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Cooperatives in California Agriculture



COOPERATIVES IN CALIFORNIA AGRICULTURE

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This report provides an overview of California agricultural cooperative activities in the mid-1980's. The study identifies 227 different cooperative businesses with a total of nearly 69,000 memberships in 1986. These organizations carry out a range of functions for their members, including processing, marketing, bargaining, and providing different services such as input supplies and insurance. In several subsectors, separate cooperatives perform services at different levels in the commodity vertical system. Growers often belong to more than one cooperative.

The activities of these cooperatives are analyzed by functions performed. Examples are given of cooperatives' involvement in the almond, cotton, and fresh and processed fruit sectors. Relationships between bargaining associations and marketing/processing cooperatives are described. Explanations are given for different patterns of cooperative involvement between industries.

Keywords: Cooperatives, California, agriculture, cooperative functions, bargaining associations, market shares

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Preface

Throughout this century, farmer-owned cooperatives have played important roles in the development of California's diverse agricultural economy. As different agricultural sectors have evolved, so have the extent and variety of cooperative activities. This report provides a comprehensive overview of the roles of cooperatives in the mid-1980's.

The study summarizes information obtained about 227 different cooperative businesses with combined memberships totaling nearly 69,000 active in California agriculture in 1986.^{1/} These organizations carry out a range of functions for their members, including processing, marketing, bargaining, and providing different services such as input supplies and insurance. Often, within a particular industry, several cooperatives carry out different functions or serve different groups of growers. The resulting organizational structures differ between industries and often create confusion for persons not directly involved.

The purpose of this study is to help those interested in California's agriculture to understand how different agricultural industries are organized and the roles of cooperatives.

There were two broad goals of the research for this report. The first was to provide descriptive explanations of the services that cooperatives are providing to growers in different industries. This required contacting all known cooperatives in the State and establishing the functions and services that each provides. The second goal was to examine how and why the nature and extent of cooperative activity differs between commodity sectors.

The research was conducted under a cooperative research agreement between the Agricultural Cooperative Service (ACS), U.S. Department of Agriculture, and California State University (CSU), Fresno. Dr. Charles A. Kraenzle, Director of ACS Statistics and Technical Services Staff, served as ACS coordinator for the project. At CSU, Dr. John W. Hagen provided information on the status of California's raisin industry. Dr. Juan C. Batista compiled data on the structure and role of cooperatives in the cotton industry. Special contributions in contacting cooperatives were made by research assistants Mrs. Janice Williams and Ms. Susan Corsey.

^{1/} Reported membership figures include growers who may belong to more than one cooperative.

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Highlights

Farmer-owned cooperatives have played important roles in the development of California's diverse agricultural economy throughout this century. Cooperatives are significant in most of the State's more than 250 crop and livestock commodities.

In 1986, 227 cooperatives were operating in California—204 marketing and 23 supply cooperatives—with nearly 69,000 memberships. (Growers often hold membership in more than one cooperative.) In several subsectors, different cooperatives perform services at different levels in the marketing system. Further, many California farms produce more than one crop.

Among the 204 marketing cooperatives, a number of services are provided. For example, 141 provide first-handler functions, 102 market domestically, and 36 are involved in export marketing. Fifty-seven perform transportation functions for members. Twenty cooperatives market byproducts. Thirteen cooperatives provide bargaining functions for members. Two of five cooperatives operate in the fruit and nut crops sector with nearly 33,000 memberships.

No cooperatives, however, are active in the nursery, cattle, chicken, and turkey subsectors.

Cooperatives' marketing shares vary by commodity. The share of almond hull marketing is estimated at 38 percent. About 47 percent of the almond production from 75 percent of the State's growers is handled by cooperatives performing processing and marketing functions.

Cooperative cotton gins process about 39 percent of cotton produced in the State. An estimated 80 percent of cotton growers who farm 46 percent of total cotton acreage belong to cooperative gins.

About 63 percent of the cotton handled by Calcot is ginned by cooperatives. Calcot and a few other cooperatives handle an estimated 47 percent of California cotton.

About 60 percent of California rice is dried by cooperatives, and about 70 percent is milled and marketed.

Only 2 percent of California hay, 4 percent of wheat and barley, and 5 percent of fresh table grapes are marketed by cooperatives.

The Raisin Bargaining Association (RBA) represents about 40 percent of all raisin growers. Combined, RBA and cooperative handlers represent about 74 percent of growers and about 78 percent of total tonnage.

Cooperatives play important roles in the processing fruit and tomato sectors. The combined shares of total production handled by cooperative canners and bargaining associations range from 70 to 95 percent for the processing cling peach, tomato, pear, and apricot subsectors.

Two multiple-commodity cooperatives, Tri/Valley Growers and Pacific Coast Producers, market some of California's most important agricultural products—processed cling and freestone peaches, pears, apricots, and tomatoes.

Interaction between cooperatives is found in the raisin, prune, fig,

rice, almond, citrus, and walnut sectors. Five cooperatives are members of Sun-Diamond Growers, which provides some functions as a marketing agency in common.

Bargaining associations negotiate with noncooperative handlers in a subsector. Typically, cooperative handlers refer to the negotiated price schedules for determining raw product values of member production. Recent developments indicate future cooperative handlers may also negotiate directly with their respective bargaining associations for delivery of product for further processing.

Interactions among cooperatives in the canning fruit and tomato sectors are complex. Growers may be members of a canning cooperative, bargaining association, or both.

Growers often have the option of joining more than one cooperative to obtain different services. When a grower produces more than one commodity, it's possible that one person will be a member of several cooperatives. Although cooperatives that operate at different levels are typically separate companies, considerable coordination takes place.

Seven characteristics of commodity sectors appear to be fundamental in explaining differences in the extent of cooperative involvement. Cooperative involvement will be higher when (1) a large investment is required for preprocessing and processing, (2) there are few growers with volumes large enough to capture processing economies of scale, (3) crop production requires fixed investments committed over several years, (4) the raw product can be stored before processing, or harvesting schedules can be adjusted, (5) useful grades can be defined and prices can be pooled over marketing periods, (6) costs of marketing can be spread over a longer season, and (7) growers make marketing decisions infrequently and/or cannot earn higher returns to justify costs of self-marketing.

Cooperatives in California Agriculture

David K. Smith ^{1/} and Henry N. Wallace ^{2/}

OVERVIEW

Agricultural cooperatives perform important roles in many of the more than 250 crop and livestock commodities produced commercially in California. Cooperatives are a form of business organization characterized by member-patron ownership and control; they are operated to provide services to patrons. In terms of understanding the roles cooperatives perform, Sexton and Iskow ^{3/} state that "...joint vertical integration is the economic essence of a cooperative. Stated in terms of a definition, agricultural cooperation represents coordination of producers to achieve mutual vertical integration." Growers have formed cooperatives to perform marketing functions and to purchase and supply production and marketing inputs.

The business volume of California cooperatives in 1987 exceeded \$6.4 billion or more than 40 percent of the State total. In terms of business volume, California cooperatives ranked first in the Nation in 1987. California cooperatives accounted for about 11 percent of the total volume of business done by cooperatives in the United States.^{4/} The extent and importance of cooperative activities in different sectors is indicated in table 1.

The study found 227 cooperatives with

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^{3/} Richard J. Sexton and Julie Iskow, Factors Critical to the Success or Failure of Emerging Agricultural Cooperatives. University of California, Division of Agriculture and Natural Resources, Giannini Foundation Information Series No. 88-3, June 1988, p. 3.

^{4/} Ralph M. Richardson and others, Farmer Cooperative Statistics, 1987, ACS Service Report 24, Agricultural Cooperative Service, U.S. Department of Agriculture, Washington, DC, April 1989, p. 41.

nearly 69,000 memberships in 1986. Table 1 gives the number of cooperatives and memberships by commodity grouping; it also distinguishes between two broad classifications, marketing cooperatives and supply cooperatives. Focus of the study was on functions performed by different cooperatives. Business dollar volumes are not reported due to difficulties in comparing values within and between sectors.^{5/}

Cooperatives in the marketing classification perform a variety of different functions, as discussed later. Among marketing cooperatives, the fruit and nut crops sector has the largest number

^{5/} ACS classifies cooperatives as marketing, supply, or service according to the primary dollar volume of business. In this study, we distinguish only between supply and marketing cooperatives. Marketing cooperatives are further categorized according to function (such as first-handler, processing, etc.) and not by dollar volume.

Table 1—California cooperatives, number of businesses and memberships, by commodity groupings, 1986

Sector/Grouping	Cooperatives		Memberships
	Number	Percent of total	Number
Marketing cooperatives			
Fruit and nut crops	96	42	32,625
Field and seed crops	67	30	13,967
Livestock and poultry	14	6	1,987
Flowers and nursery	2	1	30
Vegetables and strawberries	<u>25</u>	<u>11</u>	<u>778</u>
Total marketing cooperatives	204	90	49,388
Supply cooperatives			
Field and seed crops	2	1	1,960
Citrus production and packing	3	1	6,295
Flower growers' supplies	2	1	176
Dairy and poultry feed	3	1	690
Fertilizer manufacturer	1	1	1,500
General retail supply	<u>12</u>	<u>5</u>	<u>8,840</u>
Total supply cooperatives	23	10	19,461
Total	227	100	68,849

of organizations. Two out of five California cooperatives were in this category. The lowest number was in the nursery and flowers sector.

Membership numbers overstate the number of individual growers who belong to cooperatives because, in several subsectors, growers can belong to both a local first-handler or preprocessing cooperative and a marketing/processing cooperative. Examples would include cotton ginning, almond hulling, and fruit packing. Also, diversified growers may belong to more than one cooperative.

Table 1 also classifies by sector the 23 cooperatives for which the primary function was identified as providing supplies and services to growers. The large number of memberships indicated in the citrus production and packing category is due to the fact that each member of Sunkist Growers, Inc., Van Nuys, a citrus mar-

keting cooperative, is also a member of the affiliated—but separate—cooperative, Fruit Growers Supply Company, also headquartered in Van Nuys.

Also included in this category are two cooperatives that provide biological pest control services for citrus growers. The dairy and poultry feed category includes dairy feed supply cooperatives and one egg layer feed cooperative. As discussed in the next section, a number of marketing cooperatives also provide supplies and services in conjunction with other functions.

Cooperative Involvement in California's Top 20 Agricultural Sectors

As evidence of the importance of cooperative organizations in California, information about the cooperatives active in the State's top

Table 2—Cooperatives in California's top 20 agricultural subsectors, 1986

Subsector 1/	Share of State gross farm income	State's share of U.S. production	Cooperative function:		
			First-handler	Marketing/processing	Other 2/
	Percent			Number	
Milk and cream	14.0	12.1	4	8	Su(2)
Cattle and calves	9.0	5.1	-	-	-
Grapes, all	7.1	91.3			
Table grapes			-	3	-
Raisin			-	2	B
Wine			-	8	Sr,
Nursery products	5.3	77.6	-	-	-
Cotton	5.2	23.0	36	2	Su(2)
Hay	4.2	5.6	-	2	-
Flowers and foliage.....	3.8	28.6	-	1	Su(2),Sr
Lettuce	3.3	71.8		6	Sr
Almonds.....	3.1	100.0	13	3	-
Tomatoes, processing.....	2.7	87.7	-	3	B
Strawberries.....	2.6	77.3	-	3	-
Oranges	2.5	31.1	24	3	-
Eggs, chicken	2.4	11.4	-	2	Su
Chickens	2.2	5.1	-	-	-
Broccoli	1.5	97.3	-	2	-
Turkeys	1.4	11.2	-	-	-
Walnuts.....	1.3	99.2	3	1	B
Sugar beets	1.1	19.2	-	1	B
Peaches.....	1.0	61.4			
Canning.....	-	-	-	3	B(2)
Fresh	-	-	-	5	-
Potatoes.....	1.0	5.2	-	2	-
Total	74.7	-	80	60	16

1/ California Gross Farm Income and U. S. production shares from CDFA, *California Agriculture Statistical Review 1986*.

2/ Other codes: B=bargaining, Su=supply, Sr=service.

- No cooperative involvement.

20 agricultural subsectors is shown in table 2. An important dimension of cooperative activities is that different cooperatives operate at different levels within sectors.

Table 2 differentiates between "first-handlers" that provide intermediate processing before the product is marketed or processed by other firms and "marketing" cooperatives. The latter include processing, domestic and export marketing, and byproduct processing and marketing firms. The different functions and how cooperatives interact within different sectors' vertical structure are discussed more fully in later sections.

The largest numbers of cooperatives are in the cotton, almond, and citrus sectors, each of which includes several cooperatives at the first-handler level. Notably, there are no cooperatives active in the nursery, cattle, chicken, and turkey subsectors.

Marketing Cooperatives by Commodity Sector

A more detailed breakdown of the information on marketing cooperatives in table 1 is presented in table 3. The number of marketing cooperatives and memberships is given for individual commodities or groupings. In some cases, sectors have been grouped to avoid disclosing individual firm data. Totals will not correspond with table 1 because cooperatives that handle more than one commodity are counted in each and the number of members growing each has been estimated. Following are some highlights and notable points by sector or group.

Fruit and Nut Crops

Some 60 different fruit and nut crops are produced in California. Included are deciduous fruits, nuts, citrus and other subtropical crops, grapes, and small fruits, for example, berries. In many cases, California is the sole or leading State producing the commodity.

Nut Crops. Cooperatives are active in the almond, walnut, pistachio, and macadamia industries. Almonds are California's leading nut crop, ranking ninth in the total value of production in 1986. Active in this industry are 16 cooperatives with 6,500 memberships. Thirteen of these cooperatives provide hulling services for members. As discussed later, almond growers who belong to a local hulling cooperative may

also belong to the major marketing cooperative, Blue Diamond Growers, Sacramento. Six cooperatives, with 2,850 members, operate in the walnut, pistachio, and macadamia industries.

Dried Fruits. California supplies virtually the entire U. S. production of the major dried fruits—raisins, prunes, figs, apricots, pears, and dates. Cooperatives are active in each of these industries, except dates. The important feature of this category is Sun-Diamond Growers of California, Pleasanton. Sun-Diamond is a federated cooperative which markets raisins, prunes, figs, and other dried fruits for separate cooperatives in each sector. More will be said about this organization later.

Processed Fruits. The major canning fruits

Table 3—California marketing cooperatives and memberships, by commodity grouping, 1986

Commodity grouping	Cooperatives handling	Memberships
		Number 1/
<u>Fruit and nut crops</u>		
Almonds	16	6,500
Walnuts, pistachios, macadamias	6	2,850
Avocados and olives	6	4,207
Citrus	31	9,435
Dried figs, prunes, raisins	9	5,223
Fresh: peaches, pears, plums, nectarines, table grapes, others	12	1,035
Wine	9	1,438
Processing: apples, pears, peaches, apricots	9	1,818
<u>Field and seed crops</u>		
Dry beans	8	1,584
Cotton	38	5,428
Grain and seed crops	7	1,544
Hay	2	947
Rice	8	3,478
Other (potatoes, sugar, misc.)	6	1,101
<u>Livestock and poultry</u>		
Dairy processing 2/	7	1,511
Eggs and poultry	3	61
Sheep and Wool	2	415
<u>Flowers and nursery</u>		
Flowers	2	30
<u>Vegetables and strawberries</u>		
Lettuce, broccoli	8	58
Strawberries	3	107
Tomatoes, processing and fresh	5	547
Misc. vegetables	11	247

1/ Totals will not correspond with table 1 because cooperatives that handle more than one commodity are counted in each category and the numbers of memberships in multiple-commodity cooperatives have been estimated for each crop.

2/ Does not include shipping associations.

in California are cling peaches, Bartlett pears, and apricots. Two major centralized fruit canning cooperatives process and market these commodities (as well as processing tomatoes). Each of these sectors also has active bargaining cooperatives involved in marketing and price negotiation with noncooperative processors for member growers. One cooperative processes apples. Of the nine cooperatives active in the wine industry, eight crush grapes and make wine, and one cooperative provides storage and shipping consolidation services for small wineries.

Subtropical Fruits. Oranges and other citrus, avocados, and olives are the primary subtropical fruits produced in California. Cooperatives operate at four levels in the citrus sector. Twenty-eight of the 31 cooperative packing houses assemble, grade, and pack fresh citrus (table 3). Most but not all of these are affiliated with Sunkist Growers, which provides marketing and byproduct processing services. One cooperative, whose members are cooperative and noncooperative packing companies, processes juice. Cooperatives are also involved in providing supplies and services to citrus growers. In the avocado and olives sectors, there are two marketing/processing cooperatives and one bargaining association in each.

Field and Seed Crops

The leading field crops produced in California, ranked by value of production, are cotton, hay, sugar beets, potatoes,^{6/} wheat, and rice. Ranked by acreage, the five leading field crops grown in California are hay, cotton, wheat, barley, and rice. Cooperatives play relatively small roles in the grain and hay sectors, but are very important in the sugar beet, rice, and cotton sectors.

A sugar beet bargaining association negotiates with handlers on price and terms of trade on behalf of essentially the entire industry. A cooperative sugar mill also operates in California. In the rice sector, six cooperatives provide drying and storage services, and two dif-

^{6/} Potatoes are typically classified as vegetable crops, but California Agricultural Statistics Service aggregates potatoes within the field and seed crops category.

ferent cooperatives perform milling and marketing functions. In the cotton sector, there are 36 cooperative gins, a major lint marketing cooperative, a cottonseed processing and marketing cooperative, and a cooperative which specializes in handling cottonseed for planting by its members.

Livestock and Poultry

Milk and cream and cattle and calves are the two leading commodity sectors in California in terms of value of production. Eggs, chickens, and turkeys are among the top 20 sectors. Seven cooperatives process milk. Three of these jointly own a cooperative marketing company. In 1986, four shipping associations were in operation. These cooperatives consolidate members' milk deliveries to noncooperative handlers for recordkeeping purposes under the State's milk pooling laws. Three of these cooperatives ceased operations in 1987, but one new one was formed so that two were operating in 1988.

No marketing or supply cooperatives operate in the cattle and calves sector. The California Cattlemen's Association, Sacramento, is a service group. In the egg sector, two are marketing cooperatives. One poultry-processing cooperative specializes in squab and specialty birds.

No cooperative processors operate in the chicken or turkey sectors. One cooperative markets lamb. The California Wool Growers Association, Sacramento, is a cooperative that markets wool and provides supplies for its members.

Flowers and Nursery

Nursery products and flowers and foliage are both sectors among the top 20 in California. No cooperatives are in the nursery products sector. Two cooperatives are involved in the fresh flower sector. One markets members' flowers. The other is a service cooperative that operates a flower market facility for shippers.

Vegetables and Strawberries

Eight cooperatives market lettuce for member growers. Two of these also market fresh broccoli. In the strawberry sector, three cooperatives market fresh berries. Two of these also operate freezing plants. Four cooperatives are

involved in the processing tomato sector—three operate canneries and one is a cooperative bargaining association. One cooperative packs and markets fresh tomatoes for members. Among other cooperatives in the vegetable sector, two market fresh potatoes, two handle sweet potatoes, and a bargaining association negotiates for members who grow cornnuts, pickling cucumbers, and chile peppers. One cooperative processes and markets horseradish. No cooperatives operate in the cantaloupe and other melon sectors.

FUNCTIONS PERFORMED BY CALIFORNIA MARKETING COOPERATIVES

Most cooperatives in California would be broadly classified as “marketing” cooperatives. However, to appreciate more fully the roles performed by cooperatives, it is necessary to distinguish among different activities that are carried out at successive levels in the vertical channel in the overall process of (a) converting raw farm products into various product forms and (b) pro-

viding these at the times and places that users and consumers demand.

The functions involved include assembling, grading and sorting, processing in different amounts, packaging and distributing, marketing, and various related activities that facilitate the marketing process. Some cooperatives specialize in one or a set of closely related functions, while others provide a wider set of services for members.

Table 4 shows the number of marketing cooperatives performing particular functions. Cooperatives primarily involved in supplying production inputs to members are not included. Most cooperatives perform more than one of the functions indicated. Terminology varies between sectors, and therefore the functions performed by each cooperative were classified into general functional categories. These categories are now discussed.

First-Handler

Two-thirds of the cooperatives included in

Table 4—Functions performed by California marketing cooperatives, 1986

Function	Fruit and nut crops	Field and seed crops	Livestock and poultry	Vegetables and melons	Flowers and nursery	Total
	<i>Number</i>					
Cooperatives	96	67	14	25	2	204
	<i>Number performing function 1/</i>					
First-handler	64	59	2	15	1	141
Processing	27	6	10	5	—	48
Marketing, domestic	39	32	8	22	1	102
Marketing, export	20	9	2	5	—	36
Marketing, byproducts	16	4	—	—	—	20
Transportation	19	27	9	2	—	57
Supplies	16	28	3	3	—	50
Services	24	24	4	6	1	59
Bargaining	9	1	—	3	—	13
	<i>Percent performing function</i>					
First-Handler	67	88	14	60	50	69
Processing	28	9	71	20	—	24
Marketing, domestic	41	48	57	88	50	50
Marketing, export	21	13	14	20	—	18
Marketing, byproducts	17	6	—	—	—	10
Transportation	20	40	64	8	—	28
Supplies	17	42	21	12	—	25
Services	25	36	29	24	50	29
Bargaining	9	1	—	12	—	6

1/ Most cooperatives perform several functions.

- No cooperative involved.

table 4 perform the first-handler function. Cooperatives have been classified as performing this function when a cooperative receives a product from a grower and either (1) assembles, sorts, and markets without processing or (2) performs intermediate processing.

Examples of the first case include cooperatives handling fresh fruit and vegetables and milk shipping associations. In other cases, the farm-level raw product requires intermediate processing or preprocessing, which is performed near the farm point of production.

Examples of intermediate processing would include cotton ginning, almond hulling, rice and prune drying, and citrus and fresh fruit packing. In these sectors, groups of growers have formed cooperatives to provide the "first-handler" functions. These cooperatives may provide marketing services, or the product may be passed to another firm for processing and marketing.

Cooperatives performing the first-handler function typically also provide a range of other related member services such as transportation, the purchase of fertilizer and other input supplies, and, in some cases, group insurance programs.

Alternative providers of assembly and intermediate processing functions include non-cooperative firms and individual growers themselves. As individual farm size increases, it is not uncommon for a grower's scale of operation to enable capturing economies of size in processing, especially when the volume handled is augmented by providing for other growers.

Processing

Cooperatives that operate processing facilities have been classified as providing this function. The farm-level raw product may be received directly from growers, for example, milk and canning fruits and tomatoes, or from a first-handler after intermediate processing. Examples include fruit and vegetable canning, dried fruit and nut processing, and rice milling. In some cases, the raw-farm product involves a joint product that requires processing, such as lint cotton and cottonseed, or a byproduct such as citrus juice.

The significant economies of scale usually associated with processing operations generally require the production volume of many growers.

Thus, cooperatives involved in processing tend to have many members and to process large volumes. The largest and most well-known cooperatives in California are typically involved in processing and marketing.

Marketing

Of the 204 cooperatives included in table 4, one-half carry out such marketing functions as packaging, distribution and storage, sales, and market development in domestic markets. Of these, 36 cooperatives are also involved in export marketing. In terms of the functional breakdown used in table 4, it is important to note that, in most cases, these firms also carry out first-handler and/or processing functions.

Byproduct Marketing

Twenty cooperatives are involved in marketing byproducts. In the fruit and nut crops sectors, among the 16 cooperatives that market byproducts, 11 are almond hullers and 2 specialize in marketing almond hulls for cooperative and noncooperative hullers. One raisin processor also operates a distilling plant for raisins.

Two cooperatives process oranges and market orange juice. One is primarily a fresh-citrus marketing firm that also processes; the other is a specialized juice processor whose members include cooperative and noncooperative packing companies. The four byproduct marketing cooperatives in the field and seed crop sectors include two rice millers, one cottonseed processor, and one cotton gin that markets cottonseed for livestock.

Transportation

Often, cooperatives, especially those performing first-handler functions, operate transportation and handling equipment used for hauling growers' production from the farm to processing or assembly points. Fifty-seven cooperatives, or 3 out of 10, perform transportation functions for grower members. This function is typically provided by first-handlers or processors. Examples include loading and trucking equipment operated by almond hullers, module handling equipment by cotton gins, and milk hauling by dairy processing cooperatives.

Supplies

A number of marketing cooperatives provide input purchasing and supply functions for members. These are primarily first-handlers who purchase fertilizer and other inputs for members. Other examples include some dairy and egg cooperatives that provide feed and other services. These are not primary functions of these cooperatives. The combined values of input supply business conducted by marketing cooperatives and the specialized supply cooperatives that operate in the State is small compared with the volume of business marketed by cooperatives. Of the \$6.4 billion business volume handled by California cooperatives in 1987, \$281 million, or only 4.4 percent, came from the input supply business.^{7/}

Services

Cooperatives counted as providing services include both specialized service cooperatives and those cooperatives whose primary functions are marketing and processing. They also provide services such as group insurance programs for members. Examples of specialized service cooperatives include a cooperative that provides market information for lettuce shippers and a group of flower shippers who cooperatively operate market facilities.

Bargaining

Thirteen bargaining associations operate in California. The roles of these cooperatives are discussed later.

STRUCTURAL ORGANIZATION OF COM-MODITY SECTORS

Another perspective on the role of cooperatives in California agriculture is available by examining how cooperatives relate to one another and to other firms within a particular sector. Given the diversity of California's agriculture, a number of different organizational relationships exist. Three of particular importance are (1) separate cooperatives handling a commodity at dif-

ferent levels within a sector, (2) cooperatives that handle more than one commodity and thus operate across sectors, and (3) concurrent operations of marketing/processing cooperatives and bargaining associations within a particular sector. The purpose of this section is to discuss and provide examples of each. After describing examples of the three types of relationships, trends and issues are considered in each case.

Cooperatives at Different Levels Within a Sector

As previously discussed, different cooperatives perform different functions within several sectors. The almond industry provides a particular example. Similar relationships between cooperatives also exist in the cotton, fresh fruit and citrus, rice, and prune industries.

Almonds

Almonds, when harvested, have a soft outer hull that is removed by "hullers." The hulls are a byproduct marketed for livestock feed. After hulling, the in-shell nuts may move directly into consumer channels via cooperative or noncooperative sellers, or the in-shell nuts are further processed. For most of the nuts, the shells are removed and the nut meats are graded, processed, and prepared for marketing. The shells are another byproduct that is either sold for charcoal briquet manufacturing or is burned in electricity cogeneration plants.

About 16 percent of almond growers are members of one of 13 hulling cooperatives in the State. These cooperatives handle an estimated 16 percent of the State production, mostly members' production with a small amount of non-member volume. To lengthen the hulling season, some almonds are piled onfarm and can be fumigated and stored for a short time before being hulled. As a service to members, some huller cooperatives supply tarpaulins, fumigation supplies, loading and transportation equipment, as well as fertilizer and other inputs.

Some huller cooperatives also shell almonds, handle other nuts, and carry out other processing and marketing functions. It is important to note that growers typically have several options for obtaining hulling services, including noncooperative hulling companies. Growers who operate their own hullers are not uncommon and often provide custom hulling services

^{7/} Ralph M. Richardson and others, *Farmer Cooperative Statistics, 1987*, ACS Service Report 24, Agricultural Cooperative Service, U.S. Department of Agriculture, Washington, DC, April 1989, pp. 40-41.

for neighboring growers.

Of the 13 almond hulling cooperatives, 11 market hulls. The other two hullers that do not sell their own hulls belong to specialized hull marketing cooperatives. These also handle hulls for noncooperative hullers. The combined share of total hull marketing by cooperatives is estimated at 38 percent.

From the huller, if the grower is a member of Blue Diamond Growers (BDG), a cooperative processing and marketing firm, the in-shell nuts (or nut meats if the huller also shells) are transferred to BDG. A few almond hulling cooperatives only handle nuts for growers who belong to BDG, but most provide the hulling service and prepare the nuts for transfer to any handler that the grower specifies. BDG receives nuts from both cooperative and noncooperative hullers, depending upon where members choose to have their nuts hulled. BDG and other cooperatives that perform processing and marketing functions handle about 47 percent of almond production, which comes from 75 percent of the State's growers.

Cotton

Cooperatives operate in four aspects of the cotton sector. Thirty-six cooperative gins process a combined share of about 39 percent of cotton produced in the State. Other cotton gins in the State are operated by noncooperative cotton marketing firms or large growers. Cooperatives tend to provide ginning services for small-volume growers. An estimated 80 percent of growers, farming 46 percent of total cotton acreage, belong to cooperative gins.

After ginning, marketing of lint cotton may be handled either by Calcot, Ltd., Bakersfield, a cooperative, or by the grower through brokers or noncooperative cotton marketing companies. About 63 percent of the cotton handled by Calcot is ginned by cooperatives. Thus, a grower may belong to a cooperative gin, Calcot, or both. Calcot and a few gins that also market cotton for members handle an estimated 47 percent of California cotton.

Cottonseed is processed into oil and meal products and sold as a cattle feed. Ranchers Cotton Oil, Fresno, is a cooperative oilseed processor and merchandiser of bulk cottonseed for cattle feed. Cottonseed oil mill cooperatives are

traditionally organized as federated cooperative gins. Hence, gins, rather than growers, are members of Ranchers, but the board of directors are mostly growers from the member gins. Of the 33 gins that belong to Ranchers, 29 are cooperatives.

The fourth aspect of the cotton sector with significant cooperative involvement is planting seed. California Planting Cotton Seed Distributors, Bakersfield, is a cooperative involved in seed development and preparation and distribution of over half the cottonseed used for planting in the State.

Fresh Fruit and Citrus

Cooperative involvement in this sector is at two levels. First, packing houses receive fruit from growers, grade, sort, pack the fruit, and provide short-term storage. Four cooperative packing companies handle fresh peaches, nectarines, and/or plums; six pack fresh pears. Packed fruit may be marketed by the packing cooperative, or the fruit may be sold by cooperative or noncooperative agents. Blue Anchor, Inc., Sacramento, is a cooperative marketing company whose members include both cooperative and noncooperative packing companies that pack fresh fruits.

Similar relationships exist in the citrus sector. Oranges, lemons, and other citrus are graded and packed by cooperative and noncooperative packing companies. Twenty-eight cooperatives are citrus packing, and two are citrus marketing. Fruit from 25 of the 28 cooperative packing houses is marketed through Sunkist Growers. Sunkist also markets fruit for noncooperative packing companies. Through Fruit Growers Supply Company, a separate but affiliated supply cooperative, grower members of Sunkist obtain production inputs and harvesting supplies, and affiliated packing companies obtain packing materials, other supplies, and a range of services. Sunkist processes and markets processed citrus products.

Central California Citrus Producers, Lindsay, which also processes and markets citrus products, is a cooperative whose members are noncooperative packing companies.

Rice and Prunes

Both rice and prunes are harvested at high moisture levels and must be dried soon after harvest, before storage and subsequent processing and marketing. In both industries, cooperatives are involved at the first-handler level and at the processing and marketing levels. In the rice sector, six first-handler cooperatives dry and store paddy rice for members. At the member's direction, the rice then is moved to either of two marketing cooperatives or noncooperative companies that mill and market rice. The two marketing cooperatives also operate rice dryers which serve members who do not belong to separate rice drying cooperatives or operate their own dryers. It is estimated that about 60 percent of California rice is dried by cooperatives, and about 70 percent is milled and marketed by cooperatives.

At the first-handler level in the prune sector, cooperative dehydrators receive and dry members' fruit, which then goes only to Sunsweet Growers Inc., Yuba City, a processing and marketing cooperative. Local dehydrators are operated by Sunsweet Dryers, Yuba City, a separate cooperative

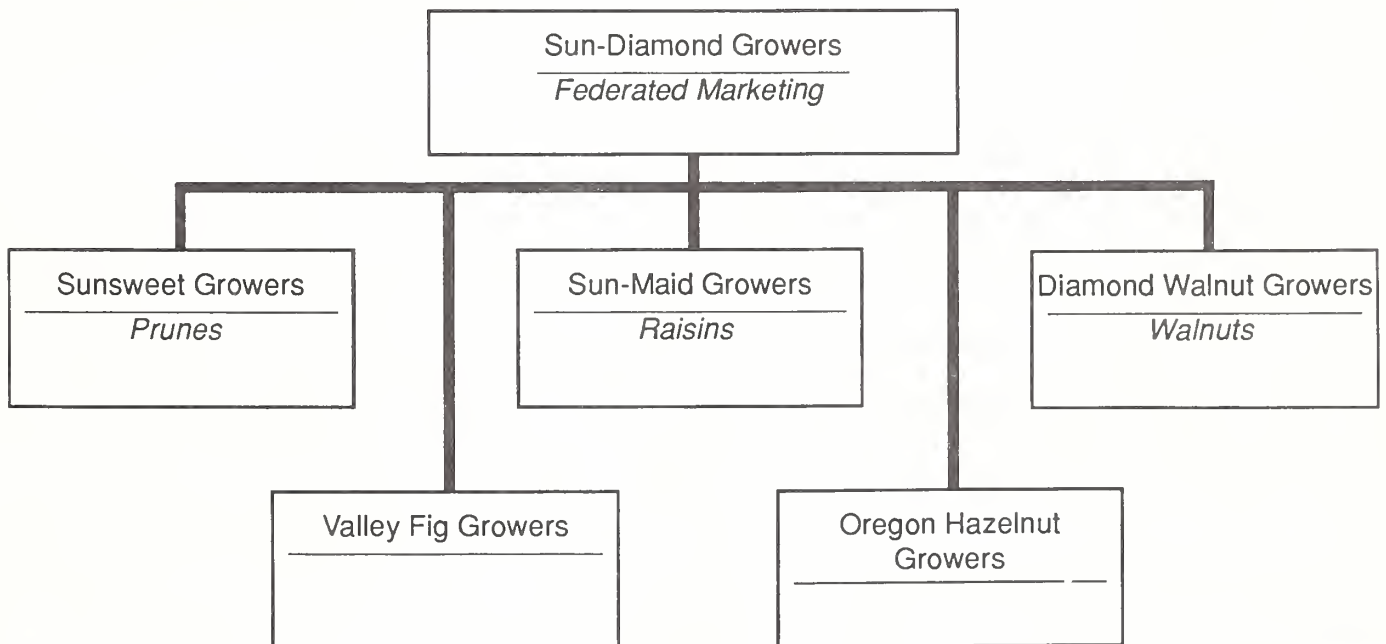
from Sunsweet Growers. The marketing cooperative also receives dried prunes from members who operate their own dryers or have their fruit dried by noncooperatives.

From the above, two points are evident. First, several agricultural commodities pass through successive stages served by different cooperatives. And, second, distinctions can be made with respect to the relationships between cooperative first-handlers and the cooperatives that process and market the commodity. In the rice subsector, for example, the ties between cooperative dryers and marketing organizations are far less rigidly defined than the relationship between Sunsweet Dryers and Sunsweet Growers, Inc.

Multiple-Commodity Cooperatives

In California, fruit and vegetable canning and dried fruit marketing provide important and interesting cases of interactions among cooperatives involved in processing and marketing different commodities. The cooperatives involved are among the oldest and largest in the State and play central roles in the sectors involved.

Figure 1—Federated Cooperative Relationships



Fruit and Vegetable Canning

Processed cling and freestone peaches, pears, apricots, and tomatoes are among California's most important agricultural products. Two cooperatives market all of these commodities. One cooperative specializes in canning only cling peaches. The other one specializes in tomato processing.

There are two multiple-commodity cooperatives in California: Tri/Valley Growers (TVG), San Francisco, and Pacific Coast Producers, Santa Clara. Both are centralized cooperatives and compete in their product markets with both noncooperative firms and each other. The primary processed products are cling peaches, pears, apricots, and tomatoes. TVG also processes olives through its Oberti division. Members may produce more than one of the commodities handled.

The other important dimension of cooperative interaction involves cooperative bargaining associations. The interactions between market-

ing/processing and bargaining cooperatives that are active in the peach, pear, apricot, tomato, and olive sectors are very important dimensions of these sectors.

Dried Fruit and Nut Marketing

The second example of interactions between cooperatives involves those that handle important shares of production in the raisin, prune, fig, and walnut sectors. Figure 1 portrays the interactions among cooperatives through Sun-Diamond Growers, a federated marketing cooperative.

Individual growers in each sector belong to the respective cooperative: Sun-Maid Growers, Kingsburg, for raisins; Sunsweet Growers, Inc., Yuba City, for prunes; Valley Fig Growers, Fresno, for figs; and Diamond Walnut Growers, Inc., Stockton, for walnuts. These cooperatives, along with the Hazelnut Growers of Oregon, Cornelius, another cooperative, formed Sun-Diamond Growers in 1980 to perform joint marketing, financial, and other services for the individual cooperatives. Since 1988, some functions have been decentralized, and the role of Sun-Diamond has been modified from being a federated cooperative that superseded the member cooperatives to a role as marketing agency in common.

Bargaining and Marketing/Processing Cooperatives

The coexistence of cooperative bargaining associations and marketing/processing cooperatives in some sectors is a unique and sometimes confusing aspect of cooperative involvement in several California agricultural sectors. As shown in table 5, bargaining associations are active in 13 sectors. The table includes the numbers of bargaining association members in 1986 and the number of cooperative and noncooperative handlers in each sector.

Bargaining cooperatives differ from marketing/processing cooperatives in that bargaining cooperatives typically do not physically handle the product. Bunge ^{8/} differentiates between

Table 5—California bargaining associations, 1986

Sector	Memberships	Growers	Cooperative handlers	Noncooperative handlers
	Number	Percent	Number	
Asparagus ^{1/}	10	-	-	-
Sugar beets	1,000	99	1	3
Cling peaches	550	78	3	7
Freestone peaches	125	32	1	<u>2/</u> 1
Pears	300	70	2	<u>2/</u> 10
Apricots	250	73	3	<u>2/</u> 4
Olives	285	30	2	8
Walnuts ^{3/}	200	2	1	70
Avocados ^{4/}	600	17	2	45
Prunes	80	5	1	15
Processing tomatoes	350	58	3	22
Processing vegetables ^{5/}	100	-	0	6
Raisins	2,100	40	2	19

^{1/} Association provides marketing and pricing information for 10 fresh asparagus shippers.

^{2/} Indicated numbers of handlers are canners. Associations also market members' production to other uses (juice, freezers, and dryers).

^{3/} Association provides information for members and does not bargain for members with handlers.

^{4/} Association provides marketing and pricing information.

^{5/} Association negotiates for members' production of three commodities: corn nuts (one handler), pickling cucumbers (one handler), and chili peppers (four handlers).

^{8/} Ralph B. Bunge, Cooperative Farm

Bargaining and Price Negotiations, Cooperative

Information Report No. 26, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture, Washington, DC, July 1980, pp. 46-48.

bargaining or sales agents and market service associations that provide market information for members. The asparagus, walnut, and avocado associations provide market information. The other bargaining associations typically have exclusive marketing contracts with their members to negotiate contracts with handlers on behalf of their members. These contracts specify price schedules, payment terms, and other terms of trade.^{9/}

Generally, bargaining associations deal with the noncooperative handlers in a sector. Typically, cooperative handlers refer to the negotiated price schedules for determining raw product values of member production.

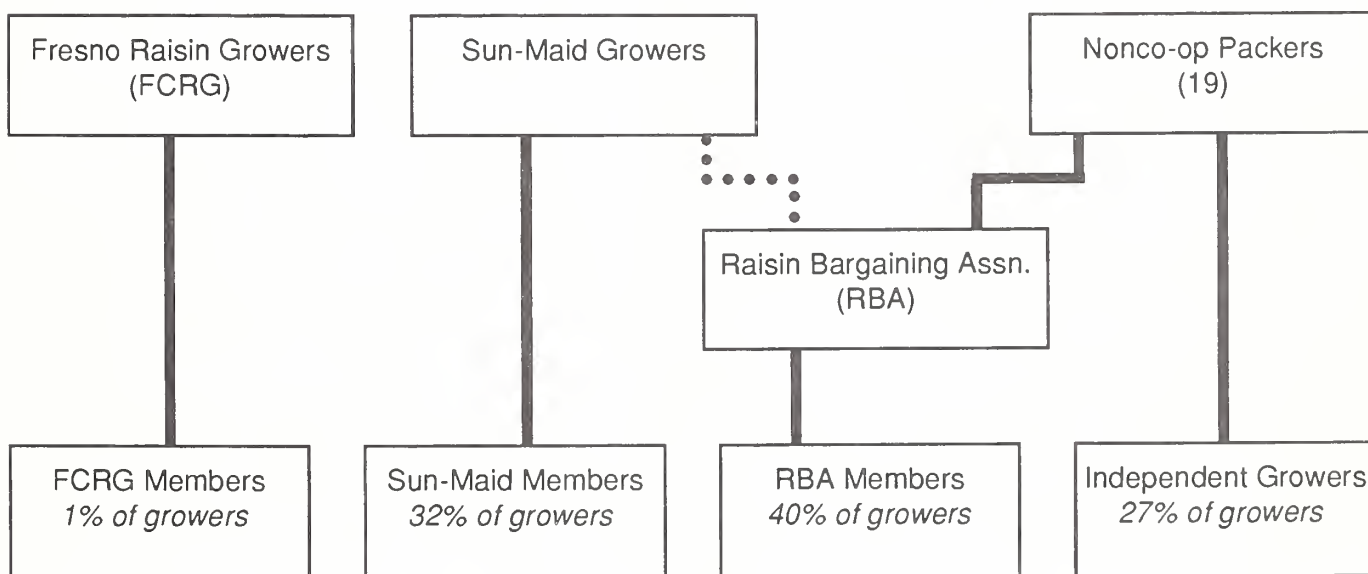
Raisin Sector

As an illustration of basic sector relationships, figure 2 portrays relationships in the

^{9/} For legal details on exclusive marketing contracts, see Charles R. Knoeber and David L. Baumer, "Guaranteeing a market and the contracts of bargaining cooperatives," *Journal of Agricultural Cooperation*, 1:1-10, 1986.

raisin industry. Sun-Maid Growers and Fresno Cooperative Raisin Growers (FCRG), Fresno, are cooperative processing and marketing companies that have exclusive marketing contracts with their members. In 1986, the Raisin Bargaining Association (RBA) represented about 40 percent of all raisin growers. Combined, RBA and the cooperative handlers represented about 74 percent of growers and about 78 percent of total tonnage. The RBA negotiates on behalf of its members for price and trading terms with 19 noncooperative raisin packers. The field price schedule negotiated by RBA serves as an industry benchmark for sales by independent growers. Historically, cooperative handlers have recognized the RBA field price in their raw product value determination, but the only formal interaction between the RBA and cooperative handlers has been through representation in the industry's State and Federal marketing orders. Relationships among cooperative handlers and bargaining associations are similar in the raisin, olive, and prune industries.

Figure 2—Bargaining and Processing Cooperative Relationships



Processing

Cooperatives play important roles in the processing fruit and tomato sectors. Combined shares of total production handled by cooperative canners and bargaining associations range from 70 to 95 percent for the processing cling peach, tomato, pear, and apricot sectors.

Interactions among cooperatives in the canning fruits and tomato sectors are complex.

Growers may be members of a canning cooperative, bargaining association, or both. Freestone peaches, apricots, and pears have multiple uses including fresh, canning, freezing, drying, and juice. Fruit marketed through fresh channels may be handled by either cooperative or noncooperative packers. Growers of canning peaches, pears, apricots, and tomatoes who belong to a canning cooperative may also belong to a bargaining association which markets the production that the processing cooperative does not take. Tomato canning cooperatives contract with members for specified tonnages.

Growers who do not belong to a cooperative canner, and those with production in excess of their membership tonnage commitments, may join the bargaining association. The associations negotiate contracts with noncooperative handlers and also, in some cases, with cooperative handlers when the latter purchase nonmember production. The price schedules and contract terms negotiated for bargaining association members typically are a benchmark for the entire industry.

Summary and Issues

From these examples of cooperative interaction, it is possible to make some generalizations and identify areas that merit additional research.

First, growers often have the option of joining more than one cooperative to obtain different services. Also, when a grower produces more than one commodity, it is possible that one person will be a member of several cooperatives.

Second, although cooperatives that operate at different levels are typically separate companies, it is clear that considerable coordination takes place. The formal and informal communications channels and coordination mechanisms within and across sectors, especially in the light

of growers' multiple memberships, merit additional study. Especially interesting would be comparative analyses of alternative organizational structures between first-handlers and marketing cooperatives, such as between almond hullers and BDG versus the relationship between Sunsweet Dryers and Sunsweet Growers.

The third observation is that future changes in the number and volume of cooperatives are especially likely to occur in sectors where first-handler functions are involved. This follows from the fact that growers typically have several alternatives to cooperatives. As the scale of farming operations gets larger, more growers may perform first-handler operations themselves. Changes in product handling, processing, or distribution (for example, field packing) that lower the scale of efficient processing will increase the likelihood of farmers' doing their own packing and marketing.

A final observation relates to relationships between bargaining and marketing/processing cooperatives. A recent development in the raisin industry is that, in 1988, Sun-Maid Growers became an RBA-affiliated handler and thus will negotiate as a handler with RBA for purchases of raisins produced by RBA members. The practice of purchasing part of raw product supplies from nonmembers has precedents in the canning peach and tomato sectors. Market supply coordination is increasingly important, especially for marketing/processing cooperatives with markets for established branded products. In the future, relationships between bargaining associations and marketing/processing cooperatives are likely to be increasingly important to the extent that cooperative handlers adopt policies of regularly supplementing limited membership volume with raw product purchases from nonmembers.

EXPLANATIONS FOR DIFFERENCES BETWEEN COMMODITY SECTORS

Cooperatives market and process significant shares of California production in a number of important sectors. This part of the report focuses on factors that determine differences between commodity sectors to help answer two general questions: (1) Will the extent of current cooper-

ative activities contract or expand in the future? (2) Are there sectors where additional cooperative involvement can be expected?

Case-by-case analyses of these questions are beyond the scope of this study. The recent report by Sexton and Iskow focuses on characteristics of successful new cooperatives and addresses the second question.^{10/}

The goal here is to identify broad characteristics of sectors that appear important for assessing prospects for future cooperative involvement. The basic conclusion is that cooperatives may not be uniformly suited for various functions in all sectors.

Table 6 reports estimated percentages for cooperatives of the number of growers and the total volume produced in selected industries. The discussion is restricted to consideration of marketing/processing cooperatives and does not deal with cooperative involvement in supply and service activities. In some cases, cooperative shares could not be estimated due to data limitations. In other cases, shares are not reported to avoid disclosing individual firm data. Some sectors are not shown in table 6 because of little or no cooperative involvement. This includes such sectors as cantaloupes, broiler chickens, and turkeys. Clearly, the extent of cooperative activity varies considerably among sectors.

Conceptually, it should be possible to explain differences between sectors by generalizing from a number of case-by-case analyses of individual cooperatives and particular sectors. Sexton and Iskow ^{11/} recently have provided a detailed discussion of five possible sources of economic gains that growers might obtain from vertical integration by participating in a cooperative. These sources are: (1) A cooperative may return savings to members if it is possible to

^{10/} Richard J. Sexton and Julie Iskow, Factors Critical to the Success or Failure of Emerging Agricultural Cooperatives. University of California, Division of Agriculture and Natural Resources, Giannini Foundation, Information Series No. 88-3, June 1988.

^{11/} Richard J. Sexton and Julie Iskow, Factors Critical to the Success or Failure of Emerging Agricultural Cooperatives. University of California, Division of Agriculture and Natural Resources, Giannini Foundation, Information Series No. 88-3, June 1988, pp. 2-18.

operate at lower costs than noncooperative alternatives, including individual grower vertical integration. (2) Cooperatives may counter market power of noncooperative marketing alternatives. (3) Marketing cooperatives may be able to differentiate their products on the basis of quality or supply assurances and thus earn a premium return for members' production. (4)

Cooperatives may in some cases reduce the risks facing grower members by operating buffer stock programs, or pooling returns across diversified products. (5) In some cases, cooperatives may successfully provide services that noncooperative firms will not.

One approach for explaining why cooperative activity differs among sectors would be to

Table 6—Cooperative involvement in selected California agricultural sectors, percentage shares of growers, and total volume produced, 1986

Selected commodities	Cooperatives	Cooperative	Share 1/
	Number	growers	volume
		Percent	
<u>Fruit and Nut Crops</u>			
Almond hulling	13	16	26
Almond nut marketing	2	75	47
Prune dehydrators	2	36	41
Prune marketing	1/2	46	61
Fresh table grapes	3	2/	5
Raisins	1/3	73	78
Wine grapes	8	2/	11
Fresh peaches, plums, nectarines	5	2/	10
Canned cling peaches	1/4	91	92
Avocados	1/3	55	53
Olives	1/3	48	70
Citrus packing	28	3/	3/
<u>Field and seed crops</u>			
Cotton ginning	36	2/	39
Cotton lint marketing	2	2/	47
Rice drying	6	2/	61
Rice marketing	3	70	70
Hay	2	2/	2
Wheat and barley	4	2/	4
Dry beans	8	2/	60
Sugar beets	1/2	2/	99
<u>Vegetable and strawberries</u>			
Lettuce	8	2/	6
Processing tomatoes	1/4	90	91
Strawberries	3	2/	22
<u>Livestock and Poultry</u>			
Dairy processing	7	60	58
Eggs	2	2/	8

1/ Number and share figures include bargaining associations.

2/ Data not available.

3/ Not estimated due to variable proportions of navel and valencia oranges, lemons, and other citrus handled by different cooperatives.

attempt to define measures of these five economic factors and quantify differences in the measures between sectors. In part due to the difficulty in defining comparable measures for so many diverse sectors and circumstances, this approach is not pursued in this study. More importantly, these factors are relevant primarily to the question of whether a particular cooperative can be successful, rather than the broader questions of individual firms' shares of total sector volume and the shares of several cooperatives operating simultaneously within a sector.

In general, whether growers in a sector form cooperatives, and the proportion of production that is handled by cooperatives, ultimately depends upon whether cooperatives, in the specific circumstances of each industry, can successfully provide to members returns and services that would not be available from alternatives. The key factors are (1) the particular functions or services that are needed, (2) whether cooperatives can effectively provide the needed functions, and (3) the alternatives that are available.

The context within which a particular cooperative can succeed is fundamentally determined by particular combinations of production, processing, and market characteristics for each sector. The next section of this part of the report discusses basic factors that underlie differences in the degree of cooperative activity between sectors. After discussing how these factors influence the extent of cooperative activity, this part concludes with discussion of a rating scheme that summarizes some of the key factors.

Explanatory Factors

Seven characteristics of commodity sectors appear to be fundamental in explaining differences in the extent of cooperative involvement. The factors are related to the degree of processing required, the proportion of value added in processing, the physical nature of the product, organization of the farming units, and the nature of markets for the commodity. In the following, the factors and the influence of each on cooperative involvement are explained with comparisons of examples from different sectors.

Processing

Two factors related to processing requirements are important determinants of the degree of cooperative involvement in a particular sector: (1) the amount of capital investment required for processing and (2) the size of farm units relative to efficient processing plant scales. Both are characteristics that differ between sectors and change over time.

Processing Investment. Cooperative involvement will be higher, the greater the investment required for preprocessing and processing.

Cooperative involvement is generally higher in sectors in which the commodity undergoes processing and significant transformation. Underlying this is the fact that, historically, achieving economies of scale has usually required larger processing plants than the scale of individual production units. Obtaining benefits of vertical integration into processing may require the combined production volumes and capital resources of a larger number of growers. Dairy processing and fruit canning are sectors with high cooperative involvement and are both sectors in which processing requires large capital investments.

In contrast, fresh fruit and vegetable growers can vertically integrate into packing and marketing with comparatively small additional capital investments. That the cooperative share of table grape marketing is relatively low (and has declined over time) is at least partially attributable to the fact most of the produce is packed in the field rather than in packing houses.

Scale of Processing Plants Relative to Size of Production Units. Cooperative involvement will be higher when few growers with large enough volumes exist to capture processing economies of scale.

Across sectors, and over time within particular sectors, differences in the scale of production units relative to processing plant volumes are an important determinant of the share of total sector volume that will be handled by cooperatives. It is important to note that, over time, farm size has grown while changes in processing technology have in some cases allowed efficient operations at relatively lower volumes.

For example, in the processing tomato sector there are examples of growers owning and operating processing plants specifically designed for particular product forms such as tomato paste. Especially with preprocessing near the farm level, the emergence of larger production units relative to efficient scale of processing has allowed individual or small groups of growers to vertically integrate and lessened the role played by cooperatives. Examples include fruit packing, almond hulling and shelling, and cotton ginning.

Production Characteristics

Physical and technological aspects of the production process and the physical characteristics of the raw farm product can have an important impact on the degree to which cooperatives provide processing, marketing, and other services for growers. Two general factors related to inherent physical characteristics of the product that are important are (1) the year-to-year continuity of production and (2) the handling requirements associated with the raw product.

Multi-Year Continuity of Production.

Cooperative involvement will be higher when crop production requires fixed investments committed over several years.

Generally, commodities that involve substantial continuing investment over several years tend to have higher cooperative involvement. Examples of such commodities that typically involve multiyear commitment at the production level, due to substantial investments in specialized equipment, include perennial crops, dairy, and processing tomatoes and cotton. Counterexamples would include annual crops such as vegetables and cattle production that allow growers to expand or contract production from year to year (often on leased ground). Continuity of production leads growers to seek reliable homes for their output. This also provides an opportunity for cooperative businesses to project volumes over longer time horizons and to plan and invest accordingly. While continuity of production appears to be an important determinant of cooperative activity, it is only part of the puzzle. For example, to explain differences between fresh versus processing fruits, it is necessary to look at the processing and market characteristics of the commodity.

Flexibility of Raw Product Handling.

Cooperative involvement will be higher when the raw product can be stored before processing or harvesting schedules can be adjusted.

Cooperative involvement in a sector is greater when the physical nature of the commodity allows harvest flexibility or storage of the product. Achieving benefits from handling combined volumes from several growers requires coordination of individual members' deliveries to the cooperative. When the product is highly perishable or it is difficult to anticipate harvest dates, a cooperative may not be able to effectively serve members. Cooperative involvement tends to be low for commodities which are highly perishable, such as fresh market vegetables and melons, flowers, and fresh deciduous fruit and table grapes. Harvest dates for these commodities vary depending upon weather. In contrast, citrus fruits and avocados are storable either on the tree or before grading and packing, and cooperatives handle large shares of production.

Marketing

The nature of the product, the characteristics of its markets, and the comparative advantage of cooperatives in capturing economies of scale in marketing are important determinants of whether cooperatives can efficiently serve growers.

Ability To Pool on Basis of Price and Quality. Cooperative involvement will be higher when useful grades can be defined and prices can be pooled over marketing periods.

Cooperative marketing activity is higher for commodities that are easily pooled on the basis of prices over time. Associated with this is the ease with which it's possible to pool on the basis of grades. Quality variation within the commodity supplied by different growers is typically an inherent feature of the physical production process and may present problems for a cooperative when there are problems defining meaningful grades used for pooling returns equitably. Difficulties with pooling due to variable quality and market price volatility provide important explanations for the low degree of cooperative marketing activity in fresh fruits and vegetables, flowers, and cattle.

Length of Marketing Season. Cooperative

involvement will be higher when costs of marketing can be spread over a longer season.

Cooperative marketing activity is higher for commodities that have relatively long marketing seasons. Extended harvest and marketing seasons may be achieved either by scheduling planting dates and using alternative varieties that mature at different dates or by geographic diversification. Storability of a commodity or its processed forms also allows marketing firms to have more efficient plant sizes, opportunities to coordinate processing and marketing, and to spread the costs of management and marketing staff and other resources over longer periods and thus achieve gains for growers. The importance of the length of the marketing season is highlighted by contrasting the situations with rice versus wheat and feed grains in California. For rice, cooperatives play important roles in drying after harvest, milling, storage before and after milling, and export marketing of the majority of the State's production. In contrast, because the State's production of other grains is considerably less than that utilized, the storage and associated marketing functions that cooperatives can provide are relatively less important to growers in California than to those in other States.

Returns to Individual Grower Marketing.

Cooperative involvement will be higher when growers make marketing decisions infrequently and/or cannot earn higher returns to justify costs of self-marketing.

Cooperative involvement is high in those sectors in which cooperatives achieve marketing economies of scale that would not otherwise be available to growers. The comparative advantage of cooperatives relative to alternatives available to growers differs between sectors and is clearly an important determinant of the extent of differences in cooperative involvement between sectors.

When a grower harvests and sells a crop once a year, the returns to self-marketing may not justify the effort, while a cooperative can spread costs over more volume and return these marketing economies to growers. There may not be sufficient potential for gains when the market is dominated by Government programs (dairy, grains) and/or there are high costs associated with new product or export market development. In cases where marketing decisions are made frequently because the production process

is continuous, there may be profitable opportunities for individual growers to perform their own marketing. This is a likely explanation of the low cooperative involvement in the broiler, egg, and flower sectors. It is important to note that in these sectors there tends to be high vertical integration in production, processing, and marketing.

Typically, processing and marketing economies of scale have been pursued simultaneously, and large processing volumes have been associated with significant accomplishments in both new product research and domestic and export market development. Notable examples include almonds and other nut crops, citrus, processed fruit and vegetables, dried fruits, and cotton. Analysis of changes in cooperative involvement over time was beyond the scope of this research. However, it is important to note that cooperative shares in some sectors (citrus, cotton, raisins) have declined over time. This is at least in part due to the fact that, as the size of production units has increased, the potential has increased for growers to achieve gains through undertaking their own processing and marketing.

The competitive structure in the dried fruit, citrus, and almond and nut subsectors is changing. A large noncooperative food marketing company has achieved significant market shares in each of these subsectors by taking some volume away from cooperatives and by consolidating the operations of some noncooperative marketing companies.

SUMMARY AND RATING SCHEME

The seven factors discussed above appear to encompass the basic physical and economic causal relationships determining the extent of cooperative activity. No single factor explains the differences. Rather, in each sector a particular combination of factors applies. Results of a simple rating scheme based on the seven factors are presented in table 7. Each factor is assigned a weight of 1 to 3, with higher values assigned when the factor would suggest a tendency for more cooperative involvement. The simple sum of the ratings serves as a rough index of the combined effects of the factors. Comparison of the sums of ratings with estimated shares of cooper-

atives generally affirms the hypothesized influences.

Of particular note are comparisons among sectors in which cooperatives operate at more than one level and also the ratings for fresh versus processed forms in some sectors. In the cases of cotton, almonds, prunes, and rice, the level of cooperative activity is lower at the first-handler level.

Two primary factors explain this. First, differences between the scale of processing and the

sizes of production units are smaller at the first-handler level than at the marketing/processing level. Second, it appears that alternatives to cooperatives, such as a grower's own preprocessing facility, offer greater individual control and more flexibility in handling products at harvest. This relationship appears to be the primary explanation for the fact that fresh product sectors (table grapes, fresh peaches, vegetables) tend to have lower cooperative activity.

With respect to implications for changes in

Table 7—Cooperative shares and explanatory factor ratings, selected sectors, 1986

Selected sectors	Level of processing required	Processing scale vs. production	Multi-year production continuity	Ability to pool price and quality	Flexibility raw product handling	Marketing season continuity	Returns to individual marketing	Sum of ratings	Cooperative share % volume
Rating Scale	1 minor — 3 major	1 low — 3 high	1 low — 3 high	1 low — 3 easy	1 low — 3 high	1 short — 3 long	1 high — 3 limited		
Milk and cream	3	3	3	3	3	3	2	20	58
Cattle and calves	1	1	2	1	2	1	1	9	
Eggs	2	1	2	2	1	3	1	12	8
Chickens and turkeys	3	1	2	2	1	3	1	13	0
Peaches, fresh	2	1	3	1	2	2	1	11	10
Peaches, clings	3	3	3	3	2	3	3	20	92
Grapes, table	1	1	3	1	2	2	1	11	5
Grapes, raisin	3	2	3	3	3	3	2	19	78
Grapes, wine	3	2	3	1	2	3	1	15	11
Prunes, drying	3	2	3	3	2	1	2	16	41
Prunes, processing	3	3	3	3	3	3	2	20	61
Almonds, hulling	3	2	3	3	2	1	2	16	26
Almonds, marketing	3	3	3	3	3	3	2	20	47
Avocados	2	2	3	3	2	3	2	17	53
Olives	3	3	3	3	3	3	2	19	70
Citrus	2	1	3	2	3	3	2	16	1/
Rice, drying	3	2	2	3	2	2	2	16	61
Rice, milling	3	3	2	3	3	3	3	20	70
Cotton, ginning	3	3	2	3	3	1	2	17	39
Cotton, marketing	1	1	2	3	3	3	1	14	47
Hay	1	1	2	1	3	2	1	11	2
Wheat and barley	1	1	1	1	3	1	1	9	4
Dry beans	2	2	1	2	3	2	2	14	60
Lettuce	1	1	1	1	1	2	1	8	6
Tomatoes, processing	3	3	2	3	2	3	2	18	91
Sugar beets	3	3	2	3	2	2	3	18	99
Flowers and foliage	1	1	1	1	2	2	1	9	1

1/ Not estimated due to variable proportions of navel and valencia oranges, lemons, and other citrus handled by different cooperatives.

the extent of cooperative activity in various sectors in the future, it is important to note that several of the factors relate to physical characteristics of the product, are unlikely to change, and therefore are unlikely to lead to changes in the level of cooperative activity in the future. On the other hand, some of the factors that appear to explain differences between sectors are related to economies of size, particularly of farm production units. Increases in farm size, and to a lesser extent changes in processing technology that allow more flexibility in scheduling processing of the raw product at harvest, will have the impact of increasing growers' opportunities for individual vertical integration without investment in a cooperative.

CONCLUSIONS AND OBSERVATIONS

This report has documented the extent and diversity of cooperative involvement in California agricultural sectors. The study summarizes the activities of 204 marketing and 23 supply cooperatives in California, with memberships totaling nearly 69,000 growers. Growers often belong to more than one cooperative. In several industries, different cooperatives perform services at different levels in the commodity vertical system.

Further, many California farm operations produce more than one crop, but identifying how many growers belong to more than one cooperative is beyond the scope of the present study. Diversified growers are likely to have cooperative alternatives in several crops, and future research should address these questions. Do particular growers tend to participate in cooperatives for all of their needs? How do growers who belong to several cooperatives evaluate relative performance of their organizations?

The study documented the functions that California cooperatives perform for members. Cooperatives are involved in different types of processing, byproduct processing and marketing, domestic and export marketing, and provision of various services including input supply. Many cooperatives provide supplies and services in addition to primary functions. Two subjects to be addressed by further research include examining these cooperatives' policies and problems in the supply area, and whether

supply operations benefit smaller versus larger volume members.

Different relationships between cooperatives within and across sectors are described. Growers are often members of more than one cooperative in a sector. Study of alternative organizational structures between first-handler and marketing/processing cooperatives merits further study. Questions to be addressed include the following: How, and to what extent, do cooperatives coordinate policies when members belong to more than one cooperative involved in a particular sector? Do current structures efficiently serve members?

Also raised is the issue of market-supply coordination by marketing and processing cooperatives. This is increasingly important, especially for marketing and processing cooperatives that sell differentiated products. Future research should address alternative methods that cooperatives could use to influence the volume of product handled. In recent developments, a major cooperative has begun to purchase raw product from nonmembers through a bargaining association. Will other cooperatives with differentiated products experiment with purchasing supplies of raw product from nonmembers? Will memberships be restricted? What policies will be followed for purchases of product from nonmembers?

The present study discusses explanatory factors contributing to the wide differences in cooperative involvement that exist across commodity sectors. At least part of the differences are due to inherent characteristics of the physical product and associated influences on the technical and economic characteristics of the sector. For example, cooperative shares at the first-handler level in sectors such as fresh fruit and vegetables would not be expected to be as high as in dairy because it may be more difficult for cooperatives to pool on the basis of grade and price and to provide sufficiently responsive service for members, given perishability. Physical characteristics of the product are unlikely to change and, therefore, are unlikely to lead to changes in the level of cooperative activity in the future.

On the other hand, the number of growers with larger production units is increasing in most sectors. Important factors that appear to

partially explain differences in cooperative share between sectors are related to economies of size, particularly of farm production units. Increases in farm size, and to a lesser extent changes in processing technology that allow more flexibility in scheduling processing of the raw product at harvest, will likely lead to more individual vertical integration by large growers.

The role of cooperatives has evolved in response to needs of members in the past. Future changes and adaptations will primarily be in response to an increasingly bimodal size distribution of farms. Cooperatives have offered, and will continue to offer, the potential gains from economies of scale to smaller growers. A primary focus of future research should be toward helping cooperatives anticipate and adapt to the needs of both small- and large-volume members.



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