	41%	35	55%
V6: Other unspecified vegetables				
Yes	22	51%	11	24%
No	21	49%	34	76%

Vg.G1–G3. Financial Characteristics

Table Vg.G1. Financial Characteristics – Off-Farm Income Share (Percent), Gross Agricultural Sales, Assets, and Debts: Mean Values by Region and Crop

	Off-Farm Income Share		Gross Agricultural Sales		Assets		Debts	
	Obs. (n)	Mean (%)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)
All Vegetable Crops	213	42%	382	$1,111,873	237	$1,888,527	166	$939,828
By Region								
Far North	12	63%	16	$62,066	9	$955,000	4	$75,000
North Coast	21	53%	26	$161,842	18	$689,145	10	$76,100
Central Coast – N.	34	49%	67	$1,231,198	37	$685,135	25	$175,920
Central Coast – S.	34	37%	47	$970,371	32	$976,203	23	$208,043
South Coast	15	46%	22	$1,559,639	11	$2,124,091	7	$836,429
Sacramento Valley	23	31%	48	$1,794,027	32	$2,053,125	21	$524,048
San Joaquin – N.	23	29%	58	$1,388,280	43	$2,447,919	34	$1,065,805
San Joaquin – Cen.	24	46%	43	$730,930	22	$1,458,136	16	$321,719
San Joaquin – S.	7	25%	16	$1,692,218	12	$2,075,033	8	$1,362,192
Sierra Nevada	3	42%	6	$398,800	–	–	–	–
Desert	17	47%	33	$887,301	20	$5,909,400	17	$4,495,588
By Crop								
V1: Beans, peas, garlic onions, leeks	28	44%	44	$608,250	31	$1,466,468	24	$327,104
V2: Lettuce, cabbages, other leafy vegetables broccoli, cauliflower, artichokes, radishes	40	33%	60	$1,618,613	29	$1,204,034	26	$303,385
V3: Melons, cucumbers, squash, other gourd family	38	48%	59	$664,955	37	$3,769,054	22	$3,432,752
V4: Tomatoes, peppers, eggplants, tomatillos	54	39%	121	$1,501,913	80	$1,942,069	58	$733,610
V5: Carrots, celery, asparagus, mush-rooms, parsley, other herbs	26	45%	53	$935,042	31	$1,659,129	17	$2,955,282
V6: Other unspecified vegetables	27	51%	45	$667,170	29	$722,414	19	$372,263

Table Vg.G2. **Financial Characteristics – Distributions of Off-Farm Income Shares and Gross Agricultural Sales**

	Observations (n)	Distribution (Percent)	Cumulative Percent
Range of Off-Farm Income Shares			
0%	14	7%	7%
1–10%	47	22%	29%
11–20%	25	12%	40%
21–30%	18	8%	49%
31–40%	9	4%	53%
41–50%	31	15%	68%
51–60%	7	3%	71%
61–70%	8	4%	75%
71–80%	16	8%	82%
81–90%	13	6%	88%
91–100%	25	12%	100%
Range of Gross Agricultural Sales (in $1,000)			
0–10	25	7%	7%
10–50	58	15%	22%
50–100	37	10%	31%
100–500	106	28%	59%
500–1,000	44	12%	71%
1,000–2,000	54	14%	85%
2,000–5,000	42	11%	96%
5,000 and Greater	16	4%	100%

Table Vg.G3. **Financial Characteristics – Mean Agricultural Sales, Mean Assets, and Mean Debts by Off-Farm Income Share Class and by Vegetable Acreage Class**

	Gross Agricultural Sales		Assets		Debts	
	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)
By Off-Farm Income Share						
0%	12	$2,074,943	8	$855,426	7	$68,649
1–10%	47	$1,834,331	31	$2,374,258	27	$494,815
11–20%	25	$1,450,183	19	$1,458,500	11	$713,273
21–30%	18	$369,111	16	$489,875	7	$195,714
31–40%	9	$233,850	5	$406,400	4	$218,750
41–50%	29	$293,362	20	$696,400	17	$214,765
51–60%	7	$158,909	6	$174,500	–	–
61–70%	8	$82,625	6	$417,000	4	$81,250
71–80%	15	$232,572	9	$621,000	5	$162,600
81–90%	12	$53,190	6	$729,167	4	$20,125
91–100%	23	$212,901	13	$691,154	7	$44,286
By Acreage Class (Vegetable Acres)						
0–10	100	$84,562	59	$489,542	32	$136,500
11–20	44	$143,713	27	$610,815	19	$222,000
21–30	11	$239,031	9	$595,956	6	$185,833
31–40	10	$222,348	6	$235,000	6	$60,500
41–50	9	$284,530	–	–	–	–
51–60	6	$475,032	5	$464,000	5	$184,000
61–70	7	$275,834	8	$985,875	4	$134,500
71–80	12	$277,050	8	$718,750	5	$56,400
81–90	3	$118,333	3	$550,000	3	$40,000
91–100	9	$720,000	4	$487,500	4	$131,250
101–200	27	$612,080	17	$1,098,706	14	$357,214
201–500	53	$1,675,760	29	$2,014,137	19	$770,947
501–1,000	49	$2,104,033	34	$2,311,247	26	$871,252
1,000 and Greater	41	$4,342,697	25	$4,766,700	21	$1,493,637

Ornamentals

Or.A1–A2. Size and Regional Profile

Table Or.A1. Size and Regional Profile – Number of Farms and Average Ornamental Acres per Farm by Region and Crop

	Observations (n)	Distribution	Mean Ornamental Acres	Standard Deviation
By Region				
Far North	33	4%	93	290
North Coast	85	9%	4	7
Central Coast – North	151	16%	14	60
Central Coast – South	101	11%	36	139
South Coast	319	34%	15	64
Sacramento Valley	51	5%	20	57
San Joaquin – North	31	3%	142	369
San Joaquin – Central	23	2%	9	14
San Joaquin – South	26	3%	86	209
Sierra Nevada	64	7%	10	16
Desert	52	6%	26	67
By Crop				
Floriculture	226	24%	14	38
Nursery	624	67%	30	141
Christmas Trees	86	9%	18	25

Table Or.A2. Size and Regional Profile – Distribution of Farms by Region/Crop and by Ornamental Acreage

	Floriculture			Nursery			Christmas Trees	
	Obs. (n)	*Dist.*		*Obs. (n)*	*Dist.*		*Obs. (n)*	*Dist.*
By Region								
Far North	6	3%		21	3%		6	7%
North Coast	12	5%		61	10%		12	14%
Central Coast – North	59	26%		78	13%		14	16%
Central Coast – South	32	14%		67	11%		–	–
South Coast	82	36%		229	37%		8	9%
Sacramento Valley	10	4%		36	6%		5	6%
San Joaquin – North	5	2%		24	4%		–	–
San Joaquin – Central	–	–		20	3%		–	–
San Joaquin – South	3	1%		19	3%		4	5%
Sierra Nevada	9	4%		26	4%		29	34%
Desert	7	3%		43	7%		–	–
	Obs. (n)	*Dist.*	*Cumul. Percent*	*Obs. (n)*	*Dist.*	*Cumul. Percent*	*Obs. (n)*	*Dist.*
By Acreage Class (Acres of Ornamentals)								
0–1	53	24%	24%	213	35%	35%	–	–
1–5	90	41%	64%	204	33%	68%	17	20%
5–10	28	13%	77%	60	10%	78%	35	41%
10–25	26	12%	89%	55	9%	87%	17	20%
25–50	12	5%	94%	31	5%	92%	10	12%
50–100	8	4%	98%	20	3%	95%	5	6%
100 and Greater	5	2%	100%	32	5%	100%	–	–
Total	222	100%		615	100%		86	100%

Note: Cells with less than three observations are indicated by "–".

Or.B1. Crop Diversification

Table Or.B1. Crop Diversification – Crop Diversification Patterns and Number of Organic Farms by Crop

Crop Diversification Patterns	Observations (n)	Percent	
Floriculture Only	194	23%	
Nursery Only	573	67%	
Christmas Trees Only	74	9%	
Floriculture/Nursery	11	1%	
Nursery/Christmas Trees	–	–	
Number of Organic Farms	**Observations (n)**	**Number of Organic Farms**	**Percent Organic**
Total	936	48	5%
Floriculture	226	15	7%
Nursery	624	25	4%
Christmas Trees	86	8	9%

Or.C1. Marketing

Table Or.C1. **Marketing – Number of Farms by Use (Processing versus Fresh) and Operation (Grower/Shipper versus Grower Only)**

Number of Farms by Use	Observations (n)	Average Volume Share (Percent) Designated
Processing	12	50.0%
Fresh	910	99.9%

Distribution of Grower/Shippers versus Growers Only	Total Number of Farms	Grower/Shippers	Growers Only
All Ornamentals			
Observations (n)	871	99	772
Row Percent		11%	89%
Floriculture			
Observations (n)	214	24	190
Row Percent		11%	89%
Nursery			
Observations (n)	578	75	503
Row Percent		13%	87%
Christmas Trees			
Observations (n)	79	0	79
Row Percent		0%	100%

Average Output Share Sold by Grower/Shippers at Predetermined Price

There were only two grower/shippers who sold crops at predetermined prices.

Marketing channel information was very scanty and could not be presented.

Or.D1–D2. Yield, Price, and Profit Fluctuations

Table Or.D1. Yield, Price, and Profit Fluctuation – Largest Yield, Price, and Profit Fluctuations for Last Five Years: Number of Farms per Fluctuation Range by Crop

	Yield		Price		Profit	
Fluctuation Range (Percent)	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms
All Ornamental Crops						
0–9	351	51%	407	60%	328	49%
10–24	171	25%	159	24%	187	28%
25–49	79	11%	64	10%	96	14%
50–74	48	7%	26	4%	39	6%
75 or More	43	6%	18	3%	21	3%
Total	692	100%	674	100%	671	100%
Floriculture						
0–9	77	45%	83	51%	58	37%
10–24	43	25%	41	25%	42	27%
25–49	26	15%	24	15%	34	22%
50–74	14	8%	12	7%	15	9%
75 or More	10	6%	3	2%	9	6%
Total	170	25%	163	24%	158	24%
Nursery						
0–9	246	53%	289	63%	240	53%
10–24	114	25%	104	23%	130	28%
25–49	42	9%	36	8%	53	12%
50–74	33	7%	14	3%	23	5%
75 or More	27	6%	14	3%	11	2%
Total	462	67%	457	68%	457	68%
Christmas Trees						
0–9	28	47%	35	65%	30	54%
10–24	14	23%	14	26%	15	27%
25–49	11	18%	4	7%	9	16%
50–74	1	2%	0	0%	1	2%
75 or More	6	10%	1	2%	1	2%
Total	60	9%	54	8%	56	8%

Table Or.D2. Yield, Price, and Profit Fluctuations – Main Cause for Lowest Profit by Region and Crop

		Main Cause for Lowest Profit (Percent of Farmers Who Answered)						
	Total No. Obs. that Answered Main Cause	Poor Yield	Poor Quality	High Input Cost	Low Market Price due to High Domestic Prod'n	Low Market Price due to Increased Imports	Inability to Market a Crop due to Quarantine	Other
All Ornamental Crops								
Observations (n)	823	101	46	156	121	121	5	273
Row Percent		12%	6%	19%	15%	15%	1%	33%
By Region								
Far North	28	21%	11%	14%	18%	4%	0%	32%
North Coast	75	17%	5%	23%	8%	5%	0%	41%
Central Coast – North	134	10%	1%	17%	13%	34%	0%	25%
Central Coast – South	90	18%	9%	20%	17%	17%	0%	20%
South Coast	283	8%	7%	20%	20%	15%	2%	27%
Sacramento Valley	45	7%	0%	22%	4%	4%	0%	62%
San Joaquin – North	28	14%	11%	11%	18%	7%	0%	39%
San Joaquin – Central	22	14%	5%	23%	14%	9%	0%	36%
San Joaquin – South	21	19%	14%	29%	0%	10%	0%	29%
Sierra Nevada	56	18%	2%	11%	9%	4%	0%	57%
Desert	41	15%	5%	15%	12%	5%	0%	49%
By Crop								
Floriculture	209	11%	6%	13%	15%	37%	0%	18%
Nursery	541	12%	5%	22%	15%	7%	1%	38%
Christmas Trees	73	21%	8%	12%	10%	4%	0%	45%

Or.E1–E5. Risk Management

Table Or.E1. **Risk Management – Ranking of Risk Sources (in Order of Importance): Mean Ranking by Crop and Distribution of Ranks by Risk Source**

	Mean Ranking of Risk Sources									
	Adverse Temperature	Floods	Drought	Disease	Irrig. Water Supply Problems	Input Price Fluctuation	Output Price Fluctuation	Pests	Quarantine	Hail
All Ornamental Crops										
Mean Ranking	2.2	6.7	4.1	3.2	4.3	3.5	3.0	3.1	7.2	6.8
Observations that Provided Ranks	658	273	347	481	362	464	519	550	264	296
By Crop										
Floriculture										
Mean Rank	2.2	6.5	4.7	3.1	4.3	3.1	2.3	3.0	7.8	6.4
Obs. (n)	161	62	79	112	84	114	150	116	51	67
Nursery										
Mean Rank	2.0	7.0	4.7	3.6	4.3	3.3	3.0	3.4	6.5	6.7
Obs. (n)	439	184	224	320	243	312	336	381	191	207
Christmas Trees										
Mean Rank	2.4	6.8	3.1	2.8	4.4	4.1	3.8	3.1	7.2	7.1
Obs. (n)	58	27	44	49	35	38	33	53	22	22
Rank Distribution										
Rank n =	658	273	347	481	362	464	519	550	264	296
1	56%	4%	12%	14%	17%	22%	36%	17%	3%	5%
2	18%	10%	18%	24%	13%	24%	22%	24%	6%	8%
3	11%	4%	12%	22%	14%	15%	13%	22%	5%	8%
4	6%	7%	10%	15%	12%	14%	9%	15%	8%	6%
5	5%	7%	13%	9%	12%	8%	6%	12%	8%	6%
6	2%	8%	9%	7%	12%	6%	5%	4%	9%	6%
7 and Greater	3%	61%	26%	8%	20%	11%	10%	7%	61%	60%
Total	100%	100%	100%	100%	100%	100%	101%	100%	100%	100%

Table Or.E2. **Risk Management – Ranking of Selected Risk Sources That May Be Specific to Region: Mean Ranking by Region**

		Mean Ranking of Risk Sources		
Region		**Drought**	**Irrigation Water Supply Problems**	**Hail**
Far North	Mean Rank	5.1	3.9	6.9
	Observations (n)	12	13	11
North Coast	Mean Rank	3.7	4.0	6.6
	Observations (n)	36	42	30
Central Coast – North	Mean Rank	4.7	4.2	6.6
	Observations (n)	52	50	47
Central Coast – South	Mean Rank	5.0	5.1	8.0
	Observations (n)	39	43	36
South Coast	Mean Rank	4.1	4.0	6.4
	Observations (n)	111	114	92
Sacramento Valley	Mean Rank	4.8	5.1	6.0
	Observations (n)	21	20	23
San Joaquin – North	Mean Rank	6.7	4.4	7.6
	Observations (n)	8	11	8
San Joaquin – Central	Mean Rank	4.7	4.9	4.2
	Observations (n)	8	11	10
San Joaquin – South	Mean Rank	5.7	6.0	7.8
	Observations (n)	100	11	8
Sierra Nevada	Mean Rank	3.8	3.8	5.8
	Observations (n)	37	35	23
Desert	Mean Rank	5.0	3.9	9.2
	Observations (n)	13	12	8

Table Or.E3. Risk Management – Preference for Risk Management Tools: Mean Ranking by Region and Crop

	Mean Ranking of Risk Management Tools							
	Crop Insurance	Different Regions	Multiple Commodities	Government Programs	Hedging with Futures or Options	Forward Contracting	Diversified Marketing	Other
All Ornamental Crops								
Mean Ranking	3.4	3.7	2.1	4.7	6.0	3.8	2.4	2.1
Observations (n)	332	237	406	230	159	225	393	215
By Region								
Far North								
Mean Rank	4.3	3.5	2.4	4.2	6.3	3.4	2.3	1.2
Observations (n)	9	11	14	12	7	11	16	10
North Coast								
Mean Rank	2.9	4.1	2.1	5.6	6.7	3.8	2.6	2.1
Observations (n)	30	18	36	17	13	17	39	17
Central Coast – North								
Mean Rank	3.1	4.5	2.1	4.0	6.2	4.0	2.7	2.6
Observations (n)	66	37	72	43	28	43	73	39
Central Coast – South								
Mean Rank	2.8	2.8	1.8	5.0	5.8	3.9	2.7	3.0
Observations (n)	39	33	59	23	17	27	44	21
South Coast								
Mean Rank	3.6	3.2	1.9	4.7	5.9	3.8	2.2	1.9
Observations (n)	95	73	126	72	45	64	119	76
Sacramento Valley								
Mean Rank	4.2	4.6	1.8	4.8	5.8	4.5	2.5	1.5
Observations (n)	15	16	23	16	11	11	22	17
San Joaquin – North								
Mean Rank	2.8	4.3	2.3	5.6	5.6	3.2	2.3	4.0
Observations (n)	16	8	11	9	8	9	12	6
San Joaquin – Central								
Mean Rank	2.8	4.3	2.3	5.6	5.6	3.2	2.3	4.0
Observations (n)	16	8	11	9	8	9	12	6
San Joaquin – South								
Mean Rank	3.1	2.8	2.2	5.3	4.5	3.3	2.0	2.2
Observations (n)	9	4	9	3	2	4	9	6

continued on following page

Table Or.E3. Continued

	Mean Ranking of Risk Management Tools							
	Crop Insurance	Different Regions	Multiple Commodities	Government Programs	Hedging with Futures or Options	Forward Contracting	Diversified Marketing	Other
By Region (continued)								
Sierra Nevada								
Mean Rank	3.4	4.8	3.1	4.8	6.8	3.5	3.4	7.0
Observations (n)	17	11	14	11	10	13	15	2
Desert								
Mean Rank	3.0	3.8	2.8	4.9	5.6	3.4	2.0	1.3
Observations (n)	17	10	18	11	7	11	19	8
By Crop								
Floriculture								
Mean Rank	3.1	3.4	1.8	4.2	5.9	4.0	2.4	2.2
Observations (n)	85	62	113	63	38	53	100	49
Nursery								
Mean Rank	3.4	3.6	2.1	4.9	6.0	3.6	2.4	2.1
Observations (n)	225	162	268	152	109	159	267	143
Christmas Trees								
Mean Rank	4.2	5.9	2.4	5.0	6.7	5.9	2.6	2.3
Observations (n)	22	13	25	15	12	13	26	23

Table Or.E4. Risk Management – Availability and Utilization of Risk Management Tools: Rates of Availability and Utilization and Mean Ranking of Preference by Crop

	Mean Ranking of Risk Management Tools							
	Crop Insurance	Different Regions	Multiple Commodities	Government Programs	Hedging with Futures or Options	Forward Contracting	Diversified Marketing	Other
All Ornamental Crops (Total Observations = 936)								
Obs. with Availability	164	107	260	42	21	83	242	35
Availability Rate[a]	18%	11%	28%	4%	2%	9%	26%	4%
Utilization Rate[b]	37%	45%	78%	36%	19%	66%	73%	74%
Mean Ranking	3.0	3.0	1.6	3.9	4.9	2.8	2.1	2.1
By Crop								
Floriculture (Total Observations = 226)								
Obs. with Availability	33	31	83	8	4	19	67	7
Availability Rate	15%	14%	37%	4%	2%	8%	30%	3%
Nursery (Total Observations = 624)								
Obs. with Availability	122	70	165	31	16	64	160	26
Availability Rate	67%	11%	26%	5%	3%	10%	26%	4%
Christmas Trees (Total Observations = 86)								
Obs. with Availability	9	6	12	3	1	0	15	2
Availability Rate	10%	7%	14%	3%	1%	0%	17%	2%

[a] Availability rates were calculated as a ratio of the number of observations with availability to the total number of observations.

[b] Utilization rates were calculated based on the number of observations with availability. Utilization rates by crop are not provided due to too few number of observations that utilized the tool.

Table Or.E5. **Risk Management – Status of Receipt of Government Disaster Payments or Loans by Crop**

		Receipt of Government Disaster Payments or Loans		
	Total Observations	**Received**	**Not Qualified**	**Unaware**
All Ornamental Crops				
Observations (n)	839	58	405	376
Row Percent		7%	48%	45%
By Crop				
Floriculture				
Observations (n)	205	19	106	80
Row Percent		9%	52%	39%
Nursery				
Observations (n)	560	36	273	251
Row Percent		6%	49%	45%
Christmas Trees				
Observations (n)	74	3	26	45
Row Percent		4%	35%	61%

Or.F1–F6. Crop Insurance

Table Or.F1. Crop Insurance (Any) Purchase – Purchase History and Average Number of Purchases for the Last Five Years by Crop

Purchased Crop Insurance in Last Five Years		No. of Years Purchased	Observations	Distribution
Yes		1	16	13%
Observations	123	2	12	10%
Distribution	13%	3	25	21%
No		4	10	8%
Observations	797	5	58	48%
Distribution	87%			

Mean Number of Purchases by Crop for the Last Five Years by Vegetable Category

	Observations	Average Years
Floriculture	19	3.8
Nursery	99	3.6
Christmas Trees	3	4.3

Table Or.F2. Crop Insurance – Number of Farmers Who Purchase Single-Peril Insurance against a Specific Peril by Crop

		Peril			
	Total Number of Farmers	Fire	Frost or Freeze	Rain	Hail
All Ornamental Crops					
Observations (n)	936	39	29	26	24
Percent		4%	3%	3%	3%
By Crop					
Floriculture					
Observations (n)	226	9	3	4	4
Percent		4%	1%	2%	2%
Nursery					
Observations (n)	624	29	26	22	20
Percent		5%	4%	4%	3%
Christmas Trees					
Observations (n)	86	–	0	0	0
Percent		–	0%	0%	0%

Table Or.F3. Crop Insurance – Mean Ranking and Distribution of Reasons for Purchasing Crop Insurance

	Risk of Crop Loss Was High	Expected Water Supplies to Be Cut Back	Insurance Req'd to Qualify for Other USDA Programs	Expected to Receive Lower Prices for Crops	Bank or Other Lender Required Insurance	Other
All Ornamental Crops[a]						
Mean Ranking	1.5	3.0	3.0	2.7	2.7	1.2
No. of Observations that Provided Ranks	73	27	25	31	32	80

[a] Due to too few observations, we do not provide the means for a further disaggregated level.

Table Or.F4. **Crop Insurance – Mean Ranking of Reasons for Not Purchasing Crop Insurance by Crop**

	Not Available for My Crop	Major Source of Risk Not Insured Cause of Loss	Too Much Paper-work to Apply	Never Lost Enough Prod'n or Revenue to File Claim	Premium Cost Too High	Couldn't Find Know-ledgable Insurance Agent	Do Not Understand Crop Insurance Program	Other
All Ornamental Crops								
Mean Rank	1.9	2.7	3.3	1.9	2.3	3.5	2.8	1.6
Total obs. (n)	366	187	164	297	268	147	264	182
By Crop								
Floriculture								
Mean Rank	1.7	2.7	3.1	2.1	2.0	3.3	2.6	1.7
Obs. (n)	101	38	42	64	64	37	75	39
Nursery								
Mean Rank	2.0	2.8	3.3	1.9	2.4	3.5	2.8	1.6
Obs. (n)	224	132	111	215	181	99	166	130
Christmas Trees								
Mean Rank	1.7	2.1	4.0	2.1	2.7	4.4	3.3	1.0
Obs. (n)	41	17	11	18	23	11	23	13

Table Or.F5. Crop Insurance – Mean Ranking of Suggestions to Modify Crop Insurance by Crop

	Compensate for a Higher Level of Production Loss	Compensate for a Loss of Gross Sales	Compensate for a Loss of Profit	Guarantee Cash Production Costs	Guarantee Costs of Establishing Orchard or Vineyard	Guarantee Replacement Costs of a Crop Inventory	Other
All Ornamental Crops							
Mean Ranking	2.7	2.3	2.5	3.0	3.8	2.3	1.2
Obs. (n) that Provided Ranks	213	228	210	204	148	261	307
By Crop							
Floriculture							
Mean Rank	2.7	2.2	2.5	2.9	3.8	2.7	1.2
Obs. (n)	56	64	57	56	36	60	83
Nursery							
Mean Rank	2.5	2.3	2.5	3.1	4.1	2.2	1.2
Obs. (n)	142	144	136	130	93	181	200
Christmas Trees							
Mean Rank	4.4	2.5	3.2	3.0	2.8	2.8	1.3
Obs. (n)	15	20	17	18	19	20	24

Table Or.F6. Crop Insurance – Importance of Risk Management and Familiarity with Crop Insurance Compared with Five Years Ago

		Risk Management Is Becoming More Important		Becoming More Familiar with Crop Insurance	
	Response	Obs. (n)	Percent of Farms	Obs. (n)	Percent of Farms
All Ornamental Crops					
	Yes	314	37%	244	29%
	No	536	63%	609	71%
By Crop					
Floriculture	Yes	81	39%	48	23%
	No	127	61%	162	77%
Nursery	Yes	213	37%	186	33%
	No	357	63%	384	67%
Christmas Trees	Yes	20	28%	10	14%
	No	52	72%	63	86%

Or.G1–G3. Financial Characteristics

Table Or.G1. **Financial Characteristics – Off-Farm Income Share (Percent), Gross Agricultural Sales, Assets, and Debts: Mean Values by Region and Crop**

	Off-Farm Income Share		Gross Agricultural Sales		Assets		Debts	
	Obs. (n)	Mean (%)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)
All Ornamental Crops	530	61%	815	$814,287	512	$1,574,914	529	$394,742
By Region								
Far North	21	66%	28	$2,070,078	17	$2,882,587	17	$204,269
North Coast	55	61%	68	$219,222	39	$422,661	41	$42,740
Central Coast – North	75	48%	135	$778,141	84	$1,240,994	85	$290,453
Central Coast – South	47	54%	87	$1,787,237	54	$3,632,727	55	$1,109,930
South Coast	181	63%	284	$661,278	167	$1,124,109	176	$277,226
Sacramento Valley	33	72%	43	$416,638	26	$382,143	26	$39,584
San Joaquin – North	14	51%	26	$1,933,373	19	$7,546,150	20	$1,180,731
San Joaquin – Central	12	63%	21	$545,467	14	$620,116	14	$60,830
San Joaquin – South	15	59%	24	$1,260,646	18	$3,017,235	18	$2,044,263
Sierra Nevada	51	74%	57	$105,811	45	$347,893	46	$87,641
Desert	26	64%	42	$631,146	29	$716,276	31	$88,500
By Crop								
Floriculture	133	64%	209	$646,808	120	$1,406,897	126	$316,624
Nursery	325	58%	528	$995,038	337	$1,798,894	348	$480,546
Christmas Trees	72	71%	78	$39,500	55	$569,115	55	$30,796

Table Or.G2. **Financial Characteristics – Distribution of Off-Farm Income Shares and Gross Agricultural Sales**

	Observations (n)	Distribution (Percent)	Cumulative Percent
Range of Off-Farm Income Shares			
1–10%	62	12%	14%
11–20%	35	7%	21%
21–30%	30	6%	27%
31–40%	22	4%	31%
41–50%	67	13%	43%
51–60%	19	4%	47%
61–70%	20	4%	51%
71–80%	70	13%	64%
81–90%	60	11%	75%
91–100%	133	25%	100%
Range of Gross Agricultural Sales (in $1,000)			
0–10	166	20%	20%
10–50	178	22%	42%
50–100	113	14%	56%
100–500	188	23%	79%
500–1,000	59	7%	86%
1,000–2,000	48	6%	92%
2,000–5,000	36	4%	97%
5,000 and Greater	27	3%	100%

Table Or.G3. **Financial Characteristics – Mean Agricultural Sales, Mean Assets, and Mean Debts by Off-Farm Income Share Class and Ornamental Acreage Class**

	Gross Agricultural Sales		Assets		Debts	
	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)	Obs. (n)	Mean ($)
By Off-Farm Income Share						
0%	12	$2,156,061	6	$9,131,871	7	$5,209,203
1–10%	57	$1,738,435	43	$3,240,704	44	$957,232
11–20%	34	$868,814	22	$1,078,161	23	$259,062
21–30%	30	$490,219	20	$698,502	21	$87,037
31–40%	21	$570,741	15	$1,173,460	15	$207,000
41–50%	64	$1,036,283	44	$1,874,909	46	$218,087
51–60%	18	$172,617	15	$741,200	15	$93,533
61–70%	20	$67,499	16	$331,563	16	$15,000
71–80%	70	$104,425	47	$492,085	48	$48,658
81–90%	55	$30,892	32	$424,545	34	$75,015
91–100%	118	$137,384	77	$557,688	77	$98,000
By Acreage Class (Acres in Ornamentals)						
0–10	220	$45,917	138	$245,089	146	$24,928
11–20	276	$223,414	173	$619,154	181	$94,627
21–30	113	$370,110	67	$916,362	68	$97,242
31–40	82	$1,104,444	56	$1,476,823	58	$431,466
41–50	47	$2,091,670	29	$2,696,724	29	$853,552
51–60	31	$2,891,679	18	$2,084,061	18	$596,507
61–70	34	$7,734,728	24	$16,079,326	24	$4,860,786

Aquaculture

Table Aq.1. **Profile and Marketing – Regional Distribution, Years of Farming, Organic Farms, Number of Farms by Use (Processing versus Fresh), and Marketing Channels**

Regional Distribution	Observations (n)	Distribution
Far North + North Coast + Sierra Nevada	9	22%
Central Coast North + Sacramento Valley	9	22%
San Joaquin Valley (North + Central + South)	15	37%
South Coast + Desert	8	20%
Years of Farming	**Observations (n)**	**Mean**
Average Years of Farming	40	18.4
Number of Farms by Use	**Observations (n)**	**Mean**
Processing	0	–
Fresh	41	100
Marketing Channels	**Observations (n)**	**Average Volume Share**
Direct to Consumers	6	64%
Marketing Cooperative	–	–
Independent Shipper/Broker	6	85%
Direct to Commercial Buyers	15	90%
Other	5	62%

Table Aq.2. **Largest Yield, Price, and Profit Fluctuations: Number of Farms by Fluctuation Range**

	Yield		Price		Profit	
Fluctuation Range (Percent)	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms	No. of Obs.	Percent of Farms
0–9	11	48%	10	45%	6	30%
10–24	5	22%	8	36%	7	35%
25–49	–	–	3	14%	3	15%
50–74	4	17%	–	–	–	–
75 or More	–	–	–	–	–	–
Total	20		21		16	

Table Aq.3. **Risk Management and Crop Insurance – Risk Sources, Risk Management Tools, Government Disaster Payments and Loans, Reasons for Not Purchasing Crop Insurance, and Suggestions to Modify Crop Insurance**

	Observations (n)	Mean Ranking	Rate of Availability
Risk Sources			
Adverse Temperature	22	2.7	
Floods	12	5.1	
Drought	15	4.7	
Disease	21	2.3	
Irrigation Water Supply Problems	15	4.0	
Input Price Fluctuation	13	3.3	
Output Price Fluctuation	16	3.3	
Pests	20	2.6	
Quarantine	10	6.8	
Hail	9	8.7	
Risk Management Tools			
Crop Insurance	16	3.0	15%
Locating Production in Different Regions	12	3.3	15%
Diversification into Multiple Commodities	13	2.5	17%
Government Programs	12	5.4	< 5%
Hedging with Futures or Options	9	5.7	< 5%
Forward Contracting	11	4.5	< 5%
Diversified Marketing	13	2.9	< 5%
Other	15	2.5	< 5%
Government Disaster Payments or Loans			
Received	5	14%	
Not Qualified	12	34%	
Unaware	18	51%	
Reasons for Not Purchasing Crop Insurance			
Not Available for My Crop	17	1.3	
Major Source of Risk Not an Insured Cause of Loss	8	2.1	
Too Much Paperwork to Apply	5	4.8	
Never Lost Enough Production or Revenue to File Claim	6	3.8	
Premium Cost Too High	11	2.0	
Could Not Find Knowledgeable Insurance Agent	7	3.6	
Do Not Understand Crop Insurance Program	11	3.3	
Other	7	2.0	

continued on following page

Table Aq.3. Continued

	Observations (n)	Mean Ranking	Rate of Availability
Ranking of Suggestions to Modify Crop Insurance			
Compensate for a Higher Level of Production Loss	11	2.9	
Compensate for a Loss of Gross Sales	10	2.3	
Compensate for a Loss of Profit	9	2.0	
Guarantee Cash Production Costs	6	3.0	
Guarantee Costs of Establishing an Orchard or Vineyard	2	7.0	
Guarantee Replacement Costs of a Crop Inventory	11	1.6	
Other	17	1.6	

Table Aq.4. Financial Characteristics – Off-Farm Income Share (Percent), Gross Agricultural Sales, Assets, and Debts

	Observations (n)	Mean	Standard Deviation	Median
By Region				
Off-Farm Income Share	25	56%	40	48%
Gross Sales of Agricultural Products ($)	32	$776,274	$1,778,045	$300,000
Assets ($)	23	$5,357,832	$20,687,389	–
Debts ($)	23	$139,087	$218,406	–

APPENDIX 3
Survey Questionnaire

Risk Management Survey of Specialty Crop Producers
California – 2001 Crop Year

OMB No. 0563-0059
Approval Expires 02/05

1. How many acres are in your current farming operation? 001 *(whole number)* Acres

2. In what county was the largest value of your agricultural products produced? 002 County

3. How many years have you been farming/ranching? 004 Years

4. Please list MAJOR crops grown, acreage, and the approximate **percentage** of the total gross sales of each individual crop produced in 2001. (For nursery and greenhouse crops, please indicate if area is in square footage.)

Crop	Acreage	Percent of Total Sales
005	006	007 %
008	009	010 %
011	012	013 %
014	015	016 %
017	018	019 %
020	021	022 %

5. Did you produce any specialty crops as organic or transitional organic in 2001?

☐ YES - ***continue*** ☐ NO - ***go to Question 6***

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a. Please list the MAJOR organic or transitional organic crops grown in 2001.

Crop	Total Crop **Acres**	Organic **Acres**	Transitional **Acres**
024	025	026	027
028	029	030	031
032	033	034	035
036	037	038	039
040	041	042	043
044	045	046	047

* * * **INSTRUCTIONS:** * * * Questions 6-11 concern your **primary specialty crop**.
(The primary specialty crop is defined as the one with the highest percentage of sales.)

6. What is your primary specialty crop? 048

a. How much of your **primary specialty crop** is used for:

Processing	049 %
Fresh Market (include ornamentals)	050 %
	100%

b. What percentage of your primary **processed** specialty crop is marketed through the following outlets? *(If none, write zero.)*

1. Marketing cooperative	051 %
2. Sold to a processor under contract with a predetermined price	052 %
3. Sold to a processor under contract without a predetermined price	053 %
4. Spot market	054 %
5. Participation Plan	055 %
6. Other (specify): _____	056 %
	100%

7. If you produce for fresh market, are you a grower-shipper or a grower only?

☐ Grower-shipper - ***complete 7a, then go to Question 9*** ☐ Grower only - ***go to Question 8***

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a. What percentage of your volume is sold with a predetermined price *(negotiated with retail or food service buyers)*? . . . . . 058 %

8. If you are a grower only and produce for the **fresh market**, what percentage of your volume is delivered to the following marketing channels?

a. Directly to consumers *(farmers markets, roadside stands, U-pick)*	059 %
b. Marketing cooperative	060 %
c. Independent shipper/broker	061 %
d. Directly to commercial buyers *(wholesalers, retailers, restaurants)*	062 %
e. Other (specify): _____	063 %
	100%

9. What was your actual yield per acre for your primary specialty crop for each of the last five years? *(Please answer in whole numbers. If you do not remember exactly, provide approximate numbers.)* **Nursery/Greenhouses, please skip to question 10.**

Year	Actual Yield Per Acre	Unit	Unit Weight in Pounds
2001	064	065	066
2000	067	068	069
1999	070	071	072
1998	073	074	075
1997	076	077	078

10. For your primary specialty crop over the last five years, please indicate the largest fluctuation from your five-year average.

Item	*Check (✓) only 1 percentage range for each item.*				
	Less than 10%	10-24%	25-49%	50-74%	75-100%
a. Annual yield per acre	079	080	081	082	083
b. Annual average price	084	085	086	087	088
c. Profit *(after deducting production and marketing expenses from revenue)*	089	090	091	092	093

11. What was the **main** cause of your lowest profit from your primary specialty crop over the last five years?

	(Please check (✓) only 1 box.)
a. Poor yield per acre	094
b. Poor quality	095
c. High input costs	096
d. Low market price due to high domestic production	097
e. Low market price due to increased imports	098
f. Inability to market a crop due to quarantine	099
g. Other (specify): _____	100

*** * * REMAINDER OF THE QUESTIONS REFER TO YOUR ENTIRE FARM OPERATION * * ***

12. Please rank the following sources of risk in terms of their effect on your net farm income.

	(Rank according to: 1=most effect, 2=next in degree of effect, etc.)
a. Adverse temperature (heat, frost, etc.)	101
b. Floods	102
c. Drought	103
d. Disease	104
e. Irrigation water supply problems	105
f. Input price fluctuation	106
g. Output price fluctuation (low price/no market)	107
h. Pests (insects, wildlife, etc.)	108
i. Quarantine	109
j. Hail	110

13. Please rank the risk management tools in the order of your preference. Also, check the risk management tools available and those used.

Risk Management Tools	Preference Rank	Available	Used
	(Rank according to: 1=most preferred, 8=least preferred)	*(Please check (✓) all that apply.)*	
a. Crop insurance	111	112	113
b. Locating production in different regions	114	115	116
c. Diversification into multiple commodities	117	118	119
d. Government programs	120	121	122
e. Hedging with futures or options	123	124	125
f. Forward contracting	126	127	128
g. Diversified marketing	129	130	131
h. Other (specify): _____	132	133	134

14. Have you ever received government disaster payments or loans?

	(Please check (✓) only 1 box.)
a. Yes	150
b. No, I wasn't qualified	151
c. No, I am not aware of such programs	152

15. Have you purchased **any** crop insurance within the past five years?

☐ YES - ***continue*** ☐ NO - ***go to Question 18***

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a. How many of the last five years? . . . . . Years | 154

16. Have you purchased any **private** crop insurance for damage from:

	(Please check (✓) all that apply.)
a. Fire	155
b. Frost or freeze	156
c. Rain	157
d. Hail	158
e. Other causes (specify): _____	159
f. None	160

17. Please rank the reasons why you purchased crop insurance.

Reasons	*(Rank according to: 1=most important, 2=next most important, etc.)*
a. Risk of crop loss was high	161
b. Expected water supplies to be cut back	162
c. Insurance was required to qualify for other USDA programs	163
d. Expected to receive lower prices for my crops	164
e. Bank or other lender required insurance	165
f. Other (specify): _____	166

18. In the most recent year that you did not purchase crop insurance, please rank the reasons for not participating in a crop insurance program?

	(Rank according to: 1=most important, 2=next most important, etc.)
a. Not available for my crop	167
b. Major source of risk is not an insured cause of loss	168
c. Too much paperwork to apply	169
d. Have never lost enough production or revenue to file a claim	170
e. Premium cost is too high	171
f. Could not find a knowledgeable insurance agent	172
g. Do not understand the crop insurance program	173
h. Other (specify): _____	175

19. How could the crop insurance program better serve your needs?

	(Rank according to: 1=most important, 2=next most important, etc.)
a. Compensate for a higher level of production loss *(more than 75%)*	176
b. Compensate for a loss of gross sales	177
c. Compensate for a loss of profit	178
d. Guarantee cash production costs	179
e. Guarantee costs of establishing an orchard or vineyard	180
f. Guarantee replacement costs of a crop inventory	181
g. Other (specify): _____	183

	YES	NO
20. Has risk management become more important to your business in the last five years?	184	185
21. Are you more familiar with crop insurance than you were five years ago?	186	187

22. How many risk management education meetings or seminars have you attended over the last five years? Number	188
23. What percentage of your household's total income in 2001 was from non-farm activities? Percent	189
24. What was your total **GROSS** sales of all agricultural **commodities** in 2001? Dollars	190
25. What is the approximate current value of your operation's:	
a. Assets Dollars	191
b. Debts Dollars	192

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