

**ECONOMIC IMPACTS
OF
AGRICULTURAL PRODUCTION AND PROCESSING
IN
STANISLAUS COUNTY**

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March, 1981

The author acknowledges with appreciation the information provided by numerous agricultural processing concerns and organizations and crop production data provided by Sheree Tillema, Agricultural Commissioner's office. Appreciation is extended to the Stanislaus County Board of Supervisors for their interest and support and to the Cooperative Extension Farm Advisors who provided commodity information.

Particular acknowledgment and appreciation is extended to George E. Goldman, Economist, Cooperative Extension, U. C. Berkeley, for his counsel and guidance in making this study; also for his review of the final manuscript as well as that by Tim L. Wallace, Economist, Cooperative Extension, U. C. Berkeley; to Marian O'Regan, Statistician, for performing the computer operations involved; to Marge Lucas for typing the manuscript; and to my wife, Rose, who gave support during many hours devoted to the study during after-work hours and on weekends.

—— Armen V. Sarquis

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SUMMARY

This study presents an analysis of the economic impact that agriculture has in Stanislaus County. For this purpose, agriculture is divided into three segments. The first segment is the agricultural production that actually takes place on farms in the county. The second segment is the agricultural processing of these products grown within the county. The third segment is the agricultural processing of products grown outside the county and then shipped into the county for processing.

Economic impact of a commodity or commodity category is defined as the sum of all (direct and indirect) sales in the county resulting from that production and/or processing category. The analysis was accomplished with the use of the 1974 Stanislaus County input-output model. A brief description is presented of input-output analysis and the input-output model.

The total economic impact of agricultural production within the county in 1979 was estimated to be about \$1.4 billion. This is the total economic effect in the county of producing almost \$700 million worth of crops and livestock.

The portion of this production processed within the county produced a net economic impact of some \$820 million--over twice the \$395 million of value-added by processing.

Commodities grown outside the county and processed within the county gave rise to a processing value-added of \$730 million which resulted in an economic impact of \$1.44 billion.

Therefore, the total economic impact of the three segments of agricultural production and processing in the county produced an economic impact of \$3.66 billion in total sales in the county. Personal income is 21 percent of this total, while farm production is 22 percent and processing is 37 percent.

Economic multipliers are determined for twelve commodity categories grown in the county. These are the total economic impact caused by the production and processing of these commodities within the county. Multipliers range from a low of 1.8 for the livestock category to a high of 10.8 for canned vegetables. The weighted average county economic multiplier is 3.2. These multiplier values do not include the impacts of crops and livestock brought into the county for processing.

I. INTRODUCTION

Input-Output Analysis is designed to estimate the quantity of dollars and the movement of these dollars resulting from an economic activity.

Input-output analysis of the economy of a specific geographic area results in an input-output model which depicts the economy as a system of interacting economic sectors and shows the magnitude of these interrelationships. With these interrelationships established, dollar changes in one sector can be traced to determine their impacts or resulting changes in another sector. The model is designed to reflect both initial or direct effects of an economic activity and the secondary or indirect effects that occur because of obvious and not-so-apparent interrelationships. It recognizes that expenditures in one sector create expenditures in another sector, which, in turn, create expenditures in other sectors.

The Stanislaus County Input-Output Model is based on 1974 production data with some recent modification. It is the result of a study in 1977 (see references). It constitutes a professional tool for economists, planners, decision-makers and interested people in determining the impacts of an economic activity and/or the impacts of any change that might affect the local economy.

It seems reasonable that our concern for environmental impacts of change would extend to a concern for economic impacts particularly when a professional tool for determining such is readily available and can be used with reasonable effort. Use of the input-output model would provide another measure for making more knowledgeable decisions.

Input-output analysis will tell decision-makers what economic impacts an economic activity or change in such activity will have on the county's economy, but it cannot tell one whether the change is a good or bad one, what its long range social impacts might be or whether the people of a community would be in support of it.

II. OBJECTIVES OF THIS STUDY

- A. To determine the economic impacts of agricultural production and processing in Stanislaus County and the resulting economic impacts on the various sectors of the county's economy.

This can provide information valuable to emphasizing the importance of the various commodity industries to the economic health of the county. It will point out the extent of dependence of various sectors on agriculture and possibly provide data useful to various commodity as well as business sectors.

- B. To develop economic multipliers for individual commodities or commodity categories. This will provide for more accurate measurement of the economic impact and importance of individual commodity production and processing.
- C. To provide examples of use of the input-output model in determining the economic impacts of proposed or unavoidable changes in the local agricultural economy.
- D. To encourage use of the Stanislaus County Model by planners, developers, decision-makers, management, etc., to the end that additional knowledge can lead to better decisions of long-term as well as immediate consequence.

This model is available through George Goldman, Economist, University of California, Cooperative Extension, Berkeley, CA (see reference). The model could easily be programmed into the Stanislaus County Data Processing Center or the Cal State, Stanislaus Computer System for accessibility and use by local planners, decision-makers and interested individuals.

A word must be said concerning the accuracy of the specific impact values presented and the thoroughness of accounting for all units of production and processing in the county.

In general impact values must be regarded as close estimates. This relates back to necessary estimates in data secured for establishing the county input-output model. Some estimates were also necessary in determining processing value-added figures, however, they were knowledgeable and best estimates available at the time. The statistical significance of the impact figures is in their order of magnitude and not necessarily in their absolute value.

In general a conservative approach is inherent in the study. There are additional agricultural and possibly minor processing activities in the county not accounted for primarily because of time constraints. Known economic activity of nominal value and not accounted for are the value of livestock manure, peach pits, almond shells, cereal straws, grazing value following some crop harvests, and the firewood value of some prunings and tree removals. As noted these are nominal but nevertheless would increase the value of agricultural production but probably not the order of magnitude of the impact values presented.

III. DEFINITIONS

DEFINITION OF TERMS

Production value:

The gross value of agricultural production as reported in the Stanislaus County, 1979 Agricultural Crop Report. These are gross producer values reported by commodity. In some cases similar commodities have been grouped into categories.

Processing value-added:

For a given amount of commodity, this is the processor's wholesale value of the finished product ready for sale less his cost of the raw commodity as delivered by the producer. This latter is equivalent to the production value. Processing value-added is thus the value added to a commodity as a result of the processing operation. In general it includes all input costs of the processor to produce and market a finished consumer product plus a reasonable profit.

Weighted average economic multiplier:

An average recognizing the relative importance or magnitude of the commodity components it represents. For example, the vegetable crops economic multiplier of 6.8 is a weighted average recognizing the relative importance of each category of vegetable product (fresh market, canned, dehydrated, frozen). It is not an arithmetic average.

It is determined by the total economic impact value of production and processing of those vegetables grown and processed within the county divided by the production value of those vegetables. It does not include those vegetables imported into the county for processing. To include the latter would significantly increase the multiplier.

Percent of total impacts:

In the Production and Processing Impacts tables for each commodity category a sub-total is shown for those sector impacts given. Minor sector impacts are not shown, however, are included in the Total Impacts figure. The "Percent of Total Impacts" is given to show the percentage of sector impacts accounted for in the sectors listed. This is generally 95 percent or more.

Economic sector:

An economic sector is a grouping of individual enterprises that have similar production or activity characteristics. These are defined in the following section and were segregated in the 1977 Input-Output Study.

ECONOMIC SECTOR DEFINITIONS

1 - 29 - Commodity Sectors

These are self explanatory production sectors.

30 - Agricultural Services

Soil services and crop preparation for market services.
Animal and veterinary services.
Landscape and horticultural services.
Farm labor and management services.

31 - General and Building Contract Construction

Residential; industrial and non-industrial building; heavy construction; special trade contract construction.

Agricultural Processing

32 - Meat and Poultry Products

Red meats, poultry, eggs

33 - Dairy Products

Milk, cheese, ice cream, etc.

34 - Canned Fruits and Vegetables

35 - Dehydrated Fruits and Vegetables

36 - Frozen Fruits and Vegetables

37 - Grain Mill Products

Consumer food and animal feed products

38 - Bakery Products

39 - Wine, Liquor, Beverages

Wine, liquor, beer and beverages

40 - Misc. Food Preparation, Fats and Oils

Manufacturing Industries

41 - Wood and Paper Products

Includes lumber, mill and millwork products, mobile homes, cabinet, furniture and fixtures; paper and allied products.

42 - Printing; Publishing

Includes printing and publishing newspapers, periodicals, books, forms, etc.

43 - Chemicals and Allied Products

Includes organic, inorganic, natural and man-made chemicals; drugs, cleaning items, protective coats; agricultural chemical products, petroleum, rubber and plastic products.

44 - Stone, Glass, Clay and Concrete Products

45 - Metal and Fabricated Metal Products

46 - Machinery and Equipment

Farm, garden, construction, industrial, office, refrigeration, etc. machinery and equipment.

47 - Electrical Machinery and Equipment

Includes electrical transmission equipment; transportation equipment; measuring instruments; medical and photographic instruments, etc.

48 - Transportation; Warehousing

Includes transportation, motor freight, warehousing, transportation services.

49 - Utilities

Telephone, electric, gas, sanitary services.

50 - Wholesale Trade

51 - Retail Trade

52 - Finance, Insurance and Real Estate

Includes banks, trust companies, credit agencies, security and commodity brokerage, insurance and real estate industries.

53 - Services

Includes establishments providing a wide range of services for individuals, business, and government, e.g. lodging, repair, health, legal, engineering, professional, educational, etc.

54 - Household or Personal Income

Employee total wages and salaries.

IV. PRODUCTION AND PROCESSING IMPACTS OF THE DIFFERENT COMMODITY CATEGORIES OF THE COUNTY AGRICULTURAL ECONOMY

Information concerning each commodity or commodity category is presented. Production figures and dollar values are essentially those given in the 1979 Stanislaus County Agricultural Crop Report. A summary follows which in addition includes value of semen production in the livestock category. All data pertains to the 1979 production and processing year. Processing data was obtained in most cases directly from the processors, from knowledgeable individuals, or from statistical sources. In most cases commodity volume, cost, finished product volume and value were the basis for processing value-added determinations. In other cases value-added figures were obtained directly from the processor or knowledgeable sources.

Similarly, commodity flow, i.e. quantity processed in the county, quantity exported from the county for processing elsewhere, quantity produced elsewhere and imported into the county for processing, was determined from knowledgeable individuals or was estimated or determined by deduction.

Because of study time constraints, certain assumptions were made with respect to commodity movements where it was determined the assumption would not significantly affect results of the study. The basis for commodity processing values-added and economic impact values are presented in the following pages by commodity category.

It is assumed all processed commodities are marketed outside the county although this is not strictly the case. Also it is known there is export from the county of unprocessed commodities as well as import into the county of commodities grown elsewhere. Unless these amounts are noted specifically, it is assumed they, for the most part, balance off and do not involve large proportions of the total quantities produced or processed.

It will be noted in many of the commodity category tables that impacts are shown in seemingly unrelated sectors. However, in fact, relationships do exist in the form of direct and indirect sales or purchases. For example, almond production (Table 5) might involve purchase of dairy manure from Sector 27, Dairy production, or the purchase (indirect) by Sector 27 of almond hulls from Sector 19, Almond production, for dairy feed. These are examples of how integrated economic activities are.

SUMMARY

1979 AGRICULTURAL PRODUCTION - STANISLAUS COUNTY

<u>Commodity</u>	<u>Sector</u>	<u>Production Value</u>
<u>Vegetables</u>		
Canning:	Tomatoes	18 \$ 11,850,000
	Spinach	17 163,000
Freezer:	Green lima	9 6,224,000
	Squash	12 354,000
	Peas	14 1,773,000
	Snap beans	16 684,000
	Spinach	17 1,736,000
	Boysenberries	23 799,000
Fresh:	Tomatoes	18 1,242,000
	Sweet Potatoes	15 3,740,000
	Melons	11 6,348,000
Dehydrator:	Peppers	15 1,605,000
	Total	<u>\$ 36,518,000</u>
<u>Grapes</u>	21	28,821,000
<u>Peaches</u>	Peaches/misc.	22 35,137,000
	Nectarines	23 2,967,000
	Total	<u>\$ 38,104,000</u>
<u>Almonds</u>	19	92,838,000
<u>Walnuts</u>	24	31,425,000
<u>Apricots</u>	20	18,033,000
<u>Field Crops</u>		
	Barley	1 3,692,000
	Wheat	2 1,595,000
	Corn-Silage	3 17,396,000
	Oats/Sorg	4 4,752,000
	Alfalfa	5 14,877,000
	Pasture	6 14,660,000
	Rice	7 3,114,000
	Sugar Beets	8 1,763,000
	Lima Beans	9 22,390,000
	Total	<u>\$ 84,239,000</u>
<u>Seed Crops</u>	10	2,080,000
<u>Nursery Products</u>	25	13,806,000
<u>Milk Products</u>	27	147,370,000
<u>Poultry Products</u>		
	Turkeys	28 10,960,000
	Chickens	28 81,964,000
	Eggs	29 57,965,000
	Total	<u>\$ 150,889,000</u>
<u>Livestock</u>		
	Beef	26 41,754,000
	Hogs	26 1,116,000
	Sheep	26 256,000
	Semen/A.I.	30 8,466,000
	Apiary/Service	30 2,450,000
	Total	<u>\$ 54,042,000</u>
	Grand Total	<u><u>\$ 698,165,000</u></u>

VEGETABLE CROPS

This category includes all vegetables, Boysenberries and melons. They enter the market as consumer items in the form of fresh, canned, dehydrated and frozen products.

Fresh market vegetables include tomatoes, melons, sweet potatoes and miscellaneous crops. Most are processed within the county for marketing. Approximately 55 percent of the tomatoes processed in the county for fresh market are grown outside the county.

Canned vegetables include principally tomatoes, spinach and yams. It is assumed that the tonnage produced in the county is processed in the county. Approximately 80 percent of the tomatoes canned in the county are grown outside the county. All the yams are grown outside the county.

Dehydrated vegetables include some 20 different vegetable crops. Those grown in the county are assumed to be processed in the county. Slightly over 90 percent of all vegetables dehydrated in the county are grown outside the county.

Frozen vegetables include about ten different crops. Approximately 60 percent of the vegetables frozen are grown in Stanislaus County, 40 percent are grown outside the county. Approximately 40 percent of the freezer vegetables grown in the county are exported from the county for processing.

The weighted average economic multiplier for all vegetables grown and processed in the county is 6.8, ranging from 3.0 for the fresh marketed crops to 10.8 for the canned commodities. Multipliers for the dehydrated and frozen crops are 6.2 and 6.5, respectively.

The overall weighted average multiplier 6.8 is based on a gross value of production of \$36,518,000 creating \$79,712,000 of economic activity and a processing value-added of \$74,322,000 creating \$169,277,000 of economic activity. Total economic activity resulting from county production of vegetable crops is thusly \$248,989,000.

Crops brought into the county for processing resulted in \$220,438,000 of value-added which created \$508,381,000 of economic activity. A summary by product category is given in Table 1.

TABLE 1

SUMMARY - VEGETABLE PRODUCTION AND PROCESSING IMPACTS

A. Grown and Processed in the County

<u>Product</u>	<u>Production Value</u> (1)	<u>Processing Value-Added</u> (2)	<u>Economic Impact Value</u>		<u>Economic Multiplier*</u> (5)
			<u>Production</u> (3)	<u>Processing</u> (4)	
Fresh Market	\$11,330,000	\$ 4,263,000	\$25,196,000	\$ 9,206,000	3.0
Canned	12,013,000	44,641,000	26,287,000	103,301,000	10.8
Dehydrated	1,605,000	2,787,000	3,503,000	6,504,000	6.2
Frozen	<u>11,570,000</u>	<u>22,631,000</u>	<u>24,726,000</u>	<u>50,266,000</u>	<u>6.5</u>
Totals	<u>\$36,518,000</u>	<u>\$74,322,000</u>	<u>\$79,712,000</u>	<u>\$169,277,000</u>	
Total Economic Impact--\$248,989,000					6.8

* Column (5) is Column (3) plus Column (4) divided by Column (1).

B. Grown Outside the County, Processed Within the County

<u>Product</u>	<u>Processing Value-Added</u>	<u>Processing Impact Value</u>
Fresh Market	\$ 5,954,000	\$ 12,858,000
Canned	167,849,000	388,410,000
Dehydrated	31,566,000	73,643,000
Frozen	<u>15,069,000</u>	<u>33,470,000</u>
Totals	<u>\$220,438,000</u>	<u>\$508,381,000</u>

Total economic activity resulting from production and all vegetable crops processing in the county was \$757,370,000.

These production and processing impacts result in impacts on various sectors of the county's economy. These are shown in Table 2.

TABLE 2 - VEGETABLE CROPS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector <u>1/</u>	(\$1,000)	<u>Grown in County</u>			Grown	Total
		<u>Production</u>	<u>Processing</u>	<u>Impact</u>	Outside County <u>Processing</u>	Vegetable Industry <u>Impact</u>
34 Canning	\$ 671	\$ 48,376	\$ 49,047	\$177,034	\$226,081	
35 Dehydration	139	4,539	4,678	43,687	48,365	
36 Freezing	426	25,136	25,562	23,322	48,884	
All Production sectors	36,500	---	36,500	---	36,500	
30 Agric. Services	---	4,334	4,334	6,118	10,452	
31 General & Contract Const.	208	284	492	846	1,338	
37 Grain Mill Products	---	56	56	150	206	
41 Wood & Paper Products	232	5,309	5,541	14,666	20,207	
42 Printing, Publishing	171	1,973	2,144	6,636	8,780	
43 Chemicals & Allied Products	140	1,380	1,520	2,762	4,282	
44 Stone, Glass, Clay, Concr. Prod.	189	337	526	988	1,514	
45 Metal & Fabricated Metal Prod.	119	6,339	6,458	21,218	27,676	
46 Machinery and Equipment	---	136	136	411	547	
47 Electrical Mach. & Equipment	53	119	172	366	538	
48 Transportation, Warehousing	409	2,629	3,038	7,904	10,942	
49 Utilities	1,142	796	1,938	2,400	4,338	
50 Wholesale Trade	679	4,857	5,536	14,377	19,913	
51 Retail Trade	5,416	7,354	12,770	23,337	36,107	
52 Finance, Insur., Real Estate	4,608	6,252	10,860	18,551	29,411	
53 Services	2,902	4,370	7,272	13,161	20,433	
54 Household or Personal Income	24,023	36,902	60,925	115,988	176,913	
Sub-total	\$78,027	\$161,478	\$239,505	\$493,922	\$733,427	
Percent of Total Impacts	<u>97.8</u>	<u>95.4</u>	<u>96.2</u>	<u>97.2</u>	<u>96.8</u>	
Total Impacts	<u>\$79,712</u>	<u>\$169,277</u>	<u>\$248,989</u>	<u>\$508,381</u>	<u>\$757,370</u>	

1/ Principal business sectors that experience economic activity as a result of the growing and processing of vegetables. Sector impacts based on the Stanislaus County Input-Output matrix of direct and indirect effects.

Sub-total includes those sector values shown. It is shown also as a percentage of total impacts (includes those not shown above).

2/ From Table 1.

Interpretation of Table 2.

This table shows that vegetables produced in the county with a grower value of \$36,518,000 (Table 1) resulted in economic impacts (direct and indirect) on the various sectors of the local economy totaling \$79,712,000. These impacts may be described also as the total effect of direct transactions plus those resulting indirectly (the ripple effect) as farmers purchase inputs to produce their crops. Collectively these inputs resulted in an output of saleable crops with a value of \$36,518,000 which resulted in \$79,712,000 of direct and indirect impacts (economic activity) in the various sectors of the local economy.

For example, economic impact (activity) resulting in Sector 48, transportation and warehousing, was \$409,000. Activity also resulted in or made possible \$5,416,000 of retail sales (Sector 51). Sector 52 was affected to the extent of \$4,608,000; Professional services (Sector 53) benefited to the extent of \$2,902,000, while employee total wages and salaries (Sector 54) was \$24,023,000.

This same reasoning applies to the impact values shown for both the processing columns and the last column showing the total vegetable crops industry impacts.

This table points out the importance of vegetable production to the economy as well as the importance of the processing industry with its capacity and capability to handle locally grown vegetables and vegetables grown in adjacent counties. In fact this latter capacity constitutes the major portion of the total economic impact or activity.

Theoretically, if production and all vegetable crops processing in the county were to cease, \$757,370,000 of resulting economic activity would be lost to the local economy and individual sectors of the economy would be affected negatively to the extent as shown in the last column of Table 2. For example, retail sales would be reduced by \$36,107,000 and personal wages and salaries would be reduced by \$176,913,000. However, it is conceivable that some other industry or economic activity would replace the vegetable crops industry.

In the following commodity discussions, similar tables of economic impact are presented. Interpretation is analogous to that discussed above. Total commodity industry impacts by sector are given and are determined by adding totals for that grown in the county and that grown outside the county. For example, total grape/wine industry impact on the banking, insurance and real estate sector (Sector 52) is \$9,617,000 plus \$20,226,000 or \$29,843,000 (Table 3).

GRAPES

This category includes all grapes. They enter the market ultimately as wine, raisins and canned grapes. Approximately 10 percent of the county's 1979 production was crushed in the county. Less than one percent was used for making raisins. The major portion was exported out of the county for crushing and fermentation into wine an estimated 50 percent of which is later imported into the county for processing and marketing. Approximately 20 percent of the wine marketed from the county is made from grapes grown in the county, while 80 percent is from grapes grown outside the county. A considerable tonnage is imported into the county for canning while a relatively minor tonnage is imported for drying into raisins.

The weighted average economic multiplier for grapes produced and marketed in the county is 7.8. This is based on a gross value of production of \$28,821,000 creating \$63,219,000 of economic activity. Processing value-added is \$97,219,000 creating \$161,315,000 of economic activity. Total economic activity resulting from grapes produced and processed in the county is thus \$224,534,000.

Grapes or wine (including that from apples and pears) brought into the county for processing and marketing resulted in \$383,496,000 of value-added which created \$640,335,000 of economic activity.

A breakdown of this economic impact on the various sectors of the county's economy is shown in Table 3.

TABLE 3 - GRAPES

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	(\$1,000)	<u>Grown in County</u>			<u>Grown</u>	<u>Total</u>
		<u>Production</u>	<u>Processing</u>	<u>Impact</u>	<u>Outside</u>	<u>Grape/Wine</u>
					<u>County</u>	<u>Industry</u>
					<u>Processing</u>	<u>Impact</u>
21 Grape Production	\$28,838	\$ ---	\$ 28,838	\$ ---		\$ 28,838
39 Wineries	144	100,123	100,267	388,718		488,985
30 Agric. Services	23	40	63	160		223
31 General & Contract Const.	205	230	435	916		1,351
37 Grain Mill Products	8	27	35	108		147
41 Wood & Paper Products	181	2,333	2,514	9,299		11,813
42 Printing, Publishing	135	760	895	3,169		4,064
43 Chemicals & Allied Products	116	2,019	2,135	7,907		10,042
44 Stone, Glass, Clay, Concr. Prod.	151	201	352	808		1,160
45 Metal & Fabricated Metal Prod.	94	1,001	1,095	4,615		5,710
46 Machinery and Equipment	11	45	56	185		241
47 Electrical Mach. & Equipment	43	68	111	274		385
48 Transportation, Warehousing	491	1,500	1,991	6,054		8,045
49 Utilities	907	542	1,449	2,172		3,621
50 Wholesale Trade	549	2,757	3,306	11,105		14,411
51 Retail Trade	3,679	4,421	8,100	17,864		25,964
52 Finance, Insur., Real Estate	4,541	5,076	9,617	20,226		29,843
53 Services	2,041	2,753	4,794	11,063		15,857
54 Household or Personal Income	18,962	24,432	43,394	98,273		141,667
Sub-total	\$61,119	\$148,328	\$209,447	\$582,914		\$792,361
Percent of Total	97	92	93	91		92
Total Impacts	<u>\$63,219</u>	<u>\$161,315</u>	<u>\$224,534</u>	<u>\$640,335</u>		<u>\$864,868</u>

^{1/} Principal business sectors that experience significant economic activity as a result of the growing and processing of grapes. Sector impacts are based on Stanislaus County Input-Output matrix of direct and indirect effects.

Sub-total includes those sector values shown. It is also shown as a percentage of total impacts (which includes those not shown above).

PEACHES

Primary commodities in this category are cling and freestone peaches. Included also are pears, cherries, nectarines, and other miscellaneous fruit crops, some of which are marketed fresh. The major portion of this category is marketed as canned items. About 50 percent of the clings and 28 percent of the freestones grown in the county are processed in the county. The remainder leave the county for processing elsewhere. Approximately 13 percent of the clings processed in the county are grown outside the county, while about 90 percent of the pears processed are grown outside the county.

The weighted average economic multiplier for this category is 6.0. This is based on gross value of production of \$38,104,000 and a processing value-added of \$63,887,000 creating economic activity of \$81,975,000 and \$147,841,000, respectively, or a total of \$229,816,000 of economic activity.

Cling peaches and pears brought into the county for processing resulted in \$35,322,000 of value-added which resulted in \$81,739,000 of economic activity.

Breakdown of this economic activity by sector is shown in Table 4.

TABLE 4 - PEACHES

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	Grown in County			Grown Outside County	Total Tree Fruit Industry
	Production	Processing	Total Impact	Processing	Impact
22 Peach Production	\$35,178	\$ ----	\$ 35,178	\$ ---	\$ 35,178
23 Misc. Tree Fruits	2,967	---	2,967	---	2,967
27 Dairy Products	138	---	138	---	138
30 Agric. Services	28	37	65	20	85
31 General & Contract Construction	251	250	501	138	639
32 Meat Processing	294	823	1,117	455	1,572
33 Milk Processing	376	1,387	1,763	766	2,529
34 Canning Fruits/Vegetables	682	66,549	67,231	36,793	104,024
35 Dehydrated Fruits/Vegetables	140	963	1,103	532	1,635
36 Frozen Foods	433	2,339	2,772	1,293	4,065
37 Grain Mill Products	9	47	56	26	82
38 Bakery Products	249	445	694	246	940
39 Wine, Liquors, Beverages	183	595	778	329	1,107
40 Misc. Food Preparation/Oils	24	395	419	218	637
41 Wood and Paper Products	236	2,394	2,630	1,323	3,953
42 Printing, Publishing	173	2,310	2,483	1,277	3,710
43 Chemicals and Allied Products	146	737	883	407	1,290
44 Stone, Glass, Clay, Concr. Prod.	192	287	479	158	637
45 Metal and Fabricated Metal Prod.	120	7,745	7,865	4,282	12,147
46 Machinery and Equipment	13	117	130	65	195
47 Electrical Machinery and Equipment	54	113	167	62	229
48 Transportation, Warehousing	624	2,411	3,035	1,333	4,368
49 Utilities	526	724	1,250	400	1,650
50 Wholesale Trade	909	4,223	5,132	2,334	7,466
51 Retail Trade	5,281	7,403	12,684	4,093	16,777
52 Finance, Insurance, Real Estate	5,571	5,482	11,053	3,031	14,084
53 Professional Services	2,406	3,958	6,364	2,188	8,552
54 Household or Personal Income	24,415	36,059	60,474	19,937	80,411
Sub-total	\$81,618	\$147,793	\$229,411	\$81,721	\$311,132
Percent of Total Impacts	99.6	100	100	100	100
Total Impacts	<u>\$81,975</u>	<u>\$147,841</u>	<u>\$229,816</u>	<u>\$81,739</u>	<u>\$311,555</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of peaches and miscellaneous tree fruits.

Sector impacts based on Input-Output matrix of direct and indirect effects.

ALMONDS

In 1979 over 57,000,000 pounds of almond meats and 40,000 tons of almond hulls were produced with a gross value of \$92,838,000. This production had an economic impact of \$200,261,000.

It was assumed, on balance, that this production was processed within the county resulting in a value-added of \$14,256,000 and economic activity of \$33,336,000. Knowledgeable sources indicate a net import into the county of 3,000,000 lbs. of meats for processing resulting in \$750,000 value-added and \$1,754,000 of economic activity.

The breakdown of this economic impact by sector is shown in Table 5. For almonds grown and processed in the county the economic multiplier effect is 2.5.

TABLE 5 - ALMONDS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector <u>1/</u>	(\$1,000)			Grown Outside County Processing	Total Almond Industry Impact
	Grown in County		Total		
	Production	Processing	Impact		
19 Almond Production	\$ 92,900	\$ ---	\$ 92,900	\$ ---	\$ 92,900
27 Dairy Production	304	---	304	---	304
30 Agric. Services	71	15,539	15,610	817	16,427
31 General & Contract Construction	603	108	711	6	717
32 Meat Processing	652	119	771	6	777
33 Milk Processing	826	154	980	8	988
34 Canning Fruits/Vegetables	1,493	248	1,741	13	1,754
35 Dehydrated Fruits/Vegetables	307	55	362	3	365
36 Frozen Foods	948	158	1,106	8	1,114
37 Grain Mill Products	22	15	37	1	38
38 Bakery Products	550	91	641	5	646
39 Wine, Liquors, Beverages	401	70	471	4	475
40 Misc. Food Preparation/Oils	54	11	65	1	66
41 Wood and Paper Products	552	997	1,549	52	1,601
42 Printing, Publishing	395	79	474	4	478
43 Chemicals and Allied Products	377	329	706	17	723
44 Stone, Glass, Clay, Concrete Prod.	472	190	662	10	672
45 Metal and Fabricated Metal Prod.	288	131	419	7	426
46 Machinery and Equipment	34	49	83	3	86
47 Electrical Machinery and Equipment	137	26	163	1	164
48 Transportation, Warehousing	812	254	1,066	13	1,079
49 Utilities	3,337	156	3,493	8	3,501
50 Wholesale Trade	3,682	446	4,128	23	4,151
51 Retail Trade	13,732	1,686	15,418	89	15,507
52 Finance, Insurance, Real Estate	13,395	2,397	15,792	126	15,918
53 Professional Services	9,744	1,222	10,966	64	11,030
54 Household or Personal Income	53,363	8,785	62,148	462	62,610
Sub-total	\$199,451	\$33,315	\$232,766	\$1,751	\$234,517
Percent of Total Impacts	99.6	100	99.6	100	99.6
Total Impacts	<u>\$200,261</u>	<u>\$33,336</u>	<u>\$233,597</u>	<u>\$1,754</u>	<u>\$235,351</u>

1/ Principal business sectors that experience economic activity as a result of the growing and processing of almonds.

Sector impacts based on Input-Output matrix of direct and indirect effects.

WALNUTS

Approximately 34,000 tons of in-shell walnuts were produced in the county in 1979. About 75 percent of this production was exported from the county for processing elsewhere. The remaining 25 percent was processed within the county.

Of the total tonnage processed in the county 72 percent or 22,000 tons were grown outside the county. As an industry average about two-thirds of the crops is marketed as walnut meats and one-third as in-shell walnuts.

The county production had a value of \$31,425,000 and resulted in \$68,689,000 of economic activity. Tonnage grown and processed in the county resulted in a value-added of \$14,090,000 and had an economic impact of \$32,948,000. Production and processing within the county thusly resulted in \$101,637,000 of economic activity. For walnuts grown and processed in the county, the economic multiplier effect is 3.2. Walnuts brought into the county for processing resulted in \$35,625,000 of value-added which gave rise to \$83,306,000 of economic activity.

Table 6 presents a breakdown of economic impacts of production and processing on the various economic sectors of the county economy.

TABLE 6 - WALNUTS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	Grown in County			Grown	Total
	Production	Processing	Total Impact	Outside	Walnut
				County Processing	Industry Impact
	(\$1,000)				
24 Walnut Production	\$31,436	\$ ---	\$ 31,436	\$ ---	\$ 31,436
27 Dairy Production	102	---	102	---	102
30 Agric. Services	21	15,359	15,380	38,833	54,213
31 General & Contract Construction	176	107	283	270	553
32 Meat Processing	220	118	338	298	636
33 Milk Processing	278	153	431	384	815
34 Canning Fruits/Vegetables	502	246	748	620	1,368
35 Dehydrated Fruits/Vegetables	103	54	157	136	293
36 Frozen Foods	319	156	475	395	870
37 Grain Mill Products	7	15	22	37	59
38 Bakery Products	185	90	275	227	502
39 Wine, Liquors, Beverages	135	69	204	176	380
40 Misc. Food Preparation/Oils	18	11	29	28	57
41 Wood and Paper Products	188	985	1,173	2,493	3,666
42 Printing, Publishing	132	80	212	198	410
43 Chemicals and Allied Products	131	329	460	823	1,283
44 Stone, Glass, Clay, Concrete Prod.	161	188	349	475	824
45 Metal and Fabricated Metal Prod.	99	130	229	328	557
46 Machinery and Equipment	11	49	60	122	182
47 Electrical Machinery and Equipment	46	26	72	66	138
48 Transportation, Warehousing	338	251	589	635	1,224
49 Utilities	1,794	155	1,949	391	2,340
50 Wholesale Trade	1,293	441	1,734	1,115	2,849
51 Retail Trade	4,936	1,666	6,602	4,214	10,816
52 Finance, Insurance, Real Estate	3,903	2,369	6,272	5,990	12,262
53 Professional Services	3,907	1,208	5,115	3,055	8,170
54 Household or Personal Income	<u>17,960</u>	<u>8,682</u>	<u>26,642</u>	<u>21,951</u>	<u>48,593</u>
Sub-total	\$68,401	\$32,937	\$101,338	\$83,260	\$184,598
Percent of Total Impacts	<u>99.6</u>	<u>100</u>	<u>99.7</u>	<u>100</u>	<u>99.8</u>
Total Impacts	<u>\$68,689</u>	<u>\$32,948</u>	<u>\$101,637</u>	<u>\$83,306</u>	<u>\$184,943</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of walnuts.

Sector impacts based on Input-Output matrix of direct and indirect effects.

APRICOTS

Apricots produced in the county enter the market as canned, frozen, dried, and fresh market fruit. In 1979 approximately 75,000 tons were produced.

Of this production, 75 percent is exported out of the county for processing elsewhere. Of the remaining 25 percent, 55 percent is canned, 38 percent dried, 5 percent frozen and about 2 percent goes to the fresh market. Only a nominal amount is imported into the county.

The weighted average economic multiplier for apricots produced and processed in the county is 3.5. This is based on a gross value of production of \$18,033,000 creating \$40,463,000 of economic activity. Of that portion processed in the county value-added was \$9,742,000 creating \$22,546,000 of economic activity. Total economic activity resulting from apricots produced and processed in the county is thusly \$63,009,000.

Impacts on the various county economic sectors are shown in Table 7.

TABLE 7 - APRICOTS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	Grown in County			Total
	Production	Processing	Impact	Apricot Industry Impact
20 Apricot Production	\$18,040	\$ ---	\$18,040	\$18,040
30 Agric. Services	10	5	15	15
31 General & Contract Construction	79	36	115	115
32 Meat Processing	157	180	337	337
33 Milk Processing	200	174	374	374
34 Canning Fruits/Vegetables	364	7,543	7,907	7,907
35 Dehydrated Fruits/Vegetables	75	2,929	3,004	3,004
36 Frozen Foods	231	807	1,038	1,038
37 Grain Mill Products	5	6	11	11
38 Bakery Products	133	73	206	206
39 Wine, Liquors, Beverages	97	84	181	181
40 Misc. Food Preparation/Oils	12	77	89	89
41 Wood and Paper Products	123	740	863	863
42 Printing, Publishing	88	286	374	374
43 Chemicals and Allied Products	70	110	180	180
44 Stone, Glass, Clay, Concrete Products	97	41	138	138
45 Metal and Fabricated Metal Products	63	899	962	962
46 Machinery and Equipment	5	17	22	22
47 Electrical Machinery and Equipment	26	15	41	41
48 Transportation, Warehousing	224	349	573	573
49 Utilities	505	105	610	610
50 Wholesale Trade	419	642	1,061	1,061
51 Retail Trade	2,786	1,009	3,795	3,795
52 Finance, Insurance, Real Estate	1,755	792	2,547	2,547
53 Professional Services	1,584	569	2,153	2,153
54 Household or Personal Income	<u>13,037</u>	<u>5,041</u>	<u>18,078</u>	<u>18,078</u>
Sub-total	\$40,185	\$22,529	\$62,714	\$62,714
Percent of Total Impacts	<u>99.3</u>	<u>100</u>	<u>99.5</u>	<u>99.5</u>
Total Impacts	<u>\$40,463</u>	<u>\$22,546</u>	<u>\$63,009</u>	<u>\$63,009</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of apricots.

Sector impacts based on Input-Output matrix of direct and indirect effects.

FIELD CROPS

This category includes barley, wheat, corn and cereal silage, miscellaneous hay crops, alfalfa, irrigated and range pasture, rice, sugar beets and dry beans.

Processing of field crops in the county consists primarily of cleaning and grading dry beans, making corn and cereal silage, mixing of livestock and poultry feeds and production of consumer cereal products.

Of the dry beans processed in the county, about 65 percent are grown in the county; 35 percent are grown elsewhere. Essentially all commodities processed for consumer cereal products are imported into the county. Of all the animal feed constituents processed in the county, 95 percent are imported into the county with only 5 percent grown in the county.

The weighted average economic multiplier for field crops produced and processed in the county is 2.4. This is based on a gross value of production of \$84,239,000 resulting in \$186,470,000 of economic activity and a related processing value-added of \$6,795,000 resulting in \$15,713,000 of economic activity. Total economic impact is thus \$202,191,000.

Commodities grown elsewhere and imported into the county for processing resulted in \$19,390,000 of value-added creating \$40,693,000 of economic impact. A breakdown of this impact on the various economic sectors in the county is shown in Table 8.

TABLE 8 - FIELD CROPS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	(\$1,000)			Grown Outside County Processing	Total Field Crops Industry Impact
	<u>Grown in County</u>		<u>Total Impact</u>		
	<u>Production</u>	<u>Processing</u>			
1 Barley Production	\$ 3,697	\$ ---	\$ 3,697	\$ ---	\$ 3,697
2 Wheat Production	1,596	---	1,596	---	1,596
3 Corn Production	17,415	---	17,415	---	17,415
4 Misc. Hay Production	4,765	---	4,765	---	4,765
5 Alfalfa Production	14,954	---	14,954	---	14,954
6 Irrig. and Range Pasture Prod.	14,718	---	14,718	---	14,718
7 Rice Production	3,117	---	3,117	---	3,117
8 Sugar Beets Production	1,779	---	1,779	---	1,779
9 Dry Bean Production	22,426	---	22,426	---	22,426
30 Agric. Services	75	6,734	6,809	4,273	11,082
31 General & Contract Construction	679	48	727	70	797
32 Meat Processing	579	68	647	439	1,086
33 Milk Processing	734	89	823	594	1,417
34 Canning Fruits/Vegetables	1,327	116	1,443	272	1,715
35 Dehydrated Fruits/Vegetables	273	25	298	50	348
36 Frozen Foods	842	74	916	198	1,114
37 Grain Mill Products	20	746	766	18,354	19,120
38 Bakery Products	487	42	529	97	626
39 Wine, Liquors, Beverages	356	32	388	63	451
40 Misc. Food Preparation/Oils	48	45	93	1,007	1,100
41 Wood and Paper Products	501	453	954	793	1,747
42 Printing, Publishing	365	38	403	92	495
43 Chemicals and Allied Products	367	159	526	512	1,038
44 Stone, Glass, Clay, Concrete Prod.	445	84	529	96	625
45 Metal and Fabricated Metal Products	265	70	335	350	685
46 Machinery and Equipment	34	22	56	29	85
47 Electrical Machinery and Equipment	130	12	142	22	164
48 Transportation, Warehousing	927	127	1,054	506	1,560
49 Utilities	5,840	73	5,913	171	6,084
50 Wholesale Trade	1,900	230	2,130	1,043	3,173
51 Retail Trade	13,301	769	14,070	1,419	15,489
52 Finance, Insurance, Real Estate	15,119	1,075	16,194	1,557	17,751
53 Professional Services	8,932	555	9,487	991	10,478
54 Household or Personal Income	47,417	4,019	51,436	7,685	59,121
Sub-total	\$185,665	\$15,705	\$201,370	\$40,683	\$242,053
Percent of Total Impacts	99.5	100	99.6	100	99.7
Total Impacts	<u>\$186,478</u>	<u>\$15,713</u>	<u>\$202,191</u>	<u>\$40,693</u>	<u>\$242,884</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of field crops.

Sector impacts based on Input-Output matrix of direct and indirect effects.

SEED CROPS

This includes various vegetable and field crops grown for seed. Processing consists primarily of cleaning, grading and packaging.

The weighted average economic multiplier for seed crops produced and processed in the county was determined to be 4.3. This is based on a gross value of production of \$2,080,000 resulting in \$4,271,000 of economic activity and related processing value-added of \$2,118,000 resulting in \$4,574,000 of economic activity. Total economic activity is thus \$8,845,000.

Seed crops grown elsewhere and processed in the county resulted in \$3,756,000 of value-added creating \$8,111,000 of economic activity. A breakdown of this impact on other economic sectors of the county is shown in Table 9.

TABLE 9 - SEED CROPS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	Grown in County			Grown	Total
	Production	Processing	Impact	Outside County Processing	Seed Crops Industry Impact
10 Seed Crop Production	\$2,080	\$ ---	\$2,080	\$ ---	\$ 2,080
27 Dairy Production	6	---	6	---	6
30 Agric. Services	1	2,132	2,133	3,781	5,914
31 General & Contract Construction	11	14	25	26	51
32 Meat Processing	12	16	28	28	56
33 Milk Processing	16	21	37	37	74
34 Canning Fruits/Vegetables	29	34	63	60	123
35 Dehydrated Fruits/Vegetables	6	7	13	13	26
36 Frozen Foods	18	21	39	38	77
37 Grain Mill Products	0	2	2	3	5
38 Bakery Products	10	12	22	22	44
39 Wine, Liquors, Beverages	7	9	16	17	33
40 Misc. Food Preparation/Oils	1	1	2	2	4
41 Wood and Paper Products	11	136	147	242	389
42 Printing, Publishing	7	10	17	19	36
43 Chemicals and Allied Products	7	45	52	80	132
44 Stone, Glass, Clay, Concrete Prod.	9	26	35	46	81
45 Metal and Fabricated Metal Products	5	18	23	31	54
46 Machinery and Equipment	0	6	6	11	17
47 Electrical Machinery and Equipment	2	3	5	6	11
48 Transportation, Warehousing	17	34	51	61	112
49 Utilities	76	21	97	38	135
50 Wholesale Trade	16	61	77	108	185
51 Retail Trade	381	231	612	410	1,022
52 Finance, Insurance, Real Estate	257	328	585	583	1,168
53 Professional Services	205	167	372	297	669
54 Household or Personal Income	<u>1,050</u>	<u>1,205</u>	<u>2,255</u>	<u>2,137</u>	<u>4,392</u>
Sub-total	\$4,240	\$4,560	\$8,800	\$8,096	\$16,896
Percent of Total Impacts	<u>99.3</u>	<u>99.7</u>	<u>99.5</u>	<u>99.8</u>	<u>99.6</u>
Total Impacts	<u>\$4,271</u>	<u>\$4,574</u>	<u>\$8,845</u>	<u>\$8,111</u>	<u>\$16,956</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of seed crops.

Sector impacts based on Input-Output matrix of direct and indirect effects.

NURSERY PRODUCTS

Decidious fruit and nut trees, ornamentals, turf, greenhouse plants and miscellaneous are included in this category. Processing includes primarily preparation of bare-root trees, turf and ornamentals for market.

The weighted average economic multiplier for nursery products grown and processed in the county is 2.9. Gross value of production is \$13,806,000 and processing value-added is \$5,737,000 resulting in economic activity of \$28,097,000 and \$12,389,000, respectively, for a total of \$40,486,000.

Impacts on the various sectors of the county economy are shown in Table 10.

TABLE 10 - NURSERY PRODUCTS
PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	Grown in County			Total Nursery Industry Impact
	Production	Processing	Total Impact	
5 Alfalfa Production	\$ 12	\$ ---	\$ 12	\$ 12
18 Tomato Production	15	---	15	15
19 Almond Production	9	---	9	9
22 Peach Production	13	---	13	13
25 Nursery Products Production	13,807	---	13,807	13,807
26 Livestock Production	16	---	16	16
27 Dairy Production	44	---	44	44
30 Agric. Services	6	5,775	5,781	5,781
31 General & Contract Construction	57	40	97	97
32 Meat Processing	94	44	138	138
33 Milk Processing	120	57	177	177
34 Canning Fruits/Vegetables	219	92	311	311
35 Dehydrated Fruits/Vegetables	45	20	65	65
36 Frozen Foods	139	58	197	197
37 Grain Mill Products	2	5	7	7
38 Bakery Products	79	33	112	112
39 Wine, Liquors, Beverages	58	26	84	84
40 Misc. Food Preparation/Oils	7	4	11	11
41 Wood and Paper Products	80	370	450	450
42 Printing, Publishing	54	29	83	83
43 Chemicals and Allied Products	44	122	166	166
44 Stone, Glass, Clay, Concrete Products	60	70	130	130
45 Metal and Fabricated Metal Products	38	48	86	86
46 Machinery and Equipment	3	18	21	21
47 Electrical Machinery and Equipment	15	9	24	24
48 Transportation, Warehousing	192	94	286	286
49 Utilities	278	58	836	836
50 Wholesale Trade	104	165	269	269
51 Retail Trade	2,639	626	3,265	3,265
52 Finance, Insurance, Real Estate	1,276	891	2,167	2,167
53 Professional Services	660	454	1,114	1,114
54 Household or Personal Income	7,843	3,265	11,108	11,108
Sub-total	\$28,028	\$12,373	\$40,401	\$40,401
Percent of Total Impacts	99.8	99.9	99.8	99.8
Total Impacts	<u>\$28,097</u>	<u>\$12,389</u>	<u>\$40,486</u>	<u>\$40,486</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of nursery products.

Sector impacts based on Input-Output matrix of direct and indirect effects.

DAIRY PRODUCTS

The production of market milk and manufacturing milk comprises this category. The latter enters the market in the form of butter, cheese, cottage cheese, powdered milk, ice cream, etc. Considerable movement of milk occurs, however, it is assumed movement across the county lines, in general, balances out.

The weighted average economic multiplier is computed to be 2.3. This is based on a gross value of production of \$147,370,000 resulting in \$235,320,000 of economic activity and a related processing value-added of \$52,923,000 resulting in \$101,909,000 of economic activity. Total economic impact is thus \$337,229,000.

A breakdown of this impact on the various production, processing and trade sectors is shown in Table 11.

TABLE 11 - DAIRY PRODUCTS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector ^{1/}	Grown in County			Total Dairy Industry Impact
	Production	Processing	Total Impact	
(\$1,000)				
<u>Production Sectors:</u>				
3 Corn Silage Production	\$ 64	\$ ---	\$ 64	\$ 64
4 Misc. Hay Production	15	---	15	
5 Alfalfa Production	5,271	---	5,271	5,271
6 Irrig. and Range Pasture Prod.	968	---	968	968
8 Sugar Beet Production	11	---	11	11
9 Dry Bean Production	16	---	16	16
11 Melon Production	11	---	11	11
18 Tomato Production	61	---	61	61
19 Almond Production	37	---	37	37
20 Apricot Production	16	---	16	16
21 Grape Production	29	---	29	29
22 Peach Production	54	---	54	54
24 Walnut Production	20	---	20	20
26 Livestock Production	10,394	---	10,394	10,394
27 Dairy Production	147,548	---	147,548	147,548
28 Poultry Production	21	---	21	21
29 Egg Production	20	---	20	20
<u>Trade and Processing Sectors:</u>				
30 Agric. Services	32	22	54	54
31 General & Contract Construction	275	164	439	439
32 Meat Processing	382	310	692	692
33 Milk Processing	486	67,818	68,304	68,304
34 Canning Fruits/Vegetables	883	352	1,235	1,235
35 Dehydrated Fruits/Vegetables	182	77	259	259
36 Frozen Foods	561	224	785	785
37 Grain Mill Products	12	4	16	16
38 Bakery Products	322	134	456	456
39 Wine, Liquors, Beverages	237	94	331	331
40 Misc. Food Preparation/Oils	31	135	166	166
41 Wood and Paper Products	401	3,492	3,893	3,893
42 Printing, Publishing	240	512	752	752
43 Chemicals and Allied Products	223	300	523	523
44 Stone, Glass, Clay, Concrete Products	300	133	433	433
45 Metal and Fabricated Metal Products	175	1,699	1,874	1,874
46 Machinery and Equipment	17	68	85	85
47 Electrical Machinery and Equipment	73	64	137	137
48 Transportation, Warehousing	422	495	917	917
49 Utilities	2,045	933	2,978	2,978
50 Wholesale Trade	619	2,625	3,244	3,244
51 Retail Trade	20,755	2,598	23,353	23,353
52 Finance, Insurance, Real Estate	6,093	3,645	9,738	9,738
53 Professional Services	4,340	3,563	7,903	7,903
54 Household or Personal Income	31,608	12,411	44,019	44,019
Sub-Total	\$235,270	\$101,872	\$337,142	\$337,142
Percent of Total Impacts	99.9	99.9	99.9	99.9
Total Impacts	<u>\$235,320</u>	<u>\$101,909</u>	<u>\$337,229</u>	<u>\$337,229</u>

^{1/} Principal business sectors that experience economic activity as a result of the production and processing of dairy products.

Sector impacts based on Input-Output matrix of direct and indirect effects.

POULTRY PRODUCTS

This category includes the production of turkeys, chickens and eggs.

Turkeys: Production includes meat birds and poults for a total value in 1979 of \$10,960,000 resulting in \$23,588,000 of economic activity. Processing value-added for turkeys grown in the county was \$2,620,000 resulting in \$5,838,000 of economic activity. Total economic activity resulting from turkeys grown and processed in the county is thus \$29,426,000. Economic multiplier is 2.7. Processing value-added for turkeys grown outside the county was \$46,050,000 resulting in \$102,609,000 of economic activity. Turkeys are marketed as dressed birds and processed meat.

Chickens: Production includes fryers, cull hens and chicks for a total value in 1979 of \$81,964,000 resulting in \$176,403,000 of economic activity. Processing value-added was \$27,226,000 resulting in \$60,665,000 of economic activity. Production and processing thus resulted in \$237,068,000 of economic activity. It was assumed any raw product movement across county lines balanced off. Economic multiplier is 2.9.

Eggs: Production includes eggs for market, chicken and turkey hatching eggs and breaker eggs. Total value in 1979 was \$57,965,000 resulting in \$117,947,000 of economic activity. Processing value-added was \$21,683,000 resulting in \$46,824,000 of economic activity. Production and processing thus resulted in a total of \$164,771,000 of economic activity. Any raw product movement across county lines was assumed to balance off. Economic multiplier is 2.8.

The above is summarized in Table 12. Weighted average economic multiplier for the three products grown and processed in the county is 2.8. Total economic activity resulting from production and all poultry products processing in the county was \$533,874,000.

TABLE 12

SUMMARY - POULTRY PRODUCTS PRODUCTION & PROCESSING IMPACTS

A. Produced and Processed in the County

	<u>Production Value</u> (1)	<u>Processing Value-Added</u> (2)	<u>Economic Impact Value</u>		<u>Economic Multiplier*</u> (5)
			<u>Production</u> (3)	<u>Processing</u> (4)	
Turkeys	\$ 10,960,000	\$ 2,620,000	\$ 23,588,000	\$ 5,838,000	2.7
Chickens	81,964,000	27,226,000	176,403,000	60,665,000	2.9
Eggs	<u>57,965,000</u>	<u>21,683,000</u>	<u>117,947,000</u>	<u>46,824,000</u>	<u>2.8</u>
Totals	<u>\$150,889,000</u>	<u>\$51,529,000</u>	<u>\$317,938,000</u>	<u>\$113,327,000</u>	
	Total Economic Impact--\$431,265,000				2.8

* Column (5) is Column (3) plus Column (4) divided by Column (1).

B. Produced Outside the County, Processed Within the County

<u>Product</u>	<u>Processing Value-Added</u>	<u>Processing Impact Value</u>
Turkeys	<u>\$46,050,000</u>	<u>\$102,609,000</u>

A breakdown of this economic activity, showing impacts on the various sectors of the county's economy is shown in Table 13.

TABLE 13 - POULTRY PRODUCTS

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector 1/ <u>Production Sectors:</u>	Grown in County			Grown Outside County <u>Processing</u>	Total Poultry Industry <u>Impact</u>
	(\$1,000)				
	<u>Production</u>	<u>Processing</u>	<u>Total Impact</u>		
1 Barley	\$ 792	\$ ---	\$ 792	\$ ---	\$ 792
2 Wheat	265	---	265	---	265
3 Corn Silage	2,594	---	2,594	---	2,594
5 Alfalfa	146	---	146	---	146
6 Irrig. and Range Pasture	110	---	110	---	110
7 Rice	468	---	468	---	468
9 Dry Bean	4,950	---	4,950	---	4,950
18 Tomato	116	---	116	---	116
19 Almond	54	---	54	---	54
22 Peach	78	---	78	---	78
26 Livestock	186	---	186	---	186
27 Dairy	521	---	521	---	521
28 Poultry	103,255	---	103,255	---	103,255
29 Egg	68,405	---	68,405	---	68,405
<u>Trade and Processing Sectors:</u>					
30 Agric. Services	134	21,848	21,982	29	22,011
31 General & Contract Construction	387	250	637	150	787
32 Meat Processing	1,100	38,530	39,630	59,190	98,820
33 Milk Processing	1,433	532	1,965	486	2,451
34 Canning Fruits/Vegetables	1,274	747	2,021	613	2,634
35 Dehydrated Fruits/Vegetables	243	177	420	154	574
36 Frozen Foods	857	560	1,417	521	1,938
37 Grain Mill Products	44,604	64	44,668	65	44,733
38 Bakery Products	460	275	735	226	961
39 Wine, Liquors, Beverages	320	223	543	190	733
40 Misc. Food Preparation/Oils	1,970	107	2,077	140	2,217
41 Wood and Paper Products	1,318	2,830	4,148	2,205	6,353
42 Printing, Publishing	360	702	1,062	911	1,973
43 Chemicals and Allied Products	1,026	1,545	2,571	1,670	4,241
44 Stone, Glass, Clay, Concrete Prod.	370	377	747	170	917
45 Metal and Fabricated Metal Prod.	756	585	1,341	617	958
46 Machinery and Equipment	47	110	157	62	219
47 Electrical Machinery and Equipment	105	43	148	58	206
48 Transportation, Warehousing	1,337	1,768	3,105	2,177	5,282
49 Utilities	3,134	521	3,655	464	4,119
50 Wholesale	2,352	1,762	4,114	1,751	5,865
51 Retail Trade	15,439	4,810	20,249	3,766	24,015
52 Finance, Insurance, Real Estate	8,570	5,513	14,083	3,312	17,395
53 Professional Services	6,347	3,244	9,591	2,357	11,948
54 Household or Personal Income	41,837	26,136	67,973	21,288	89,261
Sub-Total	<u>\$317,720</u>	<u>\$113,259</u>	<u>\$430,979</u>	<u>\$102,572</u>	<u>\$533,551</u>
Percent of Total Impacts	99.9	99.9	99.9	99.9	99.9
Total Impacts	<u>\$317,938</u>	<u>\$113,327</u>	<u>\$431,265</u>	<u>\$102,609</u>	<u>\$533,874</u>

1/ Principal business sectors that experience economic activity as a result of the growing and processing of poultry and poultry products.

Sector impacts based on Input-Output matrix of direct and indirect effects.

LIVESTOCK

This category includes the following production and services:

- Beef, slaughter cows, veal
- Hogs and pigs
- Sheep and lambs
- Semen; heifer impregnation service
- Apiary products and services

Beef, Slaughter Cows, Veal: Total value of production in 1979 was \$41,754,000 resulting in \$65,266,000 of economic activity. Processing value-added was \$1,096,000 resulting in \$2,443,000 of economic activity. Economic multiplier is computed to be 1.6. Processing value-added of livestock imported into the county for processing totaled \$1,609,000 resulting in \$3,585,000 of economic activity. Of the total number of cattle processed, 87 percent were grown outside the county.

Hogs and Pigs: Total value of production was \$1,116,000; corresponding economic activity \$1,744,000. Processing value-added was \$1,261,000; corresponding economic activity \$2,810,000. Economic multiplier is computed to be 4.1. Processing value-added of hogs and pigs brought into the county for processing totaled \$4,500,000 resulting in \$10,027,000 of economic activity. Of the total hogs processed, 96 percent were grown outside the county.

Sheep and Lambs: Production value was \$256,000 with \$400,000 of economic activity resulting. Multiplier is 1.6. All are processed outside the county.

Semen and Related Services: Production value was \$8,466,000 resulting in \$19,797,000 of economic activity. Multiplier is 2.3.

Apiary Products and Services: This totaled \$2,450,000 of production value resulting in \$5,729,000 of economic activity. Economic multiplier is 2.3.

Following is a summary of the above.

TABLE 14

SUMMARY - LIVESTOCK PRODUCTION AND PROCESSING IMPACTS

A. Grown and Processed in the County

<u>Commodity or Service</u>	<u>Production Value</u> (1)	<u>Processing Value-Added</u> (2)	<u>Economic Impact Value</u>		<u>Economic Multiplier*</u> (5)
			<u>Production</u> (3)	<u>Processing</u> (4)	
Beef	\$41,754,000	\$1,096,000	\$65,266,000	\$2,443,000	1.6
Hogs	1,116,000	1,261,000	1,744,000	2,810,000	4.1
Sheep	256,000	---	400,000	---	1.6
Semen	8,466,000	---	19,797,000	---	2.3
Apiary	<u>2,450,000</u>	---	<u>5,729,000</u>	---	<u>2.3</u>
Totals	<u>\$54,042,000</u>	<u>\$2,357,000</u>	<u>\$92,936,000</u>	<u>\$5,253,000</u>	
Total Economic Impact--\$98,189,000					1.8

* Column (5) is Column (3) plus Column (4) divided by Column (1).

B. Grown Outside the County, Processed Within the County

<u>Commodity</u>	<u>Processing Value-Added</u>	<u>Economic Impact Processing</u>
Beef	\$1,609,000	\$ 3,585,000
Hogs	<u>4,500,000</u>	<u>10,027,000</u>
Totals	<u>\$6,109,000</u>	<u>\$13,612,000</u>

Weighted average economic multiplier for all livestock produced and processed in the county is 1.8. Economic impacts on the various sectors of the county's economy are shown in Table 15.

TABLE 15 - LIVESTOCK

PRODUCTION AND PROCESSING IMPACTS BY SECTOR

Economic Sector 1/ Production Sectors:	(\$1,000)			Grown Outside County Processing	Total Livestock Industry Impact
	Grown in County		Total Impact		
	Production	Processing			
1 Barley	\$ 80	\$ ---	\$ 80		\$ 80
3 Corn-silage	510	---	510		510
5 Alfalfa	707	---	707		707
6 Pasture	3,903	---	3,903		3,903
9 Drybean	498	---	498		498
18 Tomatoes	159	---	159		159
19 Almonds	98	---	98		98
21 Grapes	76	---	76		76
22 Peaches	142	---	142		142
26 Livestock	43,160	---	43,160		43,160
27 Dairy	95	---	95		95
28 Poultry	272	---	272		272
29 Eggs	260	---	260		260
<u>Trade and Processing Sectors:</u>					
30 Agric. Services	10,988	2	10,990	\$ 3	10,993
31 General & Contract Construction	158	8	166	20	186
32 Meat Processing	202	3,029	3,231	7,852	11,083
33 Milk Processing	257	25	282	64	346
34 Canning Fruits/Vegetables	463	31	494	81	575
35 Dehydrated Fruits/Vegetables	95	8	103	20	123
36 Frozen Foods	294	26	320	69	389
37 Grain Mill Products	144	3	147	8	155
38 Bakery Products	169	11	180	30	210
39 Wine, Liquors, Beverages	126	10	136	25	161
40 Misc. Food Preparation/Oils	22	7	29	18	47
41 Wood and Paper Products	690	112	802	292	1,094
42 Printing, Publishing	125	47	172	120	292
43 Chemicals and Allied Products	265	85	350	221	571
44 Stone, Glass, Clay, Concrete Prod.	204	9	213	22	235
45 Metal and Fabricated Metal Prod.	133	32	165	81	246
46 Machinery and Equipment	34	3	37	8	45
47 Electrical Machinery and Equipment	42	3	45	7	52
48 Transportation, Warehousing	339	112	451	288	737
49 Utilities	1,249	24	1,273	61	1,334
50 Wholesale	468	90	558	232	790
51 Retail Trade	3,464	193	3,657	499	4,156
52 Finance, Insurance, Real Estate	3,508	170	3,678	439	4,117
53 Professional Services	2,654	121	2,775	312	3,087
54 Household or Personal Income	16,553	1,090	17,643	2,824	20,467
Sub-Total	<u>\$92,606</u>	<u>\$5,251</u>	<u>\$97,857</u>	<u>\$13,596</u>	<u>\$111,453</u>
Percent of Total Impacts	99.6	100	99.7	99.9	99.7
Total Impacts	<u>\$92,936</u>	<u>\$5,253</u>	<u>\$98,189</u>	<u>\$13,612</u>	<u>\$111,801</u>

1/ Principal business sectors that experience economic activity as a result of the growing and processing of livestock, related livestock processing and services.

Sector impacts based on Input-Output matrix of direct and indirect effects.

TABLE 16

V. COUNTY SUMMARY - ECONOMIC IMPACTS AND MULTIPLIERS BY COMMODITY CATEGORY

(\$1,000)

Commodities Produced and Processed in the County:

	Production Value	Processing Value-Added	Economic Impacts			Multiplier 1/
			Production	Processing	Total	
Vegetable Crops	\$ 36,518	\$ 74,322	\$ 79,712	\$169,277	\$ 248,989	6.8
Grapes	28,821	97,219	63,219	161,315	224,534	7.8
Peaches	38,104	63,887	81,975	147,841	229,816	6.0
Almonds	92,838	14,256	200,261	33,336	233,597	2.5
Walnuts	31,425	14,090	68,689	32,948	101,637	3.2
Apricots	18,033	9,742	40,463	22,546	63,009	3.5
Field Crops	84,239	6,795	186,478	15,713	202,191	2.4
Seed Crops	2,080	2,118	4,271	4,574	8,845	4.3
Nursery Products	13,806	5,737	28,097	12,389	40,486	2.9
Dairy Products	147,370	52,923	235,320	101,909	337,229	2.3
Poultry Products	150,889	51,529	317,938	113,327	431,265	2.8
Livestock	54,042	2,357	92,936	5,253	98,189	1.8
Total	<u>\$698,165</u>	<u>\$394,975</u>	<u>\$1,399,359</u>	<u>\$820,428</u>	<u>\$2,219,787</u>	

Weighted average county economic multiplier - 3.2

1/ Dollars of economic impact per dollar of production value.

Commodities Grown out of County; Processed in the County:

	Processing Value-Added	Processing Economic Impact	Economic Multiplier 2/
Vegetable Crops	\$220,438	\$ 508,381	2.3
Grapes	383,496	640,335	1.7
Peaches	35,322	81,739	2.3
Almonds	750	1,754	2.3
Walnuts	35,625	83,306	2.3
Field Crops	19,390	40,693	2.1
Seed Crops	3,756	8,111	2.2
Poultry	46,050	102,609	2.2
Livestock	6,109	13,612	2.2
Total	<u>\$729,816</u>	<u>\$1,438,214</u>	<u>2.0</u>

2/ Based on processing value-added.

TABLE 17

VI. COUNTY SUMMARY - TOTAL ECONOMIC IMPACTS BY SECTOR 1/

(\$1,000)

<u>Economic Sector</u>	<u>County Total Sector Impact</u>	<u>Percent</u>
-- Production Sectors	\$ 801,610	21.9
30 Agric. Services	137,249	3.8
31 General & Contract Construction	7,070	0.2
32 Meat Processing	115,197	3.1
33 Milk Processing	77,475	2.1
34 Canning Fruits/Vegetables	347,727	9.5
35 Dehydrated Fruits/Vegetables	55,327	1.5
36 Frozen Foods	60,471	1.7
37 Grain Mill Products	64,579	1.8
38 Bakery Products	4,703	0.1
39 Wine, Liquors, Beverages	492,921	13.5
40 Misc. Food Preparation/Oils	4,394	0.1
41 Wood and Paper Products	56,029	1.5
42 Printing, Publishing	21,447	0.6
43 Chemicals and Allied Products	24,471	0.7
44 Stone, Glass, Clay, Concrete Products	7,366	0.2
45 Metal and Fabricated Metal Products	51,381	1.4
46 Machinery and Equipment	1,745	(0.05)
47 Electrical Machinery and Equipment	2,089	(0.06)
48 Transportation, Warehousing	35,125	1.0
49 Utilities	31,546	0.9
50 Wholesale Trade	63,377	1.7
51 Retail Trade	180,266	4.9
52 Finance, Insurance, Real Estate	156,401	4.3
53 Professional Services	101,394	2.8
54 Household or Personal Income	756,640	20.7
Total	<u>\$3,658,000</u>	<u>100.0</u>

1/ This summary includes impacts of those crops grown and processed in the county plus those grown outside and shipped into the county for processing.

VII. USE OF THE ECONOMIC MULTIPLIERS

Agricultural production and processing in the county has economic multiplier effects beyond the direct impacts of the original production or processing. Multiplier effects arise from the fact that farmers, processors, local businesses, households, governmental agencies, etc. purchase goods and services from one another. This interaction within the local economy resulting from agricultural production and processing creates indirect or multiplier effects.

The multiplier is a single value number that summarizes the total direct spending and indirect respending effects of farming activity and agricultural processing in the local county economy.

A specific economic activity (direct effect) will gradually dissipate itself. Some of the money involved will leak out of the local county economy while remaining money may turn over numerous times giving rise to additional economic activity (indirect effects).

Multipliers are determined in this study for 20 different commodities or grouped categories of commodities that are grown and processed in the county. These multipliers can be applied individually to the annual dollar production value of the respective specific commodity or commodity category. This will give a value of direct and indirect impacts (economic activity) of production and processing of the specific commodity.

For example, lets assume the value of the peach category of production is \$40,000,000 for 1980. Economic activity resulting from that production and processing, based on crop flow as described, would total \$240,000,000 ($\$40,000,000 \times 6.0$), a generation of \$200 million more than the initial value of the on-farm peach crop. This would represent the total within county direct and indirect effects of production and processing of those commodities included in the peach category. It would not reflect peaches grown outside but processed within the county. To determine a breakdown of this economic impact on the county's various economic sectors, one must utilize the computerized input-output model matrix of direct and indirect effects.

Caution must be exercised in the use of multipliers to avoid such misuses as interchanging multipliers, double counting, pyramiding, etc. It should be noted that, strictly speaking, the weighted average multipliers determined in this study are based on the multipliers of the 1974 input-output model applied to 1979 crop production values and processing value-added data. However, historically, multipliers do not change significantly unless major changes take place in the economic flow patterns in the community, in the commodity flow patterns, in price levels, or in technology.

Multipliers can be overlaid from one area to another, however, again, caution must be exercised that the economic relationships are similar: Stanislaus County has a significantly large agricultural processing industry. This may preclude the use of some of these Stanislaus County multipliers in some other counties. Errors introduced by such use would be nominal but should be recognized. It is highly unlikely that discrepancies resulting from overlaying would result in any subsequent erroneous decision-making since the impact data would provide benchmarks in lieu of having no data at all for consideration.

VIII. IMPACTS OF PROPOSED CHANGE

As stated earlier, the Stanislaus County Input-Output Model matrix can be used to determine the economic impacts of change. These could be proposed or unanticipated changes involving land use zoning changes, loss of irrigation water supply, raw land development, urbanization of agricultural land or the economic impacts resulting from plant or animal disease or insect infestation.

It should be pointed out economic impacts usually cannot be the sole determinant in a situation requiring a decision. Environmental, social and political aspects, community desires, etc. must be considered. The point is that knowledge of economic impacts provides an additional parameter for making more knowledgeable decisions.

Following are some examples of use of the input-output model matrix in determining the impacts of change.

EXAMPLE 1 - Economic Impacts of loss of 40 acres of Irrigated Pasture to Urban Type Development.

Situation: 40 acres of irrigated pasture used for beef cattle production. Soil is Madera and San Joaquin series which could be modified to grow deeper rooted crops when economically justified.

Information Needed:

A. Irrigated pasture production - 1980 value is \$125 per acre.
Total production value for 40 acres is \$5,000.

B. Beef cattle production - Potential under good management is 3 head/acre/year grown from 500 lbs. weight to 1,000 lbs. for slaughter.

Grower value of 250 lbs. gain per head per acre -
 $3 \times 250 \times 40 = 30,000$ lbs.
Sold at \$70 cwt. = \$21,000

Feed lot value is total value after additional 250 lbs. gain to 1,000 lbs. for slaughter
 $3 \times 750 \times 40 = 90,000$ lbs.
Sold at \$70 cwt. = \$63,000

Total Production Value = \$84,000

C. Meat Processing Value

120,000 lbs. x 60% yield =	72,000 lbs.
Processing value 72,000 lbs. x \$118 cwt.	\$84,960
Less production value	(84,000)
Hide and offal value	10,200
Net Processing value-added	<u>\$11,160</u>

By use of the input-output matrix of direct and indirect effects, economic impacts on the various economic sectors is determined for pasture production, the livestock production and the livestock or meat processing. These are presented in the following table.

EXAMPLE 1 - IRRIGATED PASTURE/LIVESTOCK

PRODUCTION AND PROCESSING ECONOMIC IMPACT LOSSES BY SECTOR IN DOLLARS

Economic Sector ^{1/}	<u>Pasture Production</u>	<u>Livestock Production</u>	<u>Meat Processing</u>	<u>Total Sector Losses</u>
6 Pasture Production	\$ 5,004	\$ 7,587		\$ 12,591
-- Other Crop Production	---	2,188		2,188
26 Livestock Production	---	84,180		84,180
30 Agricultural Services	3	19	\$ 7	29
31 General & Contract Construction	30	162	36	228
32 Meat Processing	36	246	14,344	14,626
33 Milk Processing	45	312	117	474
34 Canning Fruits/Vegetables	82	567	148	797
35 Dehydrated Fruits/Vegetables	17	117	37	171
36 Frozen Foods	52	360	126	538
37 Grain Mill Products	1	7	15	23
38 Bakery Products	30	207	54	291
39 Wine, Liquors, Beverages	22	152	46	220
40 Misc. Food Preparation/Oils	2	20	34	56
41 Wood and Paper Products	30	194	534	758
42 Printing, Publishing	22	142	221	385
43 Chemicals and Allied Products	22	125	404	551
44 Stone, Glass, Clay, Concrete Products	26	164	41	231
45 Metal and Fabricated Metal Products	16	105	149	270
46 Machinery and Equipment	1	10	15	26
47 Electrical Machinery and Equipment	7	47	14	68
48 Transportation, Warehousing	34	336	527	897
49 Utilities	741	2,126	112	2,979
50 Wholesale Trade	47	333	424	804
51 Retail Trade	860	4,302	912	6,074
52 Finance, Insurance, Real Estate	677	3,594	802	5,073
53 Professional Services	622	3,488	571	4,681
54 Household or Personal Income	2,955	20,303	5,159	28,417
Total Impacts	<u>\$11,455</u>	<u>\$131,305</u>	<u>\$24,866</u>	<u>\$167,626</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of irrigated pasture and livestock.

Sector impacts based on Input-Output matrix of direct and indirect effects.

EXAMPLE 2 - 40 acres French Columbard variety grapes considered for urbanization.

Question: What would be the economic impacts on the various sectors of the local economy if this loss of agricultural production occurred?

Information Needed (1980 estimates):

Production Value - Estimated annual production 8 tons/acre with a value of \$240 per ton produces \$76,800 of production value.

Processing Value

320 tons x 170 gallons/ton = 54,400 gallons wine

54,400 gallons @ \$5.35 =	\$291,040
Less production value of grapes	<u>76,800</u>
Value-added	<u>\$214,240</u>

The assumption is made that the grapes are converted to wine and bottled within the county. Based on the Input-Output model matrix of direct and indirect impacts, the county's economic sectors would realize reduced activity annually as shown in the following table.

EXAMPLE 2 - GRAPES

PRODUCTION AND PROCESSING ECONOMIC IMPACT LOSSES BY SECTOR IN DOLLARS

Economic Sector ^{1/}	<u>Grape Production</u>	<u>Grape Processing</u>	<u>Total Sector Impact</u>
21 Grape Production	\$ 76,846	\$ ---	\$ 76,846
-- Other Production Sectors	1,050	---	1,050
30 Agric. Services	61	88	149
31 General & Contract Construction	545	506	1,051
32 Meat Processing	610	2,462	3,072
33 Milk Processing	778	1,158	1,936
34 Canning Fruits/Vegetables	1,412	6,080	7,492
35 Dehydrated Fruits/Vegetables	291	2,253	2,544
36 Frozen Foods	897	9,600	10,497
37 Grain Mill Products	20	58	78
38 Bakery Products	516	2,277	2,793
39 Wine, Liquors, Beverages	379	220,639	221,018
40 Misc. Food Preparation/Oils	50	4,719	4,769
41 Wood and Paper Products	482	5,141	5,623
42 Printing, Publishing	360	1,675	2,035
43 Chemicals and Allied Products	309	4,448	4,757
44 Stone, Glass, Clay, Concrete Products	401	442	843
45 Metal and Fabricated Metal Products	251	2,205	2,456
46 Machinery and Equipment	28	98	126
47 Electrical Machinery and Equipment	115	149	264
48 Transportation, Warehousing	1,307	3,306	4,613
49 Utilities	2,418	1,193	3,611
50 Wholesale Trade	1,463	6,074	7,537
51 Retail Trade	9,804	9,741	19,545
52 Finance, Insurance, Real Estate	12,099	11,185	23,284
53 Professional Services	5,438	6,066	11,504
54 Household or Personal Income	<u>50,530</u>	<u>53,917</u>	<u>104,447</u>
Total Impacts	<u>\$168,460</u>	<u>\$355,480</u>	<u>\$523,940</u>

^{1/} Principal business sectors that experience economic activity as a result of the growing and processing of grapes.

Sector impacts based on Input-Output matrix of direct and indirect effects.

EXAMPLE 3 - Potential Economic Losses from Blackline Disease in Walnuts.

Situation - 1980 Crop Year: Blackline disease is causing serious losses to growers. At the present time prevention or cure of the disease is not known and requires removal of the infected tree to control spread. Loss of a tree is estimated to cost the grower \$200 to \$225 per tree to bring a replacement tree into full production. This includes removal of the diseased tree, soil fumigation, planting and culturing the new tree to full production eight years later. The above cost also includes loss of walnut production for seven years.

Assumptions:

Grower inputs over the seven-year period will approximate normal inputs. It is estimated 10 percent of the Stanislaus County walnut acreage (1979 - 23,700 acres) is affected or 2,400 acres. Average yield is 2,500 lbs. nuts per acre from 30 trees per acre or 83 lbs. of nuts per tree. It is assumed average loss of production over the seven-year period is 50 lbs. of nuts per tree.

Production Value Loss:

50 lbs. x 7 years x 50¢/lb.	= \$175 per tree
\$175 x 30 trees x 2,400 acres	12,600,000
Less:	
30 cords firewood @ \$80 x 2,400 acres	= <u>5,760,000</u>
Net production loss over 7 years	= <u>\$ 6,840,000</u>

Processing Value Loss:

Production loss--50 lbs./tree x 7 years	= 350 lbs./tree
350 lbs. x 30 trees/acre x 2,400 acres	= 25,200,000 lbs.
40% sold in-shell:	
10,080,000 lbs. @ 67¢	= \$ 6,753,600
60% sold as meats:	
15,120,000 lbs. x 45% yield	= 6,804,000 lbs. meats
@ \$1.75	= 11,907,000
Value of shells:	
8,316,000 lbs. @ \$75 per ton	= <u>311,900</u>
Total processing loss	= \$18,972,500
Less production value	= <u>12,600,000</u>
Total value-added loss over 7 years	= <u>\$ 6,372,500</u>

Total Economic Impacts:

This is determined by applying multipliers from the Stanislaus County Input-Output Model matrix of direct and indirect effects as follows:

Production value loss \$6,840,000 x 2.1858	= \$14,951,000
Processing value-added loss \$6,400,000 x 2.1595	13,821,000
Total economic losses over 7 years	<u>\$28,472,000</u>
Or, annual loss	<u>\$ 4,110,000</u>

This example is a realistic portrayal of the actual situation facing the walnut industry in Stanislaus County. However, it does not reflect additional losses that may result from increased incidence of the disease in succeeding years. Assuming that an additional 10 percent of the total county acreage were to become infected in 1981 and necessitate replacement, annual losses shown would essentially double.

County Economic Sector Impacts:

The above losses will be experienced by the various sectors of the county's economy and are shown in the following table.

EXAMPLE 3 - BLACKLINE IN WALNUTS

PRODUCTION AND PROCESSING ECONOMIC IMPACT LOSSES BY SECTOR

(\$1,000)

Economic Sector 1/	Walnut Production	Walnut Processing	Total Impact: 7 Year Loss	Annual Impact Loss
24 Walnut Production	\$ 6,842	\$ ---	\$ 6,842	\$ 977
-- Other Production Sectors	96	20	116	16
30 Agric. Services	4	6,443	6,447	921
31 General & Contract Construction	38	44	82	12
32 Meat Processing	47	49	96	14
33 Milk Processing	60	63	123	18
34 Canning Fruits/Vegetables	109	102	211	30
35 Dehydrated Fruits/Vegetables	22	22	44	6
36 Frozen Foods	69	65	134	19
37 Grain Mill Products	1	6	7	1
38 Bakery Products	40	37	77	11
39 Wine, Liquors, Beverages	29	29	58	8
40 Misc. Food Preparation/Oils	3	4	7	1
41 Wood and Paper Products	41	413	454	65
42 Printing, Publishing	28	32	60	9
43 Chemicals and Allied Products	28	136	164	23
44 Stone, Glass, Clay, Concrete Products	35	78	113	16
45 Metal and Fabricated Metal Products	21	54	75	11
46 Machinery and Equipment	2	20	22	3
47 Electrical Machinery and Equipment	10	10	20	3
48 Transportation, Warehousing	73	105	178	25
49 Utilities	390	64	454	65
50 Wholesale Trade	281	185	466	67
51 Retail Trade	1,074	699	1,773	253
52 Finance, Insurance, Real Estate	849	993	1,842	263
53 Professional Services	850	506	1,356	194
54 Household or Personal Income	3,909	3,642	7,551	1,079
Total Impact Losses	<u>\$14,951</u>	<u>\$13,821</u>	<u>\$28,772</u>	<u>\$4,110</u>

1/ Principal business sectors that experience economic activity as a result of the growing and processing of walnuts.

Sector impacts based on Input-Output matrix of direct and indirect effects.

REFERENCES

- Goldman, George E. 1974, Explanation and Application of County Input-Output Models. University of California Cooperative Extension.
- Goldman, George and Strong, David, 1977, Economic Impacts of Resource Utilization. Stanislaus County - 1974 Input-Output Model. University of California Cooperative Extension.
- Lewis, Youmans, Goldman, Premer, Coping with Growth. Economic Multipliers: Can a Rural Community Use Them? Western Rural Development Center, Oregon State University.
- Miernyk, William H. 1957, The Elements of Input-Output Analysis. Random House, New York.
- Richardson, Harry W. 1972, Input-Output and Regional Economics. Weidenfeld and Nicolson, London.
- Stanislaus County Agricultural Commissioner, Agricultural Crop Report, 1979.
- Yin-Po Lee, 1975, A Study of the Structure of the Stanislaus Economy. Institute of Economic Research, California State College, Stanislaus